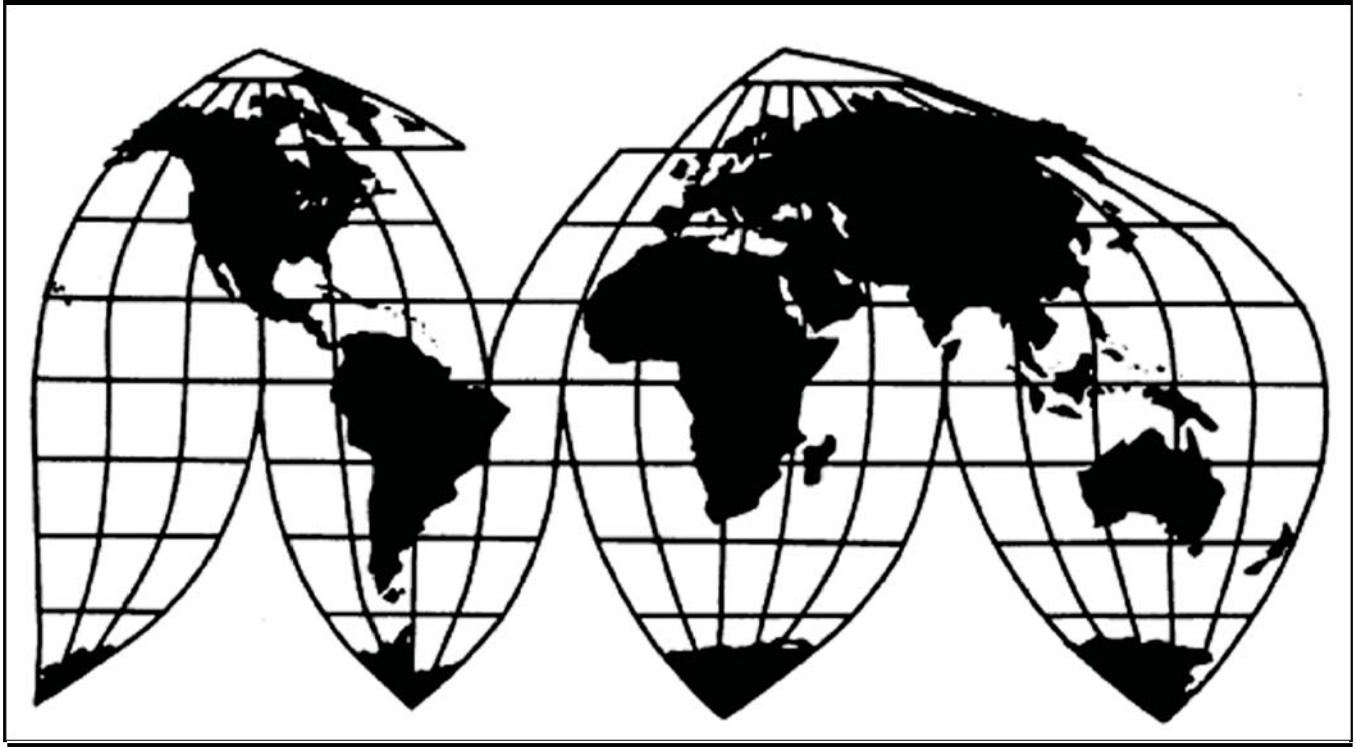
In the Matter of

Certain Combination Motor and Transmission Systems and Devices Used Therein, and Products Containing Same

Investigation No. 337-TA-561

Publication 4130 **March 2010**

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

COMMISSIONERS

Shara L. Aranoff, Chairman
Daniel R. Pearson, Vice Chairman
Deanna Tanner Okun
Charlotte R. Lane
Irving A. Williamson
Dean A. Pinkert

Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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UNITED STATES INTERNATIONAL TRADE COMMISSION
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In the Matter of **CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING THE SAME**	**Investigation No. 337-TA-561**

NOTICE OF COMMISSION DECISION TO REVIEW IN PART AND ON REVIEW TO MODIFY A FINAL INITIAL DETERMINATION FINDING NO VIOLATION OF SECTION 337

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to review in part the presiding administrative law judge's ("ALJ") initial determination ("ID") finding no violation of Section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) with regard to the above-captioned investigation. On review, the Commission has determined to take no position on the ALJ's findings concerning the economic prong of the domestic industry requirement. Accordingly, the Commission has terminated the investigation with a finding of no violation of Section 337.

FOR FURTHER INFORMATION CONTACT: Christal A. Sheppard, Esq., Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 708-2301. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov*. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION:

This investigation was instituted on February 7, 2006, based on a complaint filed by Solomon Technologies, Inc., of Tarpon Springs, Florida ("Solomon"). The complaint, as amended, alleged violations of Section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the

importation into the United States, the sale for importation, and the sale within the United States after importation of certain combination motor and transmission systems and devices used therein, and products containing same by reason of infringement of claims 1-5, 7, 8, 10, and 12 of United States Patent No. 5,067,932 ("the '932 patent"). 71 *Fed. Reg.* 7574. Only claim 7 of the '932 patent was asserted against the respondents at the hearing. However, Solomon relied upon claim 1 of the patent-in-suit to meet the technical prong of the domestic industry requirement. The amended complaint named Toyota Motor Corporation of Japan; Toyota Motor Engineering & Manufacturing North America, Inc. of Erlanger, Kentucky; Toyota Motor Manufacturing Kentucky, Inc. of Georgetown, Kentucky; and Toyota Motor Sales, U.S.A., Inc., of Torrance, California as respondents.

On February 13, 2007, the ALJ issued an ID finding no violation of Section 337 with regard to respondents' products because he found claim 7 to be invalid and not infringed. Moreover, he found no domestic industry involving the asserted patent. Complainants and the Office of Unfair Import Investigations ("OUII") each filed petitions for review on February 26, 2007. Respondents filed a joint reply on March 5, 2007. Also on March 5, 2007, OUII filed a response to Solomon's petition for review and Solomon filed a response to OUII's petition for review.

Having considered the petitions for review, the oppositions thereto, and the relevant portions of the record, the Commission has determined to review the ID in part. On review, the Commission has determined to take no position on the ALJ's findings concerning the economic prong of the domestic industry requirement. The remainder of the ID has become the Commission's final determination. *See* 19 C.F.R. 210.42(h).

This action is taken under the authority of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, and sections 210.42(c) and (h) of the Commission's Rules of Practice and Procedure, 19 C.F.R. §§ 210.42(c) and (h).

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: April 30, 2007

CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING SAME **337-TA-561**

CERTIFICATE OF SERVICE

I Marilyn R. Abbott, hereby certify that the attached **NOTICE OF COMMISSION DECISION TO REVIEW IN PART AND ON REVIEW TO MODIFY A FINAL INITIAL DETERMINATION FINDING NO VIOLATION OF SECTION 337** has been served on upon the Commission Investigative attorney, Juan Cockburn, Esq., and all parties via first class mail and air mail where necessary on May 15, 2006.

Marilyn R. Abbott, Secretary
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

ON BEHALF OF COMPLAINANT SOLOMON TECHNOLOGIES, INC.:

A. Jason Mirabito, Esq.
Dean G. Bostock, Esq.
MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C.
One Financial Center
Boston, MA 02111
P-617-542-6000
F-617-542-2241

Louis S. Mastriani, Esq.
Maureen F. Browne, Esq.
ADDUCI, MASTRIANI & SCHAUMBERG LLP
1200 Seventeenth Street, NW
Washington, DC 20036
P-202-467-6300
F-202-466-2006

Paul C. Goulet, Esq.
James R. Barney, Esq.
P. Andrew Riley, Esq.
Hayley S. Weimer, Esq.
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 New York Avenue, NW
Washington, DC 20001-4413
P-202-408-4000
F-202-408-4400

ON BEHALF OF RESPONDENTS TOYOTA MOTOR CORPORATION, TOYOTA MOTOR ENGINEERING & MANUFACTURING NORTH AMERICA, INC. AND TOYOTA MOTOR MANUFACTURING KENTUCKY, INC., AND TOYOTA MOTOR SALES, U.S.A., INC.:

Thomas W. Winland, Esq.
Christine E. Lehman, Esq.

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of	)	
	)	
CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING SAME	)	Investigation No. 337-TA-561

Final Initial and Recommended Determinations

This is the administrative law judge's Final Initial Determination, under Commission rule 210.42. The administrative law judge, after a review of the record developed, finds that there is jurisdiction; that claim 7 in issue of U.S. Patent No. 5,067,932 is not valid; that said patent is enforceable if claim 7 is found to be valid; that asserted claim 7 is not infringed; and that there is no domestic industry involving said patent. Thus, he finds no violation of section 337 of the Tariff Act of 1930, as amended.

This is also the administrative law judge's Recommended Determination on remedy and bonding, pursuant to Commission rules 210.36(a) and 210.42(a)(1)(ii). If the Commission finds an unfair act the administrative law judge recommends that the Commission issue a limited exclusion order directed to infringing hybrid vehicles and infringing hybrid systems sought to be imported by respondents. He further recommends that any bond be in the amount of $30.00 per infringing hybrid vehicle or infringing hybrid system sought to be imported during the Presidential review period.

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of **CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING THE SAME**	**Investigation No. 337-TA-561**

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AGENCY: U.S. International Trade Commission.

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This investigation was instituted on February 7, 2006, based on a complaint filed by Solomon Technologies, Inc., of Tarpon Springs, Florida ("Solomon"). The complaint, as amended, alleged violations of Section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the

APPEARANCES

For Complainant Solomon Technologies, Inc.:

Anthony J. Mirabito, Esq.
Willaim D. Belanger, Esq.
Aaron J. Levangie, Esq.
Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, P.C.
One Financial Center
Boston, MA 02111

Louis S. Mastriani, Esq.
Maureen F. Browne, Esq.
Adduci, Mastriani & Schaumberg LLP
1200 17th Street, NW
Washington, DC 20036

For Respondents: Toyota Motor Corporation, Toyota Motor Engineering & Manufacturing North America, Inc. and Toyota Motor Manufacturing Kentucky, Inc., and Toyota Motor Sales, U.S.A., Inc.:

Thomas W. Winland, Esq.
Christine E. Lehman, Esq.
Paul C. Goulet, Esq.
Finnegan, Henderson, Farabow,
Garrett & Dunner, LLP
901 New York Avenue, NW
Washington, DC 20001-4413

ITC Staff:

Juan Cockburn, Esq.
Office of Unfair Import Investigation
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

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ABBREVIATIONS

CBr	Complainant's Post-hearing Brief
CFF	Complainant's Proposed Finding
CORFF	Complainant's Objection To Respondent's Proposed Finding
COSFF	Complainant's Objection To Staff's Proposed Finding
CRBr	Complainant's Post-hearing Reply Brief
CRRFF	Complainant's Proposed Rebuttal Finding to RPFF
CX	Complainant's Exhibit
JX	Joint Exhibit
RBr	Respondents' Post-hearing Brief
RX	Respondents' Exhibit
RFF	Respondents' Proposed Finding
ROSFF	Respondents' Objection To Staff's Proposed Finding
ROCFF	Respondents' Objection To Complainant's Proposed Finding
RRCFF	Respondents' Proposed Rebuttal Finding To CPFF
RRSFF	Respondents' Proposed Rebuttal Finding To SFF
RRBr	Respondents' Post-hearing Reply Brief
SBr	Staff's Post-hearing Brief
SRBr	Staff's Post-hearing Reply Brief
SFF	Staff's Proposed Finding
Tr.	Transcript Of Pre-hearing Conference and Hearing

I. Procedural History

By notice, which issued on February 7, 2006, the Commission instituted an investigation, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation in the United States, or the sale within the United States after importation of certain combination motor and transmission systems and devices used therein, and products containing same by reason of infringement of claims 1-5, 7, 8, 10, or 12 of U.S. Patent No. 5,067,932, ('932 patent) and whether an industry in the United States exists or is in the process of being established as required by subsection (a)(2) of section 337.

The complaint was filed with the Commission on January 10, 2006, under section 337 of the Tariff Act of 1930, on behalf of Solomon Technologies, Inc. (Solomon) of Tarpon Springs, Florida. A supplemental letter was filed on January 30, 2006. Complainant requested that the Commission issue a permanent general exclusion order and a permanent cease and desist order.

The following were named in the notice of investigation as respondents and were served with the complaint:

Toyota Motor Corporation (TMC)
1 Toyota-Cho
Toyota City, Aichi, 471-8571
Japan

Toyota Motor Manufacturing North America
25 Atlantic Avenue
Erlanger, Kentucky 41018

Toyota Motor Sales, U.S.A., Inc.
19001 South Western Avenue
Torrance, California 90509

Order No. 3, which issued on March 2, 2006, set a target date of April 13, 2007, which meant that any final initial determination on violation should be filed no later than Tuesday January 16, 2007. Order No. 19, which issued on January 10, 2007, extended the target date to May 14, 2007 which meant that any final initial determination should be filed no later than February 13, 2007.

Order No. 7, which issued on May 26, 2006, granted complainant's Motion No. 561-2 for leave to amend the complaint and notice of investigation pursuant to Commission rule 210.14(b) to substitute respondent Toyota Motor Manufacturing North America, Inc. with Toyota Motor Engineering & Manufacturing North America, Inc. (TEMA) and Toyota Motor Manufacturing Kentucky, Inc. (TMMK). By notice dated June 26, the Commission determined not to review Order No. 7.

Order No. 12, which issued on September 13, 2006, denied complainant's Motion No. 561-8 seeking a partial summary determination that its domestic activities satisfy the economic prong of the domestic industry requirement.

On October 20, 2006, respondents (Toyota) moved in limine to preclude Solomon from offering evidence or agreement regarding an alleged license or, in the alternative, compelling a deposition. (Motion Docket No. 561-15.) Said motion was mooted. (Tr. at 44, 48.)

On October 20, 2006, Toyota also moved in limine to preclude Solomon from offering evidence or argument on infringement under the doctrine of equivalents for the claim-in-issue, as well as evidence or argument regarding infringement of claims 1-5 of the '932 patent,[1] and

[1] Complainant has limited the asserted claims of the '932 patent on the infringement issue to independent claim 7 of the '932 patent.

evidence or argument regarding schematics for non-accused vehicles. (Motion Docket No. 561-16.) In a telephone conference on October 26, 2006, Toyota represented that the issue regarding claims 1-5 was moot and that the only issue remaining related to schematics for nonaccused vehicles. (Tr. at 41-42.) At the telephone conference of October 26, a ruling on the modified motion was reserved. (Tr. at 53.) At the prehearing conference, a ruling was again reserved pending live examination by complainant at the hearing. Moreover, it was stated that if no one brings up Motion No. 516-16 again the motion was mooted. (Tr. at 50-51.) Said motion was not brought up and hence it was mooted.

A pre-hearing conference was conducted on October 30, 2006, with the hearing also commencing on that date and continuing to November 3. All parties participated in the hearing.

The matter is now ready for a final decision.

The Final Initial and Recommended Determinations herein are based on the record compiled at the hearing and the exhibits admitted into evidence. The administrative law judge has also taken into account his observation of the witnesses who appeared before him during the hearing. Proposed findings of fact submitted by the parties not herein adopted, in the form submitted or in substance, are rejected as either not supported by the evidence or as involving immaterial matters and/or as irrelevant. Certain findings of fact included herein have references to supporting evidence in the record. Such references are intended to serve as guides to the testimony and exhibits supporting the finding of fact. They do not necessarily represent complete summaries of the evidence supporting said findings.

II. Jurisdiction

The administrative law judge finds that the complaint and notice of investigation state a

cause of action under section 337 of the Tariff Act of 1930, as amended. Moreover, the importation requirement has been satisfied because Toyota admitted that it has imported accused products into the United States and sold them in the United States. See Joint Response to the Complaint, ¶ 6.2, at 9. See also RPH at 31. Thus, the Commission has in rem jurisdiction over the subject matter of this investigation. See Certain Automated Mechanical Transmission Systems for Medium-Duty and Heavy-Duty Trucks and Components Thereof, Inv. No 337-TA-503, Final Initial and Recommended Determination at 4, Notice of Commission Nonreview (February 24, 2005) (Transmissions). Also Toyota has appeared in this investigation. Hence, the Commission has in personam jurisdiction. See Transmissions at 4.

III. Parties

See FF 1-12.

IV. Live Witnesses

See FF 13-36.

V. Person Of Ordinary Skill In The Art

See FF 37-38.

VI. The '932 Patent

The '932 patent issued on Nov. 26, 1991 on application Ser. No. 618,934 filed November 28, 1990 by inventor Jonathan R. Edwards. Original claims 1 and 2 of said application as filed read:

> 1. A combination motor and transmission device comprising
>
> first power input means for receiving a first input of power,

second power input means for receiving a second input of power,

output means for providing an output of rotational mechanical power,

power conversion means for effectively converting said power of said first and second inputs to that of said output,

wherein the rotational speed of said output is continuously variable, at least one of said first and second power inputs is electrical power, and said power conversion means includes, for each of said first and second power inputs which is an electrical power input, a respective integral combination of a respective electric motor and a mechanical transmission unit, said transmission unit having two inputs for respectively receiving power corresponding to said first and second power inputs provided to said first and second power input means.

2. The combination motor and transmission device of claim 1, comprising said first and second power input means and said power conversion means being for both of said first and second power inputs being of electrical power, said power conversion means accordingly comprising a first integral combination of a first electric motor and said transmission unit, and a second internal combination of a second electric motor and said transmission unit.

(RX-7 at TMC01-082477-78.)

The '932 patent describes, inter alia, a combination electric motor and transmission device that includes two electric motors that are integrally combined with a mechanical transmission unit. (CX-1, col. 2, lns. 52-65.) Independent claim 7 in issue recites a device that has an "integral combination of a respective electric motor element and an element of ... [a] mechanical transmission unit." (CX-1, col. 11, lns. 38-40.) It is undisputed that said claimed device include two electric motors. (CBr at 6; RBr at 9; SBr at 3.) In dispute, inter alia, is how the claimed electric motor elements and mechanical transmission unit are integrally combined.

In prosecution of Ser. No. 618,934 in a first Office Action mailed February 28, 1991, the Examiner, inter alia, rejected original claims 1and 2 and other original claims under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,161,083 (Roe). The Examiner stated that Roe shows two electric motors 36, 38, each integrally connected to an element of a planetary gearing to drive single wheel; that the motors have switchable speeds and the motor generator 24, 26 is continuously variable to vary the drive voltage to the motors 36, 38, thus allowing continuously variable output from carrier 58a (citing col. 2. lines 19-30); and that the "planetary gearing of row is of the spur gear type. (RX-7 at TMC01-082507-512.)

An amendment was filed on May 29, 1991. (RX-7 at TMC01-082559-607.) As a result of said amendment, the Examiner issued a notice of allowability on June 20, 1991. (RX-7 at TMC01-082615.) Amended claim 2 corresponds to asserted claim 7 in issue and amended claim 1 corresponds to patent claim 1. (RX-7 at TMC01-082559-61.) Asserted claim 7, as modified by a certificate of correction dated August 23, 2006, reads:

> A combination motor and transmission device, comprising
>
> first power input means for receiving a first input of electrical power,
>
> second power input means for receiving a second input of electrical power, and
>
> power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit, said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means and an output for outputting the converted power as rotational mechanical power,
>
> wherein the rotational speed of said output is continuously variable, and said power conversion means includes, for each of said first

and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other, whereby a compact structure is provided for each said integral combination, and said two integral combinations are located closely adjacent each other [sic].

(RFF-4.1 (undisputed).)

Claim 1 of the '932 patent, which complainant relies on in connection with the domestic industry requirement, reads:

A combination motor and transmission device comprising

first power input means for receiving a first input of electrical power,

second power input means for receiving a second input of electrical power, and

power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit, said power transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means and an output for outputting the converted power as rotational mechanical power,

wherein the rotational speed of said output is continuously variable, and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said mechanical transmission unit, each said integral combination involving said two respective elements thereof being directly associated mechanically and geometrically with each other without substantial spacing or other elements including bearings and shafts therebetween.

VII. Claim Interpretation

Claim interpretation is a question of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996); see Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1455 (Fed. Cir. 1998). In construing claims, a court should look to intrinsic evidence consisting of the language of the claims, the specification and the prosecution history as it "is the most significant source of the legally operative meaning of disputed claim language." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996); see Bell Atl. Network Servs., Inc. v. Covad Comm. Group, Inc., 262 F.3d 1258, 1267 (Fed. Cir. 2001).

The claims themselves "provide substantial guidance as to the meaning of particular claim terms." Phillips v. AWH Corp., 415 F.3d 1303, 1314 (Fed. Cir. 2005), citing Vitronics, 90 F.3d at 1582. It is essential to consider the claim as a whole when construing each term, because the context in which a term is used in a claim "can be highly instructive." Id. This requirement is consistent with the Federal Circuit's guidance that a claim term can only be understood "with a full understanding of what the inventors actually invented and intended to envelop with the claim." Phillips, 415 F.3d at 1316, citing Renishaw PLC v. Marposs Societá per Azioni,158 F.3d 1243, 1250 (Fed. Cir. 1998). Claim terms "are generally given their ordinary and accustomed meaning." Vitronics, 90 F.3d at 1582.

In Pause Technology, Inc. v. TIVD, Inc., 419 F.3d 1326 (Fed. Cir. 2005) the Court stated:

> . . . in clarifying the meaning of claim terms, courts are free to use words that do not appear in the claim so long as "the resulting claim interpretation . . . accord[s] with the words chosen by the patentee to stake out the boundary of the claimed property." Cf. Renishaw PLC v. Marposs Societá per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (noting that "[w]ithout any claim term susceptible to clarification . . . there is no legitimate way to narrow

the property right").

Id. 419 F.3d at 1333. Also, claim terms are presumed to be used consistently throughout the patent, such that the usage of the term in one claim can often illuminate the meaning of the same term in other claims. Research Plastics, Inc. v. Federal Packaging Corp. 421 F.3d 1290, 1295 (Fed. Cir. 2005).

The ordinary meaning of a claim term may be determined by reviewing a variety of sources, which may include the claims themselves, dictionaries and treatises, and the written description, the drawings and the prosecution history. Ferguson Beauregard/Logic Controls v. Mega Sys., LLC, 350 F.3d 1327, 1338 (Fed. Cir. 2003). The use of a dictionary however may extend patent protection beyond what should properly be afforded by a patent. Also, there is no guarantee that a term is used in the same way in a treatise as it would be by a patentee. Phillips 415 F.3d at 1322. Moreover, the presumption of ordinary meaning will be "rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." ACTV, Inc. v. Walt Disney Co., 346 F.3d 1082, 1091 (Fed. Cir. 2003). In Terlap v. Brinkmann Corp. 418F.3d 1379, 1384 (Fed. Cir. 2005), the Court concluded that the district court "attached appropriate weight" to the dictionary definitions in the context of the intrinsic evidence in reaching its construction of a claim term "clear."

The presence of a specific limitation in a dependent claim raises a presumption that the limitation is not present in the independent claim. Phillips, 415 F.3d at 1315. This presumption is especially strong when the only difference between the independent and dependant claims is the limitation in dispute. SunRace Roots Enter. Co., Ltd v. SRAM Corp., 336 F.3d 1298, 1303

(Fed. Cir. 2003) (Sun Race). Differences between the claims are helpful in understanding the meaning of claim terms. Phillips, 415 F.3d at 1314. "[W]here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest." Liebel – Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed. Cir. 2004). An independent claim usually covers a scope "broader than the preferred embodiment, especially if the dependent claims recite the precise scope of the preferred embodiment." RF Delaware v. Pacific Keystone Tech., 326 F.3d 1255, 1264 (Fed. Cir. 2003).

The specification of a patent "acts as a dictionary" both "when it expressly defines terms used in the claims" and "when it defines terms by implication." Vitronics, 90 F.3d at 1582. For example, the specification "may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents." Phillips, 415 F.3d at 1323, quoting Iredto Access, Inc. v. Echostar Satellite Corp., 383 F.3d 1295, 1300 (Fed. Cir. 2004). Importantly, "the person of ordinary skill in the art is deemed to read the claim term not only in context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." Phillips, 415 F.3d at 1314. The Federal Circuit has explained that "although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments." Phillips, 415 F.3d at 1323.

A patentee may deviate from the conventional meaning of a particular claim term by making the intended meaning of a particular claim term clear (1) in the specification or (2) during the patent's prosecution history. Lear Siegler, Inc. v. Aeroquip Corp., 733 F.2d 881, 889 (Fed. Cir. 1984) (Lear Siegler). If using a definition that is contrary to the definition given by those of

ordinary skill in the art, however, the patentee's specification must communicate a deliberate and clear preference for the alternate definition. Kumar v. Ovonic Battery Co., Inc., 351 F.3d 1364, 1368 (Fed. Cir. 2003) (Kumar), (citing Apple Computers, Inc. v. Articulate Sys., Inc., 234 F.3d 14,21 n.5 (Fed. Cir. 2000)). In ascribing an alternative definition than the ordinary meaning, the intrinsic evidence must "clearly set forth" or "clearly redefine" a claim term so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term. Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268 (Fed. Cir. 2001) (Bell Atlantic).

The prosecution history, including "the prior art cited," is "part of the 'intrinsic evidence.'" Phillips, 415 F3d at 1317. The prosecution history "provides evidence of how the inventor and the PTO understood the patent." Id. Thus, the prosecution history can often inform the meaning of the claim language by demonstrating how an inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. Vitronics, 90 F.3d at 1582-83; see also Chimi v. PPG Indus., Inc., 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution"), quoting ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576, 1580 (Fed. Cir. 1988); Southwall Techs., Inc. v. Cardinal IG Co., F.3d 1570, 1576 (Fed. Cir. 1995). The prosecution history includes any reexamination of the patent. Intermatic Inc. v. Lamson & Sessions Co., 273 F.3d 1355, 1367 (Fed. Cir. 2001).

In addition to the intrinsic evidence, the administrative law judge may consider extrinsic evidence when interpreting the claims. Extrinsic evidence consists of all evidence external to the

patent and the prosecution history, including inventor testimony and expert testimony. This extrinsic evidence may be helpful in explaining scientific principles, the meaning of technical terms, and terms of art. See Vitronics Corp., 90 F.3d at 1583; Markman, 52 F.3d at 980. However, "[e]xtrinsic evidence is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims." Markman, 52 F.3d at 981. Also, the Federal Circuit has viewed extrinsic evidence in general as less reliable than the patent and its prosecution history in determining how to read claim terms. Phillips, 415 F.3d at 1318. In addition, while extrinsic evidence may be useful, it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence. Phillips, 415 F.3d at 1319.

In Nystrom v. Trex Company 424 F.3d 1136 (Fed. Cir. 2005), (Nystrom) the Court stated:

> . . . as explained in Phillips, Nystrom is not entitled to a claim construction divorced from the context of the written description and prosecution history. The written description and prosecution history consistently use the term "board" to refer to wood decking materials cut from a log. Nystrom argues repeatedly that there is no disavowal of scope of the written description or prosecution history. Nystrom's argument is misplaced. Phillips, 415 F.3d at 1321 ("The problem is that if the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive."). What Phillips now counsels is that in the absence of something in the written description and/or prosecution history to provide explicit or implicit notice to the public– i.e., those of ordinary skill in the art– that the inventor intended a disputed term to cover more than the ordinary and customary meaning revealed by the context of the intrinsic record, it is improper to read the term to encompass a broader definition simply because it may be found in a dictionary, treatise, or other extrinsic source. Id.

Id. 424 F.3d at 1144, 1145. In Free Motion Fitness Inc. v. Cybex International, Inc. 423 F.3d

1343 (Fed. Cir. 2005) (Free Motion), the Court concluded that:

> under Phillips, the rule that 'a court will give a claim term the full range of its ordinary meaning', Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed.Cir. 2001), does not mean that the term will presumptively receive its broadest dictionary definition or the aggregate of multiple dictionary definitions. Phillips, 415 F.3d at 1320- 1322. Rather, in those circumstances, where references to dictionaries is appropriate, the task is to scrutinize the intrinsic evidence in order to determine the most appropriate definition.

423 F.3d at 1348,49. In Network Commerce, Inc. v. Microsoft Corp. 422 F.3d 1353 (Fed. Cir. 2005), the Court concluded:

> As we recently reaffirmed in Phillips, "conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court." Phillips, 415 F.3d at 1318. Here [expert] Coombs does not support his conclusion [the "download component" need not contain the boot program] with any references to industry publications or other independent sources. Moreover, expert testimony at odds with the intrinsic evidence must be disregarded. Id. ("[A] court should discount any expert testimony that is clearly at odds with the claim construction mandated by . . . the written record of the patent." (internal quotations and citation omitted). That is the case here.

Id., at 1361.

Patent claims should be construed so as to maintain their validity. However, that maxim is limited to cases in which a court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous. Phillips, 415 F.3d at 1327. If the only reasonable interpretation renders the claim invalid, then the claim should be found invalid. See, e.g., Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed. Cir. 1999) (Rhine).

A. Asserted Claim 7 Of The '932 Patent

7. A combination motor and transmission device, comprising

first power input means for receiving a first input of electrical power,

second power input means for receiving a second input of electrical power, and

power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit, said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means and an output for outputting the converted power as rotational mechanical power,

wherein the rotational speed of said output is continuously variable, and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other, whereby a compact structure is provided for each said integral combination, and said two integral combinations are located closely adjacent each other [sic],

The parties do not dispute the following claimed phrases: "first power input means for receiving a first input of electric power," "second power input means for receiving a second input of electrical power," "power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit,"[2] and "an output for outputting the converted power as rotational mechanical power."

The parties dispute the following claimed phrases: "said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means," "wherein the rotational speed of said output is continuously variable," "and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric

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[2] While the parties do not dispute the interpretation of the "power conversion means" phrase, the parties dispute whether the respondents' accused products infringe the "power conversion means," in part, based on the parties' dispute of the "integral combination" phrase.

motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other," "whereby a compact structure is provided for each said integral combination" and "said two integral combinations are located closely adjacent each other [sic]."

1. "said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means"

In issue is said claimed phrase, which is part of the claimed "power conversion means" supra, found in independent claim 7 of the '932 patent, the only asserted claim of the '932 patent. Complainant argued that one of ordinary skill in the art would interpret said claimed phrase to mean:

> the components of the power transmission unit that receive rotational mechanical power.

(CBr at 43.) It is argued that complainant's interpretation is consistent with said claim phrase's ordinary meaning and usage in the '932 patent. (CBr at 43; CFF 165-166.) It is further argued that based on the claim language, the inputs may be any physical component within the transmission unit. (CBr at 45; CFF 174, 178-184.) Complainant also argued that in several of the embodiments disclosed in the '932 patent, the input of mechanical power is received by a transmission component other than the gear itself. (CBr at 45; CFF 174, 178-184.) In addition, it is argued that since the parties have agreed that an "output" as recited in claim 7 of the '932 patent is "the component of the power transmission unit that provides rotational mechanical power output" complainant's proposed interpretation of "input" mirrors the parties' agreed upon interpretation of "output" and hence because the term "input" and "output" describes the same

physical structure, with the only difference being whether the component is receiving or providing power, the same "straightforward definition" should be used for both terms. (CBr at 44.)

Complainant also argued that respondents seek to add a "somewhat confusing limitation" that power must pass through the transmission unit; that while "it is somewhat difficult to understand how [respondents are] trying to rewrite the claim to add this limitation, it seems that [respondents seek] to add on an additional clause to the claim that would require that mechanical power equal to 100% of the electrical power input to each motor pass through two gears of the transmission;" that it is "clear" from the specification that the same physical component can be an input and an output; and that respondents' further limitation finds no support in the intrinsic record and should be rejected. (CBr at 46.) It is also argued that it is "unclear" how or why an "input" would also be required to perform the function of "transmitting that power into the transmission unit" because the "input" is itself part of the transmission unit and therefore power flowing into the "input" would flow into the transmission unit. (CRBr at 40.)

Complainant also argued that the parties have already agreed that "output" is "the component of the power transmission unit that provides rotational mechanical power output;" and that as noted in the '932 patent, the same physical component of the transmission can be an output and an input depending upon vehicle conditions; and that thus "[respondents effectively admit] that [complainant's] proposed construction of 'input' is correct, as it mirrors the parties' agreed upon construction of 'output,' namely, the 'inputs' are 'the components of the power transmission unit that receive the rotational mechanical power input." (CRBr at 41.)

Respondents argued that one of ordinary skill in the art would understand "said

transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means" to mean:

> two gears of the mechanical power transmission unit respectively receive mechanical power corresponding to the electrical power supplied to the first and second power input means for transmission through the transmission unit.

(RBr at 62.) It is argued that the claim language requires that the mechanical power transmission unit has two inputs for respectively receiving mechanical power. (RBr at 62; RFF-4.199.) It is also argued that since both parties have agreed that the claimed mechanical transmission unit is a device that transmits a rotational mechanical input to a rotational mechanical output at varying speeds using gears, (RBr at 62; RFF-4.200), the "two inputs" limitation requires that two rotational mechanical inputs be received and transmitted through the gears of the transmission unit, such that their speeds are varied "using gears." (RBr at 62; RFF-4.201.) It is also argued that "to the extent there is a quibble about 'gears,' the term 'elements' could easily be substituted in [respondents'] proposed construction to alleviate any concern." (RBr at 63.) It is argued that a person of ordinary skill in the art would understand said claimed phrase to mean that two gears in the transmission unit (e.g. the sun gear, including its extension, the hub (carrier), or the ring gear) are being driven as inputs, i.e. receiving rotational mechanical power and transmitting that power into the transmission unit, and that the gear element itself (e.g. sun gear, carrier, or ring gear) is the component that is actually sending power into the transmission unit. (RBr at 64; RFF-4.206.) It is further argued that complainant's interpretation is improper because it seeks to read out of the claim language the expressly stated requirement "for respectively receiving mechanical

power corresponding to said first and second power inputs." (RBr at 62; RFF-4.195.) It is also argued that if the gear element itself is actually sending power into the transmission unit it is an input while if, instead, power is flowing out of the gear element, then it is an output; and that the claim requires two inputs. (RBr at 64.)

The staff argued that the function of the "power conversion means"[3] is:

> to convert the electric power received from the two inputs of each of the two motors into mechanical/rotational power and to transmit that mechanical/rotational energy through a single output to propel a vehicle (or to store the mechanical/rotational energy in fly wheels, and then using the power stored in the fly wheel to propel a vehicle when needed).

(SBr at 12.) It is further argued that the specification discloses that the corresponding structure is two electric motors that convert the electrical power to mechanical (rotational) power, which is combined for output through the transmission to the drive wheels(s) of a vehicle. (SBr at 13.) Thus, the staff argued, said element is only satisfied when both electric motor/generators are simultaneously used as motors to provide rotational power to the wheels that propel the vehicle. (SBr at 13.) Moreover, it is argued that, according to the claim language, the combined rotational/mechanical output must correspond to the sum of the electrical inputs to each of the motors, i.e. be essentially identical, which means that all of the rotational/mechanical output must go to a single device. (SBr at 13.)

The staff further argued that alternate corresponding structures of the mechanical power transmission units included in the "power conversion means" are described in the specification in

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[3] The staff interpreted the entire "power conversion means" means-plus-function limitation instead of the phrase, "said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means."

Figures 3, 4, 5 and 6. (SBr at 13.) With respect to each corresponding structure, it is argued that the specification teaches that the claimed transmission system must have inputs from two sources of mechanical power that the system outputs/transmits to a drive wheel, drive wheels, or any single device. (SBr at 14.) Thus, it is argued, said element is only satisfied when the output of both electric motors is transmitted through the combination transmission to a wheel or wheels to propel a vehicle in the case of a motor vehicle (or propellers(s) in the case of a marine vessel), or to any single device. (SBr at 14.)

In issue is whether the input of the mechanical power transmission unit is required to be a gear or gear element, as respondents argued, or is capable of being any component of the transmission unit that receives rotational mechanical power as complainant argued. The administrative law judge finds that the language of the claimed phrase at issue does not limit the "input" of the mechanical power transmission unit to a "gear" or "gear element" or any other particular component of the transmission unit. (See CX-1 at 11:28-32.) The administrative law judge further finds that the specification discloses that the combination motor and transmission device of the '932 patent discloses the use of either a differential transmission unit or a planetary gear unit:

> The device employs a novel arrangement of a differential unit or a planetary gear unit.
>
> * * *
>
> Yet another object of the invention is to provide a combination motor and transmission device employing a novel arrangement of differential transmission unit or a planetary gear unit.

(CX-1 at Abstract, 2:61-65 (emphasis added).) The administrative further finds that the

specification of the '932 patent discloses embodiments that either use a differential transmission unit or a planetary gear unit where the gears or gear elements act as the input of the combination and motor device:

> FIG. 3 shows an embodiment of the combination motor and transmission device 1 of the present invention employing a differential unit in a novel manner.
>
> * * *
>
> The two inputs 2, 3 to the motor and transmission device 1 are located below the corresponding arrows. In this embodiment the inputs are in the form of electrical power which is converted internally to mechanical power.
>
> * * *
>
> When the bevelled drive gear 23 on input 2 and the corresponding opposing drive gear on input 3 are driven by the electrical inputs to rotate at the same speed, then the pinion gears 42 do not rotate on the pinion gear shaft 41. In this case, the pinion gear shaft 41 rotates at this same speed (in a plane perpendicular to the paper), and the wheel 10 is also rotated at this rotational speed. When the two opposing bevelled gears are driven at different speeds, including the case of opposite directions, then the pinion gear shaft 41 is caused to rotate at a speed intermediate between the rotational speeds of the two opposing bevelled drive gears, by virtue of the pinion gears 42 rotating on the pinion gear shaft 41.
>
> * * *
>
> FIG. 4 shows an embodiment of the transmission device of the present invention employing a planetary gear unit.
>
> * * *
>
> Inside the ring gear member 36 are located the sun gear 46 (indicated with dotted lines only) and the hub. A portion 26 of the hub is shown extending to the left for rigid connection to the disk 23 of input 2. Both the sun gear 46 and the hub (with its portion 26) rotate coaxially with the ring gear 36. The wheel shaft 43

> extends to the right to connect rigidly with the sun gear 46, to rotate with it. The spacer 26 typically has at least three planetary gears 27 (only one is indicated by the dotted lines in FIG. 4) attached to it to rotate between the sun gear 46 and ring gear 36.
>
> FIG. 5 shows another embodiment of the transmission device of the present invention employing a planetary gear unit. Here the disk 23 of the input 2 is rigidly connected to an extension 46' of the sun gear, so as to turn the sun gear when the input 2 is activated. The sun gear and its extension 46' are cylindrically hollow along the axis of the sun gear, to allow an extension 43' (indicated by dotted lines) of the wheel shaft 43 to extend to the right along its axis to connect rigidly and nonrotatingly with the hub 26' of the planetary gear set.
>
> * * *
>
> This embodiment [i.e., FIG. 6] shows the ring gear 36 and hub 26 of the planetary unit embodiment of FIG. 4, respectively connected to the disks 33 and 23.

(CX-1 at 4:24-26, 4:33-37, 5:9-22 6:23-25, 6:38-58, 9:40-43 (emphasis added).) However, the administrative law judge finds that this language does not limit the input to "gear" or "gear elements" because it is the rotational mechanical power produced by the components connected to the electrical inputs that is recited in the claim language, and the cited portions of the specification do not include any express language limiting the impact to gears or gear elements.

In addition, the parties agreed that the phrase "output for outputting the converted power as rotational mechanical power," which also appears in claim 7 of the '932 patent, should be interpreted as "the component of the power transmission unit that provides the rotational mechanical power output." (See CBr at 40, 44; RBr at 25-27.) The administrative law judge finds that the specification discloses a differential transmission unit or a planetary gear unit where the gears or gear elements act as the output of the combination and motor device and the

only substantial difference between the "input" and the "output" of the mechanical power transmission unit, as disclosed in the specification of the '932 patent, is whether said transmission unit receives rotational mechanical power or provides rotational mechanical power:

> Proceeding to the output 4, the pinion gear shaft 41 holds the pair of pinion gears 42 to rotate between the opposing drive gears of the inputs 2 and 3, namely the drive gear 24 on input 2 and the corresponding drive gear on input 3 indicated in FIG. 3.
>
> * * *
>
> The outermost member of the planetary gear unit is the ring gear, the teeth of which are on the inside periphery of the hollow cylindrical member 36. The right end of the cylindrical member 36 can be closed, but in any case is rigidly fixed, in this example, to the disk 33 of input 3, to rotate with it.
>
> * * *
>
> The sun gear and its extension 46' are cylindrically hollow along the axis of the sun gear, to allow an extension 43' (indicated by dotted lines) of the wheel shaft 43 to extend to the right along its axis to connect rigidly and nonrotatingly with the hub 26' of the planetary gear set.

(CX-1 at 5:1-5, 6:32-37, 6:53-58 (emphasis added).) However, the parties agreed not to limit the "output" of the mechanical power transmission unit to a gear or gear element notwithstanding the language of the specification. For the foregoing reasons, the administrative law judge finds that "inputs" are not limited to "gears" or "gear elements," as respondents argued, but are any components of the mechanical power transmission unit that receive rotational mechanical power, as complainant argued.

Also in issue is whether one of ordinary skill in the art would understand that the input must transfer its received mechanical power through the transmission unit. Complainant argued

that it is "clear" from the specification that the same physical component can be an input and an output; that the "through the transmission unit" limitation, as respondents argued, finds no support in the intrinsic record; and that it is "unclear" how or why an "input" would also be required to perform the function of "transmitting that power into the transmission unit" because the "input" is itself part of the transmission unit and therefore power flowing into the "input" would flow into the transmission unit. (CBr at 46; CRBr at 40.) Respondents argued that if the gear element itself is actually sending power into the transmission unit it is an input while if, instead, power is flowing out of the gear element, then it is an output; and that the claim requires two inputs. (RBr at 64.) The staff argued that, with respect to each corresponding structure, the specification teaches that the claimed transmission system must have inputs from two sources of mechanical power that the system outputs/transmits to a drive wheel, drive wheels, or any single device; and that said element is only satisfied when the output of both electric motors is transmitted through the combination transmission to a wheel or wheels to propel a vehicle in the case of a motor vehicle (or propellers(s) in the case of a marine vessel), or to any single device. (SBr at 14.)

The claimed phrase at issue is part of a larger means-plus-function claim element:

> power conversion means for converting said electrical power of said first and second inputs for output, said power conversion means including a mechanical power transmission unit, said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means and an output for outputting the converted power as rotational mechanical power

(CX-1 at 11:25-34 (emphasis added).) The administrative law judge finds that the language

"converting said electrical power of said first and second inputs for output" in said means-plus-function claim element indicates that the function of said means-plus-function claim element is to convert the electrical power of the first and second inputs for output. Furthermore, the administrative law judge finds that the language, "an output for outputting the converted power as rotational mechanical power" in said means-plus-function claim element requires that the mechanical power transmission unit take the converted mechanical power provided to its two inputs and then output said converted mechanical power as rotational mechanical power. Thus, the administrative law judge finds that the two inputs for receiving mechanical power must transfer said mechanical power through the transmission unit to the output.

Also in issue is whether one of ordinary skill in the art would understand that the phrase "corresponding to" in the claimed phrase at issue requires that the mechanical power equal 100 percent of the electrical power of the electrical motor. Complainant argued that the limitation that the mechanical power equal 100 percent of the electrical power of the electric motor finds no support in the intrinsic record. (CBr at 46.) Respondent argued that complainant's interpretation is improper because it seeks to read out of the claim language the expressly stated requirement "for respectively receiving mechanical power corresponding to said first and second power inputs." (RBr at 62; RFF-4.195.) The staff argued that, according to the claim language, the combined rotational/mechanical output must correspond to the sum of the electrical inputs to each of the motors, i.e. be essentially identical, which means that all of the rotational/mechanical output must go to a single device. (SBr at 13.)

The administrative law judge finds that the language of claim 7 is silent as to whether the mechanical power must equal 100 percent of the electrical power of the electrical motor. (See

CX-1 at 11:19-46.) The administrative law judge further finds that the use of the phrase "corresponding to" in the claimed phrase at issue signifies a relationship between the first power input [i.e. first input of electrical power] and its respective mechanical power and a relationship between the second power input [i.e. second input of electrical power] and its respective mechanical power. The administrative law judge further finds that the specification of the '932 patent, in referring to the conversion of the electrical power into mechanical power is silent as to whether the resulting mechanical power must equal 100 percent of the electrical power:

> The two inputs 2, 3 to the motor and transmission device 1 are located below the corresponding arrows. In this embodiment the inputs are in the form of electrical power which is converted internally to mechanical power. The output 4 for rotating the drive wheel 10 is via the wheel shaft 43, which is fixed at its outer end to the wheel hub 14 for rotating it. The wheel disc 16 is connected by bolts (not shown) to a circularly shaped perimeter portion 49 of the hub 14, for rotating the wheel 10. The outer peripheral edge of the wheel disk 16 is connected to a rim (not shown) on which the tire is mounted.
>
> * * *
>
> The rotational mechanical output of the transmission drive device can be provided at any desired rotational speed, power or torque, depending on the load and the controls for the two inputs. Any type of electrical motor can be incorporated into each input, for converting electrical power supplied to the motor to rotating mechanical power of that input.

(CX-1 at 4:33-44, 7:23-29 (emphasis added).) The administrative law judge also finds that said portion of the specification, while requiring the conversion of electrical power to mechanical power, does not require that the resulting mechanical power equal one hundred percent of the electrical power.

The administrative law judge further finds that the specification of the '932 patent uses

the phrases "corresponding" or "corresponding to" in multiple contexts where the patentee is merely signifying a relation between two components and not imposing a strict one-to-one relationship. The following are representative examples:

> Known transmission devices typically involve a single rotational mechanical input and a single rotational mechanical output. Such known transmission devices, whether manual or automatic, may typically employ a set of gears. In these transmissions, the ratio of the speed of rotation of the input to the speed of rotation of the output is one of a set of fixed values corresponding to the set of gears.
>
> * * *
>
> Proceeding to the output 4, the pinion gear shaft 41 holds the pair of pinion gears 42 to rotate between the opposing drive gears of the inputs 2 and 3, namely the drive gear 24 on input 2 and the corresponding drive gear on input 3 indicated in FIG. 3.
>
> * * *
>
> When the bevelled drive gear 23 on input 2 and the corresponding opposing drive gear on input 3 are driven by the electrical inputs to rotate at the same speed, then the pinion gears 42 do not rotate on the pinion gear shaft 41.

(CX-1 at 1:35-42, 5:1-5, 9-13 (emphasis added).) The administrative law judge further finds that this finding is consistent with complainant's expert Davis's testimony as to how one of ordinary skill in the art would understand "corresponding to" in the context of the claimed phrase at issue:

> Q. What do you understand the word corresponding" to mean in the context of the claim language of claim 7?
>
> A. What they're talking about is that they're receiving the mechanical power that's related to the electrical power that's provided to the motors.
>
> * * *
>
> Q. Do you have an opinion as to whether one of ordinary skill

> in the art in 1990 would have believed the word "corresponding" in claim 7 to require that the mechanical power equal 100 percent of the electric motor?
>
> A. No. They would not.

(Davis, Tr. at 883:6-12, 884:18-23.) Thus, the administrative law judge finds, based on the plain language of claim 7 of the '932 patent and the specification of the '932 patent, that one of ordinary skill in the art would understand the phrase "corresponding to" in the claimed phrase to mean that the mechanical power relates to the electrical power of the electrical motor but not require that said mechanical power equals 100 percent of said electrical power.

For the foregoing reasons, the administrative law judge interprets "said transmission unit having two inputs for respectively receiving mechanical power corresponding to said first and second power inputs provided to said first and second power input means" as:

> two components of the mechanical power transmission unit respectively receive mechanical power relating to the electrical power supplied to the first and second power input means for transmission through said transmission unit.

2. "wherein the rotational speed of said output is continuously variable"

In issue is said claimed phrase, which is found in independent claim 7 of the '932 patent, the only asserted claim of the '932 patent. Complainant argued that one of ordinary skill in the art would understand "wherein the rotational speed of said output is continuously variable" to mean:

> subject to a continuous variation in speed from a negative maximum value to a positive maximum rotational value.

(CBr at 49.) It is further argued that complainant's definition is taken directly from the '932 patent, which states that "[t]he rotational mechanical power output 4 is at a continuously variable

speed, such as from a negative maximum value to a positive maximum value in various embodiments of the present invention." (CBr at 49; CFF 191.) It is also argued that this definition is consistent with the usage of the phrase throughout the patent, where it is used to describe the concept of continuously variable output, also described in the industry as a continuously variable transmission function. (CBr at 50.) In addition it is argued that complainant's interpretation of "continuously variable" is consistent with the purposes and advantages of the '932 patent. (CBr at 50; CFF 191, 194, 197, 211.)

Respondents argued that one of ordinary skill in the art would understand "wherein the rotational speed of said output is continuously variable" to mean:

> the rotational speed of said output can be varied such that any desired rotational speed, from full forward to full reverse, can be attained at peak power and with no intervening gear reduction to the component being driven.

(RBr at 52.) Respondents argued that the '932 specification and prosecution history define a "continuously variable" output consistent with respondents argued definition. (RBr at 52; RFF-4.149.) Specifically, respondents argued that, as defined in the '932 patent and prosecution history, a "continuously variable" output must be variable to any desired speed; that a "continuously variable" device must be capable of outputting peak power at any desired speed; and that a "continuously variable" output cannot include intervening gear reductions. (RBr at 52-61.)

The staff argued that "wherein the rotational speed of said output is continuously variable" should be interpreted to mean that:

> the output of the transmission device directed to the drive wheels is variable from full forward to full reverse and must be capable of

providing peak power at all rotational speeds.

(SBr at 15.) It is argued that the specification of the '932 patent expressly teaches that the term "continuously variable" refers to the capability of going from "full forward speed to full reverse speed." (SBr at 16.) Morever, it is argued that the term "continuously variable" as it appears in the '932 patent implicitly incorporates the requirement that peak output must be available at all speeds. (SBr at 16.) Specifically it is argued that the specification of the '932 patent expressly defines an "infinite speed transmission device" as being a device that can provide peak power over continuously variable speeds of rotation. (SBr at 16.) It is also argued that during prosecution, the applicant distinguished prior art on the basis that none of the cited art disclosed a "truly continuously variable infinite speed device." (SBr at 17.)

The parties agree that "wherein the rotational speed of said output is continuously variable" cannot be limited to preset or predetermined speeds. (CBr at 50, RBr at 53.) In issue is whether a "continuously variable" output must be capable of <u>any</u> desired speed, regardless of the specified range, or whether a "continuously variable" output must be capable of any desired speed within a specified range. The administrative law judge finds that the specification of the '932 patent, referring to the "generic features" of the combination motor and transmission device of the "present invention" and making reference to Figures 2 and 3, delineates a specified range of rotational speeds of the output and that a "continuously variable" output must be capable of any desired speed <u>within said specified range</u>:

> The rotational mechanical power output 4 is at a continuously variable speed, <u>such as from a negative maximum value to a positive maximum value</u> in various embodiments of the present invention.

(CX-1 at 4:7-23 and particularly at 4:20-23 (emphasis added).)

Also, in issue is whether the range of the rotational speed of the output is from a negative maximum value to a positive maximum value or whether the range of the rotational speed of the output is from full forward to full reverse. The administrative law judge finds that the specification of the '932 patent uses both of said ranges in describing the output as "continuously variable:"

> The generic features of the combination motor and transmission device 1 of the present invention are indicated in FIG. 2. ... The rotational mechanical power output 4 is at a continuously variable speed, such as from a negative maximum value to a positive maximum value in various embodiments of the present invention.
>
> * * *
>
> The wheel 10 is thus driven at its maximum speed, in either the forward or reverse direction, when the two inputs 2 and 3 are in the same direction, forward or reverse, and at their respective maximum speeds. As the speed of one decreases, the wheel 10 slows down. Thus the speed with which the wheel 10 can be rotated is continuously variable, from full forward speed to full reverse speed.

(CX-1 at 4:7-23, 5:23-30 (emphasis added).) The parties dispute whether these ranges are the same and specifically whether "negative maximum value" can equal zero in certain situations or whether it must always be the maximum speed of the output in the reverse direction. To the extent that the stated ranges are actually different, the administrative law judge finds that one of ordinary skill in the art would understand the range to be "negative maximum value to positive maximum value" rather than "full forward speed to full reverse speed." The administrative law judge finds that this is so because the portion of the specification of the '932 patent that discloses the range "negative maximum value to positive maximum value" describes the actual output (i.e.

output 4); that said portion of the specification describes the generic features of the invention; that said portion of the specification indicates that the range "negative maximum value to positive maximum value" is the range for various embodiments of the invention; and that the range "negative maximum value to positive maximum value" is more precise than "full reverse to full forward." (CX-1 at 4:20-23.) The administrative law judge also finds that one of ordinary skill in the art would understand the range to be "negative maximum value to positive maximum value" because the portion of the specification of the '932 patent that discloses the range "full forward speed to full reverse speed" describes the wheel and not the output. (CX-1 at 5:23-30.)

Also in issue is whether "continuously variable" output requires peak power. The claimed phrase at issue is silent as to whether peak power output is required. However, the administrative law judge finds that the Abstract section of the '932 patent states that a requirement of an "ideal infinite speed device" is peak power output:

> The directions of rotation and the rotational speeds of the two inputs can be controlled to provide the mechanical output at any desired rotational speed with peak power output, depending on the controls, thus providing an ideal infinite speed device.

(CX-1 at Abstract (emphasis added).) In addition, the administrative law judge finds that the specification of the '932 patent has numerous portions where it links the requirement of peak power output to continuously variable rotational speed, the term "continuously variable" being synonymous with the term "infinite speed," as complainant's expert Davis testified (Tr. at 1487:4-8), and as the respondents and staff argued. (RBr at 56; RPFF-4.169; SBr at 17.) Thus reference is made to the following:

> It has long been a goal in the art to find a combination power source (i.e., drive) and transmission device that can deliver the

peak output of the power source over a large range of the rotational speed (rpm) output of the transmission device. Further, it is preferable that this peak power be output from the transmission device, or from the drive device incorporating the transmission device, at continuously variable speeds of rotation over a large range of the speed of rotation of the output. A transmission device making possible such properties is known in the art as an infinite speed transmission device.

* * *

The mechanical rotational input for such known transmission devices can be the output of a gasoline or electric motor, many of which typically have a limited speed (rpm) range for peak power. As a result, the transmission device may not have a continuously variable output rotational speed for the speed of the motor in the peak power range.

* * *

An object of the invention is to provide an infinitespeed combination motor and transmission device, namely which can deliver peak power output with a continuously variable speed of rotation over a very large range of the rotational speed of the output.

* * *

Thus, when two stepping motors are employed in the two inputs of the transmission drive device of the present invention, the sum of the peak powers of the two stepping motors is effectively available at the output, when each motor is driven at a rotational speed above the minimum speed for providing the plateau value for its peak power output.

As is easily understood, this total peak power output of the transmission device of the present invention is available at any output speed. Accordingly, at low output speed, the output torque can be very high.

(CX-1 at 1:15-23, 1:48-54, 2:52-56, 7:65-8:7 (emphasis added).) Thus, the administrative law judge finds, as disclosed in the specification of the '932 patent, that one of the goals of the

invention is to provide peak power output over the continuously variable range of the rotational speed, and that the specification of the '932 patent links the requirement of peak power output with a "continuously variable" output.

The administrative law judge further finds that the specification of the '932 patent includes further references to "peak power" that stress the importance of "peak power" with respect to the claimed invention:

> The effective range over which the peak power output can be maintained increases with the number of gears in the transmission device, but only in the sense that the range is made up of overlapping subranges, each sub-range being a narrower rpm range over which the peak power is output when the known transmission device is in a respective one of the gears. However, the larger the number of gears, the heavier and more expensive the transmission device becomes, and the less efficient due to the number of interfaces (mechanical links) across which the power must be transferred.
>
> * * *
>
> Yet another object of the present invention is to provide a flywheel unit employing the combination motor and transmission device of the present invention in a conventional vehicle, for storing power for supplementing peak power when needed, and as well for regenerative braking.
>
> * * *
>
> If the source of electrical power is a battery, then the wheel 10 can be driven with full battery power at any speed in the range between full forward and reverse speeds. As is explained in the following, the combination motor and transmission device 1 can provide full power to the wheel 10 while rotating it at any speed in this large range, thus being an effective and efficient infinite speed transmission device.
>
> If the two inputs 2, 3 are driven at nearly equal but opposite speeds, then the wheel 10 is rotated at very low speed, but with very high

> available torque, corresponding to the available peak power from the battery. For each such output speed below the extreme maximum forward speed and the extreme maximum reverse speed, there is in fact a continuum of combinations of the speeds of the two inputs 2, 3.
>
> * * *
>
> A more complex approach for the embodiment of FIG. 3 would be to start with both rotational mechanical inputs 2,3 at the same speed but in opposite directions, and to slow one more than the other until at top speed of the vehicle the two mechanical inputs are rotating together in the same direction. This in effect provides a flywheel-type supplementation of the peak power from the battery by taking kinetic energy stored in advance in one of the rotating disks 23, 33.
>
> * * *
>
> However, the purpose of this embodiment is to store energy for times of peak power need, such as for either foreseen or unexpected acceleration events, or for mechanical storage of kinetic energy obtained when the vehicle was braked, by speeding up the flywheel by the braking process itself to convert the kinetic energy of the entire vehicle to kinetic energy of the one or more flywheels contained in the combination motor and transmission device 1. Various designs can be suited to these various purposes. It suffices to describe the embodiment of FIG. 6 as directed to supplementation of peak power only.

(CX-1 at 1:55-65, 3:15-20, 5:31-46, 9:5-13, 9:23-34 (emphasis added).)

The administrative law judge further finds that the applicant, in the prosecution history, relied on the "continuously variable" limitation to overcome a prior art rejection, on a patent to Roe[4] defining "continuously variable" as synonymous with "truly infinite speed transmission":

---

[4] The Examiner rejected original claim 2, which after amendment became claim 7 in issue, on Roe. Thereafter in that only substantive amendment, applicant argued patentability of asserted claim 7 over Roe. What followed was the issuance of the '932 patent with asserted claim 7. See Section VI. supra.

> [Roe U.S. Patent No. 3,161,083] thus only approximates the feature of the present invention of providing "continuously variable" rotational output speeds, that is, of a true continuously variable infinite speed device.
>
> * * *
>
> Unlike this feature of Roe, the present invention teaches providing a truly infinite speed transmission...

(RX-7, Amendment at 20-21, TMC01-082578-79 (emphasis added).) As found supra (CX-1 at Abstract, 1:15-21, 1:48-54, 2:52-56, 7:65-8:7), the specification of the '932 patent defines "infinite speed transmission" as an infinite speed combination motor and transmission device, namely which can deliver peak power output with a continuously variable speed of rotation over a very large range of the rotational speed of the output. While speed and power are generally two distinct components that do not necessarily have a relational connection, the patentee has linked the requirement of continuously variable rotational speed of the output with the requirement of peak power for each speed in the range of rotational speed, both in the specification and the prosecution history. (See CX-1 at Abstract, 1:15-26, 1:48-54, 2:52-56, 7:65-8:7; RX-7, Amendment at 20-21, TMC01-082578-79.) For the foregoing reasons, the administrative law judge finds that the output must provide peak power for the rotational speed of said output to be continuously variable.

Also in issue is whether "continuously variable" output allows for intervening gear reductions. The administrative law judge finds that claim 7 of the '932 patent is silent as to the presence of intervening gear reductions. (See CX-1 at 11:35-46.) However, the administrative law judge further finds that the prosecution history shows that the applicant distinguished the invention of the '932 patent from Roe by claiming that the claims of the '932 patent are directed

to a continuously variable transmission that achieves its results without the presence of intervening reduction gears:

> [Roe] thus only approximates the feature of the present invention of providing "continuously variable" rotational output speeds, that is, of a true continuously variable infinite speed device.
>
> * * *
>
> Unlike this feature of Roe, the present invention teaches providing a truly infinite speed transmission, wherein the gear ratio varies from a very small or very large ratio to a 1:1 direct drive to the surface on which a vehicle incorporating the invention rides, with no intervening gear reduction to the surface. By contrast, the prior art of Roe teaches a large number of gears between the mechanism cited by the Examiner and the wheel being driven, including even a right angle along the line of power transmission. It is a major advantage of the present invention that all this is avoided, as wasteful of mechanical power and unduly heavy and expensive.

(RX-7, Amendment at 20-21, TMC01-082578-79 (emphasis added).) The administrative law judge further finds that the specification of the '932 patent is consistent with the patentee's disclaimer of claim scope encompassing a transmission unit with intervening reduction gears because said specification explicitly criticizes the presence of multiple gears:

> In these transmissions, the ratio of the speed of rotation of the input to the speed of rotation of the output is one of a set of fixed values corresponding to the set of gears. These typically involve a large number of parts, undesirable weight for many applications particularly in vehicle propulsion, and high losses due to multiple transfers of the power between the many components within the transmission device, or within the drive device incorporating the transmission device.
>
> * * *
>
> However, the larger the number of gears, the heavier and more expensive the transmission device becomes, and the less efficient due to the number of interfaces (mechanical links) across which the

power must be transferred.

* * *

> Another object of the invention is to provide a combination motor and transmission device, for driving a wheel of an electrically powered vehicle, which is lightweight and highly efficient, as a result of a small number of parts, low losses and regenerative braking with antilock braking easily adapted 11/28/90.

(CX-1 at 1:39-47, 61-65, 3:0-14.) For the foregoing reasons, the administrative law judge finds that complainant is estopped from arguing that "continuously variable" allows for intervening gear reductions.

Based on the foregoing, the administrative law judge interprets "wherein the rotational speed of said output is continuously variable" as:

> the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven.

Complainant argued that the '932 patent specification's use of the term "peak power" makes it clear that the ability to attain peak power is preferable, and not a mandatory limitation that should be imported into the claim. (CBr at 51-52.) Complainant characterized the ability to provide over a wider range of output speeds as an advantage of the invention and argued that "it is well settled that aspects or benefits of particular embodiments should not be read as claim limitations." (CBr at 52.) However, the administrative law judge finds that the specification discloses that providing peak power output is not a "benefit" but a requirement for "continuously variable" output. For example:

> An object of the invention is to provide an infinitespeed

> combination motor and transmission device, namely which can deliver peak power output with a continuously variable speed of rotation over a very large range of the rotational speed of the output.
>
> * * *
>
> As is easily understood, this total peak power output of the transmission device of the present invention is available at any output speed. Accordingly, at low output speed, the output torque can be very high.

(CX-1 at 2:52-56, 7:65-8:7 (emphasis added).)

Complainant also argued that respondents' interpretation, namely the "peak power requirement," cannot be correct because the '932 patent states that any type of electric motor can be used (CBr at 52; CFF 158-160):

> Any type of electrical motor can be incorporated into each input, for converting electrical power supplied to the motor to rotating mechanical power of that input.

(CX-1 at 7:26-29.) Complainant further argued that its expert Davis testified that the '932 patent discloses that different types of motors can be used to accomplish the advantages of the invention:

> Q. I would like to direct your attention to column 7, starting at line 26 of the patent. Do you see the statement which reads: Any type of electric motor can be incorporated into each input for converting electrical power supplied to the motor to rotating mechanical power of that input?
>
> * * *
>
> Q. Did you consider that portion of the patent in forming your opinion in this case?
>
> A. Yes. Basically, it's saying that you don't have to use exactly the motors that are depicted in some of these figures. You

could use different variations.

(Davis Tr. at 857-858.) Complainant also argued that, despite this statement in the '932 patent, respondents' expert Caulfield admitted that one of ordinary skill in the art would understand that conventional electric motors only have a single peak power point, and therefore, Caulfield's "peak power requirement" could only be met by using esoteric engines that did not exist in 1990. (CBr at 52; CFF 429.)

A claim limitation written in a means-plus-function form, reciting a function to be performed rather than a definite structure, is subject to the requirements of 35 U.S.C. § 112, ¶ 6 (1994). See B. Braun Med., Inc. v. Abbott Lab., 124 F.3d 1419, 1424 (Fed. Cir. 1997). As such, the limitation must be construed "to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." See 35 U.S.C. § 112, ¶ 6; B. Braun Med., 124 F.3d at 1424.

The administrative law judge finds that the "first power input means," and "second power input means" are means-plus-function claim limitations whose structure includes the field elements of the two electric motors disclosed in Figures 3, 4, 5 and 6 of the '932 patent and their equivalents under 35 U.S.C. § 112, ¶ 6. Likewise, the administrative law judge finds that the "power conversion means" is also a means-plus function claim limitation whose structure includes the field elements and armature elements of the two electric motors disclosed in said Figures 3, 4, 5 and 6, and their equivalents under 35 U.S.C. § 112, ¶ 6. Thus, the administrative law judge finds that the structure of an electric motor that is part of the combination motor and transmission device of the '932 patent must conform to the structural limitations disclosed in the specification of the '932 patent or be deemed an equivalent to the disclosed structure in the

specification of the '932 patent under 35 U. S. C. § 112, ¶ 6. Hence, the administrative law judge finds that not any motor can be used in the combination motor and transmission device, despite the cited sentence of the '932 patent, because the motor must conform to the structural limitations disclosed in the specification of the '932 patent and its equivalents under 35 U.S.C. § 112, ¶ 6. In other words, the administrative law judge finds that the opinion of Davis, who was not qualified as an expert in patent law, as to the effect of the general language cited at column 7, lines 26 to 29 of the patent '932 is irrelevant because said language of the specification of the '932 patent does not allow the use of structures other than the disclosed corresponding structures and their equivalents under 35 U.S.C. § 112, ¶ 6 to satisfy the means-plus-function limitation.

In addition, the administrative law judge finds that Davis later conceded that said language of the specification of the '932 does not allow the use of structures other than the disclosed corresponding structures and their equivalents under 35 U.S.C. § 112, ¶ 6:

> Q. And how, if at all --
>
> JUDGE LUCKERN: How far can you go when you say different variations?
>
> THE WITNESS: Well, I think you can use different motors. <u>But you would have to maintain some of the key features which, again, would be to take these transmission elements and pull them inside the motor itself so that you could reduce the axial dimensions.</u>

(Davis Tr. at 858-859 (emphasis added).)

Finally, the administrative law judge finds that the single sentence (CX-1 at 7:26-29) cannot outweigh the numerous sections of the specification of the '932 patent where the patentee describes the requirement of peak power output and links it to the terms "continuously variable"

and "infinite speed" nor does the administrative law judge find said sentence consistent with the prosecution history. Thus, the administrative law judge rejects complainant's argument that "peak power" cannot be a requirement of "continuously variable."

Complainant further argued that claim 7 does not require that there be no intervening gear reduction to the component being driven because this limitation is entirely missing from claim 7, and it is expressly captured in other dependent claims. (CBr at 53.) For example, complainant argued that claim 6 and claim 14 (which depends from claim 7) both require that the output be directly connected to the vehicle wheel. (CBr at 53; CFF 200-203.) Complainant further argued that the patent includes examples where there is an intervening gear reduction to the component being driven. (CBr at 53.) For example, complainant argued that the Figure 6 embodiment is connected to a differential and therefore includes a gear reduction between the transmission unit and the wheels. (CBr at 53; CFF 199.) Complainant in addition argued that because the file history expressly states that a "direct driving of a wheel" limitation would be an additional limitation to claim 1, it cannot be part of the definition of the "continuously variable" language that already appears in claim 1. (CBr at 54.)

The administrative law judge finds that none of the language of the claims that are not at issue in this investigation changes the fact that the applicant argued before the Patent Office that, inter alia, claim 7 of the '932 patent differentiated from the Roe prior art because "the present invention teaches providing a truly infinite speed transmission, ... with no intervening gear reduction to the surface." (RX-7, Amendment at 20-21, TMC01-082578-79 (emphasis added).) Thus, he finds that the applicant disclaimed any scope relating to "continuously variable" that includes any intervening gear reduction to the surface. Moreover, the administrative law judge

finds that claim differentiation is not necessarily controlling, as he has found with the "integral combination"limitation. See Section VII.. A. 3 infra.

It is argued that claim 7 should be construed to uphold its validity and therefore should not include the "peak power" requirement. (CRBr at 59.) However, if the only claim construction that is consistent with the written description and prosecution history, renders said claim invalid, then the claim should be held invalid. See Rhine, supra.

3. "and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other"

In issue is said claimed phrase ("integral combination" limitation), which is found in independent claim 7 of the '932 patent, the only asserted claim of the '932 patent. In said claimed phrase, there are two separate claimed sub-phrases: "for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit" and "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other." The parties have treated each of said sub-phrases separately. Thus complainant argued that one of ordinary skill in the art would understand "integral combination of a respective electric motor element and an element of said transmission unit" to mean:

> an electric motor element is formed as a unit with an element of the mechanical transmission unit, namely the two components are mechanically joined with geometric overlap.

(CBr at 55 (emphasis added).) It is further argued that the specification of the '932 patent states that Figures 3, 4, and 5 show an essential electric motor element integrally connected with an

essential transmission unit element and that each of the embodiments shown in Figures 3, 4, and 5 depict electric motor elements mechanically joined and "geometrically overlapping" with mechanical transmission unit elements. (CBr at 55-56.) In addition it is argued that the Figure 6 embodiment also contains an integral combination of motor and transmission elements and that Figure 6 shows a connection between ring gear 36 and hub 26 of the planetary unit embodiment respectively connected to the disks 33 and 23 within the geometry of the motors. (CBr at 56.) It is further argued that prior art stand alone motors had motor elements located between the bearings and the connection point to the motor was outside the geometry of the motor. (CBr at 56.) It is also argued that in contrast to the prior art motors, the integrally combined motor and transmission system of the '932 patent is more compact where the mechanical connection between the motor and transmission is made inside the geometry of the motor. (CBr at 56-57.)

Complainant further argued that one of ordinary skill in the art would understand the sub-phrase "two respective elements thereof being at least to a large extent within an envelope containing the other" to mean:

> for each integral combination, either the electric motor element or the element of the transmission unit is located within a geometric enclosure containing the other element of that integral combination.

(CBr at 64; CFF 245.) It is argued that the term "envelope" is a commonly used term in the art of automotive engineering and transmission systems to describe a geometric enclosure, for example the interior of a transmission housing. (CBr at 64; CFF 245-248.) It is also argued that the preferred embodiment of the '932 patent shows the integral combinations of an electric motor element and an element of the mechanical transmission located with an area defined by "half 15

of a housing." (CBr at 64-65; CX-1 at 4:24-32, 6:23-31.) Complainant argued that each of the embodiments show this feature of the invention, namely an integral combination within each half of the housing. (CBr at 65; CFF 250-252.)

Respondents argued that one of ordinary skill in the art would understand the sub-phrase "integral combination of a respective electric motor element and an element of said transmission unit" to mean:

> for each of the two electric motors, the armature or field of the motor is rigidly fixed together with an element of the transmission unit, such that the two elements are combined without shafts, bearings and other elements therebetween.

(RBr at 27.)

Respondents also argued that complainant's construction is "a claim construction divorced from the context of the written description and prosecution history." (RBr at 28-29.) Respondents argued that this is so because, according to complainant's construction, virtually any mechanical connection of a motor and a transmission device can be considered an "integral combination," even if there are shafts, bearings, and other elements between the motor element and the corresponding gear element, and even if the two components are non-fixedly connected, e.g., via a spline connection, provided the two components are joined "with geometric overlap," an expression nowhere to be found in the '932 patent. (RBr at 28.) Respondents argued that complainant must take this position because all of respondents' accused transaxles have shafts and other elements, including non-fixed spline connections, between the rotating motor elements (i.e., the permanent magnets of MG1 and MG2) and the corresponding gear elements in the

planetary gear transmission. (RBr at 28.)[5]

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[5] Respondents' reference to the accused transaxles in claim interpretation is appropriate. Thus, in Wilson Sporting Goods Company v. Hillerich & Bradsby Co., 442 F.3d 1322, 1330-31 (Fed. Cir. 2000), the Court stated:

> To reiterate, this court has discussed the claim interpretation based solely on the claim language and the context of the patent. Unfortunately this court lacked the full context of this infringement action and the claim construction component of infringement because the record on appeal contains no description of the accused infringing devices. Without that additional context, this court cannot fully and confidently review the infringement judgment, including its claim construction component.
>
> This court, of course, repeats its rule that "claims may not be construed with reference to the accused device." NeoMagic Corp. v. Trident Microsystems, Inc., 287 F.3d 1062, 1074 (Fed.Cir.2002); SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1118 (Fed.Cir.1985) (en banc). As noted earlier, that rule posits that a court may not use the accused product or process as a form of extrinsic evidence to supply limitations for patent claim language. Thus, the rule forbids a court from tailoring a claim construction to fit the dimensions of the accused product or process and to reach a preconceived judgment of infringement or noninfringement. In other words, it forbids biasing the claim construction process to exclude or include specific features of the accused product or process. The rule, however, does not forbid awareness of the accused product or process to supply the parameters and scope of the infringement analysis, including its claim construction component. In other words, the "reference" rule accepted in Pall Corp., Multiform Desiccants, and Scripps Clinic does not forbid any glimpse of the accused product or process during or before claim construction. Pall Corp., 181 F.3d at 1308; Multiform Dessicants, 133 F.3d at 1478; Scripps Clinic, 927 F.2d at 1580. In light of these principles, if the litigants cannot themselves inform a trial court of the specific issues presented by the infringement inquiry-that is, issues of the breadth of the claim construction analysis and the most useful terms to facilitate that defining process-then a trial court may refer to the accused product or process for that context during the process. For instance in this case, this court is puzzled by the relevance of "rigid" in this claim construction analysis. Without the full infringement context,

It is also argued that one goal of the '932 patent is to minimize the number of interfaces or mechanical links across which power must be transferred. (RBr at 29.) Consistent with that goal, it is argued, the specification of the '932 patent specifically criticized the use of shafts in the prior art as a means of transmitting power between an electric motor and a transmission unit. (RBr at 29.) It is further argued that in place of a shaft, the patentee disclosed an "integral combination" of an "essential motor element" and an "essential transmission unit element," which he described as a feature of "the present invention." (RBr at 31; RFF-4.31.) Thus, respondents argued that the specification of the '932 patent makes "crystal clear" that the use of an "integral combination" of a respective motor and transmission element eliminates the need for a shaft between those two elements. (RBr at 31; RFF-4.31.) It is further argued that every embodiment in the '932 specification shows a motor element rigidly fixed together with a transmission element without shafts, bearings, or other elements between them. (RBr at 32; RFF-4.34.) It is also argued that during prosecution of the '932 patent, the applicant repeatedly touted the "integral combination" limitation as an "important" and "key feature" of his invention, and argued that it "distinguished his pending claims from the prior art." (RBr at 33; RFF-4.39.) It is

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> including some record evidence about the accused devices, this court does not fully understand the necessity for inserting "rigid" into claims without that express language. Moreover, this court cannot assess the meaning of "rigid" in the context of this invention.
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> * * *
>
> Accordingly, this court vacates and remands to the district court for a detailed analysis of the disputed claim construction, and for any further findings or conclusions.

(emphasis added.)

further argued that the applicant's arguments to the Patent Office show that an "integral combination" cannot have "shafts and bearings and other elements" between the respective motor and transmission elements. (RBr at 35.)

Respondents argued that the specification of the '932 patent describe the armature and the field, not the rotor or rotor shaft, to be an essential "electric motor element." (RBr at 38; RFF-4.66-4.68.) It is further argued that the patentee repeatedly asserted throughout the '932 specification and prosecution history that the claimed "integral combination" eliminated the need for a shaft between a respective motor element and transmission element. (RBr at 38.) It is further argued that many of the applicant's statements made during prosecution would be "rendered nonsensical" if a rotor shaft could be considered an essential "electric motor element." (RBr at 39-40; RFF-4.70, -4.72.)

Respondents also argued that an "integral" combination for two components is commonly understood by mechanical engineers to mean that the two components are rigidly fixed together. (RBr at 40; RFF-4.74.) It is further argued that the specification of the '932 patent uses "integral" consistent with its ordinary meaning in the art, i.e. the specification describes the two components as being "rigidly fixed" together, or one component being "mounted fixedly" on the other." (RBr at 41; RFF-4.75, -4.78.)

Respondents also argued that one of ordinary skill in the art would understand the sub-phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other" to mean:

> each integral combination is contained entirely or nearly entirely within the imaginary space defined by the rotation of either the respective electric motor element (i.e., the armature or field) or the

respective transmission unit element.

(RBr at 43.) It is further argued that the claim language "makes clear" that the "envelope" must be directly associated with one of the two elements of the claimed "integral combination" because dependent claim 8 narrows claim 7 by further requiring that the "envelope is that of said respective motor element." (RBr at 43; RFF-4.115-4.116.) Thus, respondents argued, in claim 7, envelope in question can be either that of the motor element or that of the transmission element whereas claim 8 narrows that requirement by requiring that the envelope be "that of said respective motor element." (RBr at 43-44.)

Respondents also argued that during prosecution, the applicant emphasized that by locating the gear element "within the envelope" of the armature, "power its taken off from inside the armature itself "rather than being "taken out by a driven shaft from a free-standing electric motor;" and that those facts make clear that, in claim 7 of the '932 patent, the armature/transmission combination must be entirely or nearly entirely inside the volume defined by the sweep of the armature (or the sweep of the transmission element.) (RBr at 45; RF-4.113.)

The staff argued that the sub-phrase "integral combination of a respective electric motor element and an element of said transmission unit" should be interpreted to require an element of the planetary transmission (e.g., a planetary gear, ring gear, or sun gear) to be rigidly and directly attached to an element of the electric motor (e.g., the armature or field assembly) without the presence of shafts, bearings, or spacers between the motor element and the transmission element. (SBr at 18.) Moreover, it is argued that neither component of such an "integral combination" should be able to "stand alone" and the integral combination must be supportable by a single bearing. (SBr at 19.) The staff further argued that the '932 patent specification's use of the term

"integral combination" supports an interpretation of said phrase that requires an essential member of the motor, such as the armature or field element(s), be rigidly attached to an essential element of the transmission device, such as the planetary gear, ring gear or sun gear. (SBr at 19-21.)

The staff also argued that during prosecution, in responding to the Examiner's rejection of application claims as either anticipated or obvious, the applicant's statements made clear that the absence of shafts and bearings is a feature of application claim 2, which issued as asserted independent claim 7. (SBr at 21-23.) It is also argued that the applicant's statements made clear that the key feature of the "present invention" is an integral combination of armature and respective gear element that cannot be separated and that such combination can be supported by a single bearing. (SBr at 23-24.) It is further argued that the applicant made clear that a device satisfying the elements of claim 7 must have only one bearing supporting the "integral combination" and, thus, cannot have a shaft within the "armature" upon which the transmission element is mounted. (SBr at 24-25.)

The staff argued that treatises during the relevant time frame make clear that one of ordinary skill in the art would not consider the term "integral combination" to encompass structures joined together using splines. (SBr at 27.) It is also argued that other claims of the '932 patent support the staff's proposed interpretation. (SBr at 28.)

The staff argued that the entire clause[6] comprising, inter alia, "each said integral

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[6] The staff interpreted the following phrase as a unit:

> each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other, whereby a compact structure is provided for

combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other" and "whereby a compact structure is provided for each said integral combination," should be interpreted as instructing one of ordinary skill how to achieve the claimed "integral combination" of the preceding clause. (SBr at 33.) Thus, the staff argued, in order to satisfy the "integral combination" element, the armature and/or the essential transmission element must be within an "envelope" containing the other, whereby a compact structure is provided for each integral combination, and the two integral combinations are located closely adjacent to each other. (SBr at 33.) The staff further argued that the term "envelope" while encompasses "housing," should be limited to "housings" that encompass combination motor transmissions that come within the sweep of the essential electric motor element that is integrally combined with an essential transmission element. (SBr at 34.) Thus, it is argued, that the phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other," as properly interpreted, is satisfied if both combination motor transmissions are placed within a housing when the respective gear element of each respective "integral combination" is approximately within envelope [sic] of the respective electric motor element, i.e., the gear element is within the sweep of the rotating electric motor element. (SBr at 35.)

The administrative law judge finds that the sub-phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an

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> each said integral combination, and said two integral combinations are located closely adjacent each other, [sic]

(CX-1 at 11:40-46.)

envelope containing the other" should be viewed in the context of the sub-phrase "integral combination of a respective electric motor element and an element of said transmission unit," because "envelope" requires, inter alia, an "integral combination," and thus "envelope" can't be defined without first defining "integral combination." Thus, the administrative law judge is interpreting the two sub-phrases together as a collective phrase.

Intrinsic evidence comprises the claims, the specification including the abstract and figures and prosecution history. Referring to asserted claim 7 and other claims of the '932 patent, and with respect to "integral combination," the administrative law judge finds that the plain meaning of the term "integral," as defined by Random House College Dictionary is "1. of, pertaining to or belonging as an essential part of the whole constituent or component. 2. made of parts that together constitute a whole. 3. entire; complete." (SBr at 18.)[7]

The administrative law judge further finds that the language in claim 7 of the '932 patent, namely, "and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit ... and said two integral combinations are located closely adjacent each other [sic]" requires that the combination motor and transmission device has two integral combinations. (CX-1 at 11:36-40, 45-46 (emphasis added).) The administrative law judge further finds that claim 7 of the '932 patent states that an integral combination comprises an

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[7] Dictionary definitions are not necessarily controlling in claim interpretation. See Phillips where the Federal Circuit concluded that the line of cases exemplified by Texas Digital Systems, Inc. v. Telegenix Inc., 308 F.3d 1193 (Fed. Cir. 2002) placed "too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the specification and prosecution history." 415 F.3d at 1320. See also Nystrom and Free Motion, supra.

electric motor element, and a transmission unit element:

> and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit

(CX-1 at 11:36-40 (emphasis added).)

As to the other claims of the '932 patent and the phrase "integral combination," independent claim 1 of the '932 patent includes the following language:

> each said integral combination involving said two respective elements thereof being directly associated mechanically and geometrically with each other without substantial spacing or other elements including bearings and shafts therebetween.

(CX-1 at 10:13-18 (emphasis added).) The administrative law judge finds that said language articulates that two elements of an integral combination are "directly associated mechanically and geometrically with each other" and then further defines this association as "without substantial spacing or other elements including bearings and shafts therebetween." (CX-1 at 10:15-18.) While the administrative law judge finds that claim 1 uses the term "geometrically," he further finds that the claim also uses the terms "directly" and "mechanically" and goes on to further define these terms, emphasizing that there cannot be substantial spacing or other elements between the integral combination elements. In addition, the administrative law judge finds that the applicant defined the concept "geometrically" in claim 1, which word "geometrically" was added to claim 1, in the amendment filed May 29, 1991, as the absence of shafts, bearings and other elements. Thus it was argued in said amendment:

> Secondary and more importantly, this prior art does not at all teach or in any way suggest the feature of the present inventions as recited in [amended] independent claims 1 [now patent claim 1]

> and 2 [now asserted patent claim 7] or in claim 3/2, of the "integral" combination of each armature and respective gear element. Namely, in this prior art there are shafts and bearings and other elements such as one of the electric motors itself, between each respective pair of these two elements.

(RX-7 at TMC01-082479 (emphasis added).)[8]

The administrative law judge finds that under complainant's interpretation of "integral combination" (i.e. an electrical motor element is formed as a unit with an element of the mechanical transmission unit, namely the two components are mechanically joined within geometric overlap), virtually any mechanical connection of a motor and a transmission device can be considered an "integral combination," even if there are shafts, bearings, and other elements between the motor element and the corresponding gear element, provided the two components are joined "with geometric overlap," an expression nowhere to be found in the language of the claims, or anywhere in the '932 patent. Thus, if complainant's interpretation was applied to claim 1 of the '932 patent, "integral combination" could potentially contradict the express limitation of "without substantial spacing or other elements including bearings and shafts therebetween."

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[8] The term "geometric overlap" is found in the remarks to the amendment. Thus it was argued:

> There is no extended transmission transmission [sic] linkage with plural support points as in the prior art, because the drive train is direct, with the respective elements beign [sic] immediately adjacent each other, and having a close geometric overlap, or a nearly common volume in space, totally unlike the prior art.

(RX-7, TMC01-082580 (emphasis added).) However, as seen supra, the applicant described the "integral combination" of the "present invention" as not containing shafts, bearings, and other elements between the respective elements.

Claim 3 of the '932 patent, which depends on claims 1 and 2 of the '932 patent, includes the following language:

> The combination motor and transmission device of claim 2, comprising
>
> a first element of said first electric motor being an armature that is connected rigidly to a respective peripheral part of a first one of said pair of drive gears to rotate with said first drive gear,
>
> a first element of said second motor being an armature that is connected rigidly to a respective peripheral part of the second one of said pair of drive gears to rotate with said second drive gear,
>
> * * *
>
> wherein each said element of the respective one of said electric motors of each said integral combination is said armature thereof.

(CX-1 at 10:37-46, 55-57 (emphasis added).) The administrative law judge finds that said claim specifies that in each "said integral combination" the armature is the element of the electric motor, i.e., one element of the integral combination, and that it is "connected rigidly" with the drive gear, which the '932 patent explains, is an element of the transmission unit, i.e., the other element of the integral combination. Thus, the administrative law judge finds that said claim requires a rigid connection in describing the "integral combination."[9]

Claim 9 of the '932 patent, which depends on claims 7 and 8 of the '932 patent, includes the following language:

> wherein each said integral combination comprises a respective on e [sic] of said drive gears a [sic] the respective element of said transmission unit, each said drive gear being mechanically

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[9] The administrative law judge finds that claims 11 and 12 of the '932 patent, which depend on claims 7, 8 and 10 of the '932 patent similarly require a rigid connection in referencing "integral combination. (CX-1 at 12:24-33, 44-46, 47-56; 13:1-4.)

connected with the respective electric motor element

(CX-1 at 11:66 - 12:2 (emphasis added).) Thus, the administrative law judge finds that said claim requires a mechanical connection in describing the "integral combination."[10] Under complainant's interpretation of "integral combination" (i.e. an electrical motor element is formed as a unit with an element of the mechanical transmission unit, namely the two components are mechanically joined within geometric overlap), virtually any mechanical connection of a motor and a transmission device can be considered an "integral combination," even if the two components are non-rigidly connected, provided the two components are joined "with geometric overlap," an expression nowhere to be found in the language of the claims, or anywhere in the '932 patent. Thus, again, if complainant's interpretation was applied to claim 3 of the '932 patent, "integral combination" could potentially contradict the express limitation of "rigidly connected."

Complainant argued that while the disputed term "integral combination" is recited in independent claims 1 and 7, only claim 1 imposes the express limitation that requires an absence of spacing, bearing or shafts, and thus, the term "integral combination" does not require two elements that are rigidly fixed together "without shafts, bearings, or other elements there between," as these requirement are expressly set forth in claim 1. (CBr at 59; CFF 220.) Complainant further argued that respondents' interpretation impermissibly adds a limitation, namely "two elements are combined without shafts, bearings, or other elements between," which is expressly present in claim 1 of the '932 patent, to claim 7 of the '932 patent, where said

[10] The administrative law judge finds that claim 23 of the '932 patent, an independent claim, similarly requires a mechanical connection in referencing "integral combination."

limitation is not expressly present. (CBr at 59.)

The administrative law judge rejects this argument because, as found infra, the patentee, in the specification of the '932 patent, repeatedly criticized prior art combinations of transmission devices and electric motor devices that included shafts, bearings, and other components; describes the electric motor element of the integral combination being held by a single bearing; equates "integrally connected" with the absence of components in between the electric motor element and the transmission unit element. and describes an "integral combination" of the electric motor element and the transmission unit element as the two elements being rigidly fixed together, or one component being mounted fixedly on the other. Furthermore, as found infra, the applicant, in the prosecution history of the '932 patent, describes the "integral combination" of the "present invention" as not containing shafts, bearings, and other components between the respective elements.

The doctrine of claim differentiation, which complainant appears to rely on, is ultimately based on the common sense notion that different words or phrases used in separate claims are presumed to indicate that the claims stated in dependent claims are not to be read into the independent claim from which they depend. Karlin Tech, Inc. v. Surgical Dynamics Inc., 177 F.3d 968, (Fed. Cir. 1999). Thus, there is presumed to be a difference in meaning and scope when different words or phrases are used in separate claims. To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant. At the same time, practice has long recognized that claims may be multiplied to define the metes and bounds of the invention in a variety of different ways. Thus two claims that read differently can

cover the same subject matter. Tandon Corp. v. United States International Trade Commission., 831 F.2d 1017, (Fed. Cir. 1987). Claim differentiation moreover only creates a presumption that each claim in a patent has a different scope. Thus it is not a hard and fast rule of construction. That the patentee chose several words in drafting a particular limitation of one claim, but fewer (though similar) words in drafting the corresponding limitation in another, does not mandate different interpretations of the two limitations, since defining a state of affairs with multiple terms should help, rather than hinder, understanding. Moreover, that the claims are presumed to differ in scope does not mean that every limitation must be distinguished from its counterpart in another claim, but only that at least one limitation must differ. Kraft Foods Inc. v International Trading Co., 203 F.3d 1362 (Fed. Cir. 2000). Significantly the doctrine of claim differentiation cannot broaden claims beyond the scope that is supported by the specification and prosecution history. The presumption that separate claims have different scope is a guide, not a rigid rule. ATD Corp. v. Lydall Inc., 159 F.3d 534, (Fed. Cir. 1998). Claim differentiation therefore does not always control claim construction. If a claim will bear only one interpretation, similarity with another claim will have to be tolerated. Laitram Corp. Morehouse Indus. Inc., 143 F.3d 1456 (Fed. Cir. 1998). Thus, the doctrine of claim differentiation cannot overshadow the express and contrary intentions of the patent draftsman. Moreover, in general, claim differentiation applies when dealing with an independent claim and a dependent claim, and generally does not apply when dealing with two independent claims, as in the case of claims 1 and 7 of the '932 patent. Finally, claim differentiation, in general, applies when the only difference between the two claims is the specific limitation that is being interpreted, and generally does not apply when the two claims have other differences besides the specific limitation that is being interpreted, as in

the case of claims 1 and 7 of the '932 patent.[11] See Sun Race supra.

Complainant also argued that its proposed interpretation of "integral" is consistent with prior Federal Circuit decisions. (CRBr at 10.) The administrative law judge finds that the term at issue in the cases that complainant cited is "integral" not "integral combination of a respective electric motor element and an element of said transmission unit." Furthermore, the administrative law judge finds that the interpretation of different terms of different patents in different cases does not override the intrinsic evidence of the claim language, the patent specification, and the patent prosecution history.

With respect to "envelope" and the claims of the '932 patent, the plain language of the phrase in issue, viz. "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other" requires that either the electric motor element or the transmission unit element reside, to a large extent, within an "envelope" containing the other element. (CX-1 at 11:40-43.) The parties agree that the term "envelope" was a commonly used term in the art in 1990 that had the meaning of "space

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[11] Claim 1 of the '932 patent, with respect to "integral combination," includes the language "a respective integral combination of a respective electric motor element and an element of said mechanical transmission unit, each said integral combination involving said two respective elements thereof being directly associated mechanically and geometrically with each other without substantial spacing or other elements including bearings and shafts therebetween," where as claim 7 of the '932 patent, with respect to "integral combination," includes the language "a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other." (CX-1 at 10:11-18 and 11:38-43 (emphasis added).) In addition, claim 7 of the '932 patent includes two limitations that are missing from claim 1 of the '932 patent, namely the "compact structure" limitation and the "closely adjacent" limitation. (See CX-1 at 9:60-10:18, 11:19-46.)

or volume."[12] (Davis, Tr. at 946:5-11; Caulfield, Tr. at 1760:15-1761:22.) At issue is what defines the boundaries of the space that constitutes an "envelope." The administrative law judge finds that claim 7 of the '932 patent, the asserted claim in issue, uses the term "envelope" but does not define the term or identify the term's boundaries.

Complainant argued that the '932 patent shows the integral combinations of an electric motor element and an element of the mechanical transmission located within an area defined by "half 15 of a housing." (CBr at 64-65.)

It is a fact that the patentee used the term "housing" in several claims of the '932 patent that are not asserted, for example claim 2 of the '932 patent:

> a housing surrounding at least in part said drive gears, pinion gears, first shaft and second shaft

(CX-1 at 10:32-33 (emphasis added).) Thus, the administrative law judge finds that if the patentee intended to claim that the integral combination was within "half a housing" the patentee knew how to use the term "housing" in the claim language, but instead, chose to use the term "envelope." Hence, the administrative law judge finds that this supports the finding that the term "envelope" has a separate, independent meaning from the term "housing."

In addition dependent claim 8 of the '932 patent, which depends on asserted independent claim 7 of the '932 patent references the term envelope using the following language:

> The combination motor and transmission deice [sic] of claim 7, wherein each said envelope is that of said respective motor element of the respective one of said integral combinations, and each said

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[12] Complainant's expert Davis testified that the space would typically be a design space, where one would allocate different envelopes for different designers to carry out their designs within that envelope while respondents' expert Caulfield testified that the space would be an imaginary space. (Davis, Tr. at 946:7-11; Caulfield, Tr. at 1760:20-21.)

envelope has effectively a cylindrical symmetry with a length that is substantially shorter than its diameter.

(CX-1 at 11:47-52.) The administrative law judge finds that claim 8 of the '932 patent requires the envelope of claim 7 of the '932 patent to be the envelope that encompasses only the electric motor element. Thus, the administrative law judge finds that this "envelope" limitation in claim 8 of the '932 patent means that each element of the integral combination in claim 7 of the '932 patent is encompassed by a separate "envelope," which indicates that an envelope could not be the size of a housing and hold both elements of the integral combination. Furthermore, the administrative law finds that the language for the "envelope" limitation of claim 7 of the '932 patent requires that one element of the "integral combination" (i.e., the electric motor element or the transmission unit element) not only resides within its own "envelope" but also resides, "to a large extent", within the "envelope" of the other element of the "integral combination." Moreover the administrative law judge finds nothing in the claim language, specification, or prosecution history, which links the term "envelope" to the term "housing."

Complainant argued that its interpretation is consistent with the language of claim 7 of the '932 patent, because, in the context of claim 7, the envelope is described as "containing" (at least "to a large extent") both the motor element and the transmission unit element of the integral combination. (CRBr at 30.) Therefore, complainant argued that respondents' argument that the envelope is defined by the volume of those components, based on its reading of claim 8 of the '932 patent, does not properly limit claim 7 of the '932 patent, which is an independent claim. (CRBr at 30-31.) However, the administrative law judge finds that it is not just claim 8 of the '932 patent that defines the envelope by the volume of said components, but it is also other

claims of the '932 patent and especially the specification of the '932 patent, and the prosecution history of the '932 patent that defines the envelope by the volume of said components.

Referring to the specification (including the abstract and the figures) of the '932 patent, the abstract in the title page of the '932 patent recites a combination electric motor and transmission unit device which is "lightweight, requires a small number of moving parts . . ." (CX-1.) The title page also reproduces Figure 3 of the '932 patent, which is an indication of the importance of Figure 3 in illustrating the invention in issue. Following the title page and the figures, the specification has a "Background Of The Invention" section, "Summary Of The Invention" section, "Brief Description Of The Drawings" section, and "Description Of The Preferred Embodiments" section. (CX-1.)

With respect to "integral combination," the specification of the '932 patent states that prior art combinations of transmission devices and electric motor devices did not have integral combinations:

> In the prior art, combinations of a transmission device and an electric motor drive device typically involved use of a separate electric motor, the shaft of which extends to provide a rotational mechanical input to the transmission device. The shaft is typically supported by two bearings at two separated parts of the shaft, the motor elements being located between the positions of the bearings.
>
> The prior art does not involve combining any of the essential elements of the electric motor means integrally with the essential elements of the transmission means, nor the supporting of the element of the electric motor with a single bearing. Thus the prior art arrangements for combined motor and transmission means involved a large number of parts and an undesirable associated weight.

(CX-1 at 2:34-49 (emphasis added).) Thus, the administrative law judge finds that the

specification of the '932 patent criticized prior art combinations of transmission devices and electric motor devices that included shafts, bearings, and other components as "[not] combining any of the essential elements of the electric motor means integrally with the essential elements of the transmission means." (CX-1 at 2:42-44 (emphasis added).) The administrative law judge further finds that the specification of the '932 patent identified prior art combinations that were not integrally connected as not involving "the supporting of the element of the electric motor with a single bearing." (CX-1 at 2:45-46 (emphasis added).) The administrative law judge also finds that the specification of the '932 patent identified prior art combinations that were not integrally connected and as involving "a large number of parts and an undesirable associated weight." (CX-1 at 2:46-49.)

Thereafter in the "Summary Of The Invention" section it is stated that an object of the invention is to provide a combination motor and transmission device "which is lightweight and highly efficient, as a result of a small number of parts . . ." (CX-1, at 3:11-12.) In addition as found supra, the language in claim 7 of the '932 patent recites that the combination motor and transmission device has two integral combinations. (CX-1 at 11:36-40, 45-46.) The administrative law judge finds that the specification of the '932 patent contains similar language[13]:

> Another object of the invention is to provide an infinite speed combination motor and transmission device having two inputs, at least one of the inputs being an integral combination of an electric

[13] The administrative law judge finds that while the specification of the '932 patent uses the language "at least one of the inputs being an integral combination" and "at least one which involves an integral combination," asserted claim 7 of the '932 patent explicitly requires that the combination motor and transmission device have two integral combinations. (See CX-1 at 2:57-61, 11:36-40, 45-46.)

> motor element and a transmission unit element.
>
> A further object of the present invention is to provide a combination motor and transmission device for each drive wheel of an electric powered vehicle, wherein each device has two power inputs including at least one which involves an integral combination of an electric motor means and a transmission means, for effectively propelling the vehicle.

(CX-1 at 2:57-61 (emphasis added).)

The "Brief Description Of The Drawings" section of the '932 patent makes reference to Figures 1A and 1B, 2, 3, 4, 5 and 6. Figures 1A and 1B are schematics of an electric-powered vehicle having a combination motor and transmission device "of the present invention." Figure 2 of the '932 patent is a block diagram showing the general characteristics of the combination motor and transmission device "of the present invention." It indicates the first electrical or rotational mechanical input, the second electrical or rotational mechanical input, the transmission drive device, and the rotational mechanical output. Figures 3, 4, 5 and 6 of the '932 patent illustrate four different embodiments "of the present invention", namely, the combination motor and transmission device. (CX-1 at 3:21-45.) Significantly, the patentee relates each of Figures 1A, 1B, 2, 3, 4, 5, and 6 to the "present invention."

Referring to Figure 3 of the '932 patent, said figure illustrates an embodiment employing a differential unit. (CX-1 at 3:32-34.) Figure 3 of the '932 patent is a cross-section view (i.e., a view bisected along the plane of the page) of an differential unit embodiment of the patented invention, namely, the combination motor and transmission device. (See CX-1 at 3:32-34.) In this embodiment the combination motor and transmission device is connected to the undercarriage or supporting frame of an electrically powered vehicle, so that said combination

motor and transmission device is incorporated within the wheel assembly, effectively within the space which the tire rotates, as described in Figure 1A of the '932 patent, and shown in Figure 3. (CX-1 at 3:57-4:6, 4:25-32.) The components shown in Figure 3 of the '932 patent, that are relevant to "integral combination," are housing 15, field element 21, armature element 22, circular disk 23, drive gear 24, and bearing 25. (See CX-1.)

Figure 4 of the '932 patent is a cross-section view (i.e., a view bisected along the plane of the page) of a planetary gear unit embodiment of the patented invention, namely, the combination motor and transmission device. (See CX-1 at 3:35-37.) In this embodiment, the combination motor and transmission device is connected to wheel axle 43, the wheel axle 43 is supported by bearing half 44', and the wheel axle is connected to output 4, where output 4 is connected to the wheel. (CX-1 at 6:26-28.) As the specification of the '932 patent states, the parts identical to those of the embodiment of Figure 3 of the '932 patent are shown with the same reference numbers. (CX-1 at 6:24-26.) The components shown in Figure 4 of the '932 patent, that are relevant to "integral combination," are housing 15, field element 21, armature element 22, circular disk 23, bearing 25, hub 26, circular disk 33, and ring gear 36. (See CX-1.)

Figure 5 of the '932 patent is a cross-section view (i.e., a view bisected along the plane of the page) of another planetary gear unit embodiment of the patented invention, namely, the combination motor and transmission device. (See CX-1 at 3:38-40.) In this embodiment, like the embodiment depicted in Figure 4 of the '932 patent, the combination motor and transmission device is connected to wheel axle 43, the wheel axle 43 is supported by bearing half 44', and the wheel axle is connected to output 4, where output 4 is connected to the wheel. (CX-1 at 6:49-51.) Also, in this embodiment, disk 23 of input 2 is rigidly connected to an extension 46' of the sun

gear, so as to turn the sun gear when the input 2 is activated. (CX-1 at 6:51-53.) Also, in this embodiment, the sun gear and its extension 45' are cylindrically hollow along the axis of the sun gear, to allow an extension 43' to extend to the right along its axis to connect rigidly and nonrotatingly with the hub 26' of the planetary gear set. (CX-1 at 6:53-58.) The components shown in Figure 5 of the '932 patent, that are relevant to "integral combination," are housing 15, field element 21, armature element 22, circular disk 23, bearing 25, armature element 32, circular disk 33, ring gear 36, and sun gear extension 46'. (See CX-1.)

Figure 6 of the '932 patent is a cross-section view (i.e., a view bisected along the plane of the page) of a flywheel embodiment of the patented invention, namely, the combination motor and transmission device. (See CX-1 at 3:42-44.) This embodiment is used for storing energy and supplying energy as needed, and shows a combination motor and transmission device having two inputs of electrical energy and an output of rotational mechanical energy, which can be reversed in the sense of what constitutes an input or output. (CX-1 at 9:14-20.) The components shown in Figure 6 of the '932 patent, that are relevant to "integral combination," are housing 15, field element 21, armature element 22, circular disk 23, hub 26, circular disk 33, and ring gear 36. (See CX-1.)

As found supra, claim 7 of the '932 patent states that an integral combination comprises an electric motor element, and a transmission unit element. (CX-1 at 11:36-40.) The administrative law judge finds that the specification of the '932 patent, referring to Figure 2, emphasizes the generic features of the present invention in stating that an integral combination comprises an electric motor element, and a transmission unit element:

> The generic features of the combination motor and transmission

> device 1 of the present invention are indicated in FIG. 2. The two inputs, 2, 3 are for the input of power. At least one of these inputs 2, 3 is an electrical power input, to drive an integrally formed combination of an electric motor element and a transmission unit element within the device 1.

(CX-1 at 4:7-13 (emphasis added).) Thus, the administrative law judge finds that Figures 3, 4, 5 and 6 of the '932 patent disclose two integral combinations, each integral combination comprising of an electric motor element and a transmission unit element.

The administrative law judge further finds that the specification of the '932 patent generally identifies the electric motor element and transmission unit element of an "integral combination" for the embodiments illustrated in Figures 3, 4, 5 and 6 of the '932 patent as follows:

> For instance, the electric motor element might be the armature of the electric motor, mounted on the rotating ring gear as the essential element of a differential unit transmission, as discussed next for FIG. 3. Alternatively, the essential electric motor element could be the field assembly, and the essential motor element[14] another part of the transmission unit.
>
> * * *
>
> As shown in FIGS. 3, 4 and 5, a feature of the present invention is that an essential electric motor element, such as the armature element 22, is integrally connected with an essential transmission unit element, such as the drive gear 23[15] in FIG. 3, the hub 26 in

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[14] The administrative law judge finds that given the context of this paragraph in the specification of the '932 patent and the rest of said specification, "essential motor element" should read "essential transmission unit element."

[15] The specification of the '932 patent identifies the component of Figure 3 labeled 23 as "circular disc 23" and the component of Figure 3 labeled 24 as "drive gear 24":

> Turning to the invention, the input 2 includes ... an armature element 22 fixed on the outer periphery of a circular disk 23, which

FIG. 4 or the sun gear 46 (via the extension 46') in FIG. 5.

(CX-1 at 4:13-20; 7:30-35 (emphasis added).)

The administrative law judge also finds that, in the case of Figure 4, the transmission unit element for the right integral combination is a different component than the transmission unit element for the left integral combination, based on the following language of the specification of the '932 patent:

> The outmost member of the planetary gear unit is the ring gear, the teeth of which are on the inside periphery of the hollow cylindrical member 36. The right end of the cylindrical member 36 can be closed, but in any case is rigidly fixed, in this example, the disk 33 of input 3 to rotate with it.

(CX-1 at 6:32-37.) The administrative law judge finds that this also applies to Figure 5 because Figure 5 employs a planetary gear unit, the same as Figure 4, and is an alternative planetary gear element, and the specification states that the distinction is that disk 23 of input 2 is rigidly connected to sun gear extension 46', instead of hub 26 as in Figure. (See CX-1 at 6:49-53.) The administrative law judge further finds that, in the case of Figure 6, the transmission unit element for the right integral combination is a different component than the transmission unit element for the left integral combination, based on the following language of the specification of the '932 patent:

> is shown edgewise in FIG. 3.
>
> * * *
>
> Mounted fixedly on the disk 23 is a drive gear 24, a cylindrically bevelled front of which is grooved to form gear teeth.

(CX-1 at 4:53-66 (emphasis added).) Thus, the administrative law judge finds that "drive gear 23" should read "drive gear 24."

> Input 3 has similar components. This embodiment shows the ring gear 36 and hub 26 of the planetary unit embodiment of FIG. 4, respectively connected to the disks 33 and 23.

(CX-1 at 9:40-43.)

Based on the foregoing, the administrative law judge finds that the electric motor element consists of either: field element 21 or armature element 22 (and armature element 32, in the case of Figure 6). However he finds that the embodiments of the '932 patent, illustrated in Figures 3, 4, 5 and 6 of the '932 patent only disclose the armature element 22 (and the armature element 32, in the case of Figure 6) as the electric motor element of the integral combination. The administrative law judge also finds that the transmission unit element consists of either: drive gear 24 (as illustrated in Figures 3 and 6); hub 26 (as illustrated in Figure 4); sun gear 46, via the extension 46' (as illustrated in Figure 5); or drive gear 36 (as illustrated in Figures 4, 5 and 6).

The administrative law judge further finds that the specification of the '932 patent describes a circular disk which is identified as circular disk 23 in Figures 3, 4, 5 and 6:

> Turning to the invention, the input 2 includes for instance a field element 21 fixed on the interior of the housing portion 15, to interact with for instance an armature element 22 fixed on the outer periphery of a circular disk 23, which is shown edgewise in FIG. 3.

(CX-1 at 4:53-57 (emphasis added).) The administrative law judge also finds circular disc 23 of Figures 3, 4, 5 and 6 of the '932 patent is neither an electric motor element, nor a transmission unit element because the specification of the '932 patent expressly states that either an armature or armature element is the electric motor element, and that, while the specification of the '932 patent states that the armature element 22 is fixed onto the circular disc 23, the specification neither identifies the circular disk as part of the armature, nor identifies circular disc 23 as an

electric motor element. Although the specification of the '932 patent does not identify disk 23 as a electric motor element, and although in Figures 3, 4, 5 and 6 of the '932 patent, disk 23 appears to be between the electric motor element, and the transmission unit element, the administrative law judge finds that disk 23 is part of the "integral combination" of the electric motor element and the transmission unit element, and that the patentee did not consider the disk 23 an intervening structure between the electric motor element and the transmission unit element. For similar reasons, the administrative law judge finds that corresponding disc 33 of Figures 4, 5 and 6 is neither an electric motor element, nor a transmission unit element.[16]

Finally, the administrative law judge finds that the electric motor elements for the left integral combination are identical to the electric motor elements for the right integral combination for Figures 3, 4, 5 and 6 of the '932 patent based on the fact that the specification of the '932 patent states that the electric motor element can be "the armature of the electric motor" or "the field assembly" and that Figures 3, 4, 5 and 6 of the '932 patent show both field assembly 21, and armature element 22 (and armature 32, in the case of Figure 6).[17] (See CX-1 at 4:13-20.)

With respect to Figure 3 of the '932 patent, based on the previously cited sections of the specification of the '932 patent, the administrative law judge finds that the left integral combination is the combined structure of armature element 22, circular disk 23, and drive gear 24 on the left side of the combination motor and transmission device. The administrative law judge

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[16] Thus, when the administrative law judge states that the electric motor element is connected to the transmission unit element, it is inherent in that connection that said elements are each connected to the circular disk.

[17] The administrative law judge also finds that circular disk 23 is also shown in Figures 3 through 6, although, as found supra, circular disk 23 is neither an electric motor element, nor a transmission unit element.

also finds that, while the components on the right side of the combination motor and transmission device are not identified in Figure 3 of the '932 patent, the specification of the '932 patent discloses that the components on the right side of the combination motor and transmission device are the same as the components on the left side of the combination motor and transmission device in Figure 3 of the '932 patent:

> In this embodiment, input 3 has essentially the same components as input 2, as is indicated in FIG. 3.
>
> Proceeding to the output 4, the pinion gear shaft 41 holds the pair of pinion gears 42 to rotate between the opposing drive gears of the inputs 2 and 3, namely the drive gear 24 on input 2 and the corresponding drive gear on input 3 indicated in FIG. 3. The pinion gear shaft 41 is rigidly (nonrotatingly) connected at a right angle and at its center to the wheel shaft 43 for rotating the wheel 10.
>
> When the bevelled drive gear 23 on input 2 and the corresponding opposing drive gear on input 3 are driven by the electrical inputs to rotate at the same speed, then the pinion gears 42 do not rotate on the pinion gear shaft 41.

(CX-1 at 5:1-22 (emphasis added).) Thus, the administrative law judge further finds that, in Figure 3 of the '932 patent, the right integral combination is the combined structure of armature element 22, circular disk 23, and drive gear 24 on the right side of the combination motor and transmission device.[18] The administrative law judge also finds that in the left integral combination of Figure 3 of the '932 patent, the electric motor element is armature element 22 (left), and the transmission unit element is drive gear 24 (left). The administrative law judge, in addition, finds that in the right integral combination of Figure 3 of the '932 patent, the electric

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[18] Thus, when the administrative law judge refers to armature element 22, circular disk 23, or drive gear 24 on the right side of the combination motor and transmission device, he is referring to the corresponding unmarked components in Figure 3.

motor element is armature element 22 (right), and the transmission unit element is drive gear 24 (right).

With respect to Figure 4 of the '932 patent, based on the previously cited sections of the specification of the '932 patent, the administrative law judge finds that the left integral combination, in Figure 4 of the '932 patent, is the combined structure of armature element 22, circular disk 23, and hub 26 on the left side of the combination motor and transmission device. Also, the administrative law judge finds that the right integral combination is the combined structure of armature element 22, circular disk 33, and ring gear 36 on the right side of the combination motor and transmission device. The administrative law judge further finds that, in the left integral combination of Figure 4 of the '932 patent, the electric motor element is armature element 22 (left), and the transmission unit element is hub 26. The administrative law judge, in addition, finds that in the right integral combination of Figure 4 of the '932 patent, the electric motor element is armature element 22[19] (right), and the transmission unit element is ring gear 36.

With respect to Figure 5 of the '932 patent, based on the previously cited sections of the specification of the '932 patent, the administrative law judge finds that the left integral combination, in Figure 5 of the '932 patent, is the combined structure of armature element 22, circular disk 23, and sun gear extension 46' on the left side of the combination motor and transmission device. Also based on the specification of the '932 patent, the administrative law judge finds that the right integral combination, is the combined structure of armature element 22,

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[19] While the right armature is not labeled as 22 in Figure 4 of the '932 patent, the administrative law judge finds that it is an armature element because the specification states that in Figure 4, "[p]arts identical to those of the embodiment of [Figure 3] are shown with the same reference numbers and are not described again," and that in Figure 3, as found supra, the right component was also armature 22, despite not being labeled.

circular disk 33, and ring gear 36 on the right side of the combination motor and transmission device. The administrative law judge further finds that in the left integral combination of Figure 5 of the '932 patent, the electric motor element is armature element 22 (left), and the transmission unit element is sun gear extension 46'. The administrative law judge further finds that in the right integral combination of Figure 5 of the '932 patent, the electric motor element is armature element 22[20] (right), and the transmission unit element is ring gear 36.

With respect to Figure 6 of the '932 patent, based on the previously cited sections of the specification of the '932 patent, the administrative law judge finds that the lower integral combination, in Figure 6 of the '932 patent, is the combined structure of armature element 22, circular disk 23, and hub 26. Also based on the specification of the '932 patent, the administrative law judge finds that the upper integral combination, is the combined structure of armature element 32, circular disk 33, and ring gear 36. The administrative law judge further finds that in the lower integral combination of Figure 6 of the '932 patent, the electric motor element is armature element 22, and the transmission unit element is hub 26. The administrative law judge in addition finds that in the upper integral combination of Figure 6 of the '932 patent, the electric motor element is armature element 32, and the transmission unit element is ring gear 36.

The administrative law judge further finds that the specification of the '932 patent describes the circular disk that houses the electric motor element of the integral combination

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[20] While the right armature is not labeled as 22 in Figure 5 of the '932 patent, the administrative law judge finds that it is an armature element because the only structural differences between Figure 4 of the '932 patent and Figure 5 of the '932 patent do not involve the armature elements, and that in Figure 4, as found supra, the right component was also armature 22, despite not being labeled.

being held by a single bearing:

> The disk 23 is supported by a bearing 25 fixed on the housing 15, and is accordingly forced to rotate about an axis collinear with the wheel 10. Mounted fixedly on the disk 23 is a drive gear 24, a cylindrically bevelled front of which is grooved to form gear teeth. In this embodiment, input 3 has essentially the same components as input 2, as is indicated in FIG. 3.

(CX-1 at 4:62-68 (emphasis added).)

The administrative law judge further finds that the specification of the '932 patent describes the integral combination feature of the invention of the '932 patent as reducing the number of components, size and weight of the motor and transmission device:

> As shown in FIGS. 3, 4 and 5, a feature of the present invention is that an essential electric motor element, such as the armature element 22, is integrally connected with an essential transmission unit element, such as the drive gear 23 in FIG. 3, the hub 26 in FIG. 4 or the sun gear 46 (via the extension 46') in FIG. 5. This is a most effective approach for reducing the number of components, size and weight of the motor and transmission device. This reduction includes a reduction from the number of bearings required in the prior art to support both ends of the motor output shaft, namely the shaft which then serves as a rotational mechanical input to the transmission device in prior art combination. As can be seen from the drawings, there are little sideways forces acting on the illustrated essential elements of the transmission means, so further bearings are not necessarily needed. Thus, a single bearing can be made, by appropriate design in each specific case, to suffice for the essential transmission part carrying the essential electric motor part with which it is combined. Namely, most of the loading can effectively be provided in a single plane perpendicular to the axis of rotation of the essential transmission part.

(CX-1 at 7:30-52 (emphasis added).) Thus, the administrative law judge finds that the specification of the '932 patent equates "integrally connected" with the absence of components in between the electric motor element and the transmission unit element. Consistent with this

finding, the administrative law judge further finds that every embodiment in the '932 specification shows a motor element connected to a transmission element without shafts, bearings, or other components between them.[21] (See CX-1.)

The administrative law judge also finds that the specification of the '932 patent describes an "integral combination" of the electric motor element and the transmission unit element as the components being rigidly fixed together, or one component being mounted fixedly on the other:

> For instance, the electric motor element might be the armature of the electric motor, mounted on the rotating ring gear as the essential element of a differential unit transmission, as discussed next for FIG. 3.
>
> * * *
>
> Turning to the invention, the input 2 includes for instance a field element 21 fixed on the interior of the housing portion 15, to interact with for instance an armature element 22 fixed on the outer periphery of a circular disk 23, which is shown edgewise in FIG. 3.
>
> * * *
>
> Mounted fixedly on the disk 23 is a drive gear 24, a cylindrically bevelled front of which is grooved to form gear teeth.
>
> * * *
>
> The right end of the cylindrical member 36 can be closed, but in any case is rigidly fixed, in this example, to the disk 33 of input 3 to rotate with it.
>
> * * *
>
> A portion 26 of the hub is shown extending to the left for rigid connection to the disk 23 of input 2.

---

[21] As found supra, circular disk 23 (or 33) is not a component between the motor element and the transmission element.

* * *

> Here the disk 23 of the input 2 is rigidly connected to an extension 46' of the sun gear, so as to turn the sun gear when the input 2 is activated.

* * *

> As shown in FIGS. 3, 4 and 5, a feature of the present invention is that an essential electric motor element, such as the armature element 22, is integrally connected with an essential transmission unit element, such as the drive gear 23 in FIG. 3, the hub 26 in FIG. 4 or the sun gear 46 (via the extension 46') in FIG. 5.

(CX-1 at 4:13-17, 4:53-57, 4:64-66, 6:34-37, 6:40-41, 6:51-53 (emphasis added).) Thus, the administrative law judge finds that the specification of the '932 patent with the figures discloses that the key features of the "integral combination" of a electric motor element and a transmission unit element are: (1) the integral combination is supportable by a single bearing; (2) the integral combination contains no shafts, bearings, or other components between the electric motor element and the transmission unit element; and (3) the electric motor element and the transmission unit element are directly and rigidly connected.[22]

Regarding the figures of the '932 patent, the "Description Of The Preferred Embodiments" section starts with the sentence that "[t]he present invention will be understood from the detailed description of the specific embodiments hereinbelow and from the respective drawings" (CX-1 at 3:47-50.) In addition, said "Description Of The Preferred Embodiments" section contains the following references to "the present invention" in describing the figures of the specific embodiments:

> An electrically powered vehicle, having for instance its four wheels

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[22] Said connection is by way of a direct and rigid connection to the circular disk.

10 driven by four respective ones of the combination motor and drive transmission devices 1 of the present invention, is shown in FIGS. 1A and 1B.

* * *

The generic features of the combination motor and transmission device 1 of the present invention are indicated in FIG. 2.

* * *

The rotational mechanical power output 4 is at a continuously variable speed, such as from a negative maximum value to a positive maximum value in various embodiments of the present invention.

FIG. 3 shows an embodiment of the combination motor and transmission device 1 of the present invention employing a differential unit in a novel manner.

* * *

Turning to the invention, the input 2 includes for instance a field element 21 fixed on the interior of the housing portion 15, to interact with for instance an armature element 22 fixed on the outer periphery of a circular disk 23, which is shown edgewise in FIG. 3.

* * *

The transmission and drive device of the present invention is small and lightweight enough to fit with the rest of the wheel assembly within the interior space of the wheel.

* * *

It is estimated that the transmission and drive device of the present invention could weigh as little as 35 or 40 lbs or less, and have outside cylindrical dimensions of for instance 14 inches in diameter by 8 inches from end to end, or smaller.

By being small enough to fit with the wheel assembly within the wheel, the devices of the present invention allow the steering and suspension geometry for the vehicle to be correct.

* * *

For simplicity, two further embodiments of the transmission and drive devices of the present invention are described in the following with the wheel shaft 43 connecting directly to the wheel 10, with the wheel being outboard of the device 1. It is clear that these other embodiments could be provided similarly to that of FIG. 3 if desired, namely with the device 1 provided within the space inside the wheel.

FIG. 4 shows an embodiment of the transmission device of the present invention employing a planetary gear unit.

* * *

FIG. 5 shows another embodiment of the transmission device of the present invention employing a planetary gear unit.

* * *

As shown in FIGS. 3, 4 and 5, a feature of the present invention is that an essential electric motor element, such as the armature element 22, is integrally connected with an essential transmission unit element, such as the drive gear 23 in FIG. 3, the hub 26 in FIG. 4 or the sun gear 46 (via the extension 46') in FIG. 5.

* * *

Thus, when two stepping motors are employed in the two inputs of the transmission drive device of the present invention, the sum of the peak powers of the two stepping motors is effectively available at the output, when each motor is driven at a rotational speed above the minimum speed for providing the plateau value for its peak power output.

As is easily understood, this total peak power output of the transmission device of the present invention is available at any output speed.

* * *

A stepping motor is particularly advantageous for use in the drive devices of the present invention which might be employed in a

battery powered vehicle.

* * *

Use of a computer to control the stepping motors in the drive device of the present invention would easily allow for cornering, such as by driving the two front wheels that are being steered at different output speeds depending on the radius of the turn as sensed by the computer, such as by the angle to which the steering wheel is turned by the driver.

* * *

An important advantage of the present invention is that the braking of the vehicle can be performed by the drive devices of the present invention being used as generators, namely by regenerative braking.

* * *

The infinite-speed characteristic of the combination motor and transmission device of the present invention is particularly useful for this purpose, namely in being able to adjust the device for maximum regeneration.

* * *

Some considerations for controlling electrical power inputs to the combination motor and transmission device of the present invention are as follows. A first control strategy for operating the device of the present invention for bringing a vehicle to speed from standstill is simple.

* * *

FIG. 6 shows another embodiment of the present invention for use as a flywheel for storing energy and supplying same when needed.

(CX-1 at 3:54-57, 4:7-9, 4:20-26, 4:53-57, 5:54-57. 5:59-67, 6:13-24, 6:49-51, 7:30-35, 7:65-8:6, 8:8-10, 8:27-33, 8:39-42, 8:49-52, 8:64-9:1, 9:14-16 (emphasis added).)

Thus, the administrative law judge finds that the features described in the figures of the specification of the '932 patent apply to the patented invention of the '932 patent. The '932

patent does have the following boilerplate language:

> The description and drawings of the embodiments are for explanation only, and are not intended in any way to limit the invention.
>
> * * *
>
> The present invention is limited only by the scope of the following claims, and not by any specifics of the embodiments disclosed above. Numerous modifications and variations of the above embodiments will be apparent to a skilled worker in the art in possession of the present disclosure, and as well other embodiments within the scope of the present invention.

(CX-1 at 3:50-53, 9:52-58.) The specification including the abstract and the figures, as well as the prosecution history, however, may limit the claimed subject matter. See Phillips supra. Moreover the administrative law judge finds that mere boilerplate language and without giving some detail as to the "[n]umerous modifications and variations" does not enlarge the inventive concept of asserted claim 7, viz.: (1) the integral combination is supportable by a single bearing; (2) the integral combination contains no shafts, bearings, or other components between the electric motor element and the transmission unit element; and (3) the electric motor element and the transmission unit element are directly and rigidly connected, which is clearly defined by the intrinsic evidence, as dictated by the specification including the abstract and figures and the prosecution history.

Complainant argued that the specification of the '932 patent discloses that the feature of the "integral combination" that distinguished the patented invention from prior art combinations of a transmission device and an electric motor is that said two components "are mechanically joined with geometric overlap. (CBr at 56-57; CRBr at 10-11.) In other words, complainant

argued, in contrast to the prior art stand alone motors where the motor elements were located between the bearings, and where the connection point to the motor is outside the geometry of the motor, the integrally combined motor and transmission system of the '932 patent contains a mechanical connection between the motor and transmission which is made inside the geometry of the motor. (CBr at 56-57; CRBr at 10-11; CFF 224, 227, 229-233.) Complainant relied on the following language of the specification:

> In the prior art, combinations of a transmission device and an electric motor drive device typically involved use of a separate electric motor, the shaft of which extends to provide a rotational mechanical input to the transmission device. The shaft is typically supported by two bearings at two separated parts of the shaft, the motor elements being located between the positions of the bearings.
>
> The prior art does not involve combining any of the essential elements of the electric motor means integrally with the essential elements of the transmission means, nor the supporting of the element of the electric motor with a single bearing. Thus the prior art arrangements for combined motor and transmission means involved a large number of parts and an undesirable associated weight.

(CX-1 at 2:33-49.) However, said portion of the '932 patent significantly discloses the inventor's disdain for shafts between the integral combination elements which he proposes to eliminate in his invention by "combining ... the essential elements of the electric motor means integrally with the essential elements of the transmission means" to avoid a large number of parts and an undesirable associated weight, and the statement therein "the shaft of which extends to provide a rotational mechanical input." (CX-1 at 2:33-49.) Furthermore, the administrative law judge finds that, the significant number of previously cited sections of the '932 specification disclose the electric motor element being connected to the transmission unit element without

shafts, bearings, or other intervening components. Additionally, the administrative law judge finds that the concept of "geometric overlap" of the electric motor element and the transmission unit element which complainant relies on and was first disclosed in the remarks to the only substantive amendment, is not referenced in the specification of the '932 patent.[23] Rather, the '932 patent, as found supra, discloses in the title page, the "Background Of The Invention" section, the "Summary Of The Invention" section, the "Brief Description Of The Drawings" section, and the "Description Of The Preferred Embodiments" section, the concept of the electric motor element connected with the transmission unit element without shafts, bearings, or other components in between. Reference is further made to the repeated recitation of "present invention" in the "Description Of The Preferred Embodiments" section as set forth supra.

Complainant also argued that in the specification of the '932 patent, an armature, with respect to identifying an electrical motor element, is synonymous with an armature assembly. (CFF 132.) Complainant further argued that in Figure 5 of the '932 patent, the integral combination of an electric motor elements and an essential transmission unit is formed between

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[23] Claim 1 of the '932 patent does recite the following:

> said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said mechanical transmission unit, each said integral combination involving said two respective elements thereof being directly associated mechanically and geometrically with each other without substantial spacing or other elements including bearings and shafts therebetween.

(CX-1 at 10:9-18 (emphasis added).) However, as found supra applicant defined the concept "geometrically," in the only substantive amendment filed on May 29, 1991, as the absence of shafts, bearings and other elements. See supra.

the armature assembly 22 and 23, and the sun gear extension, 46', relying solely on the testimony of its expert, Davis. (CFF 137.) However, the administrative law judge finds that the earlier cited sections of the specification of the '932 patent clearly identified which components are electric motor elements, and which are transmission unit elements, and that the specification of the '932 patent clearly identified the armature or armature element 22 as an electric motor element, but did not either define the armature as including the circular disk 23, or identify the circular disk 23 as a separate electric motor element. Additionally, the administrative law judge finds that the term "armature assembly" is not used in the specification of the '932 patent, and he finds that the specification never defined a term similar to "armature assembly" that includes both armature element 22 and circular disk 23.

Complainant argued that the term "rigidly fixed" is described within the '932 patent to mean non-rotatingly connected and thus, properly understood, the term "rigidly fixed" means that the two components are mechanically joined together, which is the way a person of skill in the art in 1990 would have understood the term. (CBr at 60; CFF 218-219.) However, the administrative law judge finds that the specification of the '932 patent only used the "non-rotatingly" connected definition to describe a connection between a pinion gear shaft and a wheel shaft, which is not part of an "integral combination:"

> The pinion gear shaft 41 is rigidly (non-rotatingly) connected to a right angle and at its center to the wheel shaft 43 for rotating the wheel 10.)

(CX-1 at 5:5-8.)

Complainant also argued that if the administrative law judge finds that the "motor element" is simply the armature elements (i.e., item 22), respondents' claim interpretation cannot

be met because in every embodiment there is some element (e.g. disk 23 and bearing 25) between the electric motor element (armature elements 22) and the transmission unit element (gear 24). (CRBr at 17-18.) As found supra, disk 23 of Figures 3, 4, 5 and 6 of the '932 patent, while not an electric motor element, is not an intervening component between the electric motor element and the transmission unit element, and instead, is part of the "integral combination," as described by the applicant in the prosecution history of the '932 patent. Furthermore, the administrative law judge finds that bearing 25 in Figures 3, 4, 5 and 6 of the '932 patent is not between the electric motor element and the transmission unit element, as Figures 3, 4, 5 and 6 of the '932 patent show, and instead, bearing 25 is either to the left (in Figures 3, 4, and 5) or below (in Figure 6) of disk 23, and is not attached to either the electric motor element or the transmission unit element.

Complainant further argued that Figure 5 of the '932 patent includes an "extended shaft", which the specification labels a "sun gear extension." (CRBr at 20-21.) It is also argued that the specification clearly refers to this "shaft" as being part of the "integral combination," and therefore, the specification describes an "integral connection" (i.e. the claimed integral combination) being made via a part that respondents' expert Caulfield referred to as an "extended shaft." (CRBr at 21.) However, as found supra, the sun gear extension 46' of Figure 5 is a transmission unit element and not a component that resides between the electric motor element and the transmission unit element. Thus, the administrative law judge rejects complainant's argument.

With respect to "envelope," as found supra, the parties agree that the term "envelope" was a commonly used term in the art in 1990 that had the meaning of "space or volume." Thus,

the administrative law judge finds that what is at issue is what defines the boundaries of the space that constitutes an "envelope." (Davis, Tr. at 946:5-11; Caulfield, Tr. at 1760:15-1761:22.) The administrative law judge further finds that the specification of the '932 patent does not reference the term "envelope" nor does it define boundaries for a space that constitutes an "envelope." Thus, besides the patent drawings in the figures of the '932 patent, which disclose the placement of the components of the integral combination, but does not disclose any boundaries for a space that constitutes an "envelope," the administrative law judge finds that the specification does not aid in determining the boundaries of the space that constitutes an "envelope," as recited in the claimed phrase at issue.

Complainant argued that the specification supports its interpretation of the "envelope" limitation, viz., that the preferred embodiment of the '932 patent shows the integral combinations of an electric motor element and an element of the mechanical transmission located within an area defined by "half 15 of a housing," based on the following language of the specification of the '932 patent:

> FIG. 3 shows an embodiment of the combination motor and transmission device 1 of the present invention employing a differential unit in a novel manner. The device 1 includes a half 15 of a housing which, when the device is employed in an electric vehicle as in FIG. 1A, may be fixed directly to the suspension member 12, and to the steering member 13 in the case of the wheel being rotated for steering, or to some other appropriate member of the vehicle.
>
> * * *
>
> FIG. 4 shows an embodiment of the transmission device of the present invention employing a planetary gear unit. Parts identical to those of the embodiment of FIG. 3 are shown with the same reference numbers, and are not described again. The simplified

> output 4 shows the wheel axle 43 supported by a bearing half 44 ' connected to the housing half 15. The significant differences arise in replacing the differential gear unit with the planetary gear unit.

(CBr at 64-65; CX-1 at 4:24-32; 6:23-31 (emphasis added).) Complainant further argued that an integral combination within each half of the housing is shown in Figures 4 and 5 of the '932 patent, where the integral combination of the first armature 22 and disk 23, and the sun gear 46 and the sun gear extension 46' are located within the envelope defined by the left half of the housing, while the integral combination of the second armature and disk, and the ring gear are located within the envelope defined by the right half of the housing; and that said integral combination within each half of the housing is shown in Figure 6, where the integral combinations of the armature 22, disk 23 and hub are contained within a first half of the housing, and the integral combination of the second armature, disk 33 and ring gear are within a second half of the housing. (CBr at 65; CX-1.) The administrative law judge rejects complainant's interpretation because the administrative law judge finds that the specification of the '932 patent does not disclose whether the "half of the housing" is the left half of the housing or the right half of the housing in any of the figures of the '932 patent. (See CX-1 at 4:24-32; 6:23-31.) Instead, the administrative law judge finds that, because the housing is being viewed in cross-section, i.e., bisected along the plane of the page, the term "half of a housing" refers to the entire housing structure being shown in the figures, not the left or right half of the "half of the housing" disclosed in the figures of the '932 patent (which are in fact quarters of the housing).

Complainant argued that respondents' and the staff's interpretation of the envelope portion of the "integral combination" limitation cannot be correct because it does not apply to Figure 6 of the patent. (CBr at 66; CFF 413.) Complainant further argued that, during

prosecution, the applicant stated that the "envelope" limitation "is seen for each illustrated embodiment." (CBr at 66; RX-7, Amendment at 22, TMC01-082580.)

As found supra, Figure 6 discloses two integral combinations, viz. the left integral combination, which is the combined structure of armature element 22, circular disk 23, and hub 26, and the right integral combination, which is the combined structure of armature element 32, circular disk 33, and ring gear 36. Also, found supra, in the left integral combination of Figure 6 of the '932 patent, the electric motor element is armature element 22, and the transmission unit element is hub 26, and in the right integral combination of Figure 6 of the '932 patent, the electric motor element is armature element 32, and the transmission unit element is ring gear 36.

The administrative law judge further finds that the specification of the '932 patent discloses the following regarding the embodiment illustrated in Figure 6:

> This embodiment [i.e. Figure 6] shows the ring gear 36 and hub 26 of the planetary unit embodiment of FIG. 4, respectively connected to the disks 33 and 23.

(CX-1 at 9:40-43.) Thus, the administrative law judge finds that the patentee has linked the transmission unit elements of Figure 6 with the transmission unit elements of Figure 4 and that Figure 6 of the '932 patent discloses the same transmission unit elements as Figure 4 of the '932 patent (i.e. hub 26 and ring gear 36). The administrative law judge further finds that Figure 6 of the '932 patent discloses the same electric motor elements as Figure 4 of the '932 patent (i.e. armature elements 22 and 32) and discloses the same circular disk that houses the armature element (i.e circular disks 23 and 33), with the exception that Figure 6 includes an additional component, heavy cylindrical peripheral mass 28:

> The input 2 includes the field assembly units 21 distributed about

> the inside of the half 15 of the housing, and the armature units 22 located on the top side of the disk 23 (shown edgewise) which has a heavy cylindrical peripheral mass 28 for increasing the moment of rotational inertia. Input 3 has similar components.

(CX-1 at 9:35-40 (emphasis added).) Thus, the administrative law judge finds that, despite the difference in sizes between the hub 26 and drive gear 36 in Figures 4 and 6 of the '932 patent, based on Figures 4 and 6 of the '932 patent and the previously cited portions of the specification which state that Figure 6 of the '932 patent is comprised of electric motor and transmission unit elements which elements are identical to the electric motor and transmission unit elements of Figure 4 of the '932 patent, the administrative law judge finds that the "envelope" limitation of the claimed "integral combination" is disclosed in Figure 6 of the '932 patent, as it is disclosed in Figure 4 of the '932 patent.

Referring to the prosecution history of the '932 patent, the Examiner rejected applicant's original claims 1-3, 7-9, and 15 under 35 U. S. C. § 102(b) as being anticipated by Roe; rejected the applicant's original claims 4-6 under 35 U. S. C. § 103 as being unpatentable over Roe in view of Mohri; rejected the applicant's original claim 14 under 35 U. S. C. § 103 as being unpatentable over Roe in view of Helling; rejected claims 15-19 under 35 U. S. C. § 112, second paragraph as being indefinite; and objected to claims 10-13 and 20 as being dependent upon a rejected base claim. See RX-7 at TMC01-082507-12. Also found supra, the applicant amended his claims, and added new claims, and the Examiner allowed the '932 patent to issue. See Section VI. supra.

With respect to the claimed "integral combination" limitation, the administrative law judge finds that in the prosecution of the '932 patent, in response to rejections of several claims,

the applicant described the "integral combination" of the "present invention" as not containing shafts, bearings, and other components between the respective elements. Thus the Examiner originally rejected several claims as being anticipated by Roe:

> Claims 1-3, 7-9 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Roe '083. Roe shows two electric motors 36, 38, each integrally connected to an element of a planetary gearing to drive a single wheel.

(RX-7, TMC01-082580 (emphasis added).) In response, the applicant argued the following, with respect to Roe:

> Secondly and more importantly, this prior art does not at all teach or in any way suggest the feature of the present invention as recited in independent claims 1 and 2, or in claim 3/2, of the "integral" combination of each armature and respective gear element. Namely, in this prior art there are shafts and bearings and other elements such as one of the electric motors itself, between each respective pair of these two elements.
>
> The insertions into claim 1 contain one attempt to characterize this important "integral" feature, and other claims including 2 and 3/2 include other attempts. This key feature results in the present invention being lightweight and compact, namely neither the armature or the respective gear element combined therewith stands alone. A single bearing can support each combined gear element and electric motor element, as disclosed on page 9, lines 20-2, and page 12, lines 15-16, and as now recited in claim 22 and 23.
>
> * * *
>
> The power transfer is directly from the back side or inside of the armature to the gear element, not along any shaft connecting the two, and the output is direct to the driving wheel or hub, again with no substantial shafting in comparison to that of the prior art. There is no extended transmission transmission [sic] linkage with plural support points as in the prior art, because the drive train is direct, with the respective elements beign [sic] immediately adjacent each other [sic], and having a close geometrical overlap, or a nearly common volume in space, totally unlike the prior art.

> This "integral" feature of the present invention is surprisingly advantageous. It is also rather difficult to describe exactly, in a manner to cover every modification or embodiment of the present invention. One aspect, now recited in claim 3 is that the respective gear element of each respective "integral combination" is approximately within envelope of the respective electrical motor element, as is seen for each illustrated embodiment. Again, there is no shaft running through the armature–just one support bearing for each integral combination of an electric motor element and a mechanical gear element. The power is taken off from inside the armature itself. In all the cited prior art devices, the power is taken out by a driven shaft from a free-standing electric motor.

(RX-7, Amendment at 21-22, TMC01-082579-80 (emphasis added).)

The administrative law judge also finds that the applicant, in response to rejections that applicant's claims 4-6 (now claims 2, 3 and 9 of the '932 patent) were obvious in light of Roe and U.S. Patent No. 4,729,258 (Mohri) consistently defined "integral" as the absence of shafts, bearings, and other components:

> But this [Mohri] reference also fails to teach or suggest the important "integral" feature of the present invention, the same arguments above being equally applicable here. Namely, as can be seen from many of the drawings of this prior art (e.g. Figs. 1, 3, 4A, 8), shafts, gears and other elements separate the respective electric motor element from the respective mechanical gear element, namely those that are "integrally combined" in the present invention.

(RX-7, Amendment at 23, TMC01-082581 (emphasis added).)

The administrative law judge further finds that the applicant described the integral combination as including disk 23 in the prosecution history:

> Secondly and more importantly, this prior art does not at all teach or in any way suggest the feature of the present invention as recited in independent claims 1 and 2, or in claim 3/2, of the "integral" combination of reach armature and respective gear element.

* * *

> The insertions into claim 1 contain one attempt to characterize this important "integral" feature, and other claims including 2 and 3/2 include other attempts. This key feature results in the present invention being lightweight and compact, namely neither the armature or the respective gear element combined therewith stands alone. A single bearing can support each combined gear element and electric motor element, as disclosed on page 9, lines 20-2, and page 12, lines 15-16, and as now recited in claims 22 and 23. For instance, as seen from Fig. 3, a single bearing at the side of the housing 15 or end of the wheel spindle 44 supports the right hand integral combination 2 of these elements 22/23/24, and a single other bearing on the opposing side of the housing supports the other combination.

(RX-7, Amendment at 21-22, TMC01-082579-80 (emphasis added).)[24]

Complainant argued that the prosecution history expressly states that "[t]he insertions into claim 1 contain one attempt to characterize this important integral feature, and other claims including 2 [patent claim 7] and 3/2 include other attempts." (CBr at 59.) Thus, complainant argued that the file history makes clear that the limitations added to claim 1 are not the same as those added to claim 7. (CBr at 59.) It is further argued that the fact that applicant goes on to distinguish the prior art by referencing limitations from both claims, does not give respondents license to read limitations from one claim into another where those limitations simply do not appear. (CBr at 59.) It is also argued that the file history, in commenting on application claim 3 (patent claim 8) referenced one of a number of aspects of the "integral combination" feature, viz. the inclusion of motor and transmission elements within a common envelope. (CBr at 59.) It is

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[24] While the term "geometric overlap" is found in the prosecution history, it is not found in the claims or specification of the '932 patent. In addition, in the prosecution history, the applicant defined the claimed "integral combination" limitation of the present invention as not containing shafts, bearings and other elements. See supra.

further argued that the file history then references "another" aspect of the integral combination of the invention, which is expressly incorporated into independent claim 1 and dependent claim 5, namely that there is "no shaft running through the armature – just one support bearing for each integral combination." (CBr at 60.) Thus, it is argued that it is evident that those limitations should not be read into claim 7 of the '932 patent since "[c]laim 1 [was] narrowed to include two of these integral combinations of an electric motor element and a mechanical gear element, allowing the committing of claims 2 [7] and 3 [8] to other limitations as mentioned above." (CBr at 60.)

The administrative law judge finds that the applicant made the following statement, as to all claims that were in issue, with respect to Roe and "integral combination":

> Namely, in [Roe] there are shafts and bearings and other elements such as one of the electric motors itself, between each respective pair of these two elements.

(RX-7, Amendment at 21, TMC01-082579 (emphasis added).) The administrative law judge finds that the applicant identified the presence of shafts and bearings and other elements between the pair of elements in Roe and then distinguished the absence of said shafts, bearings, and other elements in the invention of the '932 patent.

Applicant did state:

> This "integral" feature of the present invention is surprisingly advantageous. It is also rather difficult to describe exactly, in a manner to cover every modification or embodiment of the present invention. One aspect, now recited in claim 3 [patent claim 8] , is that the respective gear element of each respective "integral combination" is approximately within envelope [sic] of the respective electrical motor element, as is seen for each illustrated embodiment. Again, there is no shaft running through the armature–just one support bearing for each integral combination of

> an electric motor element and a mechanical gear element. The power is taken off from inside the armature itself. In all the cited prior art devices, the power is taken out by a driven shaft from a free-standing electric motor.
>
> Claim 1 has been narrowed in include two of these integral combinations of an electrical motor element and a mechanical gear element, allowing the committing of claims 2 and 3 to other limitations as mentioned above.

(RX-7, Amendment at 22-23, TMC01-082580-81 (emphasis added).) However, the administrative law judge finds that the applicant supra did not identify the different aspects of "integral combination" that are within claims 1, 2 and 3, and does not indicate that they are not present in Roe, and thus that the claims are not anticipated by Roe. Instead, the administrative law judge finds that the applicant used the term "present invention" when he stated that Roe did not anticipate the invention of the '932 patent's "integrated combination" because said present invention did not have shafts, bearings, and other elements between the electric motor element and the transmission unit element. Thus, the administrative law judge finds that the applicant defined "integrated combination" as the lack of shafts, bearings, and other elements between the electric motor element and the transmission unit element, and that all "integral combination" limitations required the absence of said shafts, bearings, and other elements to avoid being anticipated by Roe.

Complainant argued that while the disputed term "integral combination" is recited in independent claims 1 and 7, only claim 1 imposes the express limitation that requires an absence of spacing, bearing or shafts, and thus that the term "integral combination" does not require two elements that are rigidly fixed together "without shafts, bearings, or other elements there between," as these requirement are expressly set forth in claim 1. (CBr at 59; CFF 220.)

Complainant further argued that respondents' interpretation impermissibly adds a limitation, namely "two elements are combined without shafts, bearings, or other elements between," which is expressly present in claim 1 of the '932 patent, to claim 7 of the '932 patent, where said limitation is not expressly present. (CBr at 59.) However the complainant appears to rely on the doctrine of claim differentiation which the administrative law judge has rejected supra as it applies to the subject matter before him. Moreover, the administrative law judge, supra, is relying on the express teachings of the specification. Thus, as indicated supra, the inventor in the "Brief Description Of the Drawings" section of the '932 patent makes reference to "the present invention." (See CX-1 at 3:48-350.) Also in the "Description of the Preferred Embodiments" section, as found supra, contains numerous references to "the present invention" in describing the figures of the specific embodiments.

As found, supra, the applicant defined "integral combination" as the lack of shafts, bearings, and other elements between the electric motor element and the transmission unit element for all claims, in the prosecution history. Also, as found supra, the applicant did not distinguish between claims when he defined "integral combination." The facts of this case are similar to those of Seachange Int'l Inc. v. C-COR Inc., 413 F.3d 1361, 1369 (Fed. Cir. 2005), where a first independent claim recited a limitation of a "point-to-point" computer network and a second independent claim recited simply "a network for data communications." Despite the different wording of those two claims, the applicant grouped the claims together during prosecution and made the same argument to overcome prior-art rejections of both claims. Specifically, the applicant argued that both claims were distinguishable because the prior art failed to disclose a "point-to-point" type of network. Id. at 1370-71. Based on that argument in

the prosecution history, the Federal Circuit held that both claims were limited to a "point-to-point" network because of the clear disclaimer of other types of networks. Id. at 1373. The Federal Circuit specifically rejected the patentee's argument that any statements made during prosecution referring to "point-to-point" networks applied only to the first claim, which specifically used the words "point-to-point" network. Id. at 1373. Thus, the administrative law judge rejects complainant's argument that the applicant's disclaimer only applied to claim 1 and not claim 7 of the '932 patent because of the express limitation in claim 1 of the '932 patent.

With respect to "envelope," the administrative law judge finds that the prosecution history of the '932 patent does reference the term "envelope." The applicant described the "envelope" limitation in arguing that the claims of the '932 patent were not anticipated by Roe:

> One aspect, now recited in claim 3 [patent claim 8], is that the respective gear element of each respective "integral combination" is approximately within envelope of the respective electrical motor element, as is seen for each illustrated embodiment. Again, there is no shaft running through the armature – just one support bearing fore each integral combination of an electric motor element and a mechanical gear element. The power is taken off from inside the armature itself. In all the cited prior art devices, the power is taken out by a driven shaft from a free-standing electric motor.

(RX-7, Amendment at 22, TMC01-082580 (emphasis added).) Thus, the administrative law judge finds that the applicant argued that claim 7 of the '932 patent[25] recited the "envelope"

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[25] The administrative law judge finds that while the applicant referenced the claim that became dependent claim 8 of the '932 patent, said claim depends on independent claim 7 of the '932 patent. The administrative law judge further finds that the "envelope" limitation of claim 7 is broader than the "envelope" limitation of claim 8 of the '932 patent as claim 8 of the '932 patent recites further limitations with respect to the "envelope" limitation that are not present in claim 7 of the '932 patent (i.e., claim 7 allows either the transmission unit element to be approximately within the envelope of the electric motor element, or visa-versa, and does not impose a volume limitation on the "envelope"; claim 8 requires that the transmission unit element be approximately within the envelope of the electric motor element, and requires that the

limitation, and he further finds that the language "as is seen for each illustrated embodiment" shows that the applicant argued that the patent drawings in each figure disclose the configuration of the "envelope" limitation. The administrative law judge further finds that in describing the "envelope limitation," the applicant stated that power is not taken out by a driven shaft but is taken right from the armature. The administrative law judge also finds that the applicant disclosed that the power is taken from the armature to the transmission unit and not through any kind of shaft. Thus, the administrative law judge finds that the applicant disclosed that the integral combination elements are "at least to a large extent within an envelope of each other" when the integral combination elements are contained entirely or nearly entirely within the space defined by the rotation of either the electric motor element or the transmission unit element so that power is taken from the electric motor element to the respective transmission unit element without the need of a shaft.

For the foregoing reasons, the administrative law judge interprets "and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other" ("integral combination" limitation) as:

> an electric motor element and a transmission unit element rigidly and directly attached without the presence of shafts, bearings or other components between the electric motor element and the

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"envelope" have effectively a cylindrical symmetry with a length that is substantially shorter than its diameter.) (CX-1 at 11:40-43, 11:48-52.) For the foregoing reasons, the administrative law judge finds that the applicant's characterization of the "envelope" limitation, with respect to claim 8 of the 932 patent, applies equally to the "envelope" limitation of claim 7 of the '932 patent.

> transmission unit element, supportable by a single bearing; where one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation of the other integral combination element so that power is taken off from inside the armature itself[26].

4. "whereby a compact structure is provided for each said integral combination"

Complainant argued that one of ordinary skill in the art would understand "whereby a compact structure is provided for each said integral combination" to mean:

> the result of an assembly where each integral combination involves one of either the motor or transmission elements being at least to a large extent within an envelope containing the other is a structure having units closely united or packed together.

(CBr at 70; CFF 221, 270-271.) It is further argued that the term "compact" follows the term "whereby," and that this language has special meaning, and indicates that the language to follow states the result of the claimed assembly. (CBr at 70.) It is further argued that the envelope refers to an area defined by "half 15 of a housing" and that this arrangement of the integral combinations of the electric motor elements and elements of the mechanical transmission within a common envelope results in an assembly with axially reduced dimensions and therefore a "compact structure." (CBr at 70-71.)

Respondents further argued that one of ordinary skill in the art would understand "whereby a compact structure is provided for each said integral combination" to mean:

> in each integral combination, neither the armature nor the respective gear element combined therewith stands alone, and a single bearing can support each integral combination.

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[26] Because the claimed "envelope" is essentially the two elements that comprise an integral combination, the administrative law judge finds that the claimed "envelope" cannot have shafts, bearings, or other components between said elements, and is supportable by a single bearing.

(RBr at 64.) It is further argued that the '932 specification does not use the word "compact," nor does it expressly define what is meant by "compact structure." (RBr at 64; RFF-4.210.) It is further argued that the '932 specification does explain that the goal of the claimed invention is to create a small, lightweight unit in which (by eliminating the motors' output shafts) each "integral combination can be supported by just a single bearing." (RBr at 64-65; RFF-4.211.)

Respondents further argued that in the prosecution history, while attempting to overcome prior-art rejections, the applicant explained what is meant by a "compact structure," namely, neither the armature or the respective gear element combined stands alone and a single bearing can support each combined gear element and electric motor element. (RBr at 65-66; RFF-4.214.)

The staff in addition to its arguments, supra, relating to "integral combination" supra, argued that, based on the prosecution history the term "compact" should be interpreted as "the integral combination cannot be separated or stand alone". (SBr at 36.)

With respect to "compact structure," at issue is whether the phrase, "whereby a compact structure is provided for each said integral combination," recites an additional limitation to claim 7 of the '932 result, or whether said phrase merely recites a result of the previous phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent [sic] within an envelope containing the other." (See CX-1 at 11:40-43.) The Federal Circuit has held that "a whereby clause that merely states the result of the limitations in the claim adds nothing to the substance of the claim." Lockheed Martin Corp. v. Space Systems/Loral, Inc., 324 F.3d 1308, 1319 (Fed. Cir. 2003); Tex. Instruments Inc. v. United States Int'l Trade Comm'n, 988 F.2d 1165, 1172 (Fed. Cir. 1993).

The administrative law judge finds that Merriam Webster defines "compact" as "2: a:

having a dense structure or parts or units closely packed or joined." (Merriam Webster's Collegiate Dictionary, Tenth Edition, 1996.) The administrative law judge further finds that the language of claim 7 of the '932 patent and the specification of the '932 patent are both silent with respect to defining a "compact structure" for an integral combination of an electric motor element and an transmission unit element. However, the administrative law judge finds that, given his interpretation of the phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other," and given his interpretation of "integral combination, "the claimed phrase at issue, namely, "whereby a compact structure is provided for each said integral combination" states a resulting structure where one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation of the other integral combination element so that power is taken directly from the electric motor element to the transmission unit element. The administrative law judge finds this so because when one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation of the other integral combination element so that power is taken directly from the electric motor element to the transmission unit element, the resulting structure of the integral combination elements will also be compact.

Respondents argued that complainant's interpretation of "compact structure" is "overboard and amorphous to the point of being indefinite [because] what may appear 'closely united' to one person will not necessarily appear 'closely united' to another." (RBr at 66.) However, the administrative law judge finds that the phrase, "whereby a compact structure is provided for each said integral combination," is a result of the "envelope" limitation stated in

claim 7 of the '932 patent, and that one of ordinary skill in the art would determine if the "envelope" limitation has been met to determine if the "compact structure" was present.

With respect to "compact structure," as found supra, the specification of the '932 patent is silent with respect to defining a "compact structure" for an integral combination of an electric motor element and an transmission unit element; and thus the phrase, "whereby a compact structure is provided for each said integral combination" states a resulting structure where one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation of the other integral combination element so that power is taken directly from the electric motor element to the transmission unit element.

With respect to "compact structure," the administrative law judge finds that the prosecution history states the following with respect to "compact":

> The insertions into claim 1 contain one attempt to characterize this important "integral" feature, and other claims including 2 and 3/2 include other attempts. This key feature results in the present invention being lightweight and compact, namely neither the armature or the respective gear element combined therewith stands alone. A single bearing can support each combined gear element and electric motor element, as disclosed on page 9, lines 20-2, and pages 12, lines 15-16, and as now recited in claims 22 and 23.

(RX-7, Amendment at 21, TMC01-082579 (emphasis added).) The administrative law judge finds that the applicant states that the compact structure of the integral combination is a result of one integral combination element being in the "envelope" of the other. Thus, the administrative law judge finds that the claimed phrase at issue states a result, and not an additional limitation, of the phrase "each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other."

Respondents argued that its interpretation is supported by the prosecution history, as the applicant explained what he meant by a "compact structure" at RX-7, Amendment at 21, TMC01-082579, supra. (RBr at 65.) However, the administrative law judge finds that that language of the prosecution history states the fact that the present invention is lightweight and compact as a result of the key feature.

The staff, as respondents, argued that its interpretation was correct based on the prosecution history. The administrative law judge rejects the staff's argument as he has rejected respondents' argument.

5. "said two integral combinations are located closely adjacent each other [sic]"

In issue is said claimed phrase, which is found in claim 7 of the '932 patent, the only asserted independent claim of the '932 patent.

Complainant argued that one of ordinary skill in the art would understand "said two integral combinations are located closely adjacent each other [sic]" to mean:

> the two integral combinations are located close to each other.

(CBr at 73.) It is further argued that this limitation is a common English phrase, and that the term "closely adjacent" is commonly used in mechanical patent claims and is not indefinite. (CBr at 73.) It is further argued that the dictionary defines the term "adjacent" as "close to; lying near" or "next to; adjoining," and defines the adjacent "close," the root for the adverb "closely," as "being near in relationship" and "having little or no space between elements or parts." (CBr at 73-74.) Accordingly, it is argued, a person of ordinary skill in the art would understand that the phrase, "said two integral combinations are located closely adjacent each other [sic]" is definite and refers to each of the integral combinations being located in close proximity to each other, but

not necessarily in contact with each other. (CBr at 74.)

Respondents argued that one of ordinary skill in the art would understand "said two integral combinations are located closely adjacent each other [sic]" to mean:

> the integral combinations are located close enough together that the entire motor and transmission device measures no more than 8 inches from end to end, i.e., small enough to fit within a vehicle wheel.

(RBr at 69.) It is further argued that the specification of the '932 patent never uses the terms "close," "closely," or "adjacent." (RBr at 69; RFF-4.231.) It is further argued that the specification of the '932 patent clearly identifies as a goal a combination motor and transmission device that is small and compact enough to fit within the wheel assembly of a while of an electrically powered vehicle. (RBr at 69-70; RFF-4.232.) It is further argued that, based on the foregoing, the most reasonable interpretation of the "closely adjacent" limitation is that the integral combinations are located close enough together that the entire motor and transmission device is small enough to fit within a vehicle wheel, and that respondents' interpretation, irrespective of whether specific dimensions are mentioned, "is most true to the specification of the '932 patent." (RBr at 70.)

The staff argued that the entire clause comprising, inter alia, of "said two integral combinations are located closely adjacent each other [sic]," should be interpreted as instructing one of ordinary skill how to achieve the claimed "integral combination" of the preceding clause. (SBr at 33.) Thus, the staff argued, in order to satisfy the "integral combination" element, the armature and/or the essential transmission element must be within an "envelope" containing the other, whereby a compact structure is provided for each integral combination, and the two

integral combinations are located closely adjacent to each other. (SBr at 33.) The staff did not give a separate interpretation of the phrase "said two integral combinations are located closely adjacent each other [sic]." (See SBr at 33-36.)

The administrative law judge finds that the language of claim 7 of the '932 patent, and the specification of the '932 patent does define "closely" or "adjacent." Thus, the administrative law judge finds that the patentee did not deviate from the ordinary meaning of either "closely" or "adjacent." Merriam Webster defines "closely" as "11: being near in time, space, effect or degree"and "adjacent" as "1: not distant, nearby." (Merriam Webster's Collegiate Dictionary, Tenth Edition, 1996.) Thus, the administrative law judge finds that one of ordinary skill in the art would understand the claimed phrase at issue to mean that the two integral combinations are located close to each other.

For the foregoing reasons, the administrative law interprets "said two integral combinations are located closely adjacent each other [sic]" as:

said two integral combinations are located close to each other.

Respondents argued that the most reasonable construction of the "closely adjacent" limitation is that the integral combinations are located close enough together that the entire motor and transmission device measures no more than 8 inches from end to end, i.e., small enough to fit within a wheel, irrespective of whether specifications are mentioned in the '932 patent, because the specification clearly identifies as a goal a combination motor and transmission device that is small and compact enough to fit within the wheel assembly of a wheel of an electrically powered vehicle. (RBr at 69-70.) However, the administrative law judge finds there is no language in the claim, specification, or the prosecution history that requires the entire motor and transmission

device to measure no more than 8 inches from end to end. Furthermore, while the specification of the '932 patent does state that it is a goal that the combination motor and transmission device be small and compact enough to fit within the wheel assembly of a wheel, the administrative law judge finds that said goal refers to the entire combination motor and transmission device, and does not refer to the distance between two integral combinations; and that there are many factors in determining the size of the entire combination motor and transmission device, and that just because the entire device does not fit within the wheel assembly of a wheel does not necessarily mean that the integral combinations are not located close to each other.

VIII. Infringement

Under the provisions of 35 U.S.C. § 271, liability for infringement arises if "whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor." 35 U.S.C. § 271(a). This infringement of a patented invention is the usual meaning of the expression "direct infringement." See Joy Techs., Inc. v. Flakt, Inc., 6 F.3d 770, 773 (Fed. Cir. 1993).

A determination of infringement requires a two-step analysis. First, the patent claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process. Zelinski v. Brunswick Corp., 185 F.3d 1311, 1315 (Fed. Cir. 1999), citing Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995). Whereas claim construction is a matter of law and therefore, the exclusive province of the court, "whether a claim encompasses an accused device, either literally or under the doctrine of equivalents, is a question of fact." Zelinski, 185 F.3d at 1315, citing N. Am.

Vaccine, Inc. v. Am. Cyanamid Co., 7 F.3d 1571, 1574 (Fed. Cir. 1993).

A. The Accused Products

The accused devices are hybrid transaxles contained in the Toyota Prius{ }Toyota Highlander HV{ } Toyota Camry HV { } and Lexus RX 400h { } (CRRFF 2.51; RX-138C at Ex. A.) For purposes of this investigation, the Highlander HV, Toyota Camry HV, and Lexus RX 400h can be considered identical in structure and operation. (RFF 2.52 (undisputed).) Hence, all parties agree that the Highlander hybrid system is representative of the hybrid systems used in the Lexus RX 400h and the Camry. (SFF 207 (undisputed).)

The Prius transaxles utilize a planetary gear system connected to a first stand-alone electric motor generator (MG1), a second stand alone electric motor generator (MG2), and an internal combustion engine (ICE). (RFF 2.53; Caulfield, Tr. at 1645, 1679-80; RDX-45C; RDX-46C; RX-443C). To create motive force using MG2, an electrical current is sent to the stator assembly of MG2. (RFF 2.60 (undisputed).) The electric current creates a magnetic field that causes the magnet assembly and the rotor shaft of MG2 to rotate on the two bearings. (RFF 2.61; Caulfield, Tr. at 1646:8-15, 1891:8-22; Davis Tr. at 1322:7-19; RDX-46C; RX-443C; CPX-4C; RX-439C; RX-458C; RX-474 at TMC01-003172, TMC01-003194). The ring gear is connected via a square cog and finger connection to the transmission drive sprocket assembly. (RFF 2.63 (undisputed).)

To start the ICE, the planetary carrier must be made to rotate. (RFF 2.67 (undisputed).) If the ICE is started when the vehicle is stationary, for instance, MG1 will operate as a starter motor to drive the sun gear, which, in turn, rotates the carrier to crank the ICE. (RFF 2.68 (undisputed).)

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In the Highlander, in contrast to the Prius, the fixed planetary gear set operates as a reduction gear because the carrier portion is fixed, only allowing the individual planet or pinion gears to rotate. (RFF 2.82 (undisputed).) Moreover, the parties agree that unlike the Prius, the Highlander's transaxle has two planetary gear sets, and the one on the MG2 side, which is not included in the Prius, functions to increase the RPM of the MG2 rotor and the second planetary gear set functions as a power splitter. (SFF 202 (undisputed).) Similar to the Prius, the Highlander typically operates using only the motive force from MG2 during low power demand situations. (RFF 2.88 (undisputed).)

B. The Accused Products Do Not Infringe Claim 7 Of The '932 Patent

Complainant argued that it has established, by preponderance of evidence, that the accused hybrid transaxles contain every limitation of claim 7 of the '932 patent and hence they infringe said claim 7. (CBr at 39-74.)

Respondents argued that complainant has not established that the accused hybrid transaxles infringe claim 7 of the '932 patent. (RBr at 70-87.)

The staff argued that complainant has not demonstrated that any of the accused hybrid transaxles infringe claim 7 of the '932 patent. (SBr at 39-55.)

Referring to the claimed phrase "wherein the rotational speed of said output is continuously variable," complainant argued that the planetary gear assembly of the Toyota Hybrid vehicles, working in combination with MG1 and MG2, acts as a continuously variable transmission, wherein the rotational speed of the output is continuously variable, as required by claim 7 of the '932 patent; that the Toyota transaxles provide a continuously variable transmission function, in that they decouple the speed of the inputs from the speed of the output; and that MG1 and MG2 can be run at high speeds while the output is at a low speed, or one motor can be run at high speed while the speed of the other motor is varied, thereby varying the speed of the output. (CBr at 54-5.)

Respondents argued that complainant offers no proof that the output of the Toyota transaxles, during the engine-startup transient can be varied "from full forward to full reverse" or "from a negative maximum value to a positive maximum rotational value"; that the evidence was overwhelming that the internal combustion engine in the Toyota vehicles does not rotate in reverse and, therefore, the "continuously variable" limitation is not met; that complainant does not address the requirement that rotational output be variable to any desired rotational speed; that there was undisputed evidence that the output during the engine-startup transient cannot be varied to any "desired" rotational speed; that there is no dispute that the "peak power" requirement is not met by any of the accused transaxles during the engine-startup transient; and that there is no dispute that the Highlander HV, Lexus RX 400h, and Camry HV do not satisfy the "no intervening gear reduction" requirement because they contain a reduction gear between MG2 and the transmission unit (the power-split device). (RRBr at 63-4.)

The staff argued that none of the vehicles at issue satisfy the "continuously variable"

element; that the evidence shows that neither of the two motors used in the Toyota vehicles at issue satisfy the "operate" at "peak power at all speeds" limitation;{

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The administrative law judge has interpreted, supra, the claimed phrase "wherein the rotational speed of said output is continuously variable" as:

> the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven.

With respect to the requirement of "any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power," the administrative law judge finds that in the accused products, peak power cannot be attained at "any desired rotational speed." Thus as for the "peak power" requirement, complainant, in response to RFF-5.75 ("None of the accused transaxles satisfies the continuously variable

limitation of claim 7 of the '932 patent because the output is not at peak power (Caulfield, Tr. at 2057:1-25)."), relying on its expert's testimony, merely argued in CRRFF-5.75 and 5.75A, that "term 'continuously variable' does not require peak power," and that a person of "ordinary skill in the art would not construe the term 'continuously variable' to include peak power." However, the administrative law judge, in his interpretation of "continuously variable," found that output speed "can be varied such that any desired rotational speed ... can be attained at peak power." Hence, the administrative law judge finds that all the accused vehicles do not have output speeds which "can be varied such that any desired rotational speed ... can be attained at peak power" as required by the "wherein the rotational speed of said output is continuously variable" limitation.

As to the requirement of "no intervening gear reduction to the component being driven,"supra, for the claimed phrase "wherein the rotational speed of said output is continuously viewable" the administrative law judge finds that the accused Highlander hybrid system products do have intervening gear reduction because they contain a reduction gear between MG2 and the transmission unit (the power-split device). As complainant's expert Davis agreed, the Highlander HV has two planetary gearsets, including two different sun gears, two different sets of planetary gears, and a common or compound ring gear. Thus, Davis testified during the cross examination:

> Q. All right. I want to talk about the differences between the compound planetary gear set of the Highlander and the structures in the – in figures 3 through 6 of the patent. One difference that you'll agree with is that the compound planetary gear set in the Highlander has more parts than the corresponding structures that are disclosed in figures 3 through 6 of the '932 patent?
>
> * * *

Q. Well, let's put it this way: How many sun gears are disclosed in, let's just take care of [Figure] 4. How many sun gears are disclosed in figure 4?

A. One sun gear.

Q. How many sun gears are in the Highlander?

A. Two.

Q. How many planetary carriers are disclosed in figure 4 of the patent?

A. There are two planetary carriers.

Q. In figure 4?

A. Oh, I'm sorry. I thought you were talking about the Highlander. No. One planetary carrier. I'm sorry.

Q. And how many planetary carriers are there in the Highlander?

A. Two.

Q. Okay. And then of course the Highlander has this big compound ring gear, right?

A. Common ring gear.

(Davis, Tr. at 1340:7-1341:2.)

Additionally, respondents' expert Caulfield testified that the first or fixed planetary gearset in the Highlander HV acts as a speed reducer for MG2. Thus, Caulfield explained:

Q. You referred, when you were talking about the Prius, you referred to the motor and generator as stand alone motor and generator. Do you have any opinion as to whether that's also applicable to the Highlander?

A. The Highlander has the same features as far as the stand alone motor generators, they are both stand alone and

operate as motors. The only additional feature, main one, is for MG2, it goes through a gear reducer reverser before it goes into the compound ring gear, which goes over to the planetary.

Q. And what you refer to as the reducer, what components make up that reducer?

A. The reducer is made up with a sun, a set of planets that are fixed on a carrier and then a ring, which is a compound ring with the next planetary unit, which is over on the right side.

Q. Are any of those components fixed in the reducer?

A. The carrier is fixed, which will fix the centers of the planets.

(Caulfield, Tr. at 1693-94 (emphasis added); CX-310C; RX-442C.) Hence, the administrative law judge finds that the accused Highlander hybrid system does not meet the "no intervening gear reduction" requirement of the claimed "wherein the rotational speed of said output is continuously variable" limitation.

With respect to the claimed phrase "and said power conversion means includes, for each of said first and second power inputs, a respective integral combination of a respective electric motor element and an element of said transmission unit, each said integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other" ("integral combination" limitation), the administrative law judge has interpreted said phrase as:

> an electric motor element and a transmission unit element rigidly and directly attached without the presence of shafts, bearings or other components between the electric motor element and the transmission unit element, supportable by a single bearing; where one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation

> of the other integral combination element so that power is taken off from inside the armature itself.[27]

Complainant argued that the accused devices include, for both MG1 and MG2, an "integral combination of a respective electric motor element and an element of said mechanical transmission unit"; that the MG2 motor assembly of the Prius contains an integral combination of a motor element (the armature or rotor assembly) and a transmission unit element (the ring gear flange); that the MG2 rotor assembly is formed as a unit with the ring gear flange and ring gear; that the rotor assembly, ring gear flange and ring gears are mechanically joined via a spline connection within the geometry of the motor; that as with MG2, the armature assemblies (or rotor assembly) for MG1 in the accused devices is formed as a unit with the sun gear extension and sun gear; and that the MG1 rotor assembly is mechanically connected to the sun gear extension using a spline connection within the geometry of the motor. (CBr at 60-1.)

Complainant further argued that the mechanical transmission unit of each of the Highlander HV, Camry HV and Lexus RX400h also contains two integral combinations of electric motor elements and transmission unit elements; that the Highlander HV includes a first sun gear connected to the rotor of MG2 with a spline connection and a second sun gear connected to the rotor of MG1 via a spline connection; that the two integral combinations in the Highlander are represented by the armature or rotor assembly combined with the sun gear, and the armature or rotor assembly combined with the second sun gear; that each of these mechanical spline connections are made at a location that is inside the geometry of the motor; that these

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[27] Because the claimed "envelope" is essentially the two elements that comprise an integral combination, it has been found that the claimed "envelope" cannot have shafts, bearings, or other components between said elements, and is supportable by a single bearing.

assemblies therefore constitute first and second integral combinations of an electric motor element and a transmission element; and that therefore, the Highlander HV, Lexus RX 400h Hybrid and Camry HV transaxle meet the "integral combination" claim requirement. (CBr at 61-2.)

Respondents argued that under the proper construction of "integral combination," the accused Toyota transaxles do not satisfy the "integral combination" limitation because (1) there are shafts, bearings, and other elements between each armature and corresponding transmission element (i.e., sun gear or ring gear) and (2) there are non-integral spline connections between each rotor shaft and corresponding transmission element; that although complainant's expert Davis initially testified that the "rotor shafts" in the Toyota devices are not actually shafts because they are not "long and slender," he eventually conceded at trial that they can be considered shafts; that in addition to shafts, there are other elements, including bearings and in the Highlander a planetary gear reducer, between the armature and corresponding transmission element in the accused transaxles; and that because the spline connections of Toyota transaxles are not fixed together, they cannot satisfy the "integral combination" limitation as properly construed. (RRBr at 45, 47, 49.)

The staff argued that the intrinsic evidence makes clear that the invention of the '932 patent requires a device without shafts and only one bearing; that the accused motors differ markedly from the motors of the invention of the '932 patent; that the shaft of each of the accused motors is supported by two bearings, and the motors are "stand-alone" motors and thus, these accused motors can be removed from their housings and operated individually; that therefore, the motor/transmission elements in these accused motors are not "integrally combined"

as that term is used in the '932 patent; and that moreover, the shaft of each motor extends outside of its housing. (SRBr at 24-5.)

Complainant also argued that in the accused Toyota vehicles, each integral combination of an electric motor element and an element of the mechanical transmission unit includes "one of said two respective elements thereof being to a large extent within an envelope containing the other," as required in claim 7 of the '932 patent; that elements of the mechanical transmission unit are located within the geometric enclosures created by the MG1 and MG2 assemblies; that in the Prius, the envelope containing the rotor of MG2 also includes the ring gear, while the envelope containing the rotor of MG1 includes the sun gear; that each of the MG1 and MG2 assemblies is contained within its own envelope; and that similarly, in the Highlander HV, Lexus RX400h and Camry HV, the envelope containing the rotor of MG2 includes the first sun gear, while the envelope containing the rotor of MG1 includes the second sun gear. (CBr at 67-8.)

Respondents argued that for the Prius transaxle, the sweep of the permanent magnets (i.e., the armature) creates a cylindrical volume and that each corresponding transmission element (sun gear and ring gear for MG1 and MG2 respectively) is outside the sweep of the armature; that the same is true for the Highlander transaxles; that unlike the apparatus described in the '932 patent, it cannot be said for the Toyota devices that "[t]he power is taken off from inside the armature itself" (RX-007, Amendment at 22, TMC01-082580); that instead, the Toyota devices are like the prior art devices the '932 applicant distinguished during prosecution, i.e., where "the power is taken out by a driven shaft from a free-standing electric motor" (Id.); and that Solomon's contention that the accused transaxles satisfy the "envelope" limitation even under Toyota's construction is clearly erroneous because it assumes that the rotor shaft is an "electric motor

element" within the meaning of claim 7. (RRBr at 49-51.)

The staff argued that the term "envelope," when properly construed, means that the gear element is within the sweep of the rotating electric motor element; that none of the accused vehicles satisfy this element; and that the evidence of record demonstrates that in the Prius, the ring gear on MG2 is outside of the envelope created by the MG2 motor element, and that the sun gear on MG1 is outside of the envelope created by the MG1. (SBr at 48-9.)

In the Prius hybrid transaxles, there is a rotor shaft between the rotating magnets and the ring gear, as well as a shim, a spline connection, and a ring gear flange between the rotor shaft and the ring gear. (RFF 5.9; Caulfield, Tr. at 1663:2-1664:4, 1670:25-1671:20; RDX-043; RDX-041; RDX-034C; RX-443C; RPX-026; RPX-028; RPX-024; RPX-027; RPX-025; RPX-030; CX-320C; CX-352C; RX-385C, RFF 5.2, 5.27.) In the Highlander HV transaxles, there is a rotor shaft, a spline connection, a sun gear, and a fixed planetary reduction gear between the rotating magnets and the compound ring gear. (RFF 5.116; Caulfield, Tr. at 1692:4-1693:18, 1754:24-1755:23; RDX-113.) There is no real dispute that the Toyota transaxles have shafts between each armature and corresponding transmission element. Although complainant's expert Davis initially testified that the "rotor shafts" in the Toyota devices, e.g., RPX-28, are not actually shafts because they are not "long and slender" (Davis, Tr. at 1297), he eventually conceded at trial that they can be considered shafts. (Davis, Tr. at 1299-1300.)[28] Since the Prius and the Highlander HV transaxles have a rotor shaft between the

[28] Davis also agreed with the description in Professor Norton's textbook, Machine Design: An Integrated Approach, that "it is most common for shafts to have a number of steps or shoulders where the diameter changes to accommodate attached elements such as bearings, sprockets, gears, et cetera." (Davis, Tr. at 1301-02; RFF 5.1 (undisputed).)

electric motor element and the transmission unit element, said transaxles do not meet the "integral combination" requirement.

Further, in the assembled Prius transaxles, the end of the MG2 rotor shaft is connected to the ring gear flange using a spline connection. (RFF 5.10; Caulfield, Tr. at 1661:9-22, 1671:21-1672:20; RDX-043; RX-443C; RPX-028; RPX-024; RPX-027; RPX 025; RPX-030.) For the Prius transaxles, the MG1 rotor shaft uses a spline to connect to the sun gear. (RFF 5.49; Caulfield, Tr. at 1754:7-24; RDX-112; RPX-022; RPX-029; RPX-043.) In the Highlander HV, the MG2 rotor shaft is connected to the sun gear of the fixed planetary gearset using a spline connection. (RFF 5.37; Caulfield, Tr. at 1695:11 1696:7; RDX-256; CX-310C; RX-442C). The two planetary gearsets in the Highlander HV share a common or compound ring gear. (RFF 5.38 (undisputed).) However, the "integral combination" limitation requires that the electric motor element and the transmission unit element be rigidly and directly attached without the presence of other components between said elements.

Moreover, for the Prius and the Highlander HV transaxles, each of the MG1 and MG2 has a rotor shaft supported by two bearings, whereas the "integral combination" limitation requires a single bearing. (RFF 5.3; Caulfield, Tr. at 1646:8-15, 1891:8-22; Davis, Tr. at 1322:7-19; RDX-046C; RX-443C; CPX-004C; CX-345C; RX-458C; RFF 5.4; Davis Tr. at 1322:7-19; RDX-046C; RX-443C; CPX-004C; CX-345C; RX-458C; CX 320C; CX-352C; RFF 5.117; Caulfield, Tr. at 1783:5-15, 1789:16-1790:9; RX-442C; RFF 5.118; Caulfield, Tr. at 1783:5-15, 1789:16-1790:9; RX-442C.)

In addition, as shown in RDX-133C, for the Prius transaxle, the sweep of the permanent magnets (i.e., the armature) creates a cylindrical volume and that each corresponding

transmission element (sun gear and ring gear for MG1 and MG2 respectively) is outside the sweep of the armature. (Caulfield, Tr. at 1771-74.) Also, as shown in RDX-134C, for the Highlander HV, Lexus RX400h, and Camry HV transaxles, the ring gear is outside the sweep or imaginary volume of the MG2 magnet assembly. (Caulfield, Tr. at 1773:18-1774:21; Davis Tr. at 1416:23-1417:15; RDX-134C; RX-442C). Hence, as Caulfield testified, it cannot be said for the Toyota devices that "[t]he power is taken off from inside the armature itself," as required by the properly construed "envelope." (Caulfield, Tr. at 1771-74; RX-007, Amendment at 22, TMC01-082580).

Complainant argued that the accused devices include "integral combination" for both MG1 and MG2 transaxles, arguing that said transaxles' motor element is either the armature or the rotor assembly. However, the administrative law judge has found, supra, in the claim interpretation section for the claimed "integral combination phrase" that the electric motor element consists of either the field element or the armature element, not the rotor assembly (i.e., rotor shaft).

Solomon's contention that the accused transaxles satisfy the "envelope" limitation even under Toyota's construction assumes that the rotor shaft is an "electric motor element" within the meaning of claim 7. (CBr at 69.) However, as indicated supra, the administrative law judge already found, in the claim interpretation section of the claimed limitation "integral combination" that the electric motor element consists of either the field element or the armature element, not the rotor assembly (i.e., rotor shaft).

As for the "compact structure" limitation the administrative law judge has already found that the claimed phrase states a result, and not an additional limitation, of the phrase "each said

integral combination involving one of said two respective elements thereof being at least to a large extent within an envelope containing the other." He has also found that complainant has not established that the accused products have the claimed "integral combination" limitation. Hence, he finds that complainant has not established that the accused products have the claimed "compact structure" limitation.

Referring to the claimed "power conversion means for converting said electrical power of said first and second inputs for output" of asserted claim 7 of the '932 patent, complainant argued that the parties have agreed to the following interpretation of "power conversion means":

> A "power conversion means" is a "means-plus-function" limitation that should be interpreted in accordance with 35 U.S.C. Section 112, paragraph 6. The function of the "power conversion means" is "converting said electrical power of said first and second inputs for output."
>
> There are multiple embodiments that disclose corresponding structure. In the embodiment of Figure 3, the corresponding structure includes portions of the field elements (21), armatures (22) of two electric motors, disk (23), drive gears (24), pinion gear shaft (41) and pinion gears (42). In the embodiment of Figure 4, the corresponding structure includes portions of the field elements (21), armatures (22) of two electric motors, disks (23 and 33), hub / spacer (26), sun gear (46), ring gear (36), and planetary gears (27). In the embodiment of Figure 5, the corresponding structure includes portions of the field elements (21), armatures (22) of two electric motors, disk (23), sun gear extension (46'), sun gear (46), hub (26'), ring gear (36), disk (33), and planetary gears (27). In the embodiment of Figure 6, the corresponding structure includes portions of the field elements (21), armatures (22 and 32) of two electric motors, disks (23 and 33), hub / spacer (26), sun gear (46), ring gear (36), and planetary gears (27). This limitation covers the above structures and equivalents.

(CBr at 40.) It is argued that respondents' accused transaxles include two electric motors and a mechanical power transmission unit that perform the identical function of converting electrical

power of the first and second inputs for output. (CBr at 41.) It is also argued that respondents' accused transaxles contains structure for carrying out the claimed function that is equivalent to the structure disclosed in the '932 patent. (CBr at 41; CFF 298-299, 301-310.)

Complainant also argued that, rather than look to the individual disk 23 component alone, the administrative law judge should look to all of the components within the '932 patent that perform the claimed function, and then determine whether respondents' accused transaxles contain a collection of components that perform the "power conversion means" function utilizing identical or equivalent structure to the embodiment show in the '932 patent. (CBr at 41-42.) It is further argued that rather than determining whether respondents' accused transaxles include a "disk" structure, the legally proper inquiry should focus upon whether the accused hybrid transaxles include structure that performs the identical "power conversion means" function described in claim 7 and whether this structure is identical or equivalent to the corresponding structure in the '932 patent specification. (CBr at 42.) Thus, it is argued, that "disk 23" is not a claim limitation; rather, the overall structure of the "power conversion means" is the relevant limitation, and the evidence clearly shows that the accused transaxles contain equivalent structure for performing that function. (CRBr at 33; CFF 303, 309-310.)

Respondents argued that the parties have agreed that every embodiment disclosed in the '932 patent for performing the function of "converting said electrical power of said first and second inputs for output" includes a "disk 23" to which a transmission element is rigidly fixed, and this "disk" structure is required corresponding structure of the "power conversion means." (RBr at 75; RFF 4.3, 4.6, 4.35.) It is further argued that this "disk" structure plays an important role in performing the claimed function of converting electrical power of the first and second

inputs for output; namely, disk 23 supports the armature elements and provides a flat surface inside the sweep of the armature elements to which the corresponding transmission unit element can be rigidly fixed. (RBr at 75-76; RFF 4.6, 4.35-37, 4.75, 4.77.) It is further argued that the result of that arrangement is a structure in which "power is taken off from inside the armature itself" rather than being "taken out by a driven shaft" as in the prior art. (RBr at 76; RFF 4.44, 4.72, 4.117.) Respondents also argued that its accused transaxles do not have a "disk" structure that corresponds to the "disk 23" disclosed in the '932 patent. (RBr at 76; RFF 5.64.) Instead, respondents argued, the permanent magnets of MG1 and MG2 are attached to two rotor plates, which, in turn, are supported by a rotor flange that is welded to a rotor shaft, which (for MG2) is spline connected to a ring gear flange. (RBr at 76; RFF 5.5-5.6, 5.9-5.10, 5.12, 5.102.) It is also argued that the combination of rotor plates, rotor flange, and rotor shaft, collectively referred to as an "armature assembly" by complainant's expert, Davis, is clearly not equivalent under 35 U.S.C. § 112, ¶ 6, because there are important, non-trivial differences between the way the two structures perform the claimed function. (RBr at 76-77; RRBr at 53-56.)

Respondents further argued that it is not urging a "component-by component" equivalence analysis, but, instead it has simply focused on the "disk" structure because that is an important aspect of the "power conversion means" structure disclosed in the '932 patent, and said "disk" structure" is clearly meaning in its accused devices. (RRBr at 54.) It is argued that the Federal Circuit has held that focusing on a particular component that plays a central role in the claimed function does not constitute a "component-by-component analysis." (RRBr at 54.) It is argued that respondents' analysis is based on comparing the overall "power conversion means" structure in the '932 patent to the accused products devices. (RRBr at 54-55.)

Respondents also argued that in addition, to the foregoing, there is a separate reason why complainant's "§ 112, ¶ 6 equivalence argument should be rejected"; namely, because the '932 patentee expressly disclaimed the use of shafts in the invention, both in the specification and during prosecution; thus, complainant is prohibited as a matter of law from arguing that respondents' rotor shafts are equivalent to the "power conversion means" structure disclosed in the patent. (RRBr at 56-57.)

The staff argued that none of the motors in the accused vehicles has a structure identical or equivalent to any of the structures described in the specification as "corresponding" to the "power conversion means," i.e., an electric motor with an hollow core, because the electric motors in the accused vehicles have solid cores. (SBr at 40-41.) Moreover, it is argued, the evidence of record demonstrates than an electric motor with a hollow core is not structurally equivalent to an electric motor with a solid core. (SBr at 41.) It is also argued that the "integral combination" in each of the disclosed embodiments is supported by one bearing; in contrast, the gear/rotor/shaft/armature combination of each motor in the accused vehicles is supported by two bearings; and that under these circumstances, the motors in the accused vehicles cannot be found to be structurally equivalent under § 112, ¶ 6. (SBr at 41.)

The staff further argued that the structure in the accused vehicles that complainant's expert, Davis, testified is equivalent to the disk disclosed in the'932 patent, namely, the combination of the rotor shaft and a portion of the magnet assembly, cannot be equivalent to the disks disclosed in the '932 patent. (SBr at 43.) It is argued that this is so because: the structure identified by Davis is supported by two bearings in each of the motors in the accused vehicles; and a device having Davis's equivalent structure cannot take power from the inside of the

armature itself, but rather, the power is taken from outside of the armature as in the prior art distinguished during prosecution on this specific ground. (SBr at 43-44.)

The staff also argued that the only testimony presented that relates directly to structural equivalency is "conclusory [sic] opinion testimony" of Davis, and that said testimony, nor the "similarly conclusory [sic] statements set forth in proposed findings" reference by complainant support complainant's assertion of structural equivalency. (SRBr at 23-24.)

In Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1266-1268 (Fed. Cir. 1999), the Federal Circuit articulated the standard for structural equivalence under 35 U.S.C. § 112, ¶ 6:

> A claim limitation written in means-plus-function form, reciting a function to be performed rather than definite structure, is subject to the requirements of 35 U.S.C. § 112, ¶ 6 (1994). See B. Braun Med., Inc. v. Abbott Lab., 124 F.3d 1419, 1424 (Fed. Cir. 1997). As such, the limitation must be construed "to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." See 35 U.S.C. § 112, ¶ 6; B. Braun Med., 124 F.3d at 1424. Literal infringement of a § 112, ¶ 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification. See, e.g., Al-Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1320 (Fed. Cir. 1999); Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934 (Fed. Cir. 1987) (en banc). Functional identity and either structural identity or equivalence are both necessary. See Pennwalt, 833 F.2d at 934.
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> Structural equivalence under § 112, ¶ 6 is, as noted by the Supreme Court, "an application of the doctrine of equivalents . . . in a restrictive role." Warner-Jenkinson Co., v. Hilton Davis Chem. Co., 520 U.S. 17, 28 (1997). As such, "their tests for equivalence are closely related," Chiuminatta, 145 F.3d at 1310, involving "similar analyses of insubstantiality of differences." Al-Site, 174 F.3d at 1321 (quoting Chiuminatta, 145 F.3d at 1310). In the doctrine of equivalents context, the following test is often used: if the "function, way, or result" of the assertedly substitute structure is substantially different from that described by the claim

limitation, equivalence is not established. See, e.g., Warner-Jenkinson, 520 U.S. at 39-40. As we have noted, this tripartite test developed for the doctrine of equivalents is not wholly transferable to the § 112, ¶ 6 statutory equivalence context. See Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1222 (Fed. Cir. 1996); Valmont, 983 F.2d at 1043; D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1575 (Fed. Cir. 1985). Instead, the statutory equivalence analysis, while rooted in similar concepts of insubstantial differences as its doctrine of equivalents counterpart, is narrower. See Al-Site, 174 F.3d at 1320 n.2. This is because, under § 112, ¶ 6 equivalence, functional identity is required; thus the equivalence (indeed, identity) of the "function" of the assertedly substitute structure, material, or acts must be first established in order to reach the statutory equivalence analysis. See 35 U.S.C. § 112, ¶ 6; Al-Site, 174 F.3d at 1320; Chiuminatta, 145 F.3d at 1308; Alpex, 102 F.3d at 1222; Pennwalt, 833 F.2d at 934. The content of the test for insubstantial differences under § 112, ¶ 6 thus reduces to "way" and "result." That is, the statutory equivalence analysis requires a determination of whether the "way" the assertedly substitute structure performs the claimed function, and the "result" of that performance, is substantially different from the "way" the claimed function is performed by the "corresponding structure, acts, or materials described in the specification," or its "result." Structural equivalence under § 112, ¶ 6 is met only if the differences are insubstantial, see Chiuminatta, 145 F.3d at 1308; that is, if the assertedly equivalent structure performs the claimed function in substantially the same way to achieve substantially the same result as the corresponding structure described in the specification. See 35 U.S.C. § 112, ¶ 6 (means-plus function claim literally covers "the corresponding structure, material, or acts described in the specification and equivalents thereof."

The similar analysis of equivalents under § 112, ¶ 6 and the doctrine of equivalents does not, however, lead to the conclusion that Pennwalt and Warner-Jenkinson command a component-by-component analysis of structural equivalence under § 112, ¶ 6. It is of course axiomatic that "each element contained in a patent claim is deemed material to determining the scope of the patented invention." Warner-Jenkinson, 520 U.S. at 29. Thus a claim limitation written in § 112, ¶ 6 form, like all claim limitations, must be met, literally or equivalently, for infringement to lie. See, e.g., Pennwalt, 833 F.2d at 935. As we noted above, such a limitation is literally met by structure, materials, or acts in the

> accused device that perform the claimed function in substantially the same way to achieve substantially the same result. The individual components, if any, of an overall structure that corresponds to the claimed function are not claim limitations. Rather, the claim limitation is the overall structure corresponding to the claimed function. This is why structures with different numbers of parts may still be equivalent under § 112, ¶ 6, thereby meeting the claim limitation. See, e.g., Al-Site, 174 F.3d at 1321-22 (upholding jury verdict of § 112, ¶ 6 equivalence between "a mechanically-fastened loop . . including either the rivet fastener or the button and hole fastener" and "holes in the arms [of an eyeglass hanger tag]"). The appropriate degree of specificity is provided by the statute itself; the relevant structure is that which "corresponds" to the claimed function. See, e.g., Chiuminatta, 145 F.3d at 1308-09 (structure "unrelated to the recited function" disclosed in the patent is irrelevant to § 112, ¶ 6); Valmont, 983 F.2d at 1044 (identifying structure referring to the claimed function). Further deconstruction or parsing is incorrect.

However, the Federal Circuit also has said that focusing on a particular component that plays a central role in the claimed function does not necessarily constitute a "component-by-component" analysis. The Toro Co. v. Deere & Co., 355 F.3d 1313, 1324 (Fed. Cir. 2004).

At issue is whether the structures of respondents' accused products, identified by complainant's expert, Davis, namely a first motor/generator (MG1), a second motor/generator (MG2), a planetary gear assembly integrated with said motors, inputs that receive mechanical power from MG1 and MG2 (the sun gear extension and ring gear flange in the Prius, the sun gears in the Highlander), and the outputs of the planetary gear assembly, including the carrier and the ring gear, which output the converted power as rotational mechanical power, are structurally identical or equivalent to the "power conversion means" of the '932 patent, namely portions of the field elements (21), armatures (22) of two electric motors, disk (23), drive gears (24), pinion gear shaft (41) and pinion gears (42) in Figure 3 of the '932 patent, portions of the field elements

(21), armatures (22) of two electric motors, disks (23 and 33), hub / spacer (26), sun gear (46), ring gear (36), and planetary gears (27) in Figure 4 of the '932 patent, portions of the field elements (21), armatures (22) of two electric motors, disk (23), sun gear extension (46'), sun gear (46), hub (26'), ring gear (36), disk (33), and planetary gears (27) in Figure 5 of the '932 patent, and portions of the field elements (21), armatures (22 and 32) of two electric motors, disks (23 and 33), hub / spacer (26), sun gear (46), ring gear (36), and planetary gears (27) in Figure 6 of the '932 patent under 35 U.S.C. § 112, ¶ 6.

The administrative law judge finds that complainant has not shown that respondents' accused products contain the identical structure for the "power conversion means" as the "power conversion means" structure disclosed in Figures 3, 4, 5 and 6 of the '932 patent because the respondents' accused products do not contain a structure that is identical to disks 23 and 33 of Figures 3, 4, 5 and 6 of the '932 patent. The administrative law judge finds that this is so because complainant's expert, Davis, did not testify that he thought that the identified structure in respondents' accused products were identical, but that they were equivalent:

> Q. Do you have an opinion as to whether the structures within the Prius and the Highlander for performing that function are either the same as or equivalent to the structures disclosed in the '932 patent?
>
> A. I think they're equivalent to. Obviously there's some different sizes in motors, the main difference being that planetary gear set in the Prius, CPX-4A, is a simple planetary gear set. The planetary gear set used in the Highlander, CPX-3 here, is a compound planetary gear set. Again, they have the same function. It's just an equivalent structure, equivalent way of doing that.
>
> ***

Q. All right. In figure 4, and in fact all of the figures, there is this item called a disk, which on figure 4 is labeled 23 on the left-hand side and 33 on the right-hand side; is that correct, sir?

A. That is correct.

Q. And the function of the disk is to support the armature elements 22, correct?

A. To support the armature elements and also provide a way of getting the rotational mechanical into or out of the armature elements.

Q. It provides an attachment point, if you will, in order for the power to be able to get from the armature to the transmission device, correct?

A. Correct.

Q. All right. And so the question in terms of infringement is whether there is anything in the Toyota transaxles that is identical to or equivalent to disk 23 and 33; is that correct, sir?

* * *

THE WITNESS: I believe that's correct.

BY MR. BARNEY:

Q. Now let's go to RX-458C. ... So on the screen I have RX-458C. And this was a schematic of the Prius that we went through at your deposition. Do you recall that, sir?

A. I believe so.

* * *

Q. Okay. Let's go back to figure 6 from your deposition. So am I correct that now what you consider to be equivalent to the disk is just the part that's hash marked in pink, excluding the ring gear flange; is that correct?

A. I think that would be more appropriate.

* * *

Q. Do you think there are any differences between the structure you've identified as equivalent in Exhibit 6 and the disk that's disclosed in the patent?

A. I think they're considered the same function in that they're equivalent. I mean, there's definitely different shapes, you know, things like that. But in terms of the important function of getting the power out, providing that location point, I would say that they're equivalent structures.

(Davis, Tr. at 1009:4:17, 1313:17-25, 1321:21-1322:6 (emphasis added).)

Additionally, complainant does not argue that the identified structure in the respondents' accused products is identical to the "power conversion means" structure disclosed in the '932 patent, but, instead, argues that said structure is equivalent to the "power conversion means" structure disclosed in the '932 patent. (CBr at 41; CFF 298-299; 301-310.) In addition, respondents expert, Caulfield, specifically testified that the identified structure in respondents' accused products did not contain a disk identical to disk 23 or disk 33 disclosed in Figures 3, 4, 5 and 6 of the '932 patent, and thus, that said structure was not identical to the "power conversion means" structure disclosed in the '932 patent:

Q. Let's move on to a different limitation. I am on RDX-136. This is the power conversion means limitation. Dr. Caulfield, I am not going to read the whole thing, but can you explain, you know, is it your understanding that all of the corresponding structures require a disk?

A. For the power conversion means, which is means plus function, the structure is -- all the structures that are in all the figures will require a disk.

Q. Okay. Now, what is the function, your understanding of the function of the disk 23 in the '932 patent?

A. The function of the disk is to take the armature elements and certainly allow them to spin. That's one of the functions of the disk. And to attach to the mechanical power transmission unit.

Q. Okay.

A. In a rigid fashion.

* * *

Q. [Referring to RX-443C,] [c]an you identify by name the components that perform the function that you just identified for the disk, in other words, holding the magnets, allowing them to spin, and providing a transmission throughput to the, to the transmission unit?

A. What is holding the magnets there, which are the permanent magnets, which are those crosshatched lines, the shaft is holding the magnets, the permanent magnet assembly. And I can do both MG1 and MG2 at the same time, the bearings. They are all holding that shaft to arrange that permanent magnet to allow it to rotate.

Then it is taken out through the splines, through the ring gear flange, outside the permanent magnet assembly, to the ring gear.

Q. Okay. And what is your understanding, sir, as to whether those components that you just mentioned perform the same function as the disk the same way to achieve the same result with respect to the '932 patent?

A. They certainly don't do it in the same way or do they get the same result.

Q. Why do you say that?

A. They basically -- the function is, they are both taking the power out. For the patent, the power is taken out from inside the armature, inside the armature assembly. It is clear through all the documents, figures 3, 4, and 5, that the power is taken out from within the armature.

The Toyota transaxles don't do that. They are taking the power out all the way outside that armature, it is kind of like the envelope argument all over again, but the power is taken outside.

A disk is not structurally a shaft, okay? There is a whole other side argument that we have the disk, they need the disk, okay, in this patent. They need the disk because they have a large plate, they are coming in with a large bevel gear, so they need something very large and very flat to get to, to make the rigid connection.

So that's going to have to be a disk. It is not going to be a shaft, because they are taking off the ends of the shafts. So disk is completely different from shaft. So my opinion is you have got a completely different structure that's doing something in a completely different way. And getting a completely different result from the result that's needed in that patent.

Q. Okay.

A. So they are not even structurally equivalent.

Q. How about your opinion, same question, but your opinion for the Highlander. Are there any differences?

A. Exact same opinion for the Highlander.

(Caulfield, Tr. at 1774:22-1775:17, 1775:24-1778:10 (emphasis added).)

Finally, the administrative law judge finds that an analysis of respondents' accused

products shows that the products do not contain a component that is identical to disk 23 or disk 33 that is between the armature of the electric motor and the transmission unit. Instead, the administrative law judge finds that respondents' accused products contain a shaft, bearings, splines, and a ring gear. (RX-443C; RX-458C.)

However, the administrative law judge further finds that complainant may still show literal infringement of the "power conversion means" limitation of claim 7 of the '932 patent if complainant shows that the structure of the "power conversion means" for respondents' accused products is structurally equivalent to the "power conversion means" structure disclosed in Figures 3, 4, 5 and 6 of the '932 patent under 35 U.S.C. § 112, ¶ 6 (i.e., that the structure of the "power conversion means" for respondents' accused products performs the identical function of the "power conversion means" structure disclosed in Figures 3, 4, 5 and 6 of the '932 patent in a substantially similar way, with a substantially similar result).

Nevertheless, the administrative law judge finds that the structure of the "power conversion means" for respondents' accused products, while performing the identical function of the "power conversion means" structure disclosed in the '932 patent (i.e., "converting said electrical power of said first and second inputs for output"), does not perform the function in a substantially similar way. The administrative law judge finds this is so because there are substantial differences between disks 23 and 33 of Figures 3, 4, 5 and 6 of the '932 patent and the shaft of respondents' accused products.

First, the administrative law judge finds that the identified structure in respondent's accused Prius product is supported by two bearings, whereas disks 23 and 33 of the '932 patent are shown supported by just one bearing. (Caulfield, Tr. at 1646:8-15, 1891:8-22; Davis, Tr. at

1322:7-19; RDX-046C; RX-443C; RX-458C; CPX-4C; CX-345C.) The administrative law judge finds that this is a substantial difference because the patentee, in the specification of the '932 patent, and the applicant, in the prosecution history of the '932 patent, repeatedly touted that an advantage of the "integral combination" feature of the invention of the '932 patent, is that it could be supported by one bearing, not two bearings. (See CX-1 at 2:34-49, 4:62-68, 7:30-52; RX-7, Amendment at 21-22, TMC01-082579-80.) Because respondent's accused products is supported by two bearings, it does not have the advantage of the "integral combination" feature, touted by the patentee/applicant, and thus, the administrative law judge finds that respondent's accused product does not perform the function of the "power conversion means" (i.e., "converting said electrical power of said first and second inputs for output") in a substantially similar way. Hence, the administrative law judge finds that the doctrine of equivalence is not applicable.

Furthermore, independent of the fact that complainant has failed to rebut that said differences between the identified structure in respondents' accused products and the "power conversion means" structure disclosed in the '932 patent are substantial, the administrative law judge finds that complainant has failed to meet its burden through a preponderance of the evidence in showing that the identified structure in respondents' accused products performs the identical function of the "power conversion means" structure disclosed in the '932 patent (i.e., "converting said electrical power of said first and second inputs for output") in a substantially similar way as the structure disclosed in the '932 patent. Thus, complainant's expert Davis merely stated that the identified structures within respondents' accused products, that complainant alleged performs the function of converting electrical power to rotational

mechanical power, are equivalent to the structures disclosed in the '932 patent because they perform said function in substantially the same way as the structures disclosed in the '932 patent:

Q. Do you have an opinion as to whether the structures within the Prius and the Highlander for performing that function are either the same as or equivalent to the structures disclosed in the '932 patent?

A. I think they're equivalent to. Obviously there's some different sizes in motors, the main difference being that planetary gear set in the Prius, CPX-4A, is a simple planetary gear set. The planetary gear set used in the Highlander, CPX-3 here, is a compound planetary gear set. Again, they have the same function. It's just an equivalent structure, equivalent way of doing that.

* * *

Q. Do you have an opinion, sir, as to whether one of ordinary skill in the art in 1990 would have believed that the structures contained within the Prius and Highlander vehicles are insubstantially different from the structures disclosed in the patent for carrying out the function of the power conversion means?

A. Yes, I do. I believe they are not substantially different.

Q. And why do you think that, sir?

A. Well, again, they're carrying out the same function. And there's just, you know, design considerations and different types of motors and motors that were disclosed so that the shapes may be a little bit different. But their functions are the same. And you obviously still have a field element, armature assembly to convert things over. So their structure is equivalent.

Q. Do they perform that function in the same way?

A. Yes.

Q. And they achieve the same result?

A. Yes, they do.

(Davis, Tr. at 1009:4-17, 1012:13-1013:10 (emphasis added).) The administrative law judge finds that Davis did not provide an analysis of the two structures or any detailed basis why Davis concluded that the identified structure of the respondents' accused products and the disclosed structure of the '932 patent was equivalent, beyond the fact that the "functions were the same." Furthermore, the administrative law judge finds that complainant's findings of fact merely repeat Davis's testimony and do not provide any additional analysis to support Davis's conclusion that the identified structure of the respondents' accused products and the disclosed structures of the '932 patent perform the function of converting electrical power to rotational mechanical power in a substantially similar way. (See CFF 303, 309, 310.)

Furthermore, independent of the fact that complainant has failed to rebut that said differences between the identified structure in respondents' accused products and the "power conversion means" structure disclosed in the '932 patent are substantial, and independent of the fact that complainant failed to meet is burden in showing that the identified structure in respondents' accused products performs the identical function of the "power conversion means" structure disclosed in the '932 patent (i.e., "converting said electrical power of said first and second inputs for output") in a substantially similar way as the structure disclosed in the '932 patent, the administrative law judge finds that, based on the prosecution history, complainant is estopped from arguing that the identified structure in respondents' accused products, which includes a shaft, is structurally equivalent to the "power conversion means" structure disclosed in the '932 patent under 35 U.S.C. § 112, ¶ 6. Thus, because the administrative law judge has

found that the '932 patentee expressly disclaimed the use of shafts in his invention, both in the specification and during prosecution, he concludes that Solomon is prohibited as a matter of law from arguing that Toyota's rotor shafts are equivalent to the "power conversion means" structure disclosed in the '932 patent. As the Federal Circuit has held:

> When a patentee advises the examiner . . . that a particular structure is not within his invention, the patentee is not permitted to assert in a subsequent infringement action that the same structure is equivalent to the structure described in the patentee's specification for purposes of section 112 paragraph 6.

Ballard Med. Prods. v. Allegiance Healthcare Corp., 268 F. 3d 1352, 1359 (Fed. Cir. 2001). Accord Signtech USA, Ltd. v. Vutek, Inc., 174 F. 3d 1352 (Fed. Cir. 1999); Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F. 3d 1214 (Fed. Cir. 1996).

In Ballard, the Court found that the patentee, in an amendment, disavowed certain types of control valves, namely, pressure valves, by characterizing them as falling outside the scope of his invention. (Id., 268 F.3d at 1359.) Also, the Court rejected the patentee's argument that the statements in the amendment applied to other claims not at issue in the case. Id. at 1360. As a result, the Court held that, "by virtue of [the patentee's] characterization of his valve structure, the disclosed structure – a vacuum control valve with a static internal seal – cannot be regarded as equivalent to a dynamic pressure valve with a shaft-to-seal interface." (Id. at 1362.) Here the administrative law judge finds that, Solomon should not be permitted to argue that a rotor shaft, the very structure disclaimed from the scope of claim 7 during prosecution, is nevertheless a structural equivalent to the claimed "power conversion means" under 35 U.S.C. § 112, ¶ 6. Hence, the administrative law judge finds that respondents' accused products lack the "power conversion means" limitation of claim 7 of the '932 patent, under the doctrine of equivalents.

Based on the foregoing, the administrative law judge finds that complainant has not established, by a preponderance of the evidence, that the accused hybrid transaxles infringe asserted claim 7 of the '932 patent.

IX. Domestic Industry

There can be a violation of section 337 "only if an industry in the United States, relating to articles protected by the patent ... exists or is in the process of being established." 19 U.S.C. § 1337(a)(2); see also Certain Methods of Making Carbonated Candy Products, Inv. No. 337-TA-292, USITC Pub. 2390, (Mar. 1990). The existence of a domestic industry is measured at the time the complaint is filed. See Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n, 714 F.2d 1117, 1121-22 (Fed. Cir. 1983).

The Commission has established a two-prong test for determining whether a complainant has satisfied the domestic industry requirement. The technical prong considers "whether the complainant is exploiting or practicing the patent in controversy," while the economic prong addresses "whether there is significant or substantial commercial exploitation." Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, USITC Pub. 2949 (Jan. 1995). As complainant, Solomon bears the burden of proving that it has satisfied both the technical prong and the economic prong.

A. Economic Prong

Complainant Solomon argued that it has received over{ } in investments in 2004 and 2005, alone, which has allowed the company to focus on and accelerate advanced stage research and development activity aimed exclusively at the exploitation and commercialization

of the '932 patent in a range of ground-based applications and markets; that Solomon has also shown that it is entitled to rely not only upon its recent investments, but also its historic investments, in the exploitation and commercialization of the '932 patent; and that Solomon also demonstrated that it is capable of manufacturing and selling, upon demand, the Electric Wheel device that practices the patented technology, known as the ST-58. (CBr at 90.)

It is argued by complainant that testimony at the hearing clarified that it is most appropriate to look at Solomon's operational history as having three business phases, with one consistent business focus spanning across all of the timeframes; that first, from August 1995 until 2000, Solomon was primarily an early stage development company, engaging solely in research and development activity and licensing efforts; that second, from 2000 until 2004, Solomon struggled with the growing pains of executing on a sales and marketing strategy for its recently developed marine product, the ST58, and going public, while trying to continue its efforts to bring the Electric Wheel technology to other markets and applications; that third, beginning in early 2004, Solomon received a substantial investment from a group of investors who replaced the board of directors and management, and reinvigorated Solomon's business operations and its commitment to the long-stated intention of introducing the Electric Wheel, or the '932 technology, to a wider segment of the marine market, and beyond to ground-based applications; that Solomon's consistent and singular business plan over this entire period, however, was to develop the Electric Wheel technology across as many applications as possible; that as a result, it is plain that a vast majority of the millions of dollars invested in Solomon over the years has been committed to provide the labor and infrastructure necessary to exploit and commercialize the '932 patent; and that thus Solomon has established the existence of a domestic industry, within

the meaning of §1337(a)(3)(A). (CBr at 90-91.)

As to its licensing activities, complainant argued that under DeVecchis' management, efforts to license the Electric Wheel technology across a range of ground-based applications are also a component of Solomon's advanced stage research and development activity; that when DeVecchis first joined Solomon, he got involved in on-going licensing discussions with WaveCrest Laboratories in Dulles, Virginia to license the Electric Wheel technology in non-marine applications; that the parties exchanged facility visits, but in December of 2005, as Solomon was preparing a term sheet, WaveCrest informed DeVecchis that it was ceasing operations; that thereafter, DeVecchis undertook a concerted effort to research and identify potential licensees in a variety of applications, which culminated in a letter and e-mail campaign in November of 2005; that although no licenses resulted, several contacts were made, including a recently restarted dialogue with Oshkosh Trucking Company; that Solomon's Christian has also assisted in these licensing efforts, and has participated in discussions with Oshkosh Trucking and John Deere; and that in October of 2006, Solomon entered into its first license agreement for the Electric Wheel technology with Hobie Cat Company of California, which license resulted from negotiations that began in August of 2006. (CBr at 99-100.)

Respondents argued that the record facts demonstrate that Solomon's "licensing efforts" were commenced only for purposes of this litigation, and are no more than a series of form letters, emails, and a few phone calls that have gone unanswered; that the one license that Solomon has obtained, which was executed the week before the hearing in this investigation began, has no inherent value and adds nothing to Solomon's licensing activity; that the record evidence demonstrate that any alleged R&D effectively ceased in 2000 and that the majority of

Solomon's alleged R&D expenditures were related to administrative costs not directed to the '932 patent; and that the record evidence demonstrates that little if any of Solomon's alleged current R&D activities actually relate to the '932 patent in issue. (RBr at 90-91.)

The staff argued that Solomon's domestic activities do not relate directly to the '932 patent and to the extent that they do, Solomon's activities are meager at best; that for example, the evidence of record demonstrates that Solomon's activities in the United States relating to the '932 patent have largely been non-existent from sometime in the early 2000s, having sold only{ } *Beta* ST-58s (the model allegedly covered by the '932 patent, the last of which was sold in 2002) prior to the institution of this investigation; and that the evidence shows that Solomon sold approximately{ } ST-37s and ST-74s, none of which are alleged to be covered by the '932 patent, during this time frame. (SBr at 58.)

The staff also argued, with respect to the research and developmental element and prong C of the domestic industry requirement, that Solomon, through its predecessor-in-interest, allegedly expended approximately{ }on research and development relating to the '932 patent from 1995 through 2000; that however, more than half of the{ } allegedly expended on research and development represents expenditures related to sales and general and administrative expenses; that Solomon's business plan in January of 2000 was to continue to pursue production and sales of Solomon's motors, which do not practice the '932 patent; that Solomon's assertions that its employees Christian and Pesiridis have spent significant amount of their time on research and development directly relating to the '932 patent (e.g. the controls research) are unavailing; that to the extent that any such research has relevance to the '932 patent, this research effort is general, and general research expenses cannot be attributed to the patented

device for purposes of the domestic industry analysis; and with respect to Solomon's alleged licensing activities, that said licensing activities "do not rise to a level sufficient, i.e., are not "substantial" enough, to support a determination that a domestic industry exists based upon licensing activities." (SBr at 59-61, 65.)

With respect to the economic prong of the domestic industry requirement, a complainant may show that a domestic industry exists or is in the process of being established under any of the three statutory grounds set forth in Section 337 (a)(3), which provides:

> (3) For purposes of paragraph (2),[29] an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, or mask work concerned –
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337 (a)(3). Given that these criteria are in the disjunctive, satisfaction of any one of them will be sufficient to meet the domestic industry requirement. Certain Integrated Circuit Chipsets and Products Containing Same, Inv. No. 337-TA-428, Order No. 10 at 3, Initial Determination (Unreviewed) (May 4, 2000), citing Certain Variable Speed Wind Turbines and

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[29] Paragraph (2) provides:

> (2) Subparagraphs (B), (C), and (D) of paragraph (1) only if an industry in the United States, relating to the articles protected by the patent, copyright, trademark, or mask work concerned, exists or is in the process of being established.

19 U.S.C. § 1337 (a)(2).

Components Thereof, Inv. No. 337-TA-376, Commission Op. at 15, USITC Pub. 3003 (Nov. 1996).

In 1988, by amending section 337 and including for the first time the factor "substantial investment in its exploitation, including engineering, research and development, or licensing," Congress intended to expand the definition of domestic industry to include certain non-manufacturing activities. Certain Dynamic Sequential Gradient Compression Devices and Component Parts Thereof, Inv. No. 337-TA-335, Initial Determination on Temporary Relief at 59 (May 15, 1992) (Compression Devices). The Senate Finance Committee Report on the Senate's version of the Omnibus Trade and Competitiveness Act of 1988 commenting on criteria (A) (B) and (C) of subsection (a) (3) of section 337, supra, stated:

> The first two factors [(A) and (B)] in this definition have been relied on in prior Commission decisions finding that an industry exists in the United States. The third factor [(C)], however, goes beyond the ITC's recent decisions in this area. This definition does not require actual production of the article in the United States if it can be demonstrated that substantial investment and activities of the type enumerated are taking place in the United States.
>
> Marketing and sales in the United States alone would not, however, be sufficient to meet this test. The definition could, however, encompass universities and other intellectual property owners who engage in extensive licensing of their rights to manufacturers.

(S.Rep. No. 71, 100th Cong., 1st Sess., at 129 (1987) (Senate Report) (emphasis added); see also H.R. Rep. No. 40, 100th Cong., 1st Sess., at 157-58 (1987) (House Report).)[30]

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[30] Both the Senate Report and the House Report state that mere ownership of a patent is insufficient to meet the domestic industry requirement. Senate Report at 130; House Report at 154. "The owner of the property right must be actively engaged in steps leading to the exploitation of the intellectual property . . .". Id. The Senate Report and the House Report have substantially the same language.

Further, the term "domestic industry" in Section 337 is not defined by the statute, but the Commission has interpreted the intent of Section 337 to be "the protection of domestic manufacture of goods." Certain Dynamic Random Access Memories, Components Thereof and Products Containing Same, Inv. No. 337-TA-242, U.S.I.T.C. Pub. No. 2034 (November 1987), Commission Opinion at 61, 1987 WL 450856 (U.S.I.T.C., September 21, 1987) (DRAMs). Also, the Commission has consistently held that relief in a patent-based investigation under section 337 is dependent upon whether a complainant "is exploiting or practicing the patent in controversy." Certain Plastic Encapsulated Integrated Circuits, Inv. No. 337-TA-315, Commission Opinion at 16 (1992). Moreover, since Congress required that the domestic industry comprise only those activities which exploit a patent, to include activities which are in the same field of technology but which do not have the requisite nexus to the patent in issue would be contrary to the statute. Hence, the activities set forth in Section 337(a) (3) may constitute a domestic industry only if they are sufficiently related to articles protected by the patent as to constitute an exploitation thereof. See, Compression Devices at 61-3.

The Commission has further stated that "[t]he scope of the domestic industry in patent-based investigations has been determined on a case by case basis in light of the realities of the marketplace and encompasses not only the manufacturing operations but may include, in addition, distribution, research and development and sales." DRAMs. at 62 (footnotes omitted). Consistent with the Commission's practice, in Certain Digital Satellite System Receivers And Components Thereof, USITC Inv. No. 337-TA-392, Initial And Recommended Determinations at 11 (10/20/97), citing e.g. Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366,

Comm'n Op. at 24 (Jan. 16, 1996), this administrative law judge found that "[t]he Commission has held that a complainant may satisfy the domestic industry requirement of section 337 by showing that the domestic industry exploits the patent in issue, and that a complainant is not required to establish that it practices asserted claims."

Complainant has argued that its investment into research and development activity and licensing efforts demonstrate the existence of a domestic industry under § 1337(a)(3)(C) which is a continuation of Solomon's substantial R&D activity during its early stage of development. (CBr at 92-105.) It is further argued that complainant has also established the existence of a domestic industry based upon its significant investment in plant and equipment under § 1337(a)(3)(A) (CBr at 105-07.)

Regarding any significant investment in plant and equipment the patent application resulting in the '932 patent was filed on November 28, 1990 and the '932 patent issued on November 26, 1991. (CX-1.) However, inventor Edwards testified that he "built no prototypes of [the patentable device]. . . until after the patent issued" (Tr. at 589.){

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It is also a fact that respondents Toyota attempted to purchase an ST58 from Solomon's web site during the course of this investigation but was informed that it was out of stock. (DeVecchis, Tr. at 239-40.) However, it is admitted by complainant that Toyota was able to obtain an ST58 in a "non-commercial sale" through Parker Engineering, Toyota's expert consulting service. (RFF-6.176 (undisputed).) {

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Referring to complainant's allegation that it has established the existence of a domestic industry based upon its investment into research and development activity, it is undisputed that Solomon over the years, assembled for sale at least{ } ST37s and ST74s. (RFF-6.141 (undisputed).) However, it is also undisputed that the ST37s and ST74s do not practice the '932 patent. (RFF 6.192 (undisputed).) Complainant however has argued that since August 2004, to

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[34] {
}

the extent that Solomon has conducted any research and development on the electric motor employed in Solomon's ST37 product,{

}

Referring to this argument of complainant, the record establishes that{ } development of the six horsepower motor for the ST58 Electric Wheel resulted in a separate product, the ST37; that the ST37 consists of a six horsepower motor fixed to the output shaft of the device, without the ST58's planetary gear set;{

} the ST74 consists of two six horsepower motors attached to an output shaft, without the gear set employed in the ST58. {

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The record further establishes that Andrew Christian began working as an employee of Solomon on "about August 3, 2004." (Christian, Tr. at 327; see CX-168 at 1.) Since joining Solomon as a full-time employee, Christian's annual compensation has been{ } (Christian, Tr. at 389-387.) Since 2004, Christian has worked{ } hours per week as the Director of Engineering for Solomon. (Christian, Tr. at 387.) Also, since August 2004, to the extent that Solomon has conducted any research and development on the electric motor employed in Solomon's ST37 product,{

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Based on the foregoing, including the relationship of the ST37 and ST58, the administrative law judge finds that complainant has established the required economic prong of the domestic industry requirement directed to the ST58 through its investment into research and development activity.

B. Technical Prong

Complainant argued that at the hearing, complainant's expert Davis established that Solomon's ST58 Electric Wheel satisfies all the limitations of claim 1 of the asserted '932 patent; that the ST58 is controlled to vary the speed of the output shaft of the device in a continuous manner from a negative maximum value to a positive maximum rotational value; that Davis reviewed assembly drawings and physically inspected the device in reaching his opinion that the ST58 practices claim 1; that Davis tested an ST58 at Solomon's facility in Tarpon Springs; that that testing of the ST58 demonstrated that the device "can provide a continuously variable output from some negative maximum value to some positive maximum value"; that significantly, Caulfield did not dispute the data that Davis relied upon to establish that the ST58 is capable of achieving a continuously variable output; and that accordingly, Solomon has established that is ST58 Electric Wheel practices claim 1 of the '932 Patent. (CBr at 88-9.)

Complainant further argued that both Toyota and staff argue that the ST58 is incapable of achieving a continuously variable output because the device "does not provide an output that can be varied such that any desired rotational speed can be attained at peak power"; and that

however, one of ordinary skill in the art would not consider "peak power" a requirement of the "continuously variable output" of asserted claim 1. (CRBr at 65.)

Respondents argued that the ST58 does not meet Toyota's construction of the continuously variable limitation of claim 1; and that the ST58 does not provide an output that can be varied such that any desired rotational speed can be attained at peak power. (RRBr at 73.)

The staff argued that Solomon's ST58 device does not satisfy the continuously variable element because, at least, it is not capable of supplying full power at all speeds. (SBr at 56.)

The domestic industry product ST58 Electric Wheel device is a combination motor and transmission device designed for marine applications, which Solomon has installed in sailboats. (RX-129C at 3.) {

} The schematic of the ST58 is shown in CX-281C. (CFF 712 (undisputed).) {

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The administrative law judge has interpreted, supra, the claimed phrase "wherein the rotational speed of said output is continuously variable" of claim 7 of the '932 patent as:

> the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven.

The claimed phrase in issue, which is part of the fourth clause of claim 1 of the '932 patent, is identical to the claimed phrase "wherein the rotational speed of said output is continuously variable" of claim 7 of the '932 patent. Based on all of the reasons set forth in the claim interpretation section, supra, the administrative law judge finds that the claimed phrase "wherein the rotational speed of said output is continuously variable" of claim 1 of the '932 patent should be given an identical interpretation as that of the identical claimed phrase in claim 7 of the '932 patent. Moreover, none of the parties argued that said identical phrases should be interpreted in a different way.

Complainant's expert Davis testified regarding the "continuously variable" limitation with respect to the domestic industry:

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} Hence, the administrative law judge finds that Davis conceded that the ST58 will not allow one to achieve peak power output at any speed.

{ }

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} However, the administrative law judge, in his interpretation of "continuously variable," required that output speed "can be varied such that any desired rotational speed ... can be attained at peak power." Hence, the administrative law judge finds that the domestic industry product ST58 does not have output speeds which "can be varied such that any desired rotational speed ... can be attained at peak power" as required by the "wherein the rotational speed of said output is continuously variable" limitation.[36]

Based on the foregoing, the administrative law judge finds that complainant has not satisfied the technical prong of the domestic industry requirement. Hence he finds that complainant has not established that an industry exists in the United States, as required by subsection (a)(2) of section 337. The administrative law judge rejects complainant's argument that it need not prove that it satisfies the technical prong of the statute provided it satisfies the economic prong of the domestic industry requirement, citing In re Dynamic Sequential Gradient Compression Devices and Components Parts Thereof, ITC Inv. No. 337-TA-335, Initial Determination on Motion for Temporary Relief, at 60 (Nov. 1992). (CRBr at 66.) Contrary to

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[36] Respondents also argued that Solomon's ST58 Electric Wheel does not practice claim 1 of the '932 patent because it does not satisfy the "integral combination" limitation as recited in claim 1. Said "integral combination" limitation of claim 1 articulates that two elements of the integral combination are "directly associated mechanically and geometrically with each of other" and then further defines said association as "without substantial spacing or other elements including bearings and shafts therebetween." An examination of the ST58 Electric Wheel discloses that the two elements of the integral combination are directly associated mechanically and geometrically with each other with no substantial spacing or other elements in between the integral combination. Hence the administrative law judge rejects respondents' argument that the ST58 Electric Wheel does not practice said claim 1 because it does not satisfy said "integral combination" limitation of claim 1.

complainant's argument, pages 60-61 of said initial determination specifically states:

> Congress did not intend, however, that activities of a complainant which generally relate to the subject area of the patent fall within the statutory definition of a domestic industry. Indeed, the plain language of the statute provides that the domestic industry comprises only those activities (either manufacturing or non-manufacturing) which exploit the intellectual property rights at issue. Paragraph 3 (C) refers to investment in the patent's "exploitation." Paragraph 3 also specifically refers to paragraph 2, which provides that relief under Section 337 is contingent upon the existence of a domestic industry "relating to the articles protected by the patent, . . ." (emphasis added). The Commission has therefore consistently held that relief in a patent-based action under Section 337 is dependent upon whether the complainant "is exploiting or practicing the patent in controversy". Certain Plastic Encapsulated Integrated Circuits, Inv. No. 337-TA-315 (U.S.I.T.C. 1992), Comm. Opn. at 16; Certain Doxorubicin And Preparations Containing Same, 20 U.S.P.Q.2d 1602 (U.S.I.T.C. 1991), vacated as moot, Erbamont, Inc. v. United States International Trade Commission (Appeal No. 91-1072, Orders of March 26 and April 9, 1991) (Fed. Cir. 1991). Therefore, the activities set forth in paragraph 3 may constitute a domestic industry only if they are sufficiently related to articles protected by the patent as to constitute an exploitation thereof.
>
> Accordingly, a domestic industry exists in this investigation under 19 U.S.C. § 1337(a)(3)(C) only if Complainant's investments in engineering and research and development projects are devoted to the exploitation of the '087 patent. See, Certain Microcomputer Memory Controllers, Components Thereof And Products Containing Same Order No. 6 (January 8, 1992) (summary judgement granted in part and denied in part; complainant's non-manufacturing activities were found to constitute a "substantial investment" for purposes of 19 U.S.C. § 1337(a)(3)(C), but a genuine issue of fact remained as to whether complainant was practicing the patent). (emphasis added) (footnote omitted)]

For reasons stated supra, while complainant established the economic prong through the relationship of ST37 and ST58, complainant has not established that it is practicing claim 1 of

the '932 patent because the ST58 will not allow one to achieve peak power output at any speed. Hence complainant has not established the existence of an industry, as required by subsection (a)(2) of section 337.

X. Validity

A. Prior Art

A patent issued from the Patent Office bears the presumption of validity. 35 U.S.C. § 282. The party challenging a patent's validity has the burden of overcoming this presumption by clear and convincing evidence. Advanced Display Sys., Inc. v. Kent State Univ., 212 F.3d 1272 (Fed. Cir. 2000). An analysis for anticipation under section 102 is a two-step inquiry. Power Mosfet Technologies, L.L.C. v. Siemens AG, 378 F.3d 1396, 1406 (Fed. Cir. 2004). The first step requires construing the claim, which is a question of law to be decided by the administrative law judge. Oakley, Inc. v. Sunglass Hut Int'l, 316 F.3d 1331, 1339 (Fed. Cir. 2003); Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995). The second step requires a comparison of the properly construed claims to the prior art, which is a question of fact. Power Mosfet, 378 F.3d at 1406; Oakley, 316 F.3d at 1339.

A patent claim is invalid for anticipation if a prior art reference discloses, either expressly or inherently, all of the limitations of a claim. EMI Group N. Am., Inc. v. Cypress Semiconductor Corp., 268 F.3d 1342, 1350 (Fed. Cir. 2001) (citation omitted). As to any inherent disclosure of a prior art reference, the Federal Circuit has stated:

> To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be

so recognized by persons of ordinary skill.

Metabolite Labs., Inc. v. Laboratory Corp. Of America Holdings, 370 F.3d 1354, 1367 (Fed. Cir. 2004).

Respondents argued, relying on complainant's claim constructions that the asserted claim 7 of the '932 patent is anticipated by each of the U.S. Patent No. 2,578,837 (the '837 patent; the Raney patent; RX-74) issued to inventor W. E. Raney on December 18, 1951, and the Japanese Laid Open Patent Application No. 63-231037 (the '037 publication; the Goto reference; RX-77 and RX-415 (certified translation)) published on September 27, 1988. (RBr at 120, 128.)

The staff, relying on complainant's proposed claim constructions, argued that each of the '837 patent, the '037 publication and U.S. Patent No,. 4,729,258 (the Mohri '258 patent (RX-7 at TMC01-082540-46)[37] anticipates claim 7 of the '932 patent. (SRBr at 34-5.)

Complainant argued that respondents failed to establish that any prior art reference anticipates the asserted claim 7 of the '932 patent. (CBr at 75.)

1. The Raney Patent (The '837 Patent)

Respondents argued that complainant's expert Davis has conceded that all of the limitations of claim 7 are satisfied under complainant "Solomon's broad (and incorrect) constructions," except for the "continuously variable" and "compact structure" limitations. (RBr at 120.)

The staff argued that in respondents' expert Caulfield's opinion, if the Toyota system

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[37] The staff references RX-76 as the '258 patent. However, while the '258 patent is in evidence as CX-3 and also as an attachment as one of the Examiner's cited references in the first Office Action mailed February 28, 1991 (RX-7 at TMC01-082540 - 46), RX-76 itself is not in evidence.

exhibits continuously variable output speed, according to Solomon's construction, then the Raney '837 patent also discloses continuously variable output speeds; and that if the motors in the Toyota Prius satisfies the "compact structure" element, then the '837 patent also satisfies this limitation. (SBr at 73-74.)

Complainant argued that respondents failed to establish that the Raney '837 patent discloses each and every element of asserted claim 7 of the '932 patent. (CBr at 75-76.)

The administrative law judge has interpreted, supra, the claimed phrase "continuously variable" as "the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven." The '837 patent states:

> The present invention relates generally as indicated to a variable speed drive and more particularly to a simple form of electric drive unit in which the drive shaft thereof may be driving at many more different speeds than the electric motors or prime movers thereof.

(RX-074 at 1:1-6.) Further, it is undisputed that in the '837 patent, there are set points for the two motors in terms of their speed, and depending on where the set points are placed, a different output speed is achieved. (RFF 7.52 (undisputed).) Moreover, when you switch speeds in the '837 patent device, the output speed is going to change from one speed to another. (RFF 7.53 (undisputed).)

Specifically, consistent with the administrative law judge's interpretation of the claimed phrase "continuously variable," the private parties agreed that the claimed phrase "continuously variable" cannot be limited to preset or predetermined speeds and a "continuously variable"

output must be capable of any desired speed. (CBr at 50; RBr at 53.) Thus, respondents argued that the intrinsic record of the '932 patent makes clear that "a "continuously variable" output must be capable of achieving any desired output speed, and it cannot be limited to preset or predetermined output speeds." (RBr at 53.) Likewise, complainant argued that "[t]he parties are in agreement that this claim limitation ["continuously variable"] cannot read on systems that merely achieve fixed, discreet output speeds." (CBr at 50.)

Further, regarding the prior art '837 patent, complainant's expert Davis testified:

> Q. And what about the Rainey reference [the '837 patent] do you believe is different from the term continuously variable as it's used in the patent?
>
> A. Again, in the Rainey reference, I believe they had -- they described a series of, like, 24 discrete output speeds. So, again, it was controlling for fixed discrete output speeds. So to change from one speed to another it would be like, you know, kind of like flipping a switch, going from one to the other. So it would, you know, have more of these step changes available in the Rainey.

(Davis, Tr. at 1027-28 (emphasis added).) Thus, Davis testified that the Raney '837 patent has an output that goes from zero to some discrete speed and that this is not a "continuously variable" output. Hence, the administrative law judge finds that the '837 patent achieves only predetermined output speeds, rather than any desired output speed as required by the proper claim interpretation of the claimed phrase "continuously variable."

As for the claimed "integral combination" limitation of asserted claim 7, supra the administrative law judge has interpreted it as:

> an electric motor element and a transmission unit element rigidly and directly attached without the presence of shafts, bearings or other components between the electric motor element and the

> transmission unit element, supportable by a single bearing; where one of the integral combination elements is contained entirely or nearly entirely within the imaginary space defined by the rotation of the other integral combination element so that power is taken off from inside the armature itself.[38]

Figures 1 and 4 of the '837 patent show many components between the motor element and the transmission element. Thus, Figure 1 of the '837 patent shows a motor element (rotor 8) rotatably supported on the drive shaft 5 by means of two bearings 10 and a second a motor element (rotor 9) rotatably supported on the drive shaft 5 by means of two additional bearings 10. (RX-74 at 3:47-54.) Similarly, Figure 4 of the '837 patent shows a motor element (rotor 39) rotatably supported on the drive shaft 33 by means of two bearings 38 and a second a motor element (rotor 40) rotatably supported on the drive shaft 33 by means of two additional bearings 38. (RX-74 at 6:5-18.)

With respect to the claimed phrase "whereby a compact structure is provided for each said integral combination," the administrative law judge has found, that said claimed phrase states a result of the claimed "integral combination" limitation. Hence, since the '837 patent does not disclose the "integral combination" limitation (which requires no shafts, bearings or other components between the electric motor element and the transmission unit element), the '837 patent also does not disclose the resulting structure, i.e., the claimed "compact structure" limitation.

Based on the foregoing, the administrative law judge finds that respondents have not established, by clear and convincing evidence, that the '837 patent anticipates asserted claim 7 of

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[38] Because the claimed "envelope" is essentially the two elements that comprise an integral combination, it has been found that the claimed "envelope" cannot have shafts, bearings, or other components between said elements, and is supportable by a single bearing.

the '932 patent.

2. The Goto Reference (The '037 Publication)

Respondents argued that complainant's incorrect and overly broad claim constructions would render claim 7 of the '932 patent anticipated by the '037 publication. (RBr at 128.)

The staff argued that the record evidence demonstrates that the Goto '037 publication discloses a device with a "continuously variable output speed" and "integral combination" under Solomon's proposed constructions of those limitations. (SBr at 71.)

Complainant argued that respondents failed to establish that the Goto '037 publication discloses each and every element of asserted claim 7 of the '932 patent. (CBr at 76.)

The administrative law judge has interpreted, supra, the claimed phrase "continuously variable" as "the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven."

The title of the '037 publication is "Drive Mechanism for Rotary Body for Auxiliary Scanning." (RX-415 at TMC01-082658.) The '037 publication states: "The present invention pertains to a drive mechanism for a rotary body for auxiliary scanning in a facsimile [device]." (RX-415 at TMC01-082658.) The '037 publication further states that "by appropriately setting various parameters such as the number of teeth of each constituent element ... in the differential gear device" and the steps of each stepping motor, that "it is possible to make the auxiliary scanning rotary body rotate at an arbitrary speed." (RX-415 at TMC01-082662.)

Regarding the "continuously variable" limitation and the '037 publication, complainant's

expert Davis testified:

> Q. And what about the Rainey reference do you believe is different from the term continuously variable as it's used in the patent?
>
> A. Again, in the Rainey reference, I believe they had -- they described a series of, like, 24 discrete output speeds. So, again, it was controlling for fixed discrete output speeds. So to change from one speed to another it would be like, you know, kind of like flipping a switch, going from one to the other. So it would, you know, have more of these step changes available in the Rainey.
>
> Q. Now, and the same for the Goto fax machine patent [the '037 publication]?
>
> A. Yes. In the Goto patent, they talk about achieving different fax standards. So there are different fixed speed steps that equate to those standards, those different fax standards.

(Davis, Tr. at 1027-28 (emphasis added).) Thus, Davis testified that the Goto '037 publication has an output that goes from zero to some discrete speed and that this is not a "continuously variable" output. Hence, the administrative law judge finds that the '037 publication achieves only predetermined output speeds, rather than any desired output speed as required by the proper claim interpretation of the claimed phrase "continuously variable."

As for the claimed "integral combination" limitation supra, Figure 1 of the '037 publication shows many components between the motor element and the transmission element. Thus, the '037 publication states regarding Figures 1 and 2:

> As shown in FIG. 1, a support shaft 2 is fixed in the left/right direction in the center inside a casing 1. In addition, a first stepping motor 3 is disposed at the left side of the support shaft 2 and a second stepping motor 4 is disposed at the right side of the support shaft 2. The above-described first stepping motor 3 has a stator 3a fixed in the above-described casing 1 and a rotor 3b

consisting of a permanent magnet inserted with play in the stator 3a. A left bearing 5 and right bearing 6 are fixedly provided at the above-described rotor 3b; the above-described rotor 3b rotates centered on the support shaft 2 with the bearings 5 and 6 interposed. In addition, a peripheral gear 7 (below, "sun gear") is formed at the right edge periphery of the above-described right bearing 6, and this sun gear 7 is formed so that it is connected to the stepping motor 3 via the right bearing 6. Meanwhile, the second stepping motor 4 has a stator 4a fixed in the above-described casing 1 and a rotor 4b consisting of a permanent magnet inserted with play in the stator 4a. A left bearing 8 and right bearing 9 are fixedly provided at the above-described rotor 4b; the above-described rotor 4b rotates centered on the support shaft 2 with the bearings 8 and 9 interposed. In addition, the left edge of the above-described left bearing 8 forms a large-diameter circular plate 10 covering the right side of the above-described sun gear 7. As shown in FIG. 2, outer-tooth small gears 11, 11, 11 (below, "planetary gears 11") are rotationally disposed at three locations on the periphery of the above-described circular plate 10 via support pins 12, 12, 12. The planetary gears 11, 11, 11 are formed so that they are connected to the second stepping motor 4 via the circular plate 10 and left bearing 8.

In addition, an inner-tooth gear 13 (below, "ring gear 13") is disposed surrounding the above-described sun gear 7. The above-described planetary gears 11, 11, 11 respectively mesh with the ring gear 13. Also, the ring gear 13 is integrally formed with a boss 14 inserted with play at the left edge of the right bearing 6 formed with the above-described sun gear 7, and with a circular plate 15 that extends radially outward from the right edge of the boss 14. The ring gear 13 rotates freely centered on the support shaft 2 with the circular plate 15 and boss 14 interposed. The above-described three constituent elements - the sun gear 7, planetary gears 11, and ring gear 13 - constitute a differential gear device 100.

Meanwhile, a drive gear 16 is formed at the outer periphery of the above-described boss 14. A driven gear 19 fixed on a support shaft 18 of a paper transport roller 17 meshes with the drive gear 16.

(RX-415 at 3-4 (emphasis added).) Hence, as shown in Figure 1 of the '037 publication, a first stepping motor 3 is disposed at the left side of the support shaft 2 and a second stepping motor 4

is disposed at the right side of the support shaft 2, and each electrical motor element is supported by two bearings, i.e., bearings 5, 6 for the first stepping motor 3 and bearings 8 and 9 for the second stepping motor 4.

Based on the foregoing, the administrative law judge finds that it has not been established, by clear and convincing evidence, that the '037 publication anticipates asserted claim 7 of the '932 patent.

3. The Mohri Patent (The '258 Patent)

The staff argued that while the Mohri '258 patent discloses a "geometric overlay" between a motor element and a transmission element, complainant's expert Davis contends that the overlap in Mohri is not an integral combination because the connection is made outside the housing (SBr at 74); that in cross-examination testimony of Solomon's expert Davis, Davis essentially admitted that Mohri anticipates claim 7 under Solomon's proposed construction when applied to Mohri; and that Solomon similarly ignored respondents' expert Caulfield's extensive testimony, both direct and on cross, that Mohri would anticipate if Solomon's proposed constructions were to be applied. (SRBr at 34-5.)

Complainant, in its post hearing briefs, did not respond to the staff's argument relating to the Mohri '258 patent.

At the outset, as shown on the face of the '932 patent (CX-1), the '258 patent was before the Examiner at the Patent Office. Moreover, the '258 patent states regarding its Figure 1:

> Referring to the drawings, a differential actuator according to the present invention is shown in FIG. 1, in which the reference numerals 1 and 2 denote first and second unit actuators having first and second drive shafts 3 and 4 which are located on the same axis 11 and opposed to each other with a predetermined space

> therebetween. Numeral 5 denotes a control means for controlling the first and second unit actuators to rotate the first and second drive shafts 3 and 4 in forward and reverse directions and also at a variable rotating speed.
>
> Numerals 6 and 7 denote first and second bevel gears fixed at ends of the first and second drive shafts 3 and 4, respectively, the bevel gears 6 and 7 being formed in the same shape and same size.

(CX-3 at 2:49-62 (emphasis added).) Hence, Figure 1 of the '258 patent shows a first drive shaft 3 between the first actuator 1 (i.e., first motor element) and the first bevel gear 6 (i.e., a first transmission element). (Davis, Tr. 1208-1209.) Figure 1 also shows a second drive shaft 4 between the second actuator 2 (i.e., second motor element) and the second bevel gear 7 (i.e., a second transmission element). (Id.)

The administrative law judge finds that in contrast to the requirement of the claimed "integral combination" limitation that the electric motor element and the transmission unit element be rigidly and directly attached without the presence of shafts, bearings or other components between the electric motor element and the transmission unit element, the '258 patent discloses drive shaft 3 between the motor element 1 and the transmission element 6, and drive shaft 4 between the motor element 2 and the transmission element 7.

As for the claimed phrase "whereby a compact structure is provided for each said integral combination," it has been found by the administrative law judge, that said claimed phrase states a result of the claimed "integral combination" limitation. Hence, because the '258 patent does not disclose the "integral combination" limitation (which requires no shafts, bearings or other components between the electric motor element and the transmission unit element), the '258 patent also is found not to disclose the resulting structure, i.e., the claimed "compact structure"

limitation.

Based on the foregoing, the administrative law judge finds that the staff has not established, by clear and convincing evidence, that the '258 patent anticipates asserted claim 7 of the '932 patent.

B. 35 U.S.C. § 112, ¶ 1 (Written Description and Enablement)

Respondents argued that, as properly construed, the "continuously variable" limitation of claim 7 requires that the output be variable, such that any desired rotational speed, from full forward to full reverse, can be attained at peak power and with no intervening gear reduction to the component being driven. (RBr at 132; RFF-7.82, RFF-4.135.) It is further argued that "there appears to be no dispute" that the '932 patent fails to disclose how to operate the claimed invention so as to achieve peak power at any desired output speed. (RBr at 132; RFF-7.89-7.90.) It is also argued that complainant's expert admitted during trial that one could "certainly not" achieve peak power at any speed using the claimed invention. (RBr at 133; RFF -7.90.) Thus, respondents argued that if the claims are properly construed to require "peak power' at any desired output speed, it is undisputed that the specification of the '932 patent fails to describe or enable a motor-and-transmission device that achieves that result. (RBr at 133; RFF-7.88-90.) Hence, it was argued that claim 7 of the '932 patent is invalid due to a lack of a written description under 35 U.S.C. § 112, ¶ 1.

Respondents also argued that the '932 patent does not disclose a system that can produce peak power at any desired speed. (RBr at 134; RFF-7.88.) Like respondents' argument as to lack of written description, it is argued that complainant's expert has admitted that such a result is certainly not possible using the '932 claimed invention. (RBr at 134; RFF-7.90.) It is further

argued that, since something that is impossible clearly cannot be enabled, claim 7 of the '932 patent is also invalid for lack of an enabling disclosure. (RBr at 134.)

The staff argued that the issue is whether the inventor Edwards, in the specification of the '932 patent, and his patent attorney during prosecution, told the world that the disclosed device was capable of providing peak power at all speeds of rotation in a continuously variable manner, and not whether one of ordinary skill would believe that the disclosed structures were capable of providing peak power at all speeds of rotation. (SBr at 76.) It is further argued that anyone, including those of ordinary skill in the art, would know that each claim of the '932 patent requires that peak power be available over the entire range of speeds of the continuously variable transmission device. (SBr at 77.) In support it is argued that the '932 patent is titled "Dual-Input Infinite-Speed Integral Motor and Transmission Device"; that the specification of the '932 patent defines an "infinite-speed transmission device" as "[a] transmission device making possible such properties is [sic] known in the art as an infinite speed device" citing CX-1, col. 1, lns. 23-25, that numerous passages in the specification refer to the term "infinite speed device;" and that during prosecution, the application distinguished cited art by arguing that the patented device was a "true continuously variable infinite-speed device" and that the cited art was not. (See SBr at 77.) It is further argued that complainant admits that the '932 patent does not describe a device that is a "true continuously variable infinite-speed device" as that term is described in the specification of the '932 patent. (SBr at 78.) Thus the staff argued that claim 1 and claim 7 of the '932 patent are invalid for failure to satisfy the written description requirement of 35 U.S.C. §

112, ¶ 1. (SBr at 78.)[39]

The staff also argued that the specification of the '932 patent does not disclose any structure that could enable an electric motor to operate at peak power over all speeds. (SBr at 78.) Thus, the staff argued, the specification does not enable one of ordinary skill in the art to practice the invention and hence that claims 1 and 7 of the '932 patent are invalid due to lack of enablement under 35 U.S.C. § 112, ¶ 1.[40] (SBr at 80.)

Complainant argued that there is no evidence, let alone clear and convincing evidence, that one of ordinary skill in the art could practice the claimed invention without undue experimentation; and that, accordingly, any invalidity arguments based on a "failure to provide an enabling written description" must fail. (CBr at 78.) It is further argued that there is no evidence to suggest that the patent fails to describe the subject matter actually claimed, and thus, respondents' assertions that the '932patent lacks an adequate written description and an enabling disclosure must also fail. (CBr at 79-80.) Complainant further argued that "peak power is not a claim limitation" because said limitation is not recited in the claims of the '932 patent, and is actually contrary to the teachings therein the '932 patent. (CBr at 79.) It is also argued that respondents' argument is entirely circular, as respondents argued that the claims be construed to include a "peak power" limitation that is not in the claims, and then argued that the '932 patent does not disclose a system that can produce peak power at any desired output speed, as required

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[39] The alleged unfair act only relates to alleged infringement of claim 7 of the '932 patent. Hence the administrative law judge is only treating claim 7 in this section.

[40] While the staff did not articulate which claims were invalid due to lack of enablement, based on the staff's arguments with respect to lack of written description (see SBr at 75-78), the administrative law judge assumes that the staff's position is that claims 1 and 7 of the '932 patent are invalid due to lack of enablement under 35 U.S.C. § 112, ¶ 1.

by claim 7. Complainant also argued that "claims should be construed to uphold the validity of the claims" and therefore, should not include the "peak power" requirement. (CRBr at 59.) With respect to the enablement requirement, complainant relied on its arguments made with respect to the written description requirement.

35 U.S.C. § 112, ¶ 1, reads:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person of ordinary skill in the art to which it pertains, or with which it is most nearly connected, to make and use the same, ...[41]

Compliance with the written description aspect of 35 U.S.C. § 112, ¶ 1 is a question of fact and must be assessed on a case-by-case basis. See Utter v. Hiraga, 845 F.2d 993, 998 (Fed. Cir. 1988), Vas-Cath, 935 F.2d at 1561. Thus, the fact finder must determine if one skilled in the art, reading the specification, would immediately describe the limitation at issue.

To constitute an enabling disclosure, "the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" In re Wright, 999 F.2d 1557, 1561, (Fed. Cir. 1993). In Harris Corp. v. IXYS Corp. 114 F.3d 1149, 1156 (Fed. Cir. 1997) in issue was the patentability of independent claim 1 of a '073 patent which claim recited an IGBT-like structure. The Court found that the specification of the '073 patent recognized that latching behavior is present in four-layer semiconductor devices and that the claimed invention is a four-layer device; that while said specification stated that the latching problem can be solved by manipulating "the conductivities

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[41] 35 U.S.C. § 112, first paragraph, requires a "written description of the invention" which the Federal Circuit stated in Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (Vas-Cath) is separate and distinct from the enablement of said first paragraph.

and geometries of the four semiconductor regions . . . so as not to form a . . . thyristor," neither that passage nor anything else in the specification, set forth how the "conductivities and geometries of the four semiconductor regions" can be manipulated so that the claimed device will not exhibit thyristor action. Thus because the applicants' disclosure did not teach a person having ordinary skill in the art how to make an IGBT that acts as a transistor "at all times," the Court concluded that the most that could be credited to the applicants was having predicted, rather than invented, such a device. Hence the Court concluded that the district court erred in granting summary judgment in the patentees' favor on the issue of enablement.

As found supra, the administrative law judge has interpreted " wherein the rotational speed of said output is continuously variable" as:

> the rotational speed of the output of the mechanical power transmission unit can be varied such that any desired rotational speed, from a negative maximum value to a positive maximum rotational value, can be attained at peak power and with no intervening gear reduction to the component being driven.

(emphasis added; see Section VII 2, supra.) In other words, the administrative law judge has found that a person skilled in the art would conclude that the combination motor and transmission device of the '932 patent must be capable of providing peak power at any desired rotational speed of the output of the mechanical power transmission unit, from a negative maximum value to a positive maximum value, with no intervening gear reduction to the component being driven. In support he found that the specification of the '932 patent has numerous portions where it links the requirement of peak power output to continuously variable rotational speed. In addition, the administrative law judge found that the prosecution history of the '932 patent defined "continuously variable" as synonymous with "truly infinite speed

transmission," which the specification of the '932 patent defined as "an infinite speed combination motor and transmission device, namely which can deliver peak power output with a continuously variable speed of rotation over a very large range of the rotational speed of the output." Hence, to the extent that the specification contains a written description that discloses that peak power in the claimed combination motor and transmission device is required, he finds the specification adequate and claim 7 not invalid for lack of a written description.

However, the administrative law judge finds no portion of the specification that describes how the combination motor and transmission device enables peak power at any desired rotational speed of the output of the mechanical power transmission unit, from a negative maximum value to a positive maximum value, with no intervening gear reduction to the component being driven. Thus the administrative law judge finds that it is undisputed that respondents' expert Caulfield testified that the specification of the '932 patent did not describe how to achieve peak power at any speed; that while the patentee Edwards, stated in the specification of the '932 patent that the claimed combination motor and transmission device could "achieve peak power at every speed" the patentee did not disclose how to "achieve peak power at any speed;" and that Caulfield was not sure that the patentee was in possession of how to achieve peak power at every speed. (RFF-7.88, -7.89 (undisputed).) Morever, it is undisputed that complainant's expert Davis testified as follows:

> Q. Dr. Davis, isn't it correct that if one uses a cone-like structure for the transmission device, it is possible to achieve peak power of whatever power source you are using over the full range of continuously variable speed of rotation instead of gears?
>
> THE WITNESS: Again, I think you are talking about a

> particular type of CVT transmission. And, again, that transmission would provide -- and, again, it depends on more than just the transmission. The input source has some bearing on this as well.
>
> But it would provide the flexibility to allow the input source to operate at a speed at which it could provide a peak power output over a large range of speeds of the output, but not all speeds, certainly not.

(RFF-7.90 undisputed (emphasis added).)[42]

In view of the teaching of the specification and the prosecution history that the claimed combination motor and transmission device must be capable of providing peak power at any desired rotational speed and the undisputed testimony of respondents' expert and complainant's expert, the administrative law judge finds that respondents have established, by clear and convincing evidence, that claim 7 of the '932 patent is invalid for lack of an enabling disclosure. See Harris Corp., supra

C. 35 U.S.C. § 112 ¶ 2 (Indefiniteness)

Respondents argued that under Solomon's vague and overly broad constructions of "compact structure" and "closely adjacent," claim 7 would be indefinite; that the claims of a patent must particularly point out and distinctly claim the subject matter that the inventor regards as the invention; that this "definiteness" requirement is met if the claims are sufficiently clear to put a competitor on notice as to what is covered by the claims; and that if the claims are "insolubly ambiguous," they are indefinite and therefore invalid. (RBr at 134-5.)

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[42] As for complainant's argument that claim 7 of the '932 patent should be construed to uphold its validity, see. Section VII.A.2, supra.

Respondents further argued that Solomon has proposed that "compact structure" is a "structure having units closely united or packed together"; that that proposed definition is ambiguous and non-informative as to what inventor Edwards regarded as his invention; that as respondents' expert Caulfield testified, the terms "closely united" and "packed together" do not have any particular meaning in the art; that instead, they are purely relative terms that can mean different things to different people in different contexts; and that for that reason, Solomon's overly broad construction of "compact structure" would render claim 7 indefinite. (RBr at 135.)

Respondents also argued that Solomon has proposed that "located closely adjacent each other" means that "[t]he integral combinations are located close to each other"; that that proposed construction is likewise ambiguous and non-informative as to what inventor Edwards regarded as his invention; that as Caulfield testified, the term "closely adjacent" does not have any definite meaning in the art, making it a difficult term to interpret; that it is instead a relative term that could have different meanings depending on the context; and that accordingly, Solomon's proposed construction of "located closely adjacent each other" would render claim 7 indefinite. (Id.)

Complainant argued that the terms "compact structure" and "closely adjacent" are definite; that Toyota does not provide any evidence, let alone clear and convincing evidence, that a person of ordinary skill in the art would not understand that the claimed "compact structure" and "closely adjacent" are achieved by the claimed arrangement; and that thus, Toyota's assertion that claim 7 of the '932 patent is indefinite must fail. (CBr at 81.)

Complainant also argued that Toyota, to support their indefiniteness argument, must establish by clear and convincing evidence that these terms are "insolubly ambiguous"; and that

here, the claims are easily understandable and not indefinite as both experts agree that "a person experienced in the field of the invention would understand the scope of the claim when read in light of the specification." (CRBr at 60.)

Complainant further argued that the term "compact structure" is amenable to construction; that complainant's expert Davis testified that one of ordinary skill in the art in 1990 would understand the term "compact structure"; that more specifically, such a person would understand the "compact structure" to be the result of an assembly where each integral combination involves one of either the motor or transmission elements being at least, to a large extent, within an envelope containing the other; that in fact, Toyota's expert Caulfield had no problem describing the Accused Transaxle as "compact"; and that Caulfield, on cross-examination, acknowledged that the Toyota transaxles contain "compact structures" under the ordinary meaning of the term. (CRBr at 60.)

Complainant further argued that one of ordinary skill in the art in 1990 would understand the term "closely adjacent" to mean that the two integral combinations are located close to each other; that Davis testified that the term "closely adjacent" was a commonly used term in the art in 1990; and that Toyota's expert had no trouble describing the integral combinations found in the Prius as "closely adjacent." (CRBr at 61.)

The staff argued that respondents contend that the following elements of the asserted claims are indefinite: "envelope,"[43] "compact structure" and "located closely adjacent to each other." (SBr at 79.) The staff, citing to its claim construction section, argued that it does not

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[43] The administrative law judge finds nothing in the post-hearing submissions of respondents where respondents argued that the claimed phrase "envelope" is indefinite.

believe that any of the foregoing terms, when properly construed, is indefinite. (Id.)

Section 112, ¶ 2 provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." A patentee's failure to do so renders the patent indefinite and invalid. See Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc., 412 F.3d 1291, 1298 (Fed. Cir. 2005). A determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims. Id., citing Atmel Corp. v. Information Storage Devices, 198 F.3d 1374, 1378 (Fed. Cir. 1999).

A decision on whether a claim is invalid under 35 U.S.C. § 112, requires, inter alia a determination of "whether a person experienced in the field of the invention would understand the scope of the claim when read in light of the specification." Energizer Holdings, Inc. v. International Trade Comm'n, 435 F.3d 1366, 1369 (Fed. Cir. 2006). However, "[c]laim definiteness is analyzed 'not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.'" Id., quoting In re Moore, 439 F.2d 1232, 1235 (C.C.P.A. 1971). Moreover, because a claim is presumed valid, a claim is indefinite only if the "claim is insolubly ambiguous, and no narrowing construction can properly be adopted." Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1375 (Fed. Cir. 2001).

Referring to the claimed phrase "whereby a compact structure is provided for each said integral combination," the administrative law judge has found, supra, based on the claims, the written disclosures of the specification, and the prosecution history, that said claimed phrase states a result, and not an additional limitation, of the claimed "integral combination" limitation.

Hence, the administrative law judge finds that the claimed phrase "whereby a compact structure is provided for each said integral combination" in issue is not indefinite.

Referring to the claimed phrase "said two integral combinations are located closely adjacent each other [sic]," the administrative law judge has interpreted, based on the plain language of the claim, that said claimed phrase means "the two integral combinations are located close to each other;" that the patentee did not deviate from the ordinary meaning of either "closely" or "adjacent," and that one of ordinary skill in the art would understand the claimed phrase to mean that the two integral combinations are located close to each other. Hence, the administrative law judge finds that the claimed phrase "said two integral combinations are located closely adjacent each other [sic]" is not indefinite.

Based on the foregoing, the administrative law judge finds that respondents have not met their burden in establishing, by clear and convincing evidence, that claim 7 of the '932 patent is indefinite.

XI. Enforceability

Respondents argued that the evidence at the hearing demonstrated that the '932 patent is unenforceable. In support, it is argued that in a May 13, 1992 letter to Ron Grable, at Motor Trend Magazine, Jonathan Edwards, the inventor and founder of Town Creek Industries (TCI), and Bob Sheridan, the first president of TCI, reminded Grable of an article he had published in the January 1989 issue of Motor Trend magazine entitled "Sport Car 2010;" that the letter began:

> We have kept a copy of your article "Sports Car 2010 a" from the January 1989 issue of Motor Trend magazine anticipating the day we could write this letter.

(RX-60; RFF-7.98); that the next two sentences of the letter recall a specific passage of that

1989 article and draw a comparison with Edwards's '932 patent:

> You refer on page 91 to pancake motors in the wheel. We have enclosed a copy of our patented system which employs pancake type motors working into a planetary gear set for a true infinite mechanical advantage and direct drive simultaneously.

(RX-60); that a review of page 91 of Ron Grable's January 1989 "Sports Car 2010" article in Motor Trend reveals that it does suggest employing pancake type motors in the vehicle's wheels:

> Companies like Unique Mobility and General Motors are working on modern versions of the "pancake" motor, with extremely high power-to-weight ratios. Motors capable of continuous outputs of 40 hp (and short overloads up to 80 hp) can easily be held in your hand and are on the order of 8 inches in diameter. Eighty horsepower doesn't sound like much, but imagine one motor in each wheel, and it suddenly becomes much more interesting.

(RX-149); that the question naturally arises whether inventor Edwards, a life-long auto mechanic, had knowledge of Grable's January 1989 Motor Trend article when Edwards began working on his idea in January of 1989, or, indeed, at any time prior to issuance of the '932 patent; that when asked point-blank at the hearing, he said no; that while no copies of the article were found in the document productions from Edwards, Sheridan, or Solomon, or in the files of Johnston, who prepared the patent application, a copy of the 1992 letter to Ron Grable Edwards and Sheridan referencing the Motor Trend article did turn up in Johnston's files; that{

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{ }

Respondents argued, as for the materiality of the Motor Trend article, that the Edwards/Sheridan letter itself acknowledges the idea of putting pancake motors in the wheels of automobiles, as discussed in the article, also formed a part of Edwards's patented system; and that Edwards admitted that the article described something that was "very similar" to what Edwards was trying to design.

Complainant argued that Edwards did not commit inequitable conduct during the prosecution of the '932 patent. (CRBr at 64.)

The staff argued that the '932 patent is enforceable, assuming it meets the other statutory requirements. (SBr at 84.)

An otherwise valid patent will be rendered unenforceable for inequitable conduct if a party challenging the patent proves by clear and convincing evidence that the patent applicant, with intent to mislead or deceive the Patent Office, fails to disclose material information or submits materially false information to the Patent Office during prosecution. Digital Control Inc. v. Charles Machine Works, 437 F.3d 1309, 1313 (Fed. Cir. 2006); In re Certain Optical Disk Controller Chips and Chipsets and Products Containing Same, Including DVD Players and PC Optical Storage Devices, ITC Inv. No. 337-TA-506, Order, Final Initial and Recommended Determinations (May 16, 2005). To prevail with a defense of inequitable conduct, however, the alleged infringer "must prove a threshold level of materiality and intent by clear and convincing evidence." Digital Control Inc., 437 F.3d at 1313, citing Molins PLC v. Textron, Inc., 48 F.3d 1172, 1178 (Fed. Cir. 1995).

At the time the '932 patent was before the Examiner, between 1990-91, information was

considered material for purposes of an inequitable conduct determination where there was a substantial likelihood that an Examiner would consider it important in deciding whether to allow the application to issue as a patent. Am. Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1362 (Fed. Cir. 1984) (citing 37 C.F.R. § 1.56(a), third sentence (1983)); In re Optical Disk Controller Chips, ITC Inv. No. 337-TA-506; see MPEP §§ 2001, 2001.05 (5th ed., Rev. 13, Nov. 1989).[44] Moreover, "[t]o be guilty of inequitable conduct, one must have intended to act inequitably." FMC Corp. v. Manitowoc Co., Inc., 835 F.2d 1411, 1415 (Fed. Cir. 1987). A breach of the disclosure duty alone does not suffice to render a patent unenforceable; rather, there must be clear and convincing evidence that the patent applicant deliberately withheld a known material reference. See Digital Control Inc., 437 F.3d at 1318, citing Baxter Int' l, Inc. v. McGaw, Inc., 149 F.3d 1321, 1329 (Fed. Cir. 1998); In re Optical Disk Controller Chips, ITC Inv. No. 337-TA-506. Also, "gross negligence does not alone suffice to establish intent [to deceive]." CFMT, Inc. v. Yieldup Int'l Corp., 349 F.3d 1333, 1342 (Fed. Cir. 2003), citing Kingsdown Med. Consultants, Ltd. v. Hollister Inc., 863 F.2d 867, 876 (Fed. Cir. 1988); cf. M. Eagles Tool Warehouse v. Fisher Tooling Company, Inc., 439 F.3d 1335, 1341 (Fed. Cir. 2006) (failure to disclose prior art, where only evidence of intent is a lack of a good faith explanation for nondisclosure, cannot constitute clear and convincing evidence of culpable intent). In addition, the Federal Circuit has warned that inequitable conduct not serve as "a magic incantation to be asserted against every patentee." FMC Corp., 835 F.2d at 1415.

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[44] Patent Office Rule 56 provides that to be material for patentability, the information cannot be "cumulative to information already of record or being made of record in the [patent] application ...." 37 C.F.R. § 1.56(b) (2005).

There is evidence that the May 13, 1992 letter to Grable (RX-60) indicates that Sheridan is the sole author of said letter. {

} Thus, Edwards testified:

Q. Okay. Referring now back to the letter to Mr. Grable, did you draft this letter?

A. No.

Q. Who drafted it?

A. It was Bob Sheridan.

* * *

Q. Did you review the letter before it was sent?

A. No. My signature doesn't appear anywhere on here. I always sign things that I review.

(Edwards, Tr. at 533-34.)

In addition, while Toyota claims that Sheridan testified at deposition that "he recalled drafting the letter with input from Mr. Edwards" (RBr. at 138.) {

}

Assuming arguendo the materiality of the Motor Trend article, Sheridan, who is the

source of information relating to Edwards's purported knowledge of the 1989 Motor Trend article, did not appear at the hearing to reiterate and/or expand upon his deposition testimony. In contrast, Edwards testified that he did not recall reading the article; and that he does not read Motor Trend. Moreover, the letter allegedly sent to Motor Trend does not bear a letterhead. In addition, the administrative law judge finds no evidence that Edwards deliberately withheld the Motor Trend article from the Patent Office during the prosecution of the '932 patent, even assuming arguendo Edwards had knowledge of the Motor Trend article during the prosecution of the '932 patent. Hence, the administrative law judge finds that respondents have not established, by clear and convincing evidence, that the '932 patent is unenforceable.

XII. Remedy

A. Exclusion Order

Solomon requests that the administrative law judge recommend a limited exclusion order preventing the importation of vehicles containing the infringing combination motor and transmission systems manufactured by or on behalf of Toyota. It is argued that this limited exclusion order should also ban the importation of vehicles manufactured by Toyota's affiliated companies, subsidiaries, contractors, licensees, joint venturers or other related entities{

} It is also argued that the accused devices are hybrid transaxles contained in the Toyota Prius{ }Toyota Highlander HV { }Toyota Camry HV{ }and Lexus RX 400h { } citing RX-138C at Ex. A, and thus to provide full relief to

Solomon's domestic industry that the scope of any limited exclusion order should necessarily extend to all infringing transaxles as well as those Toyota vehicles incorporating said transmissions without regard to specific models. (CRBr at 79.) Solomon does not object to limiting any exclusion order so that it does not reach third-party customers who have already purchased Toyota hybrid vehicles with the accused devices installed. Solomon also does not object to exempting from an exclusion order any transaxles, or components thereof, to be used for repair or replacement of transaxles installed in vehicles purchased by third-party consumers prior to the issuance of any exclusion order. (CRBr at 81.)

As to downstream products Solomon argued that a downstream product analysis under the long-standing EPROMs factors is unnecessary as nearly all of Toyota's infringing imports to date consist of hybrid vehicles, such as the Toyota Prius, not stand-alone combination motor and transmission systems. (CBr at 113-14.) However it later argued that "if a downstream products analysis is deemed necessary," the EPROMs factors favor a limited exclusion order extending to the vehicles containing the infringing combination motor and transmission systems manufactured by or on behalf of Toyota. (RBr at 113-17.)

Respondents argued that Solomon has only accused the following five Toyota transaxles types of infringing the '932 patent: { } which was incorporated into the first generation Prius vehicle;{ } which is incorporated into the current generation Prius vehicle;{ } which is incorporated into the Camry HV vehicle; and the { } which is incorporated into the Highlander HV and the Lexus RX400h vehicles. Accordingly it is argued that should the Commission determine that Toyota violates Section 337, any limited exclusion order should be appropriately directed to "Toyota's infringing transaxles"

and "Toyota vehicles containing the infringing transaxles." (RBr at 139; RRBr at 85.)

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} Hence it is argued that any recommendation on remedy specifically make clear that the 380K transaxle was not found to infringe and that remedy against the 380K transaxles is not appropriate. It was also argued that should Solomon present evidence regarding the need or appropriate justification for downstream product relief, any such relief should be limited to Toyota vehicles containing the infringing transaxles. (RBr at 140-42.)

The staff argued that if a violation were to be found, an order should issue directed solely to the exclusion of hybrid subsystems made by or on behalf of one or more of the respondents that may be found to infringe claim 7 of the '932 patent. (SBr at 82.) {

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Under Commission rules 210.36(a) and 210.42(a)(1)(ii), the administrative law judge is to consider evidence and argument on the issues of remedy and issue a recommended determination thereon. Under Section 337(d), 19 U.S.C. § 1337(d), the Commission may issue a limited exclusion order against a respondent that has been determined to be in violation of section 337. Such an order directs the Customs and Border Protection service (CBP) to exclude from entry into the United States articles that are covered by, and thus infringe, the intellectual property rights at issue. Certain Flash Memory Circuits and Products Containing Same, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm'n Op. at 26 (June 1997).

An exclusion order may cover not only articles specifically found to infringe, but also so-called downstream products, i.e., those products that incorporate the infringing articles as components, if the Commission decides that exclusion of downstream products is necessary to give a complainant complete and effective relief. On the other hand, including downstream products has the potential to expand the coverage of the exclusion order, thus increasing the risk of interfering with legitimate commerce. Hence, a balancing of factors may be appropriate. To assist in any balancing, the Commission, in Certain Erasable Programmable Read-Only Memories Inv. No. 337-TA-276, Comm'n Op. at 124-26, 136 U.S.I.T.C., Pub. 2196 (May 1989) (EPROMs), aff'd sub nom Hyundai Electronics Industries Col., Ltd. v. U.S. Intern'l Trade Comm'n, 899 F.2d 1204 (Fed. Cir. 1990) (Hyundai Electronics), identified certain relevant factors for consideration.

Should the Commission determine that there is a violation of Section 337, exclusion of the accused infringing imported transaxles as well as Toyota vehicles containing the infringing transaxles, as agreed to by the parties, is recommended. Moreover the administrative law judge recommends that any exclusion order apply not only to respondents TMC but also to any of its affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or successors or assigns of TMC. See, Limited Exclusion Order which issued on February 16, 2005, in Certain Audio Digital-To-Analog Converters And Products Containing Same Inv. No. 337-TA-499 ("limited exclusion order applies to any of the affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or their successors or assigns, or ...[respondent]").

In addition, it is recommended that any limited exclusion order should not reach third-party customers who have already purchased Toyota hybrid vehicles with the accused transaxles installed and also that the order exempt any transaxles or components thereof to be used for repair or replacement of transaxles installed in vehicles purchased by third-party consumers prior to the issuance of the exclusion order.

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B. Cease And Desist Order

Complainant, as to any cease and desist order, argued that the administrative law judge should recommend that the Commission issues a cease and desist order, directed to respondents Toyota Motor Sales, U.S.A., Inc. (TMS), Toyota Motor Engineering & Manufacturing North America, Inc. (TEMA) and Toyota Motor Manufacturing Kentucky, Inc. (TMMK).

It is argued that respondent TMS, the distributor for Toyota and Lexus vehicles within the continental United States and Alaska, maintains commercially significant inventory in the United States of the imported Toyota Prius, Toyota Highlander HV, Toyota Camry HV and Lexus RX400h vehicles at issue; that distribution pipeline for the accused Toyota and Lexus vehicles begins at one of respondent Toyota Motor Corporation's manufacturing facilities located in

Japan and from there, the vehicles begin their journey to the United States via commercial shipping lines and TMS takes title to these vehicles while the vehicles are still loaded on a vessel, prior to their arrival at a port facility in the United States; that when the vehicles arrive at one of the various port facilities in the United States; that when the vehicles arrive at one of the various port facilities, TMS processes these vehicles, which takes anywhere from one to four days, before the vehicles are ultimately distributed to their final destination, viz. one of 1,200-plus independent Toyota or Lexus dealers or two independent distributors, all of which are located in the United States; that at any given moment, a snapshot of Toyota's distribution pipeline reveals that TMS maintains a significant inventory of the accused vehicles within the United States; that for example, on August 31, 2006, respondent TMS had{ } Prius vehicles, { } Camry HV vehicles,{ } Highlander HV vehicles and{ } Lexus RX400h vehicles "in process," meaning that the vehicles were under TMS's control at a port facility or that TMS had shipped them from a port facility to a Toyota or Lexus dealer and each of those vehicles was in TMS's custody while located in the United States at some point in its journey from a Toyota plant and Japan to an independent Toyota or Lexus dealer, that given the mechanics of TMS's distribution process, the same holds true for the{ } Prius, Camry HV, Highlander HV and Lexus RX400h vehicles located at Toyota and Lexus dealers on August 31, 2006 and each of those vehicles constituted a part of TMS's inventory of vehicles located in the United States prior to arriving at a dealership; that in addition, TMS maintains significant inventory of the imported, stand-alone transaxles at its warehouse facilities; that TEMA and TMMK maintain commercially significant inventory of at least the Toyota Camry HV vehicles manufactured at its facility located in Georgetown, Kentucky; and that TMS purchase these Camry HV vehicles from

TEMA, and, from the Kentucky facility, these vehicles enter the TMS distribution pipeline for eventual arrival at independent Toyota dealers. (CBr at 117-19.)

Respondents argued that any cease and desist order is not justified; and that while a cease and desist order is appropriate where the evidence demonstrates that a respondent maintains commercially significant inventory in the United States, Toyota does not maintain inventory of vehicles containing the accused transaxles. It is argued that the inventory of all of Toyota's vehicles (the Prius, Camry HV, Highlander HV, and Lexus RX400h) are maintained by independent dealers; that when a vehicle is imported into the United States, it is immediately put into a transit pipeline for shipment to an independent dealer; that Toyota's pipeline system is designed such that vehicles do not remain in Toyota's possession, but get to a dealer for immediate sale; that Toyota's primary concern is getting the vehicle to the third party dealers as fast as possible, so that said dealer can sell the vehicle as fast as possible; and that Toyota specifically allocate vehicles to dealers as soon as the vehicle is manufactured and thus Toyota's system is the opposite of the sort of significant inventory that the Commission's cease and desist orders were designed to prevent. (RBr at 142-142.)

The staff argued that the evidence will demonstrate that the domestic respondents maintain an inventory of the accused vehicles and hybrid subassemblies in the United States. Hence it argued that cease and desist orders "might" be appropriate if Solomon prevails. (SBr at 82.)

Under Section 337(f)(1), the Commission may issue a cease and desist order in addition to, or instead of, an exclusion order. 19 U.S.C. § 1337(f)(1). A factor to consider here is whether a respondent is maintaining a "commercially significant" inventory of infringing

products in the United States, the sale of which could undercut the effect of any exclusion order. See Certain Abrasive Products Made Using a Process for Powder Preforms, and Products Containing Same, Inv. No. 337-TA-449, USITC Pub. 3530, Comm'n Op. at 7 (August 2002). Complainant bears the burden of proving that a respondent has a commercially significant inventory of the accused products in the United States. Certain Integrated Repeaters, Switches, Transceivers, and Products Containing Same, Inv. No. 337-TA-435, USITC Publication No. 3547, Comm'n Op. at 27 (October 2002).

It is undisputed that as of May 2, 2006, TMS had imported approximately{ } Prius vehicles into the United States, as compared to{ } Prius transaxle assemblies. (CFF 920 (undisputed)); that from 2003 to January 2006, TMS imported approximately{ }Highlander HV vehicles into the United States (CFF 921 (undisputed)); that from 2004 to January 2006, TMS imported{ } Lexus RX400h vehicles into the United States (CFF 922 (undisputed)); that as of May 2, 2006, TMS had imported more than{ } Highlander HV and Lexus RX400h vehicles as compared to{ } transaxle assemblies for the Highlander HV and Lexus RX400h vehicles (CFF923 (undisputed)); that as of June 1, 2006, TMS had imported at least{ } Camry HV vehicles into the United States as compared to at least{ } Camry HV transaxle assemblies for the same time period (CFF 924 (undisputed)); that as of June 1, 2006, Toyota projected the following approximate production volumes of the Camry HV vehicle at Toyota Motor Manufacturing Kentucky, Inc.:{ } vehicles in October 2006;{ }vehicles in November 2006; { } vehicles in December 2006;{ } vehicles in January 2007;{ } vehicles in February 2007;{ } vehicles in March 2007; and{ } vehicles in April 2007 (CFF 925 (undisputed)); that CX-404 is a press release entitled "Toyota Reports May Sales," which includes TMS's report

of vehicle sales during May 2006 (CFF 926 (undisputed)); and that for the month of May 2006, TMS reported sales of 3,032 Camry Hybrid units, 8,103 units of the Prius, 3,755 units of the Highlander Hybrid and 2,006 units of the Lexus RX400h (CFF 927; (undisputed).){

}

Based on the foregoing, the administrative law judge does not recommend any cease and

desist order.

XIII. Bond

Solomon requested that the administrative law judge recommend a bond of 100 percent of the entered value of vehicles containing Toyota's infringing combination motor and transmission systems, and that the bond amount also apply to imports of stand-alone combination motor and transmission systems. It is argued that Solomon sells its ST58 Electric Wheel power drive systems for marine applications, while Toyota sells vehicles incorporating the infringing combination electric motor and transmission systems; that using the price differential method to calculate the bond amount is impractical considering that Solomon and Toyota utilize the patented technology for completely different applications; that Toyota presently enjoys the competitive advantage of selling vehicles that incorporate the infringing combination electric motor and transmission systems, without paying any license fees or royalties on vehicle sales to Solomon; and that given the impracticality of performing a price comparison or applying a reasonable royalty rate, a bond set at 100 percent of the entered value for vehicles will sufficiently offset the competitive advantage resulting from Toyota's unfair acts. It is further argued that the record demonstrates that Toyota imports stand-alone combination motor and transmission systems; and that it is impractical to perform a price comparison between Solomon's ST58 Electric Wheel power drive system for marine applications and Toyota's replacement infringing systems; and that there is no factual basis to support a reasonable royalty calculation. (CBr at 120-21.)

Respondents argued that because Solomon accuses Toyota's transaxles of infringing, a bond of 100% of the value of an imported vehicle vastly over compensates Solomon for any

alleged loss from the importation of a transaxle; and that Solomon has not put any evidence in the record showing what competitive advantage Solomon has lost through the importation of Toyota's transaxles but rather attempts to use its evidentiary failures as a springboard to request a 100% bond. It is argued that the evidence demonstrates that a reasonable royalty rate is $30 per accused transaxle or vehicle containing the accused transaxle;{

} Hence Toyota argued that the appropriate bond is $30 per accused transaxle or vehicle containing the accused transaxle. (RBr at 144-45.)

The staff argued that the record contains evidence relating to royalties;[45]{

} Hence the staff proposed that the administrative law judge recommend a bond of $30.00 per infringing hybrid vehicle or infringing hybrid system sought to be imported during the Presidential review period. (SBr at 83-84.)

Pursuant to 19 U.S.C. § 1337(e)(1) and (j)(3) if an exclusion order issues, the Commission must determine the amount of the bond that respondents must post if they wish to continue entry of the accused articles from the date of the Commission's final order of violation of section 337 until expiration of the 60-day Presidential review period. In determining the

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[45] The staff noted that it believes that the appropriate bond in this investigation should be based on a reasonable royalty basis because complainant does not make, and has not made, any products that practice the invention; that to the extent that complainant's ST58 device practices any claim of the '932 patent, the evidence does not demonstrate that ST58 could be used in place of the accused hybrid systems; and that therefore, price comparisons, even if comparative prices were available, would not be appropriate.

amount of respondents' bond, the Commission should take into account the amount that would offset any competitive advantage resulting from the unfair acts of respondents. See 19 C.F.R. § 210.50(a)(3); Certain Dynamic Random Access Memories, Components Thereof and Products Containing Same, Inv. No. 337-TA-242, Comm'n Op. (Sept. 21, 1987).

Solomon only makes products for the marine industry and Solomon does not make any products for the automotive industry.[46] Hence, Solomon does not manufacture any product that competes with Toyota's accused transaxles. {

} Hence, should a violation be found by the Commission, the administrative law judge recommends that the appropriate bond, during the Presidential review period, be $30.00 per imported accused transaxle or vehicle containing the accused transaxle.

XIV. Additional Findings Of Fact

A. Parties

1. Complainant Solomon Technologies, Inc. (Solomon) of Tarpon Springs, Florida, is a Delaware corporation and is the owner, by assignment, of the '932 patent at issue. (Complaint, ¶¶ 2.1, 2.2, p. 3; ¶¶ 5.1 - 5.4, pp. 6-7.) Solomon has a manufacturing facility in Tarpon Springs, Florida. (Complaint, ¶ 2.4, pp. 3-4; ¶ 9.4, p. 15.) (SFF 1 (undisputed).)

2. After the '932 patent issued, in early 1992, inventor Jonathan R. Edwards

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[46] CX-107, Solomon's 2005 SEC Form 10KSB at SOL 044883 under the heading "our markets;" RX-129C, Solomon's Supplemental Response to Interrogatory No. 6.

established a business called Town Creek Industries in order to further develop the technology of the '932 patent and produce a prototype. (Edwards, Tr. at 524, 622.)

3. In addition to Edwards, an individual named Robert Sheridan was a founder of Town Creek Industries. Sheridan served as vice president. (Edwards, Tr. at 524, 622.)

4. Solomon and Town Creek Industries merged. The Merger agreement states, under the title "Intellectual Property" that "[t]he consummation of the transactions contemplated hereby do not and shall not result in the loss or impairment of Town Creek's right to own or use any of the Intellectual Property." (CX-15 at SOL017901.)

5. Respondent Toyota Motor Corporation (TMC) of Toyota City, Japan is a corporation organized under the laws of Japan. TMC is allegedly engaged in the design, manufacture, and exportation of motor vehicles to the United States, including models that allegedly contain infringing combination motor and transmission systems. (Complaint, ¶ 3.1, p. 4; Exhibit 3.)

6. Respondent TMC has sold for importation the accused combination electric motor and transmission systems used in the Toyota Hybrid System and Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same,{

} as incorporated into the Toyota Prius, Toyota Highlander HV, Lexus RX 400h and Toyota Camry HV vehicles. (CX-95C at 4.)

7. Respondent Toyota Motor Engineering & Manufacturing North America, Inc. (TEMA) and respondent Toyota Motor Manufacturing Kentucky, Inc. (TMMK) are successors in interest of the former Toyota Motor Manufacturing North America, Inc. See Order No. 7, which issued on May 26, 2006.

8. Toyota Motor Sales, U.S.A., Inc. (TMS) has imported into the United States the accused combination electric motor and transmission systems used in the Toyota Hybrid System and Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same, { } as incorporated into the Toyota Prius, Toyota Highlander HV, Lexus RX 400h and Toyota Camry HV vehicles. (CX-95C at 6.)

9. TMS has sold within the United States after importation the accused combination electric motor and transmission systems used in the Toyota Hybrid System and Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same,{ } as incorporated into the Toyota Prius, Toyota Highlander HV, Lexus RX 400h and Toyota Camry HV vehicles. (CX-95C at 6.)

10. TEMA intends to sell within the United States after importation the accused combination electric motor and transmission systems used in the Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same,{ } as incorporated into the Toyota Camry HV vehicle. (CX-95C at 7.)

11. TMMK has imported into the United States the accused combination electric motor and transmission systems used in the Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same,{ } as incorporated into the Toyota Camry HV vehicle. (CX-95C at 7.)

12. TMMK intends to sell within the United States after importation the accused combination electric motor and transmission systems used in the Toyota Hybrid System II featuring Hybrid Synergy Drive and vehicles containing the same,{ }

{ } as incorporated into the Toyota Camry HV vehicle. (CX-95C at 8.)

B. Witnesses

13. Peter DeVecchis testified on behalf of Solomon. DeVecchis is currently Solomon's president, having assumed that post in May 2004. (DeVecchis, Tr. at 152, 156, 161.) He was initially hired by Solomon as a contractor in March 2004. (DeVecchis, Tr. at 154, 160.)

14. {

}

15. {

}

16. Andrew Christian testified on behalf of Solomon. Christian has a degree in industrial engineering, concentrating in operations engineering. Operations engineering is the study of the processes of both of people and manufacturing, research and development and all goes into manufacturing and plant operations. (Christian, Tr. at 324-25.)

17. Christian was initially hired by Solomon as a contractor in July 2004 and later as a full-time employee on August 3, 2004. (Christian, Tr. at 326-27.)

18. {

}

19. DeGroot is the president and treasurer of Homewood Products Corporation (Homewood) of Pittsburgh, Pennsylvania. (CX-124; DeGroot, Tr. at 442.) {

}

20. In 1995, DeGroot{ }

{ }

21. Homewood is a spin off from Westinghouse Electric. Homewood's primary business is the production of replacement parts for vintage equipment. (DeGroot, Tr. at 422.)

22. Homewood's supply of replacement parts for vintage Westinghouse equipment "range from push buttons and control devices to power circuit breakers to a full range of motors, integral horsepower, 1 horsepower to several-thousand horsepower, AC motors and DC motors and generators." (DeGroot, Tr. at 422.)

23. {

}

24. {

}

25. {

}

26. Inventor Edwards appeared as a witness for Solomon. (Edwards, Tr. at 514.)

27. Solomon has retained Edwards as a consultant since April 2005. (Edwards, Tr. at 640.) Edwards' work as a consultant has included providing assistance to Solomon's counsel in preparing responses to interrogatories and by providing deposition testimony on behalf of the corporation. In addition, Edwards has performed work related to the transaxle project. (Id. at 640-41.)

28. Edwards is one of the founders of Solomon and its predecessor-in-interest and

{ }

29. It is undisputed that with the exception of its expert witnesses, each of Solomon's witnesses has a financial interest in the outcome of this investigation since each witness owns stock in Solomon. (SFF 23 (undisputed).)

30. Gregory W. Davis was called as Solomon's technical expert. Davis is a professor of Mechanical Engineering at Kettering University. (CX-260 at 1.)

31. Davis was qualified as an expert in automotive engineering, including the design and operation of transmission systems and hybrid vehicles. (Davis, Tr. at 796.)

32. C. Douglass Locke was called as Solomon's technical expert. Locke was qualified an expert in software development and analysis for embedded software systems. (Locke, Tr. at 1081-82.)

33. Koichiro Muta of Toyota was called as an adverse witness by Solomon. (SFF27 (undisputed).)

34. Masahiro Kojima of Toyota was called as an adverse witness by Solomon. Kojima is the manager of the development group in the number 3 power train development division of Toyota Japan. (Kojima, Tr. at 755.) Kojima has personal knowledge of the transaxles used in Toyota's hybrid vehicles. (Id.)

35. Edward Caulfield was called as Toyota's technical expert. Caulfield is the president and chief technical officer of Packer Engineering. Packer Engineering is in the consulting business, providing consulting services to the United States Government and to industry, as well as to parties engaged in litigation. (Caulfield, Tr. at 1577.)

36. Caulfield was qualified as an expert in mechanical and automotive engineering, including transmission systems. (Caulfield, Tr. at 1591-92.)

C. Person Of Ordinary Skill In The Art

37. A person of ordinary skill in the art would hold an undergraduate degree, probably in mechanical engineering, and have about two to five years of experience with vehicles and drive trains of vehicles, or have equivalent practical experience. (Davis, Tr. at 797.)

38. Caulfield agrees with Davis's characterization of one of ordinary skill but adds such a person would also have some experience in electrical motors. (SFF 33 (undisputed).)

CONCLUSIONS OF LAW

1. The Commission has in rem jurisdiction and in personam jurisdiction.

2. There has been an importation of certain combination motor and transmission systems and devices used therein and products containing same which are the subject of the alleged unfair trade allegations.

3. An industry does not exist in the United States, as required by subsection (a)(2) of section 337, that exploits the '932 patent in issue because complainant has not satisfied the technical prong of the domestic industry requirement.

4. Respondents' accused products do not infringe asserted claim 7 of the '932 patent.

5. The asserted claim 7 of the '932 patent is not valid because of a lack of an enabling disclosure.

6. If the '932 patent is found valid, it is enforceable.

7. There is no violation of section 337.

8. Assuming there is an unfair act, the record supports issuance of a limited exclusion order directed to infringing hybrid vehicles or infringing hybrid systems sought to be imported by respondents and imposition of a bond in the amount of $ 30.00 per imported infringing hybrid vehicle or infringing hybrid system during the Presidential review period.

ORDER

Based on the foregoing, and the record as a whole, it is the administrative law judge's Final Initial Determination that there is no violation of section 337 in the importation into the United States, sale for importation, and the sale within the United States after importation of certain combination motor and transmission systems and devices used therein and products containing same. It is also the administrative law judge's recommendation, if the Commission finds an unfair act, that a limited exclusion order should issue directed to infringing hybrid vehicles or infringing hybrid systems sought to be imported by respondents. The administrative law judge further recommends that a bond of $30.00 per infringing hybrid vehicle or infringing hybrid system sought to be imported by respondents be imposed during the Presidential review period.

The administrative law judge hereby CERTIFIES to the Commission his Final Initial and Recommended Determinations together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary and the transcript of the pre-hearing conference, and the hearing, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

Further it is ORDERED that:

1. In accordance with Commission rule 210.39, all material heretofore marked in camera because of business, financial and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission rule 201.6(a), is to be given in camera treatment continuing after the date this investigation is terminated.

2. Counsel for the parties shall have in the hands of the administrative law judge

those portions of the final initial and recommended determinations which contain bracketed confidential business information to be deleted from any public version of said determinations, no later than February 28, 2007. Any such bracketed version shall not be served via facsimile on the administrative law judge. If no such bracketed version is received from a party, it will mean that the party has no objection to removing the confidential status, in its entirety, from these initial and recommended determinations.

3. The initial determination portion of the Final Initial and Recommended Determinations, issued pursuant to Commission rule 210.42(h)(2), shall become the determination of the Commission forty-five (45) days after the service thereof, unless the Commission, within that period shall have ordered its review or certain issues therein or by order has changed the effective date of the initial determination portion. The recommended determination portion, issued pursuant to Commission rule 210.42(a)(1)(ii), will be considered by the Commission in reaching a determination on remedy and bonding pursuant to Commission rule 210.50(a).

Paul J. Luckern
Administrative Law Judge

Issued: February 13, 2007

CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING SAME

Investigation No. 337-TA-561

CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **Public Version Final Initial and Recommended Determinations** was served by hand upon Commission Investigative Attorney Juan Cockburn, Esq. and upon the following parties via first class mail, and air mail where necessary, on **April 10, 2007.**

Marilyn R. Abbott

Marilyn R. Abbott, Secretary
U.S. International Trade Commission
500 E Street, SW - Room 112
Washington, DC 20436

For Complainant Solomon Technologies, Inc.:

Anthony J. Mirabito, Esq.
Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, P.C.
One Financial Center
Boston, MA 02111

Louis S. Mastriani, Esq.
Maureen F. Browne, Esq.
Adduci, Mastriani & Schaumberg LLP
1200 17th Street, NW
Washington, DC 20036

CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING SAME

Investigation No. 337-TA-561

Certificate of Service page 2

For Respondents: Toyota Motor Corporation, Toyota Motor Engineering & Manufacturing North America, Inc. and Toyota Motor Manufacturing Kentucky, Inc., and Toyota Motor Sales, U.S.A., Inc.:

Thomas W. Winland, Esq.
Christine E. Lehman, Esq.
Paul C. Goulet, Esq.
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
901 New York Avenue, NW
Washington, DC 20001-4413

CERTAIN COMBINATION MOTOR AND TRANSMISSION SYSTEMS AND DEVICES USED THEREIN, AND PRODUCTS CONTAINING SAME

Investigation No. 337-TA-561

PUBLIC MAILING LIST

Sherry Robinson
LEXIS-NEXIS
8891 Gander Creek Drive
Miamisburg, OH 45342

Ronnita Green
Thomson West
1100 13th Street, NW
Suite 200
Washington, DC 20005

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