

In the Matter of

**CERTAIN SOFTBALLS AND
POLYURETHANE CORES
THEREFOR**

Investigation No. 337-TA-190

**Unreviewed Initial
Determination**



USITC PUBLICATION 1751

SEPTEMBER 1985

UNITED STATES INTERNATIONAL TRADE COMMISSION

COMMISSIONERS

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This is an initial determination issued by a Commission administrative law judge that the Commission determined to review in part. That part of the initial determination the Commission did not reviewed has, therefore, become the Commission determination in this investigation on the issue of violation of section 337. See section 210.53(h) of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.53(h)) and the notice published in the Federal Register on April 24, 1985 (50 Fed. Reg. 16,171).

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PROCEDURAL HISTORY

On April 3, 1984, Eannom Manufacturing Co., Inc., Tullahoma, Tennessee, filed a complaint and a motion for temporary relief pursuant to Section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337). The complaint alleges unfair methods of competition and unfair acts in the importation of certain softballs and polyurethane cores therefor into the United States, or in their sale, by reason of alleged (1) direct infringement of claims 3, 4, 5, and 10 of U.S. Letters Patent 3,976,295 (the '295 patent), (2) contributory infringement of said claims of the '295 patent, (3) infringement of federal trademark Registration No. 1,028,767, (4) false deceptive advertising in violation of 15 U.S.C. § 1125(a) and state law, (5) product disparagement in violation of 15 U.S.C. § 1125(a) and state law, and (6) false designation of origin, false description of goods, or false representations on goods or containers of goods in violation of 15 U.S.C. § 1125(a). The complaint further alleges that the effect or tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States.

On May 1, 1984, the Commission ordered pursuant to 19 U.S.C. § 1337(b) that an investigation be instituted to determine whether there is a violation

(3) infringement of the '767 trademark, (4) false and deceptive advertising, and (5) false representation, the effect or tendency of which is to destroy or substantially injure an efficiently and economically operated domestic industry. Notice of Investigation, 49 Fed. Reg. 20,076 (May 11, 1984). The Commission, pursuant to 19 C.F.R. § 210.24(e), also forwarded to the Office of Administrative Law Judges complainant's motion for temporary relief under 19 U.S.C. § 1337(e) and (f) for an initial determination pursuant to 19 C.F.R. § 210.53(b). Id. The Notice of Investigation and Complaint were served on parties and interested government agencies either by first-class mail or air mail on May 8, 1984. The Notice of Investigation was also published in the Federal Register on May 11, 1984. Id.

The following persons were named as respondents in this investigation:

Complete Merchants Corporation
9th Floor
No. 319 Chung-Hsiao East Road, Sec. 4
Taipei City, Taiwan

Success Chemical Co., Ltd.
Room 403
San Chin Building, 31-1, Sec. 2
Shin Sheng North Road
Taipei City, Taiwan

Regent Sports Co.
Hauppauge, New York 11787

Diamond Sports Co.
P. O. Box 637
10602 Humbolt Street
Los Angeles, California 90720

Keith Kleppe & Associates
23272 Vista Grande Drive, Unit B
Laguna Hills, California 92653

Team West
P. O. Box 62
Redmont, Washington 98052

George Tyler Enterprises
2950 South Jamaca Court, Suite 100
Aurora, Colorado 80014

B.O. Mickelson & Associates
4111 Trail Ridge Circle
Ames, Iowa 50010

Dan Spika & Associates
1121 Dallas Drive, Suite 5
Denton, Texas 76201

Mets-Rupp, Inc.
4901-05 Distribution Drive
Tampa, Florida 33605

Dave Middleton & Associates
P. O. Box 473
Willow Grove, Pennsylvania 19090

Paul Shaughnesy & Associates
36 Grove Circle
Braintree, Massachusetts 02184

By Initial Determination of the administrative law judge on July 27, 1984,
the Notice of Investigation was amended to include the following person as a
respondent in this investigation:

Tusa, Inc.
Kaohsiung, Taiwan
Republic of China

Order No. 8. This Initial Determination inadvertently was not served on
parties until December 28, 1984. Memorandum, Office of the Secretary
(Dec. 28, 1984).

Harold Brandt, Esq., Unfair Import Investigations Division, U.S. International Trade Commission, was designated the Commission investigative attorney. As of August 17, 1984, Robert D. Litowitz, Esq., replaced Harold Brandt as the staff attorney. 49 Fed. Reg. 34,315 (Aug. 29, 1984). Pursuant to Rule 210.4(b), the Commission investigative attorney is a separate and independent party to this proceeding.

Chief Administrative Law Judge Donald K. Duvall on May 11, 1984, designated himself to preside over this investigation. Order No. 1, 49 Fed. Reg. 21,809 (May 23, 1984). For reasons of administrative necessity, Judge Duvall on July 23, 1984, designated Administrative Law Judge Sidney Harris to preside over this investigation. Order No. 6, 49 Fed. Reg. 30,811 (Aug. 1, 1984).

On May 31, 1984, respondent Diamond Sports filed a motion to terminate this investigation pursuant to Rule 210.51(a) or, alternatively, to dismiss complainant's motion for temporary relief pursuant to Rule 210.24. Motion Nos. 190-2, 190-3. Diamond Sports asserted that this investigation should be terminated because (1) the complaint was not properly filed in accordance with Rule 210.12 and (2) complainant was barred from § 337 relief by the doctrine of unclean hands. The administrative law judge denied respondents' motion for the following reasons: (1) the decision of the Commission to institute a § 337 investigation is conclusive and not within the purview of the administrative law judge; and (2) allegations of bad faith and inequitable conduct bear on the final determination as to whether there is a violation of

§ 337 and, as such, must await the completion of the investigation. Order No. 10 (July 30, 1984).

The Preliminary Conference in the Matter of Certain Softballs and Polyurethane Cores Therefor was held on June 1, 1984. Appearances were noted for the record by complainant Lannom, the Commission investigative attorney, and one respondent, Diamond Sports. Complainant withdrew its motion for a temporary exclusion order (Motion No. 190-1) and agreed to an expedited hearing on permanent relief set for November 5, 1984. Prelim. Conf. Tr. 30-31, 40; see Order No. 4, at 1 (June 28, 1984).

On July 11, 1984, respondent Diamond Sports filed a motion to terminate this investigation as to respondents Keith Kleppe & Associates, Team West, B.O. Mickelson & Associates, George Tyler Enterprises, Dan Spika & Associates, Mets-Rupp, Paul Shaughnessy & Associates, and Dave Middleton & Associates, collectively known as respondent Diamond Sports' manufacturing representatives. Motion No. 190-11. Diamond Sports asserted that relief against or discovery of these respondents was not necessary or appropriate because they acted only as manufacturing representatives for Diamond Sports. Order No. 11, issued August 8, 1984, denied this motion because respondents, as agents of Diamond Sports, had participated in the sale of the allegedly infringing softballs.

On August 13, 1984, respondent B.O. Mickelson & Associates filed a motion to request leave to make an appearance and respond to the complaint. Motion No. 190-13. B.O. Mickelson asserted that it was under the impression that it

did not need to file an appearance and response in this proceeding since none of the allegations of the complaint were directed at it. Order No. 12, issued August 21, 1984, granted respondent's motion and ordered it to respond immediately to complainant's interrogatories and requests for production of documents.

On October 3, 1984, complainant and respondent Diamond Sports filed a joint motion to terminate this investigation as to Diamond Sports and its manufacturing representatives on the basis of a licensing agreement. Motion No. 190-19. On October 19, 1984, the administrative law judge issued an Initial Determination terminating this investigation as to respondent Diamond Sports. Order No. 16. The administrative law judge, however, denied the motion to terminate as to respondent manufacturing representatives because these respondents had not entered into a sublicense agreement with Diamond Sports nor a consent order agreement with Lannom. "Assurances by Lannom and Diamond that such respondents will no longer commit the unfair acts alleged in the complaint are tenuous grounds upon which to terminate an investigation under Section 337." Id., at 3. Notice of the Commission's Determination not to review the Initial Determination terminating Diamond Sports was filed on November 21, 1984. 49 Fed. Reg. 46,819 (Nov. 28, 1984).

A Prehearing Conference was held on October 30, 1984. Appearances were noted for the record by complainant Lannom and the Commission investigative attorney. Counsel for respondent Diamond Sports also noted its appearance with regard to the testimony of Frank Hardy, President of Diamond Sports.

pursuant to the representations made by complainant in its Prehearing Brief, the following issues were withdrawn from consideration in this investigation: (1) direct and contributory infringement of claim 10 of the '295 patent; (2) infringement of the '767 trademark; (3) false and deceptive advertising; and (4) false representation. Prehearing Conf. Tr. 8-15. Complainant also clarified for the record that as to the respondents located in Taiwan (Tusa, Success Chemicals, and Complete Merchants), it no longer considered sales by them to Diamond Sports to constitute an unfair act. Complainant restricted its case against these three respondents to sales by them to non-licensees of complainant. Id. at 12+13; see Hearing Tr. 7-11.

The administrative law judge also discussed at the Prehearing Conference his earlier request that complainant and the Commission investigative attorney supplement the record by submitting a complete file wrapper of the patent at issue and other involved patent applications. Prehearing Conf. Tr. 16-21. Complainant objected to production of this information for the following reasons: (1) the statutory presumption as to the validity of a patent does not require the person asserting the validity of the patent to produce the patent file wrappers or any other evidence (Prehearing Conf. Tr. 19); and (2) the Administrative Procedure Act, 5 U.S.C. § 556, does not grant administrative law judges the power to enter evidence or order the government investigative attorney to present certain evidence (id.).

The administrative law judge overruled complainant's objection based upon the Commission policy set forth in Certain Food Slicers and Components

Thereof, which stated that in those investigations in which respondents do not actively participate, complainant and the Commission investigative attorney are required to make a reasonable effort to produce "substantial, reliable and probative evidence sufficient to establish a prima facie case of violation by respondents." The complainant cannot rest on the allegations in the complaint except where critical information cannot be obtained after a reasonable effort." Inv. No. 337-TA-76, Comm'n Decision at 5 (1981), quoting from Certain Window Shades and Components Thereof, Inv. No. 337-TA-83, at 5 (1981); see Prehearing Conf. Tr. 16-18, 20-21. The administrative law judge also pointed out that it was not uncommon for judges and administrative law judges to enter their own exhibits in evidence. Prehearing Conf. Tr. 20. The administrative law judge concluded that because of the public nature of § 337 investigations, "[t]he parties must produce a sufficient quantum of evidence to render an appropriate decision in the case." Id. at 21. The decision of the administrative law judge to require complainant to submit a file wrapper for the patent at issue and related patent applications, together with technical references mentioned in the file wrappers, is supported by Rule 210.20(c) of the Commission Rules of Practice and Procedure.

There shall accompany the submission of the original of each complaint based upon the alleged unauthorized importation or sale of an article covered by, or produced under a process covered by, the claims of a valid U.S. letters patent the following:

. . .

(2) One (1) certified copy of the Patent and Trademark Office file wrapper for each involved U.S. letters patent . . . ; and

(3) Four (4) copies of each patent and applicable pages of each technical reference mentioned in the file wrapper of each involved U.S. letters patent.

49 Fed. Reg. 46,123, at 46,128-29 (Nov. 23, 1984).

The Hearing in the Matter of Certain Softballs and Polyurethane Cores Therefor commenced before Administrative Law Judge Sidney Harris immediately after the Prehearing Conference. Complainant, the Commission investigative attorney, and, for a limited purpose, respondent Diamond Sports, noted their appearance. The Hearing concluded on November 2, 1984. On October 31, 1984, complainant alleged unfair surprise in the questioning of staff counsel and moved to strike the testimony given by Mr. Heald, President of Worth Sports, that morning relating to the issue of patent validity. Tr. 203-07. Staff counsel asserted there was no surprise since complainant was informed of the nature of the questioning in Staff's Prehearing Statement and in the October 12, 1984 deposition of Mr. Heald.^{1/} Tr. 208-09; SX 1. The administrative law judge offered complainant the opportunity to recess the testimony of Mr. Heald until the conclusion of the remaining witnesses' testimony or until a reasonable time thereafter. Tr. 210, 216. Complainant declined the offer claiming that the continuance would not cure the damage. Tr. 216.

^{1/} Respondent Diamond Sports had taken a position contrary to the validity of the '295 patent. Tr. 211-12. Diamond Sports entered into a settlement agreement with complainant in September 1984 and was terminated as a respondent on October 19, 1984. Tr. 209. During this period staff counsel became more active in developing evidence necessary for an adequate record. Id.

Surprise is not a ground for exclusion under Rule 403 of the Federal Rules of Evidence. A continuance, in lieu of exclusion, is the appropriate remedy. Complainant has the burden of showing (1) that there is actual, not merely legal, surprise, (2) that a continuance would not be an adequate remedy, and (3) that the admission of the material would be unfair. 10 J. Moore, Moore's Federal Practice § 403.14 (2d ed. 1979). Complainant has made no such showing in this case.

Complainant has not suffered actual surprise in the testimony of Mr. Heald. First, the patents at issue and their histories are required to be filed with the Commission pursuant to 19 C.F.R. § 210.20. Second, Diamond Sports had continuously contested the validity of the patent until terminated as a respondent two weeks before the hearing in this investigation. Finally, the staff attorney had used the same line of questioning while deposing Mr. Heald (SX 1) and Mr. Hardy (SX 3) in mid-October and had informed complainant of the nature of the questioning in its Prehearing Statement. Complainant has had constructive and actual notice that patent validity would be an issue in this investigation. Complainant's motion to strike was appropriately denied.

This Initial Determination is based on the entire record of this proceeding. Proposed findings not herein adopted, either in form or in substance, are either specifically dealt with in this Initial Determination, or are rejected as not supported by the evidence or as involving immaterial matters.

The findings of fact include references to supporting evidentiary items in the record. Such references are intended to serve as guides to the depositions, exhibits, and testimony supporting the findings of fact; they do not necessarily represent complete summaries of the evidence supporting each finding. Some findings of fact are contained within the body of this opinion.

The following abbreviations are used in this Initial Determination:

- CX - Complainant's Exhibit (followed by its number and the referenced page(s))
- CPX - Complainant's Physical Exhibit
- S" - Staff Counsel's Exhibit
- SPX - Staff Counsel's Physical Exhibit
- FF - Finding of Fact
- Tr. - Transcript

OPINION

I. Introduction

This investigation concerns the importation into or sale in the United States of certain softballs composed of polyurethane cores and leather covers which are alleged to infringe U.S. Letters Patent 3,976,295 (the '295 patent). These unfair methods of competition and unfair acts are alleged to have the effect or tendency to destroy or substantially injure an industry, efficiently and economically operated, in the United States.

The product in issue is a polyurethane core softball with a leather cover. FF 17. Complainant Lannom Manufacturing Co. (Lannom) produces and

sells 16 different varieties of a polyurethane core softball with a leather cover. FF 18. Prior to the introduction of the polyurethane core softball, softball cores were made either from cork or kapok. FF 20. The major advantages of the polyurethane core softballs over cork or kapok core softballs is that they are much more durable FF 28, and the resilience or liveliness can be varied by manipulation of the chemicals used to make the core. SX 4.

There were originally 12 respondents named in this investigation. An additional respondent, Tusa, was added by amendment to the complaint and Notice of Investigation on July 27, 1984. Order No. 8. The principal respondent Diamond Sports has been terminated on the basis of a settlement agreement. Order No. 16 (Oct. 19, 1984). None of the remaining respondents entered a formal appearance or participated in the hearing on this matter. Nevertheless, none of these remaining respondents have been found in default, nor has the administrative law judge imposed sanctions. Instead, the administrative law judge has instructed both complainant and the Commission investigative attorney that it is the practice of the Commission to require a reasonable effort on their part to produce substantial, reliable, and probative evidence sufficient to establish a prima facie case of violation of § 337 by respondents. "The complainant cannot rest on allegations in the complaint except where critical information cannot be obtained after a reasonable effort." Certain Food Slicers and Components Thereof, Inv. No. 337-TA-76, Comm'n Memorandum Opn., U.S.I.T.C. Pub. 1159, at 5-6 (June 1981).

II. Jurisdiction

Pursuant to § 337 of the Tariff Act of 1930, as amended, the U.S. International Trade Commission has jurisdiction over unfair methods of competition and unfair acts in the importation into or sale in the United States of products the effect or tendency of which is to destroy or substantially injure an industry, efficiently and economically operated, in the United States. Therefore, the Commission has jurisdiction to investigate the unfair methods of competition and unfair acts alleged in the complaint and set forth in the Notice of Investigation to determine whether there exists a violation of § 337.

The record indicates that the complaint and Notice of Investigation was properly served as to the remaining respondents in this investigation with the exception of Tusa. Nevertheless, the power of the Commission to enter an exclusion order against goods is based on in rem, rather than personal, jurisdiction. The Commission, therefore, has in rem jurisdiction over any of the accused polyurethane core softballs that have been imported or sold in the United States whether or not a person has been named as a respondent or received actual notice of the investigation. Sealed Air Corp. v. U.S. Int'l Trade Comm'n, 209 U.S.P.Q. 469 (C.C.P.A. 1981).

For this reason, I find that the U.S. International Trade Commission has subject matter jurisdiction over the polyurethane core softballs that have been imported into or sold in the United States.

III. U.S. Letters Patent 3,976,295

U.S. Letters Patent 3,976,295 (the '295 patent), entitled "Game Ball," issued on August 24, 1984, is assigned to complainant. FF 46. Jesse H. Heald, Jr., vice president of complainant's Worth Ball division, is named as the inventor of the '295 patent. Heald, Tr. 24; CX 2. Mr. Heald has been an employee of complainant since 1970 when he joined the company to become product development manager. Heald, Tr. 13, 122; see FF 54. Before joining Lannom, Mr. Heald served as a research engineer for six years at Arnold Engineering Development Center where he became familiar with polyurethane foam plastics and the ease with which those plastics can be molded. FF 54-55; Heald, Tr. 123; Heald Dep., SX 1, at 22.

A. Claims 3, 4, and 5 of the '295 Patent

The unfair acts alleged by complainant are limited to infringement of claims 3, 4, and 5 of the '295 patent. Opn., at 6. Independent Claim 3 of the '295 patent discloses a composite ball comprised of a stitched leather cover and a spherical polyurethane core of such density and resilience that it in effect duplicates the appearance, dimensions, and physical playing characteristics of a conventional cork or kapok core softball "so as to be usable in organized league play." FF 47; SX 4; CX 2; Heald, Tr. 20, 123. As specified in the claim, the patented ball should be essentially the same as the rebound, weight, hardness, size, feel, and sound of a "conventional softball." FF 47.

According to dependent claim 4, the polyurethane core portion of the patented ball of claim 3 is equal to 90 percent of the diameter of the finished composite ball. FF 48. Dependent claim 5 discloses the polycore of claim 3 as being formed from a mixture of isocyanate with a blend of catalyst and blowing agent. FF 48.

B. Background of the Invention Claimed in the '295 Patent

While serving as complainant's product development manager in 1970, Jesse Heald sought to develop a livelier, more durable, and more consistent performing softball than was characteristic of existing conventional balls. The manufacture of such a ball would require less labor and would thus reduce costs of manufacture. SX 15; Heald, Tr. 20, 122. At that time, virtually all softballs contained cores formed of compressed cork or kapok and contained a yarn winding which was covered with leather, or other suitable materials. SPX 33, Muhlfelder Dep., at 13-14.^{2/} Mr. Heald felt that introduction of a softball with a polyurethane core would enable complainant to compete

^{2/} Softball emerged as a popular sport in 1920. SPX 33, Muhlfelder Dep., at 13-14. In that year, and up until 1960, softballs were formed out of kapok, a compressed fabric material which was wound with a yarn wrapping and encased in a leather stitched cover. SPX 33, Muhlfelder Dep., at 14. In 1960, Dudley Sports Company introduced the cork centered softballs which captured part of the market held by the kapok ball and became one of the standard constructions. Id. Cork softballs are the softball of choice for use in slow pitch softball in certain areas of the United States, and in all parts of the United States for use in fast pitch softball. FF 331-36; SPX 33, Muhlfelder Dep., at 12, 21.

successfully with its major competitors in the burgeoning softball market. Heald, Tr. 121. Prior to its introduction of the polycore ball, complainant had not been successful in its attempts to compete in the market for top grade softballs. Id.

Mr. Heald undertook to develop a polyurethane core softball by drawing on his experience with polyurethane foam plastics gained during his previous employment as a research engineer. Heald, Tr. 122-23; see FF 54. Mr. Heald has no formal training as a chemist, but while at Arnold, he used polyurethane foam as an insulating material and became familiar with the ease of molding such plastics into rigid but flexible shapes. FF 55; Heald, Tr. 123. He acted as a consultant to complainant to design an aluminium ball bat filled with polyurethane foam. Id.

In 1970, Mr. Heald contacted Flexible Products Company, inquired about the possibility of using polyurethane to make a core for softballs, and asked Flexible Products to provide a polyurethane foam system. FF 58; Heald, Tr. 130. In response to this request, Flexible Products supplied Mr. Heald with an isocyanate and a polyol catalyst. Heald, Tr. 131. Isocyanate, a plastic ingredient, is the basic constituent of polyurethane. Polyol catalyst is the substance which initiates the establishment of the gel reaction. FF 59; Heald, Tr. 495, 513-14. A blowing agent is added to the catalyst to cause the foaming reaction necessary for the production of polyurethane foam. In the polyurethane system employed in the production of polycores, the blowing agent is water. FF 59; Heald, Tr. 131-32.

Mr. Heald was unable to formulate a polyurethane core softball with the requisite liveliness and durability characteristics with the materials initially supplied by Flexible Products. Heald, Tr. 133. He therefore embarked on a "trial and error" development effort with Flexible Products and other companies, including Freeman Chemical Company and Reynolds Chemical, directed to creating a new polyurethane ball core. FF 58, 60; Heald, Tr. 127, 134, 141-42. They reported on the results of impact, compression, and durability tests. The companies supplied test cores which they felt met the specifications desired by Mr. Heald. FF 60-65; SX 22; Heald, Tr. 134-35.

Mr. Heald informed Flexible Products that the core should rebound with 20-30 percent of the height from which it was dropped, based on a 20 feet drop test, which he said covered the range of rebound of what was available in a cork ball. FF 63; Heald, Tr. 136-38. He also supplied figures for desired surface hardness and compression strength. Heald, Tr. 137. Compression strength is calculated based upon the amount of deflection that occurs when a ball is compressed between two flat plates that press together to approximate the force that occurs when a ball is hit with a bat. Heald, Tr. 133. Complainant also supplied Flexible Products with a test mold so that Flexible Products could experiment with fabrication of polyurethane cores. FF 61; Heald, Tr. 135.

By 1972 Mr. Heald had molded "crude" softball cores. SX 1, at 10. The cores provided by Freeman Chemical had problems with durability and shape retention. SX 1, at 16-17. The problem was solved by Flexible Products.^{3/}

^{3/} U.S. Letters Patent 3,644,168 (Bonk) dated February 22, 1972 entitled "Varied Density Polyisocyanate Foam Structure," revealed recent advances in self-skinned polyurethane "which combines the advantages of fabrication by molding (in various shapes) in a one-step procedure with high structural strength." (Emphasis added.) SX 13.

Heald, Tr. 144, 146.

The efforts to develop a polyurethane core softball continued until late 1973 or early 1974, when two prototype cores were developed. SX 22; SX 23. During the time the development efforts were underway, Mr. Heald was not aware that others had obtained patents on similar baseballs and softballs using cores of rigid but resilient expanded closed cell plastic materials which "simulated regulation balls" (Tr. 125-26); however, his counsel cited the Pooley and Pietraszek patents, which disclose such balls, as part of the parent application which led to the '295 patent.^{4/} SX 6; SX 8; SX 91. Mr. Heald also had not seen the Kohn patent which discloses a softball core made of polyurethane and filler, which has the same "balance," "sound," "flexibility" and "flight characteristics" as traditional softballs, but with improved durability over such balls, until about one month before the hearing in this investigation. Heald, Tr. 241. He was aware that others had made golf balls of solid polyurethane. Heald, Tr. 126. If Mr. Heald had been aware that others had made softballs with cores of polyurethane and other plastic materials, it "possibly" would have assisted him in his development of a polycore ball. Heald, Tr. 125-26.

Commercial production of polyurethane cores began at Lannom in June 1974. FF 67; SX 58. The equipment used to fabricate the cores at that time included

^{4/} The patent examiner did not list these patents as part of the prior art.

a metering system to dispense the plastic components in the proper amounts into a container and an electric appliance (a milk shake type mixer) to thoroughly mix the ingredients before they were poured into a mold. FF 67. The molds were clamped and the mixture was allowed to cure in the mold for ten minutes. Heald, Tr. 157. This procedure, including use of the milk shake mixer, was the technique employed by Lannom at the time Mr. Heald initially applied for patent protection for his ball construction and method of manufacturing.^{5/} Heald, Tr. 683, 684.

C. Patent Office History of '203 Application

Mr. Heald's initial application, filed July 10, 1974, was entitled "Ball and Method of Making Same," and was designated No. 487,203 (the '203 application). FF 69; SX 91. The application recited that the invented ball "had desired characteristics essentially identical to prior conventional balls, but having uniformity of construction, cost and durability advantages over prior known conventional balls." SX 91. The applicant was required by the examiner at the first office action to elect between the method and product claims and chose to proceed with the product claims. FF 79.

On December 10, 1974, the examiner notified the applicant that all claims were rejected under 35 U.S.C. §§ 102, 103, and 112. FF 80. The examiner

^{5/} It is not known when complainant first applied a leather cover to a polyurethane core. Heald, Tr. 156.

found pursuant to 35 U.S.C. § 103, that "leather" is an obvious substitute for "vinyl" as a cover and noted that the Fechner and Bonk patents "show urethane articles." SX 91. The rejection under 35 U.S.C. § 112 related to ambiguity as to the meaning of "conventional" softball. In response to the § 112 rejection the applicant stated a conventional softball "can only mean a ball of the type meeting the specifications and having the characteristics of the ball required by the official rules of . . . softball." FF 82; SX 91. The applicant did not, however, submit any rules. With respect to the rejections under §§ 102 and 103, the applicant stated that the reference patent, which disclosed use of polyurethane foam in various shapes for balls and playthings, did not disclose how to make a softball from polyurethane foam "that has the same rebound qualities as a conventional . . . softball." FF 83; SX 91.

After reconsideration the examiner again rejected the claims stating "there is no definite line between conventional and non-conventional . . . softballs." FF 84; SX 91. All claims were further rejected under 35 U.S.C. § 103 as obvious over Fechner. SX 91. Essentially what is now independent claim 3 of the '295 patent was also rejected as obvious under Holtvoight (see infra) since use of a leather cover was an obvious substitute for the reference cover; that is, when leather is used there is no difference between the reference and the structure claimed. FF 85; SX 91. In response the applicant stated that persons of skill in the art understood that "conventional" softball means balls "constructed in accordance with the official softball rules" and that balls "not constructed in accordance with

the official rules . . . are referred to by terms such as 'practice' and 'sandlot' to distinguish them from conventional balls." Applicant further noted that "U.S. Patents 2,743,931 [Pietraszek] and 2,753,599 [Pooley] illustrate the use of 'practice' to describe non-conventional baseballs [or softballs]." FF 87; SX 91.^{6/} The applicant also noted the various objections of the examiner were all based on the same premise, "that the term 'conventional' as applied to . . . softballs is so broad as to encompass a wide variety of ball constructions." SX 91. Consequently, as part of the response to the examiner's second rejection, an affidavit of Mr. Heald dated September 6, 1975, was submitted concerning the understanding of those in the trade regarding the meaning of a conventional softball. The affidavit recited that the term "conventional softball" means a "ball which has the physical characteristics provided in Rule 3, Sec. 2 of the Official Softball Rules of The International Joint Committee on Softball. Balls having the appearance of conventional softballs but not conforming to the standards of organized softball, are not 'conventional' or 'official'." SX 91. Finally, the applicant's counsel admitted that the application presented difficulties in defining the scope of the claims solely in terms of the claim language. The applicant's counsel stated that the application is "a

^{6/} In fact these patents refer not only to practice balls but also to "play balls" which seek to simulate the functional characteristics of traditional yarn wound softballs. SX 6; SX 8.

classic example of how the scope of coverage provided by the particular claim language must be interpreted in light of the specification and prosecution history of the application." SX 91.

The examiner again rejected the application and the applicant appealed to the Board of Appeals. About one month later, the applicant abandoned the '203 application, filed a continuation in part application (the '705 application) and on that same day the '295 patent was issued. FF 89-90.^{7/} SX 4; SX 91; SX 111. In issuing the patent, the examiner recited that "for the purpose of eliminating indefiniteness" that may be involved with the phrase "conventional softball", the words "including a core of cork or kapok, yarn windings, a leather cover" were to be inserted after the word "softball" in claim 3 of the application. See FF 90. The title was also to be changed to game ball. SX 111.

D. The Presumption of Validity

Complainant's patent enjoys a presumption of validity pursuant to 35 U.S.C. § 282. The Court of Appeals for the Federal Circuit has explained the operation of the presumption as follows:

The presumption of validity afforded by 35 U.S.C. § 282 does not have independent evidentiary value. Rather, the presumption places

^{7/} Two new affidavits relating to softballs, one from Mr. Heald and one from an official of a softball association, were included in the '705 application. FF 83; SX 91.

the burden of going forward, as well as the burden of persuasion, upon the party asserting invalidity. [Citation omitted.] We do not agree that the presumption is affected where prior art more relevant than that considered by the examiner is introduced. Rather, the offending party is more likely to carry the burden of persuasion.

SSIH Equipment, S.A. v. U.S. Int'l Trade Comm'n, 218 U.S.P.Q. 678 (Fed. Cir. 1983).

The Patent and Trademark Office's decision to issue a patent is entitled to deference only with respect to evidence bearing on validity which was considered in determining whether to grant the patent. American Hoist & Derrick Co. v. Sowa and Sons, Inc., 220 U.S.P.Q. 763, 771 (Fed. Cir. 1984).

E. The '295 Patent is Invalid Under 35 U.S.C. § 112

(1) Enablement Requirement.

The first paragraph of § 112 contains what is known as the enablement requirement. It provides that the patent 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 skilled in the art to which it pertains . . . to make and use the same."

The patent describes as the method of manufacture mixing of the chemicals in the mold. Heald, Tr. 700-01. According to Mr. Heald, however, if this method were utilized it would be difficult, if not impossible, to produce a spherical core which could serve as the core of a softball. Heald, Tr. 723, 747-48. Mr. Heald was aware that good mixing is essential, otherwise there would not be proper polymerization, and that it was desirable to complete the

mixing within 10 to 20 seconds. FF 70; Heald, Tr. 700, 703; SX 24(C). Mixing in the mold is unsatisfactory for it can only be done in the lower half of the mold; aggressive mixing would cause the mixture to spill over the side. The mold is "not really amenable to good handling for mixing purposes." Heald, Tr. 706. Poor mixing would affect most of the important physical properties of the core, including durability, density, and hardness, as well as the uniformity of these qualities throughout the core. Tuten, Tr. 502-06, 526, 529, 536-37. When complainant first began manufacturing polyurethane softball cores, Mr. Heald issued manufacturing instructions that provided for the ingredients to be dispensed into a cup, then mixed in a milk shake type mixer. SX 24(C). Included in the molding instructions were the following instructions:

IMPORTANT: Thorough mixing is extremely important to proper quality. A pour [sic] mix will result in a weak ball which can easily split when hit with a bat.

SX 24(C).

At the time of the '203 application complainant was using metering devices which dispensed precise amounts of the chemical into a papercup which were mixed together rapidly by milk shake type mixers. Mr. Heald believed this type of mixing to be the best method for molding a polycore softball. Heald, Tr. 693-94, 697. This information was communicated by Mr. Heald to complainant's attorney (Tr. 696) yet it was not included in the '203 application; instead, mixing in the mold was described as the method of making the polycore. FF 51-52.

Complainant never commercially produced cores by mixing in the mold; it became clear the rejection rate was such that a more efficient mixing method was necessary. Heald, Tr. 700-06. The plastics process is dependent upon thorough mixing of the ingredients. If there is poor mixing "there would be areas within the . . . core where one component would be out of ratio with . . . the other." Heald, Tr. 699-700; see FF 70. Generally, this would result in a loss of strength and other flaws. Heald, Tr. 700. Thorough mixing is needed to ensure a uniform structure. Heald, Tr. 147. Mr. Tuten, complainant's expert witness and an employee of complainant's chemical supplier, stated that stirring by hand is "very ineffective," that he does not even do it in the laboratory when making experimental samples, and that he is not aware of any hand mixing. Tuten, Tr. 502-03. Mr. Tuten stated that a polyurethane foam core cannot duplicate a conventional softball without proper mixing. Tuten, Tr. 504. Proper mixing cannot be achieved by mixing in the mold since this would have to be done by hand and one could not achieve proper mixing without spilling material over the side of the lower half of the mold.

The polyurethane cores were in production at the time of the '203 application. FF 72; Heald, Tr. 719. There is no evidence, other than Mr. Heald's statement (Heald, Tr. 701), that complainant ever performed hand mixing in the mold. There are no mixing instructions in the '295 patent beyond the mention that mixing in the mold is the method used to make the ball disclosed in the '295 patent specification. FF 51-51; see FF 92. Mr. Tuten, in making laboratory samples, dispenses the ingredients in a cup and mixes

using a milk shake type mixer. Tuten, Tr. 502, 537. Only limited quantities for test purposes were allegedly made by hand mixing. The milk shake mixer came next as an economical way to do mixing to get complainant started in manufacturing. Heald, Tr. 725-26. Lannom purchased its first mass production pour machine in February 1975 and prior to that time had made about 1000 dozen cores using a milk shake type mixer. SX 58(C). Thus, complainant never made any cores for commercial purposes by hand mixing or by hand mixing in the mold.

That the patent specification does not enable persons of ordinary skill in the art to produce the patented article is illustrated by the experience of Diamond Sports and Success Chemicals in attempting to make the "Game Ball" described in the '295 patent. The President of Diamond Sports, now a licensee of complainant but formerly the principal respondent, set out to duplicate complainant's product with various Taiwanese companies and individuals.

C*

C

. FF 226;

C Hardy, Tr. 307, 373-74, 378-79. It took about of experimental work

C to approximate complainant's product, although one of the companies,

C respondent Success Chemicals,

C

.^{8/} SX 3, at 6, 37-39; Hardy,

C

C ^{8/} Success Chemicals Co.

C , as suggested by staff counsel (Post Hearing Br., at 26); it is (Footnote continued to page 27)

Tr. 371. This goes far beyond any reasonable experimentation. Certain Limited-Charge Cell Culture Microcarriers, Inv. No. 337-TA-129, 221 U.S.P.Q. 1165, 1171 (1983). Certainly, Success Chemicals would be a person of at least ordinary skill in the art of plastic forming.

C

C

C

. Hardy, Tr. 375-79; see

FF 229.

Mr. Heald's statements that one could produce acceptable cores in the mold by hand in light of the testimony of Messrs. Tuten and Hardy, both called as expert witnesses by complainant, and in light of other parts of Mr. Heald's testimony, are not credible. In providing for mixing in the mold, the '295 patent specification indicates a positive effort to prevent persons from manufacturing the patented game ball so that it could be used, as intended, for league play. The mixing method described would in effect prevent manufacture of satisfactory quality ball cores by persons of ordinary skill in the art. For this reason the '295 patent is invalid under 35 U.S.C. § 112.

(2) Best Mode.

Section 112 of Title 35 of the United States Code requires that the patent specification "set forth the best mode contemplated by the inventor of carrying out his invention." The inventor must not conceal a preferred

(Footnote continued from page 26)
a chemical company producing

C

C

carrying out his invention." The inventor must not conceal a preferred embodiment of his invention. In re Gay, 309 F.2d 769, 135 U.S.P.Q. 311, 315 (C.C.P.A. 1962). The '295 patent specification does not set forth the best method of making the game ball.

The patent specifications refer to use of a cotton yarn cover over the polyurethane core which in turn is to be covered with cowhide, but at the time of the '203 application complainant had ceased using a thread winding around the polycore. Heald, Tr. 715-18. Elimination of the winding would eliminate significant labor costs in producing the patented ball and may make it more difficult to manufacture game balls with particular rebound specifications. Prior to the introduction of the polyurethane core softball, all softballs had some kind of yarn winding in which the stitching on the leather cover was anchored. The winding was eliminated by complainant prior to the '203 application when an anchorless stitch was developed. Id.

Inclusion of the yarn winding in the patent specifications and failure to disclose the anchorless stitch is not sufficient concealment of the preferred embodiment to find the patent invalid. Nevertheless, it does create a misleading impression concerning the best mode of carrying out the invention.

(3) Indefiniteness.

The patent is invalid under 35 U.S.C. § 112 because it is indefinite. The second paragraph of § 112 provides that the patent claims shall "particularly" point out and "distinctly" claim "the subject matter

which the applicant regards as his invention." The broad goal of the second paragraph of § 112 is to ensure that an inventor informs the public of the limits of the patent. Claims must be definite so that it is known which art may be practiced without fear of infringement. General Electric Co. v. Wabash Corp., 304 U.S. 364, 37 U.S.P.Q. 466, 468 (1938); D. Chisum, Patents, § 8.03 (1984). Definite claims establish the boundaries of the invention and thereby give notice to others in the field of what is actually protected. Remgo Co., Ltd. v. Molins Machine Co., Inc., 211 U.S.P.Q. 303, 321 (3d Cir. 1981), cert. denied, 454 U.S. 1055 (1981); Norton Co. v. Bendix Corp., 171 U.S.P.Q. 449, 450 (2d Cir. 1971). If a patent established by indefinite claims were enforced, the effect would be to create "[a] zone of uncertainty [into] which enterprise and invention would enter only at the risk of infringement" This would discourage invention in the field. Union Carbon v. Binney & Smith Co., 317 U.S. 228, 55 U.S.P.Q. 381, 385 (1942).

Complainant contends that all softballs with a polyurethane core, including those without a leather cover (SX 1, at 34), are infringements of claims 3, 4, or 5 of the '295 patent. Complainant, Reply Br., at 9. However, only balls which essentially duplicate the dimensions, weight and performance characteristics of conventional softballs usable in league play are entitled to patent protection. FF 47-48. In attempting to use ambiguous patent claim language, complainant is attempting to obtain a monopoly over all polycore softball sales in the United States when the patent monopoly is limited to a particular and distinct "conventional" softball.

The '295 patent claims a composite ball having the "appearance, physical characteristics and dimensions of a conventional softball" comprising a core of polyurethane foam and a leather cover wherein the core is of such density and resilience to give the ball "essentially the same rebound, weight, hardness, size, feel and sound qualities as said conventional softball so as to be usable in organized league play of softball." FF 47; SX 4. The patent office history also reveals that the complainant in an affidavit dated September 6, 1975, defined the term "conventional softball" to mean a "ball which has the physical characteristics provided in Rule 3, Sec. 2 of the Official Softball Rules of The International Joint Committee on Softball," although as already indicated a copy of the rules was not submitted with the application. FF 87. The rule cited in the affidavit provides that "the ball must conform to dimensional and weight limitations and must be made of specified materials." FF 91. The affidavit, however, is subject to misinterpretation because in the same sentence it states that "such balls have specific performance characteristics such as percent rebound and compression strength (hardness) and any ball not having such performance characteristics is not considered to be or referred to as a conventional softball by those in the art." SX 91. The rules not having been submitted, the examiner could get the impression from this affidavit that the Official Rules provided specifications for such performance characteristics, when there were no such specifications.

The applicable league rules, of course, specified only the circumference, size, and weight of the ball, and that it have a cork or kapok center, wound

with yarn, and a leather cover. In 1974, the official rules of the Amateur Softball Association (ASA) prescribed the requirements for an official ball as follows:

Sec. 2. THE OFFICIAL SOFTBALL SHALL BE A REGULAR, SMOOTH-SEAM CONCEALED STITCH OR FLAT SURFACED BALL, NOT LESS THAN 11 7/8 INCHES NOR MORE THAN 12 1/8 INCHES IN CIRCUMFERENCE, AND SHALL WEIGH NOT LESS THAN 6 1/4 OUNCES NOR MORE THAN 7 OUNCES. The center of the ball may be made of either #1 quality long fibre kapok or a mixture of cork or rubber, or other materials as approved by the Joint Rules Committee on Softball, hand or machine wound with a fine quality twisted yarn and covered with latex or rubber cement. The cover of the ball shall be the finest quality #1 chrome tanned horse or cow hide cemented to the ball by application of cement to the under side of the cover and sewed with waxed thread of cotton or linen.

FF 75; SPX 31. At that time there were no published specifications governing other performance characteristics of softballs such as rebound, hardness, sound, or feel in the rulebook of any softball association. Heald, Tr. 55-60, 741-43.

The patent examiner had refused to recommend the issuance of a patent on the basis of the '203 application on the ground, among others, of lack of definiteness of the term "conventional softball" in the claim language.

SX 91; see FF 84. Complainant appealed and then abandoned the '203 application. See FF 89. A new application - the '705 application - was filed and was virtually identical to the rejected '203 application. FF 90; SX 111. In issuing the patent, the examiner recited that "for the purpose of eliminating indefiniteness" (emphasis added) that may be involved with the phrase "conventional softball," the words "including a core of cork or kapok,

yarn windings, a leather cover" were to be inserted after the word "softball" in claim 3 of the application. See FF 90.^{9/} The added words, however, merely made clearer the general types of balls which were in use at the time of issuance of the '295 patent. Softballs that had cork or kapok centers, yarn winding, and a leather cover, received automatic league approval if a license fee were paid to the league. Such balls were checked only for materials, content, size, and weight. Heald, Tr. 90-91. A ball with a polyurethane core would require special league approval. Id. Thus, the additional words did not ensure that the reference was to a ball that had particular and distinct playing and performance characteristics as recited in the claim language.

In an affidavit filed with the '705 application, Mr. Heald stated that the term "conventional softball" was defined in his prior affidavit in the '203 application,^{10/} that the polycore ball could not be distinguished from conventional balls, and that such balls had enjoyed commercial success and had been approved for use by two softball leagues. In another affidavit filed by Mr. Ramsey of the United States Slow Pitch Softball Association, he stated

^{9/} The title was also to be changed to game ball.

^{10/} The affidavit refers to a prior affidavit filed October 22, 1975. No affidavit bearing such a date is in the file. The only affidavit of Mr. Heald in the '203 application file relating to the definition of the term "conventional softball" is dated September 6, 1975, and it will be presumed that this is the affidavit which is referred to in his affidavit in the '705 application file. See FF 87.

that complainant's polycore balls were essentially indistinguishable from prior conventional softballs. FF 88; SX 111. Significantly, Mr. Ramsay in his affidavit failed to state that complainant's polyurethane softballs, which he field tested, had the same rebound characteristics as a "conventional" softball. Id.

Mr. Heald and Mr. Ramsey indicated in their affidavits that there are performance criteria which can be sensed by playing the game. However, the law requires a clear delineation of the patented subject matter. Subjective criteria which may be felt by some during play or allegedly observed while watching games do not suffice to put the public on notice as to what actually is included under the patent.

Mr. Hardy, President of Diamond Sports, called by complainant as an expert in the softball industry, stated that Diamond Sports polyurethane core balls do not have essentially the same characteristics as conventional softballs in that there are substantial differences between Diamond Sports' balls and cork and kapok balls. SX 3, at 35. Mr. Hardy stated that there are "pretty good" differences between the kapok ball and Diamond Sports' polyurethane balls, but the differences are not as great between cork and the polyurethane core balls.^{11/} Id. The kapok centered ball is very soft and has a dull sound as

^{11/} Diamond's Sports' polycore balls are essentially the same as complainant's polycore balls; the only difference may be in the quality of thread used. Tr. 47; SX 64-66.

compared to the polycore ball. There is also a "major" difference in the feel of the two balls. Id. Furthermore, the polycore ball has a harder feel than the cork ball and, in order for the polycore ball to replace the cork ball, players have to get used to it and accept the harder feel. Id., at 10. The yarn winding gives a flexible feeling with cork which is not present with polyurethane. See id., at 36.

There is confusing and conflicting evidence concerning the nature of the rebound characteristics of cork centered softballs in use at the time of the '203 application. The coefficient of restitution (referred to as COR) is an industry standard in use for the past two years but not known at the time of the '203 application and the '295 patent which describes or measures the degree of softball rebound or ball liveliness. At the time of the '203 application, complainant used a 20 foot drop test to calculate percentage rebound. Tr. 116-19. This drop test was used by complainant and chemical companies in developing the prototype polycores (see, e.g., SX 17) and was in general use in 1973 and 1974. Heald, Tr. 451. Mr. Heald stated that there is a direct mathematical relationship between the percentage rebound calculated using the 20 foot drop test and COR in that COR is the square root of the percentage rebound. Heald, Tr. 117-19. For example, a COR of 0.50 would be equal to 25 percent rebound. Heald, Tr. 117. However, other evidence contradicts Mr. Heald. In a comparison of Diamond Sports' and complainant's balls, both the drop test and COR were calculated by complainant and the two do not appear to be in the mathematical relationship described by Mr. Heald.

SX 64-66. For example, the COR 0.50 balls had a 37 or 38 percent rebound, whereas according to Mr. Heald they should have about a 25 percent rebound. SX 65. The difference is substantial and serves to point out the widespread confusion about the rebound characteristics of a "conventional softball" as shown by the following examples.

Mr. Heald has stated that 25 to 35 percent was the rebound range of the conventional softball. Heald, Tr. 55. However, in contrast, when developing the prototype polycores he asked the Freeman Chemical Co. to develop cores with 20 to 30 percent rebound to cover the conventional ball spectrum. Heald, Tr. 36-38. The rebound characteristics of a polyurethane core softball can be widely varied depending upon the ratio of the chemicals. SX 1, at 9; SX 4. Diamond Sports produces three or four different polycore balls each with different CORs.^{12/} FF 198-99.

Diamond Sports produces a 0.44 COR ball, which is the least lively ball and known as a short field ball. It is the most prevalent polycore ball in the United States and accounts for about two thirds of all Diamond Sports'

^{12/} Mr. Hardy has stated the range of the COR of cork centered softballs, depending upon how they are made, is about 0.43 to 0.46 or 0.47. Hardy, Tr. 265, 272. However, the average COR of a cork centered ball is 0.45 or 0.46 (SX 3, at 28) and the maximum COR of the cork ball is about 0.46 (SX 3, at 36). The normal range of cork is a COR of 0.44 or 0.45. Hardy, Tr. 381-82. Mr. Heald has testified that the COR range of conventional cork balls is from 0.42 to 0.48. Heald, Tr. 114.

sales of polycore balls.^{13/} Diamond Sports also makes a 0.48 COR mid-field ball and the more lively 0.50 and 0.52 COR balls. Heald, Tr. 262-63, 271; SX 3, at 28. Complainant makes similar COR balls. Heald, Tr. 47; SX 64-66.

Rather than duplicating conventional softballs, it appears that the balls actually put into production by complainant were more lively than previously used softballs. Two polycores were chosen for production, one which exhibited an 80 inch rebound (the livelier ball) and a less lively core which exhibited a rebound in the 65 to 75 inch range using the 20 foot drop test. Heald, Tr. 140-41, 720. Even the lower range of the low rebound ball (about 27 percent using the 20 foot drop test) was livelier than the top rebound range of cork balls, since, using Mr. Heald's method of calculation, a 27 percent rebound is equivalent to a COR of over 0.52, substantially above the maximum COR of any cork centered ball. "Ball liveliness was an essential ingredient" in his invention. Mr. Heald tested for it and prepared a research report on the subject, sent it to the softball league, and requested they adopt a ball liveliness standard. Heald, Tr. 748-52. Players like a lively softball because they like scoring more runs (SX 1, at 25) and liveliness is a "very

^{13/} Only since 1982 have there been published league rebound standards for the restricted flight ball, or for any softball. SX 93; Heald, Tr. 91. Very recently, rebound specifications for a livelier ball have been approved by the American Softball Association, which are just now going into effect. Heald, Tr. 91. The 0.44 COR ball is used not only in tournament play, but also when there is a short playing field, or because of the simple desire to use a league approved ball. Heald, Tr. 91-92.

important performance characteristic . . . to determine whether or not [the ball] really is an acceptable elite-type ball." SX 1, at 49. Mr. Heald recognized that added ball liveliness, which could be created with a polycore ball but not present in the cork or kapok balls, would change the nature of the game:

The rebound then was an observable quality or property witnessed in actual play. Used in a game, a ball with much higher rebound, much livelier would result in more hits, more homeruns, longer games, and this would be an observable end result. (Emphasis added.)

Heald, Tr. 743. The polyurethane softball introduces a greater degree of liveliness into the game. It tends to be more popular with players that want more hits and runs. The polycore ball is generally unbalanced and tends to waffle a little in the air, whereas the cork and kapok balls have truer flight characteristics. SPX 33, Muhlfedler Dep., at 14, 22-23. The polycore ball "really changes the game" in that it lengthens it and makes it livelier. The nature of the game is changed by use of the polycore ball, and there is some reluctance to do that in New England. SPX 33, at 33.^{14/}

The only standard features of "conventional softballs" were the circumference size and weight, the inclusion of yarn windings, and a leather

^{14/} Mr. Ramsey's omission of the rebound characteristics in his affidavit in the '705 application is also consistent with this finding. SX 111.

cover.^{15/} There were substantial differences between the cork and kapok centered balls in rebound, hardness, and sound qualities. SX 3, at 35. There were also differences among the cork balls depending upon how they were made. Id. Since the Official Rules contained no performance standards for "regulation" or "conventional" balls, even the cork balls that were accepted for league play varied in their performance qualities. Hardy, Tr. 381-82. The leagues also did not deny approval of kapok centered balls although performance characteristics were different than cork centered balls. If a ball made of these materials met the size and weight requirements, the major obstacle to league approval was payment of the license fee. Heald, Tr. 90-92; SPX 33, at 33-34, 53; SX 1, at 60. As complainant's expert Mr. Tuten said, originally there were not many specific requirements for the ball other than it be "playable." Tuten, Tr. 497. At the time of the '203 application, softballs varying widely in performance characteristics, were league approved and thus usable in organized league play.

The patent office examiner had found the term "conventional" too indefinite, but had changed his opinion upon amendment of the claim language to specify that the conventional softball had a cork or kapok center, yarn winding, and a leather cover. FF 90-91. A copy of the rules cited in the

^{15/} Circumference size and weight also varied. In some parts of the country 16 inch circumference balls were used and in other parts an 11 inch ball was used. Heald, Tr. 60-61.

affidavit submitted with the '203 application to support the distinctiveness of the term "conventional softball" was not submitted to the examiner. Heald, Tr. 753. Thus, the examiner was not aware that the various cork and kapok centered balls that would be included in the term "conventional softball," even with the amended language, differed substantially in performance characteristics. The examiner never realized that there were no official rules or standards governing the various performance qualities which a ball usable in organized league play was supposed to have and that there was no single conventional softball that possessed distinctive and particular performance characteristics.

The rebound quality of a softball is an important performance characteristic which separates different balls. Mr. Hardy, when asked if Diamond Sports' polycore softballs have the same characteristics as conventional softballs when new, stated: "If it is the proper COR ball." Hardy, Tr. 271. The trade is aware of the COR of the ball by the various thread colors and by the softball association whose name is on the ball. Hardy, Tr. 271-73. Mr. Heald has stated that the 0.44 COR ball, the most prevalently sold ball, is generally "deader" than conventional softballs had been. Heald, Tr. 92. There was no conventional softball that had particular and distinct performance characteristics any more than there is presently one such ball.

Where the patent is a combination of old elements, as it is in this investigation, the particularity and distinctness of the claim language is

especially important. Rockwell v. Midland-Ross Corp., 438 F.2d 645, 653, 169 U.S.P.Q. 5 (7th Cir. 1971). Because such patents lend themselves easily to abuse, they merit "very close scrutiny." Halliburton Co. v. Walker, 329 U.S. 1, 71 U.S.P.Q. 175, 179 (1946). Moreover, the claim language must be clear when read in light of the disclosure of the patent specification. Medtronic, Inc. v. Daig Corp., 221 U.S.P.Q. 595 (D. Minn. 1983). The only information given in the '295 patent specification that possibly relates to performance criteria are four examples "of balls having different [resiliency] characteristics" as a result of varying the ratio of isocyanate to catalyst. The first example has a resilience of 31 percent, the second of 23 percent, the third of 21.5 percent, and the fourth of 20.5 percent. However, nothing is said in the specification about which, if any, have the resilience of a "conventional softball." The inventor, Mr. Heald testified that conventional softballs have a rebound percentage from 25 to 35 percent. Thus, only the first example would fit his definition. The '295 patent specification does not clarify the ambiguous and indefinite claim language.

Claim language concerning flexibility or resilience is especially hard to define without a clear standard of measurement. Claims referring to "elastic, flexible, relatively impermeable, polyurethane polymer foam parts, having good resistance to plastic deformation" have been determined to be indefinite. Scheller-Globe Corp. v. Milsco Mfg. Co., 206 U.S.P.Q. 42, 52, 63 (E.D. Wis. 1979), aff'd in part (on patent invalidity) rev'd in part (on attorney fees) 636 F.2d 117, 208 U.S.P.Q. 553 (7th Cir. 1980). In that case, the meaning and

scope of the terms were unclear because there was no standard with which to distinguish those materials which had the patented characteristics from those that did not. Id. Similarly, in the present investigation, complainant has not sufficiently defined a standard by which patented softballs may be distinguished from nonpatented polycore softballs. Since no performance criteria for a "conventional" softball existed at the time of the '203 application and issuance of the '295 patent, in light of the circumstances, it would be unreasonable to find that the claims at issue set out and circumscribe a particular area with a reasonable degree of precision and particularity.

For these reasons, use of the term "conventional softball" in the '295 patent claims does not serve sufficiently to particularly point out and distinctly claim the invention of the patentee. The patent therefore is invalid.

F. Validity of the '295 Patent Under 35 U.S.C. § 103

The '295 patent is invalid because the subject matter as a whole would have been obvious to a person having ordinary skill in the art.

Under 35 U.S.C. § 103, a patent may not be obtained if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. The test for obviousness, established by the Supreme

Court in Graham v. John Deere & Co., 383 U.S. 1, 148 U.S.P.Q. 95-99 (1966), involves a determination of: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art.

(1) Scope and Content of the Prior Art.

(a) Scope of the Art.

The patent in suit and the prior art applied to its claims by the Patent and Trademark Office (PTO) offers a convenient starting point for ascertaining the scope and content of the prior art. See Orthopedic Equipment Co., Inc. v. United States, 702 F.2d 1005, 217 U.S.P.Q. 193, 196 (Fed. Cir. 1983). The invention of the '295 patent is entitled "Game Ball" and is identified as being within the "field of balls per se." CX 2, col. 1, line 9. The prior art references cited by the PTO during prosecution of the '295 patent include patents disclosing softballs, plastic core golf balls (used to practice or simulate the flight patterns of regulation balls), and children's play balls and toys with plastic cores, together with a patent that demonstrates the method of making and using rigid but resilient closed cell polyurethane of uniform density in a variety of shapes.

A second factor bearing on the determination of the relevant prior art concerns what persons skilled in the art would have been familiar with at the time of the invention. Orthopedic Equipment, 217 U.S.P.Q. at 196. The evidence indicates that persons engaged in softball and baseball product

development were aware of materials employed in the construction of types of game balls other than baseballs and softballs. Heald, Tr. 126; Muhlfelder Dep., SPX 33, at 23. For example, J. Muhlfelder, Vice President of J. deBeer and Sons, Inc., a competitor of complainant, indicated that in developing a plastic core ball with a cork center, deBeer looked to golfball technology for guidance. SPX 33, at 30.

It is also appropriate in ascertaining the relevant art to consider the nature of the problem which confronted the inventor at the time of his invention. Graham, 383 U.S.P.Q. at 196. Here, Mr. Heald has testified that the impetus was a desire to develop a new type of ball construction based on his experience in molding plastics, which would enable complainant to compete in the top of the line or more expensive softball market. Heald, Tr. 121. Accordingly, it would have been natural to examine developments in all areas of ball and plastics technology in attempting to arrive at a solution to this problem

Thus, even though the invention of the '295 patent is directed specifically to the field of softballs and baseballs, each of the above factors supports the conclusion that the relevant art for the purpose of evaluating obviousness is the art in the field of balls generally and use of plastic materials in constructing balls. FF 94.

(b) Content of the Prior Art.

Of the prior art references cited by the PTO during examination

of the '295 patent, the following are the most pertinent:^{16/}

(i) Dillon -- U.S. Letters Patent No. 3,069,170 (SX 7).

Dillon discloses a ball formed of multicellular foamed polyethylene, polypropylene, or copolymer for golf, baseball, softball or other use the advantages of which over prior balls are, among others, resistance to "repeated impact," excellent weight "uniformity," and "balance." The patent's specification teach a way to fabricate balls by placing a polymer mixture and blowing agent into a mold.

(ii) Grau -- U.S. Letters Patent No. 2,138,004 (SX 10).

Grau discloses a cork core softball around which a stitched leather cover is applied.

(iii) Bonk -- U.S. Letters Patent No. 3,644,158 (SX 13).

Bonk discloses the method of making rigid but resilient structural polyurethane foam in a variety of shapes in a one piece molding process wherein the core has uniform closed cells and a microcellular skin is formed by the pressing of the expanding polyurethane foam against the walls a enclosed mold.

^{16/} Other patents cited as references during prosecution of the '295 patent were Fegan (2,081,531) (SX 9), Fechner (3,185,476) (SX 11), and Holtvoight (3,518,786) (SX 12).

(iv) Gentiluemo -- U.S. Letters Patent 3,940,145 (SX 14).^{17/}

Gentiluemo discloses a polyurethane centered golf ball approved by the United States Golf Association for par three golf courses. The ball is designed to have the same "click" sound and simulate the flight pattern of regulation balls molded in the same or similar way as the core of the ball in the '295 patent. The differences between this patent and the '295 patent are that in the '295 patent the polyurethane core is covered with leather, whereas there is no cover on the polyurethane or other material of the Gentiluemo patent, and the core is of a size suitable for use as a softball rather than a golf ball.

Other relevant prior art references that were not cited during prosecution of the '295 patent include:

(v) Kohn -- Canadian Patent No. 632,220 issued Dec. 5, 1961 (SX 5).

Kohn discloses a new and improved baseball and softball core and method of making same. The core is comprised of 50 to 90 percent

^{17/} Although staff counsel suggests that Gentiluemo is not prior art as to the '295 patent because Gentiluemo's publication date, February 28, 1976, is later than the filing date of the '295 patent's parent application, the examiner listed it as prior art. Moreover, the relevant date is not the date of filing of the parent application but the filing of the continuation-in-part '705 application, because the claims made in the '203 application were rejected and then granted after modifications made in the '705 application. The date of filing of the '705 application is February 20, 1976, and the date of filing of Gentiluemo as listed by the examiner is February 28, 1974. SX 111.

polyurethane (including a polyisocyanate and a poly-functional material) and a 10 to 50 percent filler material consisting of cotton flock and micro-ballons. The stated object of this invention is to produce a ball (baseball or softball) which when covered with an outer protective coating, such as vinyl or any other suitable covering, will produce a ball exhibiting the flight characteristics and the "crack" sound of prior art balls. Kohn is obviously more relevant to the subject matter of the '295 patent than the prior art cited by the PTO.

(vi) Pooley -- U.S. Letters Patent, No. 2,743,931 issued May 1, 1956 -
(SX 6).

Pietraszek -- U.S. Letters Patent No. 2,753,599 issued July 10,
1956 (SX 8).

These references disclose a method of making a ball (either softball or golfball) which is designed to closely simulate "regulation balls." The ball contains a core of expanded cell plastic dipped in nylon to form an outer coating. The ball is designed for practice and to simulate the flight pattern of regulation balls with improved dimensional stability. These references are more relevant to the subject matter of the '295 patent than the prior art cited by the PTO because they disclose molded plastic core softballs designed to simulate the flight pattern of regulation balls.

(vii) Holley -- U.S. Letters Patent No. 3,647,229 (SX 89).

Holley is directed to a painted golf ball structure and method for making same. It pertains most directly to a method of painting solid polyurethane golf balls, but contains claims directed to a solid, painted polyurethane ball. Holley appears to be at least as relevant as the art cited by the examiner during prosecution of the '295 patent because it shows use of a polyurethane core in a ball construction.

(2) Differences Between the Claimed Subject Matter and the Prior Art.

The claims of the '295 patent at issue here disclose a composite softball having the appearance, physical characteristics, and dimensions of a conventional softball comprising: (1) a core made from flexible and resilient polyurethane foam; and (2) a leather stitched cover. FF 97.

The use of a leather stitched covering with a softball is specifically disclosed by Grau. FF 101. Leather and vinyl or other synthetic materials are obvious substitutes for one another.

Kohrn discloses polyurethane foam as a suitable substance for use in formulating softball cores, although it teaches the combination of polyurethane and filler material in a softball core. FF 98. Specifically, claim 5 of the Kohrn patent teaches that the filler content should comprise 10 to 50 percent of the finished core. The objective of the Kohrn patent is to produce a ball of "homogeneous" construction, which is "durable, pliable, yet rugged," and has the flight characteristics and "crack" sound of prior art

balls. It suggests that a cover of vinyl or other suitable material could be applied to the core, although the preferred embodiment uses a uniform non-stitched plastic vinyl coating. SX 5, col. 1, lines 38-50; col. 5, line 16, col. 6, line 18.

Since a "suitable cover" in view of the prior art could include either a vinyl or leather cover,^{18/} the only difference between Kohn and the '295 patent is the inclusion in the plastic material of 10 to 50 percent filler. If the filler is removed from Kohn there are no differences between the two patents. It appears that the claims of Kohn would anticipate the '295 patent. For example, in claim 8 of the Kohn patent, a molded baseball or softball core is claimed which is created by placing a mixture of polyurethane and diisocyanate and filler "in a mold having an inner spherical surface . . . [to] produce a solid, impact resistant, durable, tough core adaptable for use in a baseball [or softball]." SX 5, at 4. The polyurethane core in the '295 patent reads on claim 8 of the Kohn patent and the '295 patent merely eliminates one element of Kohn, the filler.^{19/}

^{18/} Mr. Heald also appears to hold this view. SX 1, at 34.

^{19/} Pietraszek, Pooley, and Dillon relate to practice or play balls fabricated from plastic materials which simulate the appearance of regulation balls. Holley suggests solid polyurethane as a suitable substance for forming ball cores. They are very similar to the Heald patent, but not quite as close as Kohn.

Elimination of the filler is obvious in view of Holley, Gentiluemo, and Bonk. FF 104-05. In Bonk, the prior art is described as follows:

recently the production of self-skinned rigid polyurethanes has been described. These foams are derived in a single molding operation from a polyurethane foam reaction mixture and are molded under such conditions that an outer noncellular skin is produced on the surface of the foam which contacts the mold walls. The inner core of the molded object is cellular. The production of such self-skinned polyurethane foams, otherwise known as integrally skinned foams, represents a marked advance in the art in that it greatly simplifies the production of molded structural units of a wide variety of shapes. However, the skinned foams so produced suffer the disadvantage that they have relatively low structural strength properties and, more particularly, have low resistance to deformation by heat. The number of applications to which the material can be put is therefore limited.

We have now provided a novel structural material which combines the advantages of fabrication by molding in a one-step procedure, with high structural strength (Emphasis added.)

SX 13. Until the Bonk patent was issued in 1972, the durability problem involved in producing a softball polycore was not solved. Heald, Tr. 144-46; SX 1, at 17. Before this problem was solved in 1973 the "balls failed after little usage and would not hold their shape well." SX 1, at 16-17. Mr. Heald does not recall how the durability problem was solved. Heald, Tr. 145.

(3) Level of Ordinary Skill.

The Court of Appeals for the Federal Circuit (CAFC) has indicated that the following factors may aid in developing a picture of the level of skill for the ordinary person in an art:

- (1) the educational background of the persons working in the field;
- (2) the rapidity with which innovations are made;
- (3) the sophistication of the technology involved; and
- (4) the types of problems encountered in the art.

Where the prior art reflects the level of skill in the art it may be relied upon and expert testimony may not be required. Chore Time Equipment Inc. v. Cumberland Corp., 713 F.2d 774 (Fed. Cir. 1983).

An examination of the game ball art, and particularly the softball art, reveals that the level of skill of the ordinary person in the art is relatively low. Persons involved in product development in the ball field do not appear to possess any specialized or specific training or educational backgrounds. James Muhlfelder testified that his company, J. deBeer & Sons, employs one person who is devoted to research and development. This employee has no engineering degree and has developed his knowledge of ball construction and technology during his 25 year tenure with the company. SPX 33, at 24. Mr. Muhlfelder, with a liberal arts degree and an international economics background, has participated in ball development. Id. Similarly, Frank Hardy, President of Diamond Sports, with a background as a physical education instructor and experience as a ball player, has developed baseballs and softballs. Hardy, Tr. 260.

Jesse Heald, who has a degree in aerospace engineering and six years experience as a resident engineer dealing with plastics (Heald, Tr. 14, 123), possesses a more technical background than that of Messrs. Muhlfelder and

Hardy. Indeed, Mr. Heald's qualifications appear to exceed, rather than approximate, those of persons of ordinary skill in the art. Thus, as complainant's counsel noted during the course of the hearing, Mr. Heald should be considered a person of "more than ordinary skill." Tr. 237.

The fact that persons are able to engage in softball product development without specific technical training is an indication of the level of sophistication and the nature of problems encountered in the field. Evidently, the level of technical sophistication is not great. The relevant prior art reflects, however, that persons of skill in the art were aware that plastics technology could be applied to ball construction.

The ball game art is not one in which innovation has been frequent. In the softball field, four major innovations have occurred in the last 65 years: (1) introduction of the kapok ball in the 1920's; (2) introduction of the cork ball in the 1960's; (3) introduction of the polyurethane core ball in 1974; and (4) introduction of an E.V.A. surlyn plastic centered ball about two years ago. SPX 33, at 14.

The profile of the person of ordinary skill that emerges from the factors discussed above is of a person with a college degree who is employed in the game ball industry. He or she is essentially a layperson that has gained experience over time in the manufacture and production of game balls and would have been aware of the use of plastic materials in ball construction.

(4) Secondary Considerations.

Secondary considerations are also assessed in evaluating nonobviousness under § 103. These considerations include:

- (1) commercial success of products produced under the patent;
- (2) long felt but unresolved need for the patented invention;
- (3) failure of others to arrive at a solution to the problem solved by the patented invention; and
- (4) industry acquiescence in the validity of the patent.

Graham, 383 U.S. at 17-18.

Some of the secondary considerations support the conclusion of obviousness while others do not. First, complainant's polycore ball has enjoyed considerable commercial success since its introduction into the market. Heald, Tr. 32, 731. Complainant was able to sell 20,000 of its patented polyurethane core softballs in the first year following the product's introduction. FF 107; Heald, Tr. 731. In 1983, 38.4 percent of all softballs sold in the United States are polyurethane core softballs with leather covers. FF 107, 165.

There is no evidence that complainant's introduction of the polycore was preceded by a long-felt need in the softball industry to find a synthetic substitute for the traditional cork or kapok softball. FF 57, 108; Heald, Tr. 125. While the industry, with the notable exception of Diamond Sports, has avoided infringing the '295 patent, it is unclear whether the industry's position can be interpreted as acquiescence to the patent's validity. The principal competitors have developed alternative type of plastic-core

softballs -- the Surlyn and Dyna-Core balls -- which they believe are more desirable balls. Muhlfelder Dep., SPX 33, at 23-27.

Diamond Sports has been given a license as part of a settlement agreement in this investigation which provides that if complainant obtains a general exclusion order, it will pay a fee of _____ per dozen for polyurethane core softballs imported into the United States.

_____ The royalty rate of _____ per dozen is lower than the fee originally sought from Diamond Sports and others (Heald, Tr. 199, 230) and constitutes about _____ percent of the selling price of complainant's polyurethane softballs. SX 39. It would be an understatement to say that the royalty to be received is .20/

Spalding, the only company other than Diamond Sports to have taken an express license under the patent, appears to have accepted a license at a nominal rate in order to avoid the high cost of litigation. FF 109-11; Heald, Tr. 182, 192, 218; SX 45; SX 67-68. Another so-called licensee, Rawlings, declined an express license and opted to purchase its requirements for cores

.20/ As part of the licensing arrangement, complainant promises

C
C
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C

. See Opn., at 74-79.

from complainant. FF 112; Heald, Tr. 225. Similarly, complainant's other "licensees," including Wilson, Regent, Steele, McGregor, and Seamco, are implied licensees. FF 113-14; 180; Heald, Tr. 211.

Although plastic companies familiar with polyurethane foam systems, such as Reynolds Chemical and Freeman Chemical, were working at the behest of complainant to develop a polyurethane core for softballs, complainant in actuality was not seeking to duplicate the existing conventional softballs but to produce a livelier and more durable ball. After the commercial success of this ball competitors developed their own plastic-core lively softballs.

Thus, on balance, the secondary considerations do not support nonobviousness. There has been commercial success, but there has been no long felt need or failure of others to find a solution to a problem solved by the '295 patent. There also has been no industry acquiescence.

(5) Conclusion As to Obviousness.

As the CAFC has noted, the question of nonobviousness is a simple one to ask but difficult to answer. CAFC precedent instructs that the proper analysis of the nonobviousness question begins with the presumption that the person of ordinary skill in the art at the time of the patentee's invention is presumed to have before him all of the relevant prior art. The next inquiry is whether, armed with this information, it would have been nonobvious to this person of ordinary skill in the art to coordinate the teachings of the prior art elements in the same manner as the claims in suit. Orthopedic Equipment, 217 U.S.P.Q. at 199.

The CAFC has cautioned that the strong temptation to rely on hindsight in evaluating obviousness must be resisted:

It is wrong to use the patent in suit as a guide through the maze of prior art references in the right way so as to achieve the result of the claims in suit. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law.

Id. The court has also cautioned that obviousness cannot be established by combining the teachings of the prior art absent some suggestions or incentive to do so. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572 (Fed. Cir. 1984).

In the present investigation, the prior art does suggest that the references could be combined in such a way as to produce a softball suitable for use in official league play. Opn., at 47-49. Also, the Kohn ball core is essentially indistinguishable from the '295 patent ball core. Kohn anticipates Heald since merely dropping one element of the Kohn combination -- the filler -- could not avoid infringement. Kohn discloses a "suitable cover" for the core which obviously could include leather. The Kohn softball core is designed to simulate the flight of traditional balls. Removal of the filler in the Kohn core is also obvious in view of Dillon, Holley, and Gentiluemo, and the disclosure of new structural polyurethane foam in Bonk.

The evidence adduced by staff counsel has overcome the presumption of validity, and the '295 patent is obvious and invalid under 35 U.S.C. § 103.

G. Unfair Acts - Infringement of the '295 Patent

The principal respondent and importer of the alleged infringing softballs, Diamond Sports, has been granted a license by complainant as part of a settlement in this investigation. The settlement does not constitute a determination of whether there has been a violation of § 337 of the Tariff Act of 1930, as amended. Nevertheless, under certain circumstances, a settled respondent's importations and sales should be taken into account in determining whether a violation of § 337 has occurred in an investigation.

Certain Trolley Wheel Assemblies, Views of the Commission, Inv. No.

337-TA-161, at 8-11 (Aug. 29, 1981). As indicated below, it does not appear appropriate to take into account Diamond Sports' importations. Opn., at 71-79. For purposes of judicial economy and efficiency and in order to properly assess the conduct of respondents Tusa and Success Chemicals, however, the administrative law judge will consider whether Diamond Sports has committed unfair acts . . .

The unfair acts alleged are infringements of the '295 patent. If that patent is valid, and for purposes of this discussion we will assume its validity, the initial question is whether Diamond Sports has caused softballs to be made and sold which have infringed claims 3, 4, or 5 of the '295 patent. Mr. Hardy, President of Diamond Sports, has himself provided the answer to this question: When asked if his polycore balls have essentially the same qualities as a conventional softball, Mr. Hardy responded, if it is the proper COR ball. Thus, we must determine which balls duplicate the construction and performance characteristics of a conventional softball.

Only two sources exist in Taiwan for the manufacture of polyurethane
C cores, Success Chemicals Co. and Mansui Chemplas Co. FF 219;
Diamond Sports' softballs are made entirely from cores supplied by Success
C Chemicals (Hardy, Tr. 274) and Diamond Sports through Tusa
C Opn., at 74-78.

There is some evidence that cores manufactured by Mansui have been
manufactured into softballs and shipped into the United States and that more
may be coming. FF 235-40. Complainant alleges that the balls with the Mansui
cores infringe the '295 patent. There is a substantial question whether the
quality of the Mansui core renders it unusable for league play and
consequently not within the claim language of the '295 patent. Mr. Tuten, a
chemist and expert witness called by complainant, examined what is believed to
be a Mansui core by gouging out some of the material and inspecting the
condition of the core interior. FF 119; Tuten, Tr. 525-31; CPX 11. He stated
that while the materials used appear to be good, the quality of molding
appeared to be poorer than he could produce in the laboratory; i.e., without
use of the automated pour machine that significantly improves the quality of
mixing. Tuten, Tr. 529. The machining of the mold used to make the core is
poor and rough spots on the inside of the mold tend to cause air entrapment,
which may affect the performance of the ball. Tuten, Tr. 535-36. What
appears to be poor molding can also result from poor mixing. Poor mixing can
result in nonuniform density and hardness, leading to a core which would
exhibit inconsistent physical properties such as hard spots, soft spots, or

The claims of the '295 patent do not include all softballs with a polyurethane core and leather cover as claimed by complainant (Reply Br., at 9), but only those which duplicate conventional softballs and are usable in organized league play. The evidence as described above shows that the Mansui core is unreliable in its rebound qualities and lower or deader than even the restricted flight ball. Therefore, softballs made from the Mansui polyurethane cores do not duplicate conventional softballs and are not usable in organized league play. Softballs made from this core do not infringe claims 3, 4, or 5 of the '295 patent.

The more difficult question is whether leather covered softballs using Success Chemicals' polyurethane cores infringe the '295 patent claims. FF 118. When asked if Diamond Sports' softballs duplicate the essential characteristics of the conventional softball, Mr. Heald indicated this was true for the ball with equivalent rebound characteristics if it is the proper COR ball. Rebound is one of the essential features of a ball's playability. In slow pitch soft ball, the game in which the polycore ball is used, virtually everyone up at bat hits the ball. FF 34. Thus, rebound off the bat and off the playing field is crucial. Diamond Sports makes four balls, each with a different COR rebound quality, 0.44; 0.48; 0.50, and 0.52.

Mr. Heald stated that the 0.44 COR ball is "deader" than the "conventional" ball. Thus, this ball would not duplicate the essential characteristics of the conventional softball and would not infringe the '295 patent. However, Diamond Sports' mid-field 0.48 COR ball appears sufficiently

close to the conventional cork ball so that it could be said to functionally duplicate a conventional ball.^{23/}

Complainant alleges that higher COR polycore softballs, those that rebound more than "conventional" softballs, are covered by the '295 patent under the doctrine of equivalents. Tr. 112. The doctrine of equivalents allows a patent holder to hold as an infringement a product or process that does not correspond to the literal terms of the claims of the patent but performs substantially the same functions in substantially the same way to obtain the same result. The purpose of the doctrine is to prevent others from practicing frauds on patents. Chisum, supra, § 18.04.

Application of this doctrine is determined by the degree of the invention. Chisum, supra, § 18.04(2). Pioneer patents receive the broadest protection while small improvements receive fewer equivalents. John Zink Co. v. National Airoil Burner Co., 613 F.2d 947, 205 U.S.P.Q. 494 (5th Cir. 1980); Azvim Indus., Inc. v. Berns Air King Corp., 525 F.2d 182, 188 U.S.P.Q. 49, 51, 52 (7th Cir. 1975) (patent receives narrow range of equivalents because it was at best minor improvement over prior art). Patents which consist of continuations of old elements are often classified with narrow or small improvements and thus receive fewer equivalents than other inventions. Chisum, supra, § 18.04(2).

^{23/} As discussed above, however, the evidence concerning the rebound characteristics of the conventional cork softball is confusing and conflicting.

Claim 3 specifies that the '295 patent covers softballs with polyurethane cores and performance characteristics which essentially duplicates those of "conventional" softballs usable in league play. The rebound characteristic, or "resilience" of these softballs is an important performance criteria. Claim 3 specifically limits patent coverage to those softballs which have a rebound characteristic or "liveliness" equivalent to conventional balls. Nevertheless, complainant argues that respondents' softballs, which are livelier than conventional softballs, the COR 0.50 and 0.52 balls, are covered by the patent by virtue of the doctrine of equivalents.

The burden of persuasion rests on complainant. Complainant must establish by a preponderance of the evidence that respondents' more lively softballs are the physical or functional equivalent of the patented softballs. Duplan Corp. v. Deering Milliken, Inc., 197 U.S.P.Q. 342, 349 (D. S.C. 1977) aff'd in part (patent validity), rev'd in part (antitrust) 201 U.S.P.Q. 641 (4th Cir. 1979), cert. denied 205 U.S.P.Q. 96 (1980). This burden has not been met.

One of the elements of Claim 3 is that the rebound characteristic of patented balls is equivalent to that of "conventional" softballs. Respondents' COR 0.50 and 0.52 softballs are more lively, i.e., have a greater than "conventional" rebound characteristic. Thus, one of the patented elements is clearly missing. When one of the patented elements is missing, the doctrine of equivalents cannot be applied. Id. The '295 patent never claimed to cover all softballs with a polyurethane core regardless of resiliency. Claim 3 limited the '295 patent to those softballs performing

like "conventional" softballs. Therefore, respondents' 0.50 and 0.52 COR softballs which admittedly have greater resiliency than "conventional" softballs are not covered by the patent under the doctrine of equivalents.

Assuming for discussion purposes the validity of the '295 patent and the absence of the license agreement between complainant and Diamond Sports, I would find that Diamond Sports and Tusa infringed claim 3 of the '295 patent in the manufacture and sale of the 0.48 COR ball. I would also find that Success Chemicals is a contributory infringer in that it manufactures the 0.48 COR ball cores knowing they will be made into softballs by Tusa and will be shipped to Diamond Sports for sale in the United States. Softballs made from the Mansui polyurethane core do not duplicate conventional softballs and are not usable in league play; therefore, they do not infringe the '295 patent.

IV. Importation and Sale

To invoke the subject matter jurisdiction of the Commission and to support a finding that a violation of § 337 exists, complainant must establish that the accused product has been imported and/or sold in the United States. 19 U.S.C. § 1337.

The evidence of record indicates that all remaining respondents to this investigation have imported, sold, or offered to sell allegedly infringing polyurethane core softballs in the United States except Regent Sports. The evidence submitted by complainant as to Regent Sports demonstrates that respondent had imported from Taiwan a finished polyurethane core softball with

a leather cover. CPX 1-2. Complainant, however, after inspecting the core of the Regent Sports softball, testified that the 1979 date on the core indicated that the core was probably manufactured by Lannom. FF 270. Complainant has also testified that Regent Sports had purchased from complainant approximately 400 polyurethane cores pursuant to an implied license agreement to produce softballs. FF 180. The package which contained Regent Sports' softballs states that the softball has a "Polycore" and is produced under complainant's '295 patent. FF 271.

that Regent Sports had a polyurethane core softball manufactured in Taiwan is not necessarily inconsistent with the above facts; the Regent Sports softball states on its cover that it is made in Taiwan. It could have been assembled in Taiwan from Lannom cores supplied by Regent Sports from the United States. Therefore, the evidence indicates that Regent Sports purchased from complainant under an implied license to produce softballs with polyurethane cores, shipped those cores to Taiwan in order to produce a finished softball, then imported the finished polyurethane core softballs back to the United States where they were appropriately advertised under the implied license as produced under the '295 patent.

DOMESTIC INDUSTRY

The Commission has customarily defined the domestic industry in patent-based investigations as the domestic operations of the patent owner and its licensees devoted to the exploitation of the patent. Certain Methods for

Extruding Plastic Tubing, Inv. No. 337-TA-110, 218 U.S.P.Q. 348 (1982);
Certain Slide Fastener Stringers and Machines and Components Thereof, Inv. No.
337-TA-85, 216 U.S.P.Q. 907 (1981); see H.R. Rep. No. 93-571, 93 Cong., 1st
Sess. 78 (1973). The domestic industry is not limited to manufacturing per se
but encompasses distribution, research and development, and sales. Certain
Personal Computers, Inv. No. 337-TA-140, at 38 (1984); Plastic Tubing, supra.
The Commission also does not adhere to any rigid formula in determining the
scope of the domestic industry as it is not precisely defined in the statute,
but will examine each case in light of the realities of the marketplace.
Slide Fastener Stringers, supra; Certain Apparatus for the Continuous
Production of Copper Rod, Inv. No. 337-TA-52, 206 U.S.P.Q. 138 (1979).

Lannom employs approximately 237 individuals at its Tullahoma, Tennessee,
facility who are primarily engaged in the production of polyurethane cores,
the making of leather softball covers, the application of leather covers to
polyurethane cores, the packaging and shipping of finished softballs, and the
administrative and management duties surrounding production and sale of
softballs. FF 124. Lannom operates a tannery in Tullahoma, Tennessee, which
employs 100 individuals who produce all the leather covers used by Lannom for
polyurethane core softballs sold under the WORTH trademark. FF 131. Lannom
also employs 20 individuals to sell the polyurethane core softball throughout
the United States. FF 130. Finally, Lannom conducts extensive research and
development with regard to the technology associated with polyurethane core
softballs. FF 135-36.

In 1983, Lannom products accounted for 40 percent of the total United States market for softball products. FF 166. Lannom's 1983 annual gross profits from the sale of polyurethane core softballs equaled percent of the company's total gross profits and percent of its total sales. FF 169, 171. Of the softballs produced by Lannom in 1983, percent were polyurethane core softballs. FF 168. percent of the softballs sold by Lannom are polyurethane core softballs with leather covers. FF 167, 171.

Lannom has granted a number of companies either an expressed or implied license to manufacture polyurethane core softballs, including McGregor Athletic Products, the Wilson Division of PepsiCo, Spaulding Sports Company, Rawlings Sporting Goods Company, Regent Sports, Steele Sports, Seamco, and AMF. FF 180. The administrative law judge, however, is unable to find that any of complainant's licensees should be considered part of the domestic industry in this investigation. As of the institution of this investigation, only one company, the Wilson Division of PepsiCo, continues to purchase polyurethane cores for softballs from Lannom. FF 181-82. Though there is evidence of record that Wilson has purchased and plans to purchase a significant quantity of polyurethane cores from Lannom (FF 181-82), there is no substantial evidence that Wilson utilized these cores to manufacture a polyurethane core softball with a leather cover to compose a conventional softball usable in official league play. See FF 183. The only exhibit of a Wilson softball features a polyurethane core enclosed by a nonleather cover. SPX 20.

All the components used in the manufacture, production, and assembly of polyurethane core softballs by Lannom originate from sources inside the United States. FF 137-38. The actual assembly of the polyurethane core softballs, however, takes place at complainant's facilities in Port-au-Prince, Haiti, Port Cortis, Honduras, and Lucia, Jamaica. FF 155. Lannom sells the polyurethane cores together with the leather covers and materials needed to stitch and adhere the covers to the cores to its offshore facilities operated by affiliated companies. FF 156. The polyurethane cores are then covered to produce a finished product and re-sold to complainant. FF 155-56, 161. Complainant stamps and packages the finished product in the United States and distributes it throughout the country. FF 140.

Section 337(a) requires that the unfair methods of competition and unfair acts have the effect or tendency to injure substantially an industry in the United States. The Commission has clarified the definition of a domestic industry by requiring an inquiry into the nature and significance of complainant's business activities in the United States as they relate to the article in question. Certain Miniature, Battery-Operated, All-Terrain, Wheeled Vehicles, Inv. No. 337-TA-122, Comm'n Dec., at 5-11 (1982); Certain Airtight Cast-Iron Stoves, Inv. No. 337-TA-69 (1981). A finding that complainant utilizes offshore facilities to assist in the production of the patented article does not in and of itself preclude the administrative law judge from making an initial determination that complainant's domestic operations constitute a domestic industry under § 337. Such a determination

requires additional analysis, however, when the exploitation of the patent takes place outside the United States.

Claim 3 of the '295 patent defines the relevant industry as those domestic operations designed to exploit the production of (1) a composite ball, (2) having the appearance, physical characteristics, and dimensions of a conventional softball, (3) comprising a spherical core member formed of flexible and resilient molded polyurethane foam and a leather cover portion enclosing and stitched over the core, (4) such that the composite ball has essentially the same rebound, weight, hardness, size, feel, and sound qualities as a conventional softball, (5) so as to be usable in organized league play. FF 47. The '295 patent therefore is a combination patent. A combination patent protects only against the operable assembly of the whole article and not the manufacture of its parts. Deepsouth Packing Co. v. Laitram Corp., 406 U.S. 518 (1971), rehearing denied, 409 U.S. 902 (1972). The activities of Lannom in the United States, including the molding of polyurethane cores and the cutting of leather into figure eight patterns with stitch holes stamped into the leather, are not protected under the '295 patent. It is not until the cores are stitched and adhered to the leather covers to constitute a conventional softball usable in official league play that there allegedly exists an invention under the '295 patent.

Section 337, however, is an international trade statute and not a patent statute. It is not designed to protect patents per se but domestic industries. There exists in the United States a significant domestic industry

that is inextricably tied to the eventual exploitation of the '295 patent. For example, the stated cost in 1984 to Worth Haiti to purchase the total materials to produce a polyurethane core softball from Worth Tullahoma was per dozen. FF 158. The per dozen price for the polyurethane core slug was ; thread, ; leather cover, ; cement, ; freight, ; packing, ; and hot press, . CX 21(C). The total labor cost to Worth Haiti for the sewing and cleaning of the finished polyurethane core softballs was . FF 159. Worth Haiti sold the finished softballs to Worth Tullahoma for per dozen. FF 161. The profit to Worth Haiti therefore was . FF 162. After Worth Tullahoma purchased the finished softballs, it incurred the following additional costs per dozen units: duty, ; freight, ; cleaning/grading, ; packing materials, ; packing labor, ; stamping labor, . CX 21(C). The total cost to Worth Tullahoma in 1984 for a dozen finished polyurethane core softballs was , which includes the profit to Worth Haiti. FF 163.

For this reason I find that Lannom's domestic operations related to the manufacture, research, and development of the component parts for the production of a polyurethane core softball with a leather cover demonstrating the characteristics of a convention softball usable in official league play, and the distribution and sale of this same finished softball, constitute a domestic industry under § 337.

VI. Efficient and Economic Operation

In order to prevail under § 337, a complainant must establish that the relevant domestic industry is efficiently and economically operated. The guidelines set forth by the Commission to assess whether a complainant's domestic industry is efficiently and economically operated include: (1) use of modern equipment and manufacturing facilities; (2) investment in research and development; (3) profitability of the relevant product line; (4) substantial expenditures in advertising, promotion, and development of consumer goodwill; and (5) effective quality control programs. E.g., Certain Methods for Extruding Plastic Tubing, Inv. No. 337-TA-110, 218 U.S.P.Q. 348 (1982); Certain Coin Operated Audio Visual Games and Components Thereof, Inv. No. 337-TA-105, 216 U.S.P.Q. 1106 (1982); Certain Slide Fastener Stringers and Machines and Components Thereof, Inv. No. 337-TA-85, 216 U.S.P.Q. 907 (1981).

The machinery and equipment used by Lannom in the fabrication, packaging, and marketing of polyurethane core softballs are state of the art and valued at approximately . FF 128, 134. The raw materials used for production of polyurethane cores are stored in large heated tanks, each of which contains an agitator to ensure the chemicals remain homogeneous. When production begins, the materials are pumped into the mixing chamber of a pour machine where an auger type mixer combines the two ingredients, isocyanate and polyol, at high speed. FF 142. A timing mechanism meters the amount of isocyanate and polyol entering the mixing chamber to mix the proper ratio of the ingredients. FF 143. Following thorough agitation, the mixture is

dispensed into the lower half of a two-piece spherical mold. The top half of the mold is then placed on the lower half. The mold is spun to coat the interior, clamped shut, and placed on a four-tiered rotating carousel developed by complainant specifically for use in molding polyurethane cores. The core is cured as it rotates in the carousel. FF 144. Employees pull each polyurethane core and perform a quality inspection. FF 145.

Lannom's state of the art approach to molding polyurethane softball cores is a result of ongoing research and development designed to improve the quality and consistency of its product. FF 135. Complainant is currently conducting research designed to expand the liveliness levels of polyurethane core softballs to satisfy new market demands and to develop a polyurethane core softball which will reduce injuries in youth softball leagues. FF 136.

C Lannom has increased its share of the total softball market from
C percent in 1978 to percent in 1983. FF 168. As complainant's percentage
share of the total softball market increased, softball sales as a percentage
share of Worth Sports total sales increased. FF 169. For example, in 1978,
C softball sales comprised percent of Worth Sports total sales; in 1983,
C softball sales comprised percent of Worth Sports total sales. FF 169.
C percent of the softballs now sold by Worth Sports are
polyurethane core softballs with leather covers. FF 127. For 1981, gross
C profit on softballs equalled , or percent of total company gross
C profit; for 1982, , or percent of total company gross profit; and
C for 1983, , or percent of total company gross profit. FF 171.

The advertising and promotional expenses of Worth Sports from 1978 through
C 1983 demonstrate that it has spent over _____ for this six-year period
on promotional products, shows, advertising, and catalogs in an effort to sell
the polyurethane softball. FF 170.

As of 1983, polyurethane core softballs constituted 38.4 percent of the
total softball market in the United States. FF 165. Lannom possesses the
present capacity to fully satisfy current and future demand for polyurethane
core softballs. FF 154. Specifically, complainant now operates four of its
six injection molding machines in full time production of 12-inch polyurethane
softball cores and is able, within a short time span, to increase production
by employing additional shifts to operate the injection molding machines or by
converting its fifth and sixth machines to production of 12-inch polyurethane
softball cores. FF 146-53, 176-78.

For the foregoing reasons, I find that the domestic industry is
efficiently and economically operated pursuant to the provisions of § 337.

VII. Injury

As a final element in a § 337 action, complainant must show that the
respondents' unfair methods of competition and unfair acts have the effect or
tendency to destroy or substantially injure the domestic industry. 19 U.S.C.
§ 1337(a). Injury requires proof separate and independent from evidence of an
unfair act. Complainant must establish a causal relationship between
respondents' unfair acts and the injury suffered as a result of such acts.

Certain String Assemblies and Components Thereof and Methods of Their
Manufacture, Inv. No. 337-TA-88, 216 U.S.P.Q. 225, 243 (1981).

There has been substantial discussion by the Commission whether to include the importation and sale of allegedly infringing products by respondents who, after the institution of an investigation, have settled with complainant. See Certain Foam Earplugs, Notice of Commission Decision Not to Review, Supplementary Information, Inv. No. 337-TA-184 (Jan. 22, 1985); Certain Bag Closure Clips, Notice of Commission Decision Not to Review, Supplementary Information, Inv. No. 337-TA-170 (Sept. 7, 1984); Certain Trolley Wheel Assemblies, Views of the Commission, Inv. No. 337-TA-161, at 8-11 (Aug. 29, 1984). On October 19, 1984, the administrative law judge issued an Initial Determination which recommended that the Commission terminate this investigation as to respondents Diamond Sports. Order No. 16. Lannom and Diamond Sports had entered into a settlement agreement that granted respondent the exclusive right and license to import, use, and sell throughout the United States polyurethane core softballs as set forth in claims 3 through 15 of the '295 patent. Lannom retained the right to manufacture and sell softballs in the United States under its trade name. Id., at 1-2. Notice of the Commission's decision not to review this initial determination was published in the Federal Register on November 28, 1984. 49 Fed. Reg. 46,819. Pursuant to 19 C.F.R. § 210.51(b)(2), an order of termination based upon a licensing agreement shall not constitute a determination as to violation of § 337.

The Commission's recent decision in Trolley Wheel Assemblies overruled the administrative law judge's determination not to include importations by a

settled respondent in an assessment of injury because such an inclusion would be inconsistent with the Consent Order Agreement entered into by the parties.

Certain Trolley Wheel Assemblies, Views of the Commission, Inv.

No. 337-TA-161, at 7, 8 (Aug. 29, 1984); see id., Initial Determination, 61-62 (May 31, 1984). The Commission reviewed its earlier decision in Certain Food Slicers, Inv. No. 337-TA-76, and stated that consideration of a settled respondent's imports may be appropriate depending upon the facts presented.

Certain Trolley Wheel Assemblies, Views of the Commission, Inv. No.

337-TA-161, at 9-10 (Aug. 29, 1984), citing Certain Food Slicers, USITC Pub. 1159, at 19 (June 1981). The Commission specifically noted its disagreement, however, with the premise set forth in Certain Heavy Duty Staple Gun Tackers, Inv. No. 337-TA-137, that the imports of settled respondents are relevant in every instance. Id., at 10.

The Commission in Trolley Wheel Assemblies concluded that consideration of the importation by the settled respondent was appropriate because

(1) virtually all the infringing imports came from the settled respondent and
(2) the settled respondent was the importer, not the original source, of the infringing imports and the settlement agreement did not effect or limit the original source. Certain Trolley Wheel Assemblies, Views of the Commission,

Inv. No. 337-TA-161, at 10. The supplementary information provided by the Commission in its decisions not to review the initial determinations in Foam Earplugs and Bag Closure Clips goes beyond its determination in Trolley Wheel Assemblies. The Commission noted in those cases that before the imports of

settled respondents could be considered, there must be a finding of an unfair act with respect to the articles imported. Because the statements of the Commission in Foam Earplugs and Bag Closure Clips are provided as "supplementary information" and are not meant to alter the basic premise of the Commission's decisions in Food Slicers and Trolley Wheel Assemblies, these two cases will be interpreted to be consistent with Trolley Wheel Assemblies.

A respondent might be reluctant to enter settlement or consent order agreements pursuant to 19 C.F.R. §§ 210.51(b) and (c) if later, after a hearing in the investigation at which respondent was not represented, the Commission determined that the importation of certain articles by the settled respondent constituted an unfair method of competition. Rules 210.51(b) and (c) provide that orders based upon such agreements shall not constitute a determination as to violation of § 337. A finding that respondent had committed an unfair act, together with a finding that such imports injure the domestic industry, constitutes in effect a conclusion that the settled respondent violated § 337. Such a conclusion is antithetical to the Commission's purpose to affect amicable settlements between the parties and might lead to unintended legal consequences in other forums. The determination as to whether an unfair act exists should be directed to the original source of the imports if that source is not limited by the agreement between complainant and the settled respondent. Therefore, introduction of a settled respondent's importations provides secondary evidence as to the effect or tendency of the unfair acts committed by the original source to injure the domestic industry.

Diamond Sports is now a licensee of Lannom. The activities of Diamond Sports at this time no longer allegedly injure the domestic industry as defined under § 337. According to the evidence, Diamond Sports imports virtually all of the allegedly infringing products relevant to this investigation but is not the original source for these imports. FF 196-97, 203. Diamond Sports obtains all of its completed polyurethane core softballs from respondent Tusa. FF 204. Tusa purchases the polyurethane cores for its softballs from respondent Success Chemicals. FF 220. Respondents Keith Kleppe & Associates, Team West, George Tyler Enterprises, B.O. Mickelson & Associates, Dan Spika & Associates, Metts-Rupp, Dave Middleton & Associates, and Paul Shaughnessy & Associates, act as manufacturer representatives from which Diamond Sports products may be purchased. FF 220. For the following reasons, I find that an assessment of the importation and sale of allegedly infringing polyurethane core softballs with leather covers by settled respondent Diamond Sports is not relevant to a determination of injury in this investigation as to any of the remaining respondents.

Two companies in Taiwan produce polyurethane cores for balls. FF 219. One of these companies, Success Chemicals, is a respondent in this investigation.

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Tusa, located in Kaohsiung, Taiwan, has a facility approximately

C square feet in size and is engaged in the business of adhering and
stitching leather covers to polyurethane cores to produce finished softballs.

C FF 207-208.

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The respondent manufacturing representatives handle the DIAMOND baseball and softball on an exclusive basis. Hardy, Tr. 257; see FF 200. Diamond Sports has an oral agreement with each manufacturing representative as to commissions and terms for dismissal. Id. Each representative works in a set geographical area and solicits business for Diamond Sports' products. FF 200; Hardy, Tr. 258. The respondent manufacturing representatives only carry samples of polyurethane core softballs and have no inventory. Hardy, Tr. 258. These respondents do not distribute or ship softballs sold by Diamond Sports, or have any responsibilities other than soliciting sales for Diamond

Sports. Id. Diamond Sports' manufacturing representatives have never distributed polyurethane core softballs for any other company that imports such balls into the United States. Id., at 258-59. For the above reasons, complainant moved to terminate these respondent manufacturing representatives "in view of the fact that the only unfair acts alleged against these manufacturers' reps pertain to their agency relationship to Diamond and since Diamond has been terminated as a Respondent" Counsel for Complainant, Tr. 259.

According to Paragraph III of the Settlement Agreement entered into
C between Diamond Sports and Lannom,

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It is clear that the acts of
the respondent manufacturing representatives are limited to soliciting sales for Diamond Sports. These respondents fall within the provisions of Paragraph III of the Settlement Agreement as sublicensees of Diamond Sports who are necessary to effectuate the manufacture, sale, and distribution of its polyurethane core softballs. Diamond Sports is not in any way associated with the other remaining respondents or non-respondents involved in this investigation. FF 204.

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Moreover, complainant has stated that it no longer considers sales by respondents Tusa, Success Chemicals, and Complete Merchants to Diamond Sports as constituting unfair acts. Prehearing Conf. Tr. 12-13. Therefore, facts concerning the importations by Diamond Sports of allegedly infringing articles should not be considered in determining the effect or tendency of unfair acts to injure the domestic industry.

For this reason, the administrative law judge has decided not to include specific evidence as to the importations by settled respondent Diamond Sports in an assessment of injury.^{24/} The administrative law judge will refer, however, to the activities of Diamond Sports when they provide general evidence important as a whole to the determination of injury in this investigation.

A. Substantial Injury

Several factors are relevant to a determination of substantial injury to a domestic industry, including, but not limited to: (1) declining sales;

^{24/} The facts of Diamond Sports' importations, however, are clearly apparent in this opinion and the accompanying findings of fact. In summary, Diamond
(Footnote continued to page 80)

(2) lost customers; (3) decreased employment; and (4) decreased production and profitability. E.g., Certain Vertical Milling Machines, Inv. No. 337-TA-133 (1984); Certain Drill Point Screws for Drywall Construction, Inv. No. 337-TA-115 (1983); Spring Assemblies, supra, 216 U.S.P.Q. at 242-45. While the Commission requires that a causal nexus be established between the alleged injury and the unfair act in the importation of a product, the Commission also recognizes that "[u]nder patent law, a patent is a lawful monopoly, and the owner of a valid patent is entitled to 100 percent of the domestic market for the product covered by the patent. Thus, all sales of infringing articles covered by a patent rightfully belong only to the patentee." Spring Assemblies, supra, 216 U.S.P.Q. at 243.

Lannom has not experienced a decline in its sales of polyurethane core softballs with leather covers. Lannom over the last four years has steadily increased its sale of polyurethane core softballs. FF 174. In a ten-month period from July 1, 1983, through April 27, 1984, Lannom sold dozen polyurethane core softballs, close to dozen more than it sold during the twelve months of July 1, 1982, through June 17, 1983. FF 174. In comparison, Diamond Sports, the sole importer of any significance of allegedly

(Footnote continued from page 79)

C Sports began importing polyurethane softballs to the United States
C FF 203. By October 1984, it sold dozen and
C had dozen in inventory. FF 196-97. The total importations up to that
C time were dozen. FF 231.

number of softballs sold. See Textron, Inc. v. U.S. Int'l Trade Comm'n,
Appeal No. 84-1261. The quantum of proof to establish substantial injury may
be less in a patent-based investigation than in one where the holder of rights
is not entitled to entirely exclude competitors from use, but even in
patent-based investigations "the domestic industry must normally establish
that the infringer holds or threatens to hold, a significant share of the
domestic market . . . or has made a significant amount of sales of the
articles." Id., at 20. Lannom has not identified for the record any
customers lost because of sales made by any company other than Diamond
Sports. FF 193.

There is no evidence in the record of decreased employment in the domestic
industry because of the activities associated with respondents and
non-respondent competitors.

Complainant has not suffered decreased productivity or profitability
because of the activities associated with respondents and other competitors.

C Gross profits for Lannom's polyurethane core softballs have because
C the average selling price per unit per order has FF 172.

Mr. Dale, general manager of the Worth Ball Division of Lannom, testified that

C this in gross profits may be explained by the fact that the

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FF 172.

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SX 88. Also,

the fact that complainant has demonstrated it has sufficient present capacity to meet the projected growing market demand for polyurethane core softballs (FF 154) does not demonstrate that there is an underutilization of the domestic industry. The capacity is based upon additional shifts or alteration of equipment. FF 146-53, 176-78.

For the foregoing reasons, I find that the effect of the importation and sale of allegedly infringing polyurethane core softballs with leather covers does not substantially injure the domestic industry.

B. Tendency to Substantially Injure

When an assessment of the market in the presence of the accused imported product demonstrates relevant conditions or circumstances from which probable future injury can be inferred, a tendency to substantially injure the domestic industry has been shown. Certain Combination Locks, Recommended Determination, Inv. No. 337-TA-47, at 24 (1979). Relevant conditions or circumstances may include foreign cost advantage and production capacity, ability of the imported product to undersell complainant's product, or substantial manufacturing capacity combined with the intention to penetrate the United States market. Certain Methods for Extruding Plastic Tubing, Inv. No. 337-TA-110, U.S.P.Q. 348 (1982); Reclosable Plastic Bags, Inv. No. 337-TA-22 (1977); Panty Hose, Tariff Comm'n Pub. No. 471 (1972). The legislative history of § 337 indicates that "[w]here unfair methods and acts have resulted in conceivable loss of sales, a tendency to substantially injure

such industry has been established." H.R. Rep. 93-571, 93 Cong., 1st Sess. 78 (1973), citing In re Von Clemm, 108 U.S.P.Q. 371 (C.C.P.A. 1955); see also Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n, 219 U.S.P.Q. 97, 102 (Fed. Cir. 1983).

(1) Foreign Cost Advantage.

Complainant's 1985 catalog price list offers polyurethane core softballs with a top grade leather cover as follows: (1) 1-50 dozen, \$49.32 to \$49.92 per dozen; (2) 51-95 dozen, \$45.12 to \$45.72 per dozen; (3) 96-299 dozen, \$44.28 to \$44.68 per dozen; and (4) 300 dozen and up, \$42.24 to \$42.84 per dozen. SX 88. By comparison, Diamond Sports offers similar quality polyurethane core softballs for its 1985 Early Order Program at lower price levels: (1) 1-99 dozen, per dozen; (2) 200-399 dozen, per dozen; (3) 400-599 dozen, per dozen; and (4) 600-999 dozen, per dozen. FF 202. Price lists, however, do not necessarily demonstrate cost advantages in the foreign production of an article vis-a-vis the domestic production of the same or similar article.^{26/}

The 1984 accounting cost to Worth Tullahoma to purchase from Worth Haiti a dozen completed polyurethane core softballs was . FF 161. Diamond Sports imports to the United States polyurethane core softballs purchased in

^{26/} Complainant has not reduced its prices to meet the prices set by Diamond Sports.

C Taiwan from Tusa for per dozen. FF 210. The total 1984 labor and
C material cost to Worth Haiti to produce a dozen completed polyurethane core
C softballs, however, was . FF 160. Therefore, the total profit in 1984
C including overhead accrued by Worth Haiti in its sale of these softballs to
C Worth Tullahoma was . FF 162. Worth Haiti has recognized a profit of
C for 1983, for 1982, for 1981, and for 1980. FF 162.
C Mr. Dale, general manager of the Worth Ball Division, explained these wide
C variations in profit as a result of

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C . FF 164.
C CX 21(C). It is therefore apparent
C from the record that the price paid by complainant to Worth Haiti is heavily
C affected by the degree to

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C The cost to Diamond Sports to purchase a polyurethane core softball in
C Taiwan of per dozen presupposes that the Taiwanese manufacturers set
C their prices based upon cost plus a profit margin. This price should be
C compared to the cost to Worth Tullahoma to purchase softballs from Worth Haiti
C absent the to Worth Haiti. The cost of labor
C and materials to Worth Haiti only amounts to per dozen. Still, the
C difference between Diamond Sports' purchase price and Worth Haiti's total
C cost, , demonstrates that

there exists to some degree a foreign cost advantage should a Taiwanese manufacturer of polyurethane core softballs with leather covers sell directly to the United States. See also Opn., at 88-91. The exact magnitude of that cost advantage, however, is unknown but appears small. The administrative law judge finds, therefore, that there is a foreign cost advantage in the production of a completed polyurethane core softball, though not as significant as alleged by complainant.

(2) Foreign Production Capacity.

The foreign capacity for the production of polyurethane core softballs with leather covers appears on the surface to be enormous but is actually limited by a number of factors.

The total production in Taiwan for polyurethane core baseballs and softballs exceeds dozen a month, or dozen polyurethane core balls a year. FF 239. Most of the balls produced with a polyurethane core are baseballs, however, and while stitching facilities are flexible enough in Taiwan to switch to softballs (FF 239), to do so makes the untenable assumption that these firms would stop total production of baseballs.

Companies or individuals also may solicit orders in the United States but may not as yet be in the business or may never go into business if they do not receive substantial orders.

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The appearance of a multitude

of companies soliciting completed polyurethane core softballs from Taiwan is therefore not truly representative of the number of companies actually in the business.

A number of Taiwanese manufacturers of completed polyurethane core softballs with leather covers have been named during this investigation. FF 251-58, 260-67. These companies are responsible only for adhering and stitching covers to polyurethane cores to make a finished softball. FF 251-58, 260-67. Only two companies in Taiwan, Success Chemicals and Mansui, produce polyurethane cores. FF 219. This fact immediately limits the potential size of the foreign production capacity no matter how many companies exist which attach covers to cores.

Secondary evidence indicates that Success Chemicals has the capacity to produce 120,000 dozen polyurethane cores a year. FF 223, 234. Less reliable hearsay evidence indicates that Mansui, which was never made a respondent to this investigation, has the capacity to produce 200,000 dozen polyurethane
C cores a year.^{27/} FF 234.

^{27/} The evidence regarding Mansui's production capacity is particularly unreliable. No witness has testified to observing that it has an automated pour machine and is in full production of polycores which are shipped to the United States. Only one or possibly two ball cores, identified as Mansui cores, have been shown in use in this country. Various smaller non-respondent companies are said to be selling polycore softballs in the United States, but
(Footnote continued to page 88)

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Opn., at 75-79.

The polyurethane cores produced by Mansui are noticeably inferior to those produced by Success Chemicals or complainant. The inferior Mansui core does not infringe the '295 patent because it is unusable for official league play. Opn., at 56-59. As such, leather covered softballs utilizing the Mansui polyurethane core do not compete with complainant's polyurethane core softballs.

For the above reasons, the foreign production capacity available does not have the tendency to injure substantially the domestic industry.

(Footnote continued from page 87)
no reliable evidence of the sales of such balls has been produced.

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This hearsay is not given much, if any, weight in the absence of any proof of significant sales in the United States of softballs with Mansui cores. If Mansui does not have an automated pour machine its production capacity would be very limited. See also Opn., at 56-59.

(3) Ability to Undersell.

A number of companies other than Diamond Sports have had polyurethane core softballs produced in Taiwan for the purpose of importation to and sale in the United States. FF 241, 269. There is insufficient evidence to conclude, however, that these companies undersell complainant's softballs.

C Coast Marketing, a catalog-type company, that it sold polyurethane core softballs with leather covers for \$32.50 per dozen. FF 268. Because Coast Marketing sells directly to retailers through mail or phone order, a large part of the difference in price between its softballs and the softballs sold by Lannom or Diamond Sports appears due to its lower overhead by reason of its different method of distribution. It also sells a lower quality ball. Opn., at 89. The evidence suggests that the market for softballs is price conscious. FF 43-45. It would therefore follow that if one company sells softballs at significantly lower prices, it would be able to capture a major proportion of the market should the other companies fail to follow suit. Diamond Sports offered softballs below the price quoted by complainant in order to take advantage of this market characteristic. Coast Marketing offers softballs at a price level dramatically lower than both Lannom and Diamond Sports. Coast Marketing has failed, however, to have any impact on the market for softballs even though it has been selling leather covered polyurethane core softballs produced in Taiwan for a year and a half to two years longer than Diamond Sports. FF 269.

For example, Coast Marketing's impact on the polyurethane core softball market is so insignificant that Mr. Dale, general manager for the Worth Ball Division, had not seen a Coast Marketing softball until two weeks prior to the hearing in this investigation. Dale, Tr. 600. Mr. Hardy also testified that the Coast Marketing softball does not appear to be a top grade ball. Hardy, Tr. 417. It is probably made with a Mansui core and therefore has unreliable flight characteristics making it unusable for league play. Opn., at 56-59. It also has an inferior leather cover. CPX 11. The example of a Coast Marketing polyurethane core softball on record therefore demonstrates that this company's softball does not compete with the domestic industry at issue in this investigation. As such, the evidence that Coast Marketing sells a polyurethane core softball for \$32.50 is irrelevant to a determination of whether there is a tendency to substantially injure the domestic industry.

There are a number of Taiwanese firms that have offered to sell wholesale polyurethane core softballs with leather covers. FF 246, 257, 259, 262. Respondent Complete Merchants has offered polyurethane core softballs at \$22.92 per dozen, F.O.B. Taiwan (though there is some evidence to suggest that Complete Merchants has in the past offered to sell softballs for as low as
C per dozen). FF 246, 248-49. Morrison Enterprises has offered "SOLID PU CORE" softballs with a water proof leather cover for \$26.20 per dozen, F.O.B. Taiwan. FF 259. Tayang has offered polyurethane core softballs with chrome tanned leather covers for \$21.50, F.O.B. Taiwan, with a minimum purchase of 500 dozen. FF 262.

The total labor and material cost to Worth Haiti to produce a dozen completed polyurethane core softballs in 1984 was . FF 160. Worth Tullahoma purchases from Worth Haiti a dozen polyurethane core softballs for , but this price is two associated companies. FF 161; Opn., at 84-85. Minus profits to Worth Haiti, complainant would be able to purchase softballs in 1984 for \$22.95, a price lower than the price charged by Morrison Enterprises, equivalent to that of Complete Merchants, and higher than that of Tayang.^{28/} The solicitations, however, are probably lower than the price to Worth Tullahoma ().^{29/}

Nevertheless, the administrative law judge finds that there is substantial doubt whether these solicitations represent genuine offers to produce top quality balls at the stated price.

^{28/} We do not know if these solicitations represent persons actually in the business, or seeking to secure a large enough order to permit entry into the business. Hardy, Tr. 372. Mr. Hardy has testified that he also has been solicited to purchase at about per dozen, but yet entered into an agreement to purchase from Tusa at per dozen.

^{29/} An additional charge of \$1.84 was incurred by complainant in 1984 in transporting the completed polyurethane core softballs to the United States and preparing the finished product. FF 161, 163; CX 21(C). This additional cost included duty, freight, cleaning/grading, packing materials and labor, and stamping labor, but there is no evidence of record that a person purchasing softballs from Taiwan would not incur some if not all of these same costs. CX 21(C). For example, Complete Merchants charges an extra \$0.60 per dozen softballs for individually designed boxes for the softballs. FF 248.

C Therefore, there is insufficient evidence to conclude that,
C foreign manufacturers of polyurethane cores with leather covers have the
ability to undersell complainant.

(4) Manufacturing Capacity and Intention to Penetrate Market.

The evidence demonstrates that there is a substantial capacity to assemble polycore softballs combined with an intention to penetrate the United States market. The capacity to manufacture polyurethane cores, however, severely limits the ability of companies other than Diamond Sports to penetrate the market.

The following Taiwanese companies currently stitch leather covers to
C polyurethane cores: (1) Sakurai, dozen per month (FF 260); (2)
C Tayang, no estimate as to capacity (FF 263); (3) Well-Sun, dozen per
C month (FF 267); (4) Tusa, dozen per month
C (FF 208); (5) Cortina,^{30/} dozen per month (FF 251);
C (6) dozen per month (FF 255); and (7) dozen
per month (FF 258). The following non-respondent companies also have an
unknown quantity of polyurethane softballs produced in Taiwan for sale in the
United States or are making arrangements for manufacture in Taiwan and

30/ Mr. Heald has testified that Cortina has stated it would not ship polycore balls to the United States until the patent situation has been resolved. SX 1, at 74-75.

C shipment to the United States: (1) (FF 241, 256); (2) Baden (FF 241,
C 256, 266); (3) (FF 273); (4) (FF 241); (5) (FF
C 241, 267); (6) (FF 241); (7) (FF 241); and (8) (FF 241). The
evidence of whether such companies have actually imported and, if so, the
quantity of such imports, is extremely sketchy and unreliable and has not been
confirmed by evidence of sales in the United States. See SX 1, at 63. In any
event, the above companies would be severely limited in the extent to which
they can exploit the market for polyurethane core softballs with leather
covers by the fact that only two Taiwanese companies produce a polyurethane
core, Success Chemicals and Mansui, and that only one of these companies,
Success Chemicals, produces a polyurethane core which competes with the cores
C manufactured by complainant. Opn., at 56-62. Success Chemicals

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Opn., at 74-79.

Therefore, there currently exists a substantial capacity to assemble
softballs in Taiwan and an intention to penetrate the United States market.
Notwithstanding these intentions, there has been no penetration of the United
States market for polyurethane core softballs with leather covers usable in
official league play by companies other than Diamond Sports, and there is no
indication of any capability to do so apart from Diamond Sports.

The intention to penetrate the United States market may generate
sufficient interest by one of the remaining respondents or non-respondent

competitors to create a polyurethane core softball with a leather cover usable in official league play. Either the Commission investigative attorney or complainant have argued that: (1) South Korea, the Philippines, Indonesia, Thailand, and Mainland China all have the potential to produce polyurethane core softballs; (2) South Korea has which could make the transition into production of polyurethane core softballs; (3) pour machines for production of polyurethane cores are available from Germany or Japan with a two or three month lead time for only \$30,000; (4) companies which are presently selling softballs could begin to market polyurethane core softballs from Taiwan through their existing market channels. These arguments are all rejected as being theoretical, not factual. Hypotheticals are not factual bases upon which to make a determination of whether a tendency to substantially injure exists.

For the foregoing reasons, I find that there is insufficient evidence to suggest that a tendency to substantially injure the domestic industry exists.

FINDINGS OF FACT

I. Jurisdiction

1. The U.S. International Trade Commission pursuant to § 337 of the Tariff Act of 1930, as amended, has jurisdiction over the subject matter of this investigation because the alleged unfair acts and unfair methods of competition involve importations of certain softballs and polyurethane cores therefor into the United States. Notice of Investigation, 49 Fed. Reg. 20,076 (May 11, 1984).

II. The Parties

A. Complainant and Interested Persons.

2. Lannom Manufacturing Company, Inc., (Lannom) is a corporation organized and existing under the laws of Tennessee with its principal place of business located at Tullahoma, Tennessee 37388. Worth Sports Co. and Lannom Tannery are two divisions of Lannom. Complaint, Docket No. 1042, at 3 (Apr. 3, 1984).

3. Worth Sports Co., a division of Lannom, is responsible for developing, manufacturing, producing, advertising, and marketing sporting goods, including softballs, in the United States. Complaint, Docket No. 1042, at 3 (Apr. 3, 1984).

4. Lannom Tannery, a subsidiary of Lannom, produces leather for covering softball products. Complaint, Docket No. 1042, at 3 (Apr. 3, 1984).

B. Respondents.

5. Respondent Success Chemicals Co., Ltd., located at Room 403, San Chin Bldg. 31-1, Sec. 2, Shin Sheng North Rd., Taipei City, Taiwan,

C manufactures polyurethane softball cores. ; FF 118, 219-23.

6. Respondent Complete Merchants Corporation, located at 9th Floor, No. 319 Chung-Hsiao East Rd., Sec. 4, Taipei City, Taiwan, has offered to sell polyurethane core softballs with leather covers. Hardy, Tr. 315; FF 246-50.

7. Respondent Tusa, Inc., located at Kaohsiung, Taiwan, Republic of China, adheres and stitches covers, including leather covers, to polyurethane cores to manufacture finished polyurethane core softballs. Order No. 8 (July 27, 1984); FF 204-08.

8. Respondent Regent Sports Company, located at Hauppauge, New York 11787, manufactures polyurethane core softballs. CPX 1-2; FF 120-21, 270-72.

9. Respondent Keith Kleppe & Associates, located at 23063 La Cadena, Laguna Hills, CA 92653, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

10. Respondent Team West, located at P.O. Box 62, Redmond, WA 98052, was a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

11. Respondent George Tyler Enterprises, located at 5650 Syracuse Circle, Suite 122, Englewood, CO 80111, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

12. Respondent B.O. Mickelson & Associates (now known as The Mickelson Group), located at 455 W. Jackson, Suite 205, Naperville, IL 60540, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

13. Respondent Dan Spika & Associates, located at 1121 Dallas Drive, Suite 5, Denton, TX 76201, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

14. Respondent Metts-Rupp, Inc., 4901-05 Distribution Drive, Tampa, FL 33605, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

15. Respondent Dave Middleton & Associates, located at P.O. Box 473, Willow Grove, PA 19090, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

16. Respondent Paul Shaughnessy & Associates, located at 36 Grove Circle, Braintree, MA 02184, is a manufacturer representative for the sale of products produced by Diamond Sports. CX 26-27; FF 200.

III. Product in Issue

17. The product in issue is a polyurethane core softball with a leather stitched cover purportedly covered by claims 3, 4, and 5 of the '295 patent. FF 47-48.

18. Complainant manufactures and sells 16 different varieties of a polyurethane core softball with a leather cover. The model designations of those balls are: PX-1; PX-1D; PX-1XX; PX-2; RF-80; PX-2D; PX-3; PX-4; PX-5; PX-11; PX-16; PX-14; CSX-16; CSX-16Y; PX-1-B; PX-11-B. Dale, Tr. 640.

19. Complainant's polyurethane core softballs have been approved for official league play by the Amateur Softball Association (ASA), the United States Slow Pitch Softball Association (USSSA), and the National Collegiate Athletic Association. Heald, Tr. 311.

20. Prior to the introduction of the polyurethane core softball, all softball cores were made either of cork or kapok. Muhlfelder Dep., SPX 33, Tr. 13-14.

21. The core of a cork softball is formed by mixing granulated cork with a binding agent to form a sphere and winding reinforced thread around the cork sphere. A conventional leather cover is applied to the cork core to form a finished ball. Heald, Tr. 19.

22. A conventional kapok softball has a core of compressed fiber wound with yarn. The core is covered with a leather cover to form a finished ball. Heald, Tr. 19.

23. It is impossible to see any difference between a cork or kapok core softball and a new polyurethane core softball. Heald, Tr. 22, 97; Hardy, Tr. 271, 348, 350, 380.

24. In today's softball industry, rebound is expressed in terms of a ball's coefficient of restitution or COR. COR is tested in a laboratory using timing gates and a computer. A ball is propelled through a timing gate to a target on a wall against which the ball rebounds. The computer registers the inbound and outbound speeds. COR is the difference between outbound speed and inbound speed expressed as a percentage. CX 23, ¶ 6.

25. Both Diamond Sports and complainant manufacture a variety of softball models with CORs ranging from 0.44 to 0.52. Hardy, Tr. 263; Dale, Tr. 644.

26. The WORTH PX 2 and the DIAMOND D-100 mid-range have CORs of 0.48 and are considered mid-range balls. Dale, Tr. 643; Hardy, Tr. 263. The WORTH RX-80 and DIAMOND P200-6 are restricted flight balls with COR of 0.44. The Worth PX-1 and Diamond D-100W are 0.52 COR balls and are considered lively balls. Dale, Tr. 644; Hardy, Tr. 263.

27. The term "conventional softball" has a different meaning today than it did in 1974. In 1974 the term referred to cork or kapok core softballs. Today the term conventional softball embraces polyurethane core softballs. Heald, Tr. 174.

28. One major advantage of the polyurethane core softballs is that it is at least 5-10 times more durable than conventional cork or kapok softballs. Heald, Tr. 20; Hardy, Tr. 265.

29. A laboratory test may be used to measure softball durability. A pitching machine is used to propel a ball at a speed of 105 mph across a nine foot distance to a steel plate. The ball is then inspected for deterioration and defect. This procedure is repeated until a defect is observed.

Durability is determined as a function of how many times a ball can be subjected to the above procedure without exhibiting a defect. The following table is an estimate of the durability of the various types of softballs currently sold:

<u>Core Type</u>	<u>Number of Repetitions Until Defect</u>
Kapok	5
Cork	15-18
Surlyn	55-60
Polyurethane	110-130

Hardy, Tr. 264; Heald, Tr. 20.

30. According to the estimates of the ASA, approximately 40 percent of the softballs sold today in the United States are polyurethane core softballs with leather covers. Hardy, Tr. 268, 410; Heald, Tr. 32.

31. Estimates of the total United States market for softballs range from 700,000 dozen to 1.5 million dozen. Muhlfelder Dep., SPX 33, Tr. 36; Hardy, Tr. 452.

32. According to estimates of the ASA, the market demand of polyurethane core softballs is increasing. Hardy, Tr. 268, 401; Heald, Tr. 33.

33. The two primary varieties of the game of softball played in the United States are slow pitch and fast pitch softball. Muhlfelder Dep., Tr. 20; Hardy, Tr. 457-458. Approximately 88 percent of the softball played in the United States is slow pitch, and the popularity of that variety of softball is growing. Hardy, Tr. 458.

34. Polyurethane core softballs have enjoyed popularity as a slow pitch ball. Hardy, Tr. 268; Muhlfelder Dep., Tr. 20. In the slow pitch game, a softball is hit more frequently than in fast pitch. Muhlfelder Dep., SPX 33,

Tr. 20; Hardy, Tr. 380. The polycore ball's superior durability as compared to cork or kapok balls makes polyurethane core balls particularly well suited to the slow pitch game. Hardy, Tr. 380, 460.

35. Polyurethane softballs have not been well accepted for use in fast pitch softball because they tend to be slick and unbalanced. Muhlfelder Dep., Tr. 22.

36. Cork or kapok core softballs are more popular in the northern, northeastern, and midwestern areas of the United States. Heald, Tr. 51; Hardy, Tr. 404; Muhlfelder Dep., Tr. 12. Polyurethane core softballs are popular in the southern, southwestern and western regions of the United States. Hardy, Tr. 403; Muhlfelder Dep., Tr. 13. This geographical division is largely due to the popularity of slow pitch softball in the south and to complainant's early sales efforts which were concentrated there. Id.

37. A number of softball companies sell a ball containing a surlyn plastic core or surlyn composite core. Heald, Tr. 63-64.

38. Surlyn is a thermoplastic and is manufactured into softball cores through an injection molding process. Heald, Tr. 62. A surlyn core softball was introduced by Dudley Sports Company about three years ago. Id., Tr. 100, 101. Lannom subsequently introduced a surlyn ball, the Poly-E red dot softball. Id., Tr. 101.

39. J. deBeer & Sons, Inc., manufactures a ball with a cork center, surlyn inner covering, and leather outer cover. Muhlfelder Dep., SPX 33, Tr. 23.

40. The WORTH surlyn ball is designed for use in slow pitch softball and competes for sales with cork and polyurethane core balls. Heald, Tr. 103.

41. The WORTH surlyn core ball has received ASA approval. Heald, Tr. 93.

42. Surlyn core balls do not exhibit as high a durability as polyurethane core softballs. Dale, Tr. 585. Complainant plans to discontinue manufacture and sale of surlyn core balls. Dale, Tr. 587.

43. Polyurethane core softballs compete for sales in the marketplace with cork core and surlyn core balls. Dale, Tr. 644. Most softball players demand a high quality ball but are not brand conscious and will make purchasing decisions based on price when choosing between balls of comparable quality. Hardy, Tr. 413.

44. There are at least two classes of softball consumers, leagues or organizations and individual consumers. A league will generally select a ball with a certain type of core at the beginning of a season and will make purchasing decisions based largely on the prices of competing brands of that type ball. Hardy, Tr. 413.

45. Individual consumers will make purchasing decisions based on price without much consideration for the composition of a ball's core. Hardy, Tr. 413.

IV. Validity of the '295 Patent

A. The Patent

46. Complainant is the owner by assignment of U.S. Letters Patent 3,976,295 (the '295 patent) issued to Jesse H. Heald, Jr., on August 24, 1976. CX 2.

47. Independent claim 3 is representative of the claims of the '295 patent directed to softballs. Claim 3 recites:

3. A composite ball having the appearance, physical characteristics and dimensions of a conventional softball including a core of cork or kapok, yarn windings, and a leather cover comprising a spherical core member formed of flexible and resilient molded polyurethane foam and a leather cover portion enclosing and stitched over said core portion wherein said core portion is formed of polyurethane foam of such density and resilience as to give said composite ball essentially the same rebound weight, hardness, size, feel and sound qualities as said conventional softball so as to be usable in organized league play of softball.

CX 2.

48. Claims 4 and 5 of the '295 patent are dependent claims and recite:

4. The composite ball of claim 3 wherein the diameter of said core member is equal to at least 90 percent of the diameter of the finished composite ball.

5. The composite of claim 3 wherein said spherical core member is formed from a mixture of isocyanate and a mixture of catalyst and blowing agent.

CX 2.

B. Specification

49. The specification of the '295 patent reveals that Application Ser. No. 659,705 filed February 20, 1976, which matured into the '295 patent, is a continuation of abandoned Application Ser. No. 487,203 (the '203 application) filed July 20, 1974. CX 2.

50. The specification of the '295 patent is identical to that contained in the '203 application. According to the specification, the primary objective of the '295 patent is to provide a "new and improved ball construction and new and improved method of fabricating either a baseball, or softball or similar ball having desired characteristics essentially identical to prior conventional balls, but having uniformity of construction, cost and durability advantages over prior known conventional balls." CX 2.

51. The specification discloses that the objective of the '295 patent can be achieved by combining three ingredients - isocyanate, a polyol catalyst, and water - in certain specified ratios in a hollow spherical mold to form a polyurethane core of the desired weight and resilience, to which a leather cover can be stitched. CX 2, col. 1 line 60, col. 2 line 25.

52. The examples of the '295 patent instruct that polyurethane cores exhibiting the characteristics necessary to practice the invention are formed by placing measured amounts of isocyanate and a mixture of catalyst and blowing agent into a mold, and mixing the isocyanate and the catalyst-blowing agent blend in the mold itself. CX 2, col. 3 line 25.

C. Background of the Invention

53. Jesse Heald, Jr., is the president of complainant's Worth Division and vice president of complainant. He has been employed by complainant since 1970. Heald, Tr. 14.

54. Prior to his employment with complainant, Mr. Heald was employed for six years as an aerospace engineer with Arnold Engineering, Inc., of Tullahoma, Tennessee. Heald, Tr. 123; SX 1.

55. While employed at Arnold, Mr. Heald became familiar with polyurethane foam plastics and learned that polyurethane foam can be molded to form a rigid flexible object. Heald, Tr. 113.

56. Mr. Heald first considered finding a substitute for conventional softball cores in 1970 while employed as the product development manager for complainant. At that time he had no formal training as a chemist. Heald, Tr. 121-22.

57. Mr. Heald was not aware in 1970 that any of complainant's competitors were seeking to find a substitute for conventional cork of kapok softball cores. Heald, Tr. 125.

58. Mr. Heald spoke to three plastics companies-- Flexible Products (Flexible), Reynolds Chemical Co. (Reynolds), and Freeman Chemical Co. (Freeman) about the possibility of using polyurethane foam as a substance for fabricating softball cores. Heald, Tr. 130.

59. Isocyanate is a basic constituent of polyurethane. Polyol catalyst, when blended with water and mixed with isocyanate, initiates the chemical reaction which causes the formation of polyurethane. Water is a blowing agent which causes a foaming reaction. Heald, Tr. 131.

60. During this period, Mr. Heald and chemical companies developed by trial and error specifications of the ball he sought to produce, including hardness and rebound. Heald, Tr. 134, 141.

61. Lannom supplied softball molds to Flexible so that they could conduct experiments aimed at developing a polyurethane core. Heald, Tr. 135.

62. Flexible was not involved in fabricating polyurethane ball cores prior to being contacted by Mr. Heald in 1970. Heald, Tr. 135.

63. Mr. Heald informed Flexible that he was seeking to develop a core that when dropped from a 20 foot height would rebound 20-30 percent of the distance from which it was dropped. Heald, Tr. 136.

64. Complainant received sample cores from Reynolds in 1972. These samples were deemed unacceptable because their compression strength and durability were deficient. Heald, Tr. 165; SX 15.

65. Each of the companies that was engaged in the development of a polyurethane softball core on Lannom's behalf, as well as Lannom, experienced problems in developing a core exhibiting adequate durability. Flexible ultimately solved the durability problem. Heald, Tr. 144. (Mr. Heald does not recall how the durability problem was solved.) Heald, Tr. 145.

66. The ratio of ingredients and the quality of the mixing of ingredients are important to achieving good durability in a polyurethane core. Heald, Tr. 146.

67. Commercial production of polyurethane softballs began in 1974. At that time the equipment used to fabricate polyurethane cores included metering systems to dispense the two plastic components (isocyanate and polyol catalyst) in the proper amounts, a simple milk shake type mixer to mix the two components thoroughly together, and a mold. Heald, Tr. 157.

68. After Lannom developed an acceptable prototype of the polyurethane softball core, Lannom and Flexible entered into a written agreement under which terms Lannom agreed to purchase the materials needed to produce polyurethane cores for softballs exclusively from Flexible. Flexible in turn agreed to continue development efforts on behalf of Lannom. The agreement provided in relevant part:

All chemical, processing and prototype development costs shall be borne by Flexible. Design, mold, machine and finished product testing costs shall be the responsibility of Lannom. Flexible will supply a reasonable quantity of samples to Lannom without charge for screening and preliminary testing. Additional quantities for limited production evaluation and field testing shall be purchased by Lannom at the usual price schedules.

Flexible personnel (technical and service) shall be available to consult with Lannom as required at a reasonable frequency. Lannom personnel shall have access to Flexible facilities as required.

(This agreement is no longer in existence, nor is any other agreement between the parties.) SX 70; Heald, Tr. 169-70.

D. Prosecution History of the '295 Patent

69. Application Serial No. 487,203, the parent application of the patent in suit, was filed July 10, 1974. Mr. Heald participated in the prosecution of this application by supplying his attorney with a description of his invention including the mechanical properties of polyurethane core softball molding techniques and manufacturing operations. Heald, Tr. 688, 689-90.

70. Mr. Heald testified that thorough mixing for at least 10-20 seconds was integral to achieving good quality cores. One result of poor mixing is incorrect polymerization. Heald, Tr. 700, 702.

71. The specification of Application Serial No. 487,203, which is identical to the specification of the '295 patent, describes mixing of the isocyanate and polyol catalyst in the softball core mold and does not mention use of an electric mixing appliance. CX 2.

72. As of July 10, 1974, complainant was producing softball cores in accordance with example 1 and example 3 or 4 described in Application Serial No. 487,203. These cores were 5-10 times more durable than the cores of conventional softballs. Heald, Tr. 718-19.

73. As of July 10, 1974, no published or official specifications existed concerning the hardness or rebound characteristics of softballs. Heald, Tr. 710.

74. As of July 1974, the term "conventional" softball referred to a composite softball containing a core of cork or kapok and a cover consisting of chrome white tanning leather which complied with the specifications set forth in the official softball rules published by sanctioning organizations, such as the Amateur Softball Association and the United States Softball Association. Heald, Tr. 59.

75. The official rules of the ASA for 1974 provide with respect to the official softball as follows:

Section 2. The official softball shall be a regular, smooth-seamed, concealed stitch or flat surfaced ball, not less than 11 inches nor more than 12-1/2 inches in circumference, and shall weigh not less than 6-1/4 ounces nor more than 7 ounces. The center of the ball may be made of either #1 quality long fibre kapok or a mixture of cork and rubber, or other materials approved by the Joint Rules Committee on Softball, hand or machine wound with a fine quality twisted yarn and covered with latex or rubber cement. The cover of the ball shall be the finest quality #1 chrome tanned horse or cow hide cemented to the ball by application of cement to the under side of the cover and sewed with waxed thread of cotton or linen.

SPX 31, at 48.

76. The official Rules of the ASA for 1982 provide with respect to official softballs as follows:

Sec. 2. The OFFICIAL SOFTBALL shall be a regular, smooth seamed, concealed stitched or flat surfaced ball. The center of the ball may be made of either No. 1 quality, long fibre kapok or mixture of cork and rubber, hand or machine wound, with a fine quality twisted yarn, and covered with latex or rubber cement; or it may be made of other materials approved by the Amateur Softball Association of America. The cover of the ball shall be the finest quality, No. 1 chrome tanned horsehide cowhide cemented to the ball by application of cement to the underside of the cover, and sewed with waxed thread of cotton or linen. The cover of the ball may also be made of synthetic material.

NOTE: The RF-80 (Restricted Flight) ball must be used in A.S.A. men's slow pitch tournaments. This ball must meet all of the specifications noted above and must pass the Amateur Softball Association of America ball test procedure.

THE OFFICIAL SIZE AND WEIGHT OF THE SOFTBALL FOLLOWS:

SOFTBALL	SIZE			WEIGHT	
	Minimum	Maximum	:	Minimum	Maximum
12"	11 7/8	12 1/8	:	6 1/4	7 oz.
	(30.16 cm)	(30.80 cm)	:	(177.19 gm)	(198.34 gm)
16"	15 3/4	16 1/4	:	9 oz.	10 oz.
	(38.74 cm)	(41.28 cm)	:	(255.15 gm)	(283.50 gm)

SX 93.

77. The specifications provided by the ASA are the ones most widely followed. Heald, Tr. 59.

78. During the time Lannom was developing its polyurethane core softball, Mr. Heald is unaware of any other softball companies that were undertaking similar or related development. Heald, Tr. 161, 162.

79. In the first office action during prosecution of the '203 application (the office action marked September 27, 1984), the examiner required applicant to elect between seeking product claims or method claims.

SX 91. In response to the examiners restriction requirement, applicant elected to pursue the product claims. The method claims (claims 8-11) were withdrawn. SX 91, Response to Restriction Requirement (Sept. 9, 1974).

80. In the second office action dated December 10, 1974, the remaining claims (claims 1-7, 12, and 13) were rejected under 35 U.S.C. § 112. The claims were also rejected under 35 U.S.C. § 102 as anticipated by U.S. Letters Patent No. 3,518,786 (Holtvoigt) and for obviousness under 35 U.S.C. § 103 on the grounds that claims were unpatentable over Holtvoigt in view of U.S. Letters Patent No. 3,069,170 (Dillon) SX 91.

81. The claims of the Holtvoigt patent are directed to polyurethane children's building blocks. The specification, however, discloses a sphere made from polyurethane. The Dillon patent was directed to a ball formed of a synthetic substance, . SX 91.

82. Responding to the office action of December 10, 1974, applicant amended claims 1 and 12 to specifically recite a leather stitched cover as the means for enclosing a polyurethane core, thereby forming a composite ball. In answering the examiners rejection under 35 U.S.C. § 112, applicant argued that the scope of the claims in question could be easily ascertained by a person of skill in the art because the scope of the claims in question was limited by use of the term "conventional softball." That term, applicant asserted, had a clear and unambiguous meaning to a person of skill in the art. SX 91.

83. Applicant responded to the anticipation and obviousness rejections by arguing that neither the Holtvoigt patent separately nor the Holtvoigt and Dillon patents together taught construction of a ball exhibiting the characteristics of a conventional softball or baseball formed by polyurethane and a cover. SX 91.

84. In the final office action dated July 23, 1975, the examiner rejected claims 1, 3, 4, 6, 7, and 12 under 35 U.S.C. § 112 on the ground that the patent failed to permit persons of skill in the art to definitely determine what features a ball must possess to be "a conventional softball or baseball." SX 91.

85. The examiner rejected claim 6 as anticipated by the Holtvoigt patent and as unpatentable under 35 U.S.C. § 103 over U.S. Letters Patent No. 3,081,531 (Fechner) and the Dillon patent. He also rejected claim 1, 3, 4, 6, 7 as unpatentable under § 103 over the Fechner patent and rejected claims 1 and 12 as unpatentable under § 103 over the Holtvoigt patent. The Fechner patent disclosed a soft polyurethane game ball containing a handle in the center. SX 91.

86. Responding to the final office action, applicant amended claims 1 and 12 to specifically recite that the core of the ball is to be formed of "polyurethane" foam of such density and resilience as to give said ball essentially the same rebound and weight as a conventional baseball or softball. SX 91.

87. In attempting to overcome the 35 U.S.C. § 112 rejection, applicant submitted an affidavit stating that those of skill in the art clearly understood the term "conventional" baseball to mean a ball having the physical characteristics specified in the official rules, and that the persons understood the term "conventional softball" to refer to a ball which had the physical characteristic provided in Rule 3, Sec. 2 of the official Softball Rules of the International Joint Rules Committee On Softballs. SX 91; CX 2; Affidavit of Jesse H. Heald, Jr., September 9, 1975.

88. During prosecution of the '295 patent, the president of the United States Softball Association submitted an affidavit in which he stated that complainant's polyurethane core softballs were "essentially indistinguishable from previously used conventional softballs in that they have essentially the same dimensions, weight, hardness, sound and feel as conventional softballs of the type previously employed in league play." Reference to whether they have the same rebound characteristics was specifically omitted. SX 62.

89. Applicant addressed the 35 U.S.C. § 102 and § 103 rejection by arguing that none of the references cited by the examiner, either alone or in combination, taught or suggested that polyurethane could be used to form a ball having the characteristics of a conventional baseball or softball. The rejections were not withdrawn and the application was abandoned. SX 91.

90. Serial No. 659,705, the application from which the '295 patent issued, was filed on June 9, 1976. The examiner allowed all of the claims (claims 1-15) of the application without rejections after applicant's attorney in a telephone interview with the examiner agreed to amendments intended to eliminate a perceived indefiniteness involved with the phrases "conventional baseball" and "conventional softball." SX 111, Office Action, May 15, 1976.

91. After electing in Application Ser. No. 487,203 to proceed with the product claims, applicant filed application Ser. No. 624,979, a continuation-in-part of the '203 application. The specification of this application was similar to that of the '295 application, but defined the terms regulation baseball and conventional softball by specifically referring to the official baseball and official softball rules. Moreover, the specification specifically discloses a specific test for ascertaining rebound percentage. CX 2.

92. The '203 application was ultimately rejected, in part, under 35 U.S.C. § 112 for failure "to set forth an enabling embodiment and the best mode for carrying out applicants alleged improved process." Moreover, the specification was found deficient because it was not clear on the nature and technique of molding applicants foamable urethane resin reaction mixture. SX 112, September 6, 1977.

93. Applicant also filed Application Serial No. 618,432, No. 896,371, and No. 896,366 directed to its polyurethane core ball and method for fabrication of such balls. Each application was rejected in part under 35 U.S.C. § 112 based on insufficient disclosure to enable one skilled in the art to make and use the alleged invention. According to the Patent and Trademark Office, the specifications of each of the above applications failed to set forth an enabling embodiment or the best mode of carrying out applicant's alleged improved process. SX 92.

E. Scope of the Prior Art

94. Game balls, including softballs, baseballs, practice balls, as well as molding of plastic materials, comprise the pertinent art for the purpose of evaluating nonobviousness of the claims 3, 4, and 5 of the '295 patent.

F. Content of the Prior Art

95. The following game balls or polyurethane articles are prior art with respect to the '295 patent:

- (1) Canadian Patent No. 632,226 issued to Robert C. Kohn on December 5, 1961. SX 5.

(2) U.S. Letters Patent No. 3,099,170 issued to J.A. Dillon, Jr., on December 18, 1962. SX 7.

(3) U.S. Letters Patent No. 3,647,229 issued to Danforth Holley on March 7, 1972. SX 8.

(4) U.S. Letters Patent No. 2,753,599 issued to T.A. Pietraszek, et al., on July 10, 1956. SX 9.

(5) U.S. Letters Patent No. 2,138,004 issued to G.D. Grau, Jr., on November 24, 1938. SX 10.

(6) U.S. Letters Patent No. 3,185,476 issued to W.A. Fechner on May 25, 1965. SX 11.

(7) U.S. Letters Patent No. 3,518,786 issued to J.H. Holtvoigt on July 7, 1970. SX 12.

(8) U.S. Letters Patent No. 3,644,168 issued to Bonk, et al., on February 22, 1972 (structural polyurethane in various shapes). SX 13.

(9) U.S. Letters Patent No. 2,081,532 issued to Fegan in May 1937. SX 9.

(10) U.S. Letters Patent No. 3,940,145 issued to Gentiluemo on February 28, 1976.

(11) U.S. Letters Patent No. 2,743,931 issued to Pooley on May 1, 1956. SX 6.

96. Of the pertinent prior art, the Kohn, Holley, Pooley, and Pietraszek patents were not cited by the examiner during prosecution of the '295 patent. CX 2; SX 111.

G. Differences Between the Invention Disclosed
in Claims 3, 4, and 5 of the '295 Patent

97. Claims 3, 4, and 5 of the '295 patent disclose a composite softball comprised of a solid polyurethane core and stitched leather cover that duplicates the characteristics found in conventional softballs as defined by the official rules of the International Joint Rules Committee On Softballs. CX 2; Affidavit of Jesse Heald; SX 91.

98. The Kohn patent discloses a baseball and softball with a core comprised of polyurethane and filler material such as cotton flock or micro-ballons encased in a uniform non-stitched vinyl coating. SX 5.

99. The Dillon and Pietraszek patents disclose a molded plastic practice golf ball and practice baseball. SX 7; SX 9.

100. The Holley patent discloses a painted golf ball made of solid polyurethane. SX 89.

101. The Grau patent discloses a conventional cork and kapok softball with leather cover. SX 10.

102. The Fechner patent discloses a spherical ball with an internal resilient hand grip. It is a soft spongy ball that resembles a conventional core softball with a stitched leather cover. SX 11.

103. The Holtvoigt patent is directed to a child's safety play block with a soft resilient foam core and plastic cover. The Holtvoigt patent also discloses a plastic foam sphere with a vinyl cover. SX 12.

104. The Bonk patent discloses a rigid structured polymeric material in a variety of shapes. SX 13.

105. The Fegan patent discloses a conventional softball. SX 9.

H. Level of Skill in the Art

106. The person of ordinary skill in the pertinent art as of July 10, 1974, was a person employed in the ball manufacturing industry who possessed a college degree and who had experience in the manufacture and production of balls. Muhlfelder Dep., SPX 33, Tr. 24; Hardy, Tr. 260. The person of ordinary skill would have been aware that plastics technology could be applied in the fabrication of game balls, but would not necessarily possess any specialized training in or knowledge of plastics technology.

I. Secondary Considerations

107. Since its introduction, complainant's patented ball has enjoyed considerable commercial success. Complainant was able to sell 20,000 dozen polyurethane core softballs in the first year following the product's introduction. Heald, Tr. 731. Sales of the patented polyurethane core softball presently account for about 40 percent of all softballs sold in the United States. Heald, Tr. 32.

108. There is no evidence that complainant's invention was proceeded by a long felt need in the softball industry as a substitute for conventional cork or kapok softballs.

109. In 1977 the Spaulding division of Questor Corp. was granted a non-exclusive license under the '295 patent in exchange for a \$10,000 lump sum payment. Heald, Tr. 182, 192; SX 45.

110. During negotiations with Spaulding, complainant had sought a periodic royalty of \$0.50-\$1.00 per dozen balls. Heald, Tr. 199.

111. During licensing negotiations, Spaulding through its attorneys, characterized the '295 patent as "admittedly weak." SX 67; SX 68. Spaulding questioned the sufficiency of the patent's disclosure. Heald, Tr. 218.

112. Rawlings, a manufacturer of sporting equipment, declined an offer from complainant for an express license under the '295 patent, but agreed to purchase its requirements for polyurethane cores from complainant, thereby acquiring an implied license to manufacture polyurethane core softballs with leather covers. Heald, Tr. 225.

113. Wilson Sporting Goods purchases its requirements for polyurethane softball cores from complainant thereby acquiring an implied license to manufacture polyurethane core softballs with leather covers. SX 83(C); FF 180-83.

114. The following companies have in the past purchased polyurethane softball cores from complainant: McGregor, Steele, Regent, Seamco. Heald, Tr. 211.

V. Infringement

115. Thomas E. Tuten is the laboratory manager of the urethane division of Flexible Products, Marietta, Georgia. Mr. Tuten is responsible for quality control and testing and evaluation of final products, including rigid and flexible polyurethane foam systems. Mr. Tuten has been employed by Flexible Products for the last three years. CX 34, at 3.

116. In 1976, Mr. Tuten received a bachelor of science degree in chemistry from the Georgia Institute of Technology. CX 34, at 3.

117. Mr. Tuten was asked by complainant to determine the composition of CPX 1, CPX 4, CPX 5, CPX 6, CPX 7, CPX 8, CPX 9, CPX 10. CX 34. Mr. Tuten tested these items by conducting powder scans through infrared spectrophotometry, Shore durometer readings, and visual inspection. CX 34, at 5, 9.

118. CPX 4-6 are softball cores manufactured by Success Chemicals. Mr. Tuten determined that they were formed of solid polyurethane foam. CX 34, at 7, 8, 13.

119. CPX 7 and 8 are softball cores manufactured by Mansui Chemplas. Mr. Tuten determined that they were made of solid polyurethane foam. CX 34, at 15, 17.

120. CPX 1 is a softball core with a leather cover. CX 34, at 17. Mr. Tuten determined that the core was made of solid polyurethane foam. CX 34, at 18.

121. CPX 1 is a Regent polyurethane core softball. Its core was manufactured by complainant and was sold to Regent by complainant.

122. CPX 9 is a softball core and cover obtained from Tayang Sporting Goods. Mr. Tuten determined that the cover was made of leather and that the core was formed of solid polyurethane foam. CX 34, at 18.

123. CPX 10 is a softball core and cover. The cover carries the logo "Baden." Mr. Tuten determined the cover was made of leather and that the core was formed of solid polyurethane foam. CX 37, at 19, 20.

VI. Domestic Industry and Efficient and Economic Operation

124. Lannom has approximately 237 employees located at its Tullahoma, Tennessee, facility who are primarily engaged in the production of polyurethane cores, the making of leather softball covers, the application of leather covers to polyurethane cores, the packaging of softballs, and administrative and management duties surrounding production and sale of softballs. Heald Aff't, CX 1(C), at 2; Dale Aff't, CX 10, at 2-3; Heald, Tr. 15-16, 90; Dale, Tr. 575.

125. Forty-seven percent of Lannom's total employees are engaged primarily in the production of softballs. Heald Aff't, CX 1(C), at 2; Dale Aff't, CX 10, at 3.

C 126. percent of the softballs produced by Lannom's employees in 1983 were polyurethane core softballs. Heald Aff't, CX 1(C), at 2; Dale Aff't, CX 10, at 3; CX 71(C).

C 127. Approximately percent of complainant's sales of softballs in the current year have been of polyurethane core softballs. Dale, Tr. 580-83.

C Approximately percent of the softballs sold by Lannom in the current year
C have been surlyn plastic core balls (Id., at 581); less than percent of
C softballs sold by Lannom in the current year have been "mush" balls;
C approximately percent of the softballs sold by Lannom in the current year
C have been polyurethane core balls with non-leather covers; approximately
C percent of the softballs sold in the current year have been pitching machine
balls. Id., at 582.

128. The machinery and equipment employed by Lannom in the fabrication, packaging, and marketing of polyurethane core softballs are
C valued at approximately . Dale, Tr. 635-37; CX 12(C); SX 80(C).

129. The buildings and warehouse used by Lannom in Tullahoma, Tennessee, for the production and storage of polyurethane core softballs were constructed at a cost of approximately . Heald Aff't, CX 1(C), at 2; Dale Aff't, CX 10, at 3; see Dale Tr. 635-37; CX 12(C); SX 80(C); see also SX 26(a)-(b).

130. Lannom employs 20 individuals to sell the polyurethane core softball in various locations throughout the United States. Heald Aff't, CX 1(C), at 2; Dale Aff't, CX 10, at 3; Heald, Tr. 18, 24-25.

131. Lannom's tannery, located in Tullahoma, Tennessee, employs 100 individuals and produces all the leather covers used on Lannom's polyurethane core softballs sold under the WORTH trademark. Dale Aff't, CX 10, at 3; Heald, Tr. 15; Dale, Tr. 570.

132. Lannom employs approximately 47 Tullahoma, Tennessee, residents to sew covers on to polyurethane softball cores. SX 55(C); see also Dale, Tr. 551-52. Sewers are paid on a piece rate of per dozen balls. SX 44(C); see Dale, Tr. 548. The offshore cost of sewing is per dozen. FF 159. The domestic sewers are maintained to permit Lannom to have a manual sewing capacity in Tennessee and out of loyalty to the local families that have for many years engaged in this activity. Dale, Tr. 551-52. In 1983, these domestic sewers assembled 9,364 polyurethane core leather softballs. SX 54(C).

133. The polyurethane core softball produced by Lannom is more economical to fabricate than the prior known conventional softballs. The polyurethane core softball provides uniform quality control and lasts longer than prior known conventional softballs. Heald Aff't, CX 1(C), at 4.

134. The machines and facilities used by Lannom in the manufacture of polyurethane core softball products are "state of the art." Some of the machinery used to manufacture these articles was developed by Lannom. Heald Aff't, CX 1(C), at 5; Dale Aff't, CX 10, at 3; Heald, Tr. 32; CX 11(C).

135. Lannom's "state of the art" approach to the molding of polyurethane softball cores is a result of ongoing research and development conducted by Lannom to improve the quality and consistency of this product. Dale Aff't, CX 10, at 3.

136. Lannom has conducted extensive research and development as to the technology of polyurethane softball cores, including: (1) expanding the liveliness levels of polyurethane core softballs to satisfy the new demands of various types of softball games; (2) developing a polyurethane core softball which will reduce injury levels in youth leagues (e.g., current research involves "dynamic cushions," which will have a minimal affect on the way the game is played while reducing the softball's effect when it impacts on a person's body, and "double molding," which employs a hard polyurethane core surrounded by a softer polyurethane shell to provide a cushion); and (3) developing a 16-inch "clincher" polyurethane core softball to meet demand in the Chicago area. Dale Aff't, CX 10, at 5-6.

137. All the components used in the manufacture, production, and assembly of Lannom's polyurethane core softballs originate from sources in the United States:

(a) polymers and isocyanates:

C

C

- C (b) catalysts:
- C
- C
- C (c) vinyl:
- C
- C (d) thread:
- C (e) adhesives:
- C
- C (f) staples:
- C (g) wax and methylene chloride:
- C
- C (h) polyols and surfactants:
- C
- C (i) pigments:
- C (j) hides:
- C
- C (k) chrome:
- C
- C (l) soda acid and soda ash:
- C
- C (m) salt:
- C (n) lime:

CX 10; see Dale, Tr. 555-60.

138. The injection mold machines used by Lannom for the fabrication of polyurethane softball cores was manufactured by North American Urethane, a division of Edge Industries, Grand Rapids, Michigan. CX 10; see Dale, Tr. 575; CX 12.

139. Charles Dale, general manager of the Worth Ball Division of Lannom Manufacturing Company, has overall supervisory responsibility for complainant's Tullahoma ball manufacturing operations and foreign affiliates that are involved in the assembly of polyurethane core softballs. He is also the employee most familiar with complainant's production, sale, and profits respecting polyurethane core softballs. Dale, Tr. 553, 579-80.

140. The following steps in the production of polyurethane core softballs are performed at Lannom's Tullahoma facilities:

- (a) cutting of leather into figure eight patterns with stitch holes stamped into the leather (Dale, Tr. 570-72);
- (b) molding of polyurethane cores (Heald, Tr. 15; see SX 24(C));
- (c) stamping and packaging of finished balls (see Dale, Tr. 553);
- (d) warehousing and shipping of polyurethane cores (Heald, Tr. 15; see Dale, Tr. 553).

See also SX 28(C).

141. Complainant uses the following equipment in the production of polyurethane core softballs: large chemical storage tanks; pour machines; molds; and mold carousels. Dale, Tr. 560-63.

142. The raw materials for production of polyurethane cores are stored in large 20,000-40,000 gallon tanks. Dale, Tr. 561. Each of these large tanks is heated and contains an agitator to insure that the chemicals being stored remain homogenous. Id., at 563. Before production begins, these

materials are transferred into small tanks. Id., at 561. From there the materials are pumped into the mixing chamber of the pour machine, where there is an auger type mixer which mixes the two ingredients at high speed. Heald, Tr. 24; Dale, Tr. 591; see SX 24(C).

143. A timing mechanism meters the amount of isocyanate and polyol which enter the mixing chamber, ensuring the ~~proper~~ ratio of ingredients for the formulation of a polyurethane core. Dale, Tr. 561; see SX 24(C).

144. Following thorough agitation, the isocyanate polyol mixture is dispensed through a pour head into the lower half of a two-piece spherical metal mold. Dale, Tr. 561. The top of the mold is placed on the lower half, and the mold is spun to coat the interior part of the mold. Id., at 561. The mold is clamped shut and placed on a compartment of a four-tiered motorized, rotating carousel. Id., at 561; Heald, Tr. 86-87. The carousel was developed by complainant for use in the molding of polyurethane cores. Dale, Tr. 562. The core is cured as the mold rotates in the carousel for a period of eight minutes. Id., at 563; see SX 24(C).

145. Graders pull each polyurethane core out of the rack to visually inspect them. They also bounce a few cores on the floor to insure that they have a "good crack." If the twisting process is not properly completed so that there is a fault on the outside of the core or if there is serious air entrapment in the core or if there is any foreign substance in the core, the grader will discard the core. The graders also weigh sample cores and check to see if the ratios between the isocyanate and the polyol reflect specific characteristics. Dale, Tr. 567-68; see SX 24(C).

146. There are currently six pour machines operating at complainant's Tullahoma, Tennessee, facility. Four pour machines are devoted to full time production of 12-inch polyurethane softball cores. Dale, Tr. 591. One pour machine is devoted to full time production of 16-inch and 14-inch polyurethane softball cores. Id., at 591. A sixth pour machine is used to manufacture profile molded balls, i.e., pitching machine baseballs and softballs. Id., at 593, 631.

147. Complainant's pour machines were purchased on the following dates and at the following prices:

<u>Machine No.</u>	<u>Date of Purchase</u>	<u>Cost</u>
1	Feb. 28, 1975	\$14,287.60
2	Aug. 31, 1975	\$18,404.75
3	Aug. 31, 1977	\$13,800.00
4	Aug. 31, 1977	\$28,851.12
5	June 30, 1978	\$22,078.54
6	May 31, 1981	\$14,350.00

SX 59; Dale, Tr. 631. Some of these machines were purchased new, while others were previously owned and used for other applications when bought by complainant. Id., at 634.

148. The pour machine used to manufacture 16-inch and 14-inch cores could be converted to manufacture 12-inch softball cores within one day. Dale, Tr. 591-92.

149. The pour machine used to manufacture profile molded balls could be converted to the production of 12-inch polyurethane cores if new pumps were added and a new carousel were obtained. New pumps could be obtained in two weeks, while a new carousel could be obtained in four to six weeks. Dale, Tr. 593.

150. Additional carousels would be needed to mass produce cores with these machines and could be built in four to six weeks. Dale, Tr. 591-94. The cost of purchasing a new mold carousel would be approximately \$30,000. Id., at 592-93, 638.

151. Each converted machine could produce an additional 120,000 dozen cores a year using a single shift of workers. Dale, Tr. 594.

152. Lannom has the ability to add a new pour machine to its existing facility and have the machine rolling in eight to ten weeks. Dale, Tr. 594-55.

153. The estimated cost of obtaining a new pour machine is \$20,000-\$50,000. Dale, Tr. 633.

154. Complainant possesses the present capacity to fully satisfy or exceed the domestic market demand for polyurethane core softballs. Heald, Tr. 32; FF 146-53, 176-78.

155. Complainant maintains the following facilities outside the United States at which polyurethane core softballs with leather covers are assembled:

- (a) Worth Haiti, Port Au Prince, Haiti;
- (b) Worth Honduras, S.A., Port Cortis, Honduras;
- (c) Lannom Jamaica, Lucia, Jamaica.

SX 59(C).

156. Complainant ships the raw materials needed for construction of polyurethane core softballs, such as cores, covers and threads, to its offshore facilities, where the balls are assembled. Dale, Tr. 569; CX 10(C).

157. Complainant employs 60 persons at Lannom Jamaica, 350 persons at Worth Haiti, and 400 persons at Worth Honduras. Heald, Tr. 16-17; SX 60; Response to Interrogatories 6, 15.

158. The total stated or accounting cost to Worth Haiti to purchase from Worth Tullahoma a dozen PX-1 style polyurethane cores, together with the materials needed to stitch leather covers to the cores in 1984 was ;
C 1983, ; 1982, ; 1981, ; and 1980, . CX 20(C); CX
C 21(C).

159. The cost of labor to Worth Haiti to stitch a dozen PX-1 style polyurethane cores to leather covers in order to produce a completed softball in 1984 was ; 1983, ; 1982, ; 1981, ; and 1980, .
C CX 20(C); CX 21(C).

160. The total labor and material cost to Worth Haiti to produce a dozen completed PX-1 style polyurethane core softballs in 1984 was ;
C 1983, ; 1982, ; 1981, ; and 1980, . FF 158-59; CX
C 20(C); CX 21(C); see Dale, Tr. 623-24.

161. The total cost to Worth Tullahoma to purchase from Worth Haiti a dozen completed PX-1 style polyurethane core softballs in 1984 was ;
C 1983, ; 1982, ; 1981, ; and 1980, . CX 20(C);
C CX 21(C); see Dale, Tr. 628.

162. The total profit including overhead accrued by Worth Haiti in its sale of a dozen completed PX-1 style polyurethane core softballs to Worth Tullahoma in 1984 was ; 1983, ; 1982, ; 1981, ; and 1980,
C . FF 160-61; CX 20(C); CX 21(C); see Dale, Tr. 624-25.
C

163. The final cost to Worth Tullahoma in its production of a dozen PX-1 style polyurethane core softballs in 1984 was ; 1983, ; 1982,
C ; 1981, ; 1980, . CX 21(C); see Dale, Tr. 597.
C

164. The discrepancy between the change in the final cost for the production of a dozen PX-1 style polyurethane core softballs is explained by two factors:

C
C
C

. Dale, Tr. 625-27; see CX 21(C).

165. In 1983, the polyurethane core softball constituted 38.4 percent of the total softball market in the United States. Heald Aff't, CX 1(C), at 5; see Heald, Tr. 32; Hardy, Tr. 410.

C

C

C

166. Lannom products account for percent of the total United States market for all softball products in 1983. Dale Aff't, CX 10, at 5; Heald, Tr. 77; Dale, Tr. 666-68; CX 71(C).

167. Lannom's softballs constitute percent of its 1983 total sales. Heald Aff't, CX 1(C), at 3; Dale Aff't, CX 10, at 5; CX 71(C).

168. A chart indicating sales of softballs by Worth Sports from 1978 through 1983 shows Worth Sports' total softball unit sales, the share represented by polyurethane core softballs, and Worth Sports' share of the total softball market:

C
C
C
C
C
C

<u>Year</u>	<u>Total Softball Unit Sales (doz)</u>	<u>Total Poly-X Units (doz)</u>	<u>Poly-X Units as Percent of Total</u>	<u>Total Softball Market Share</u>
1978				
1979				
1980				
1981				
1982				
1983				

CX 71(C); SX 27(C).

169. A chart indicating sales of softballs by Worth Sports from 1978 through 1983 shows Worth Sports' total softball sales, Worth Sports polyurethane core softball sales, and Worth Sports softballs sales as a percentage of its total sales.

<u>Year</u>	<u>Poly-X Units As % of Total Softballs</u>	<u>Total Softball \$ Sales</u>	<u>Total \$ Worth Sales</u>	<u>Softball Sales As % Total Sales</u>
C 1978				
C 1979				
C 1980				
C 1981				
C 1982				
C 1983				

CX 71(C); SX 27(C).

170. The advertising and promotional expenses of Worth Sports from 1978 through 1983 demonstrates that Worth Sports has spent in the range of (1979) to (1982), or a total of for a six-year period, on promotional products, shows, advertising, and catalogs in an effort to sell the Poly-X softball. CX 15(C); SX 85(C).

171. Lannom's current annual gross profits for the sale of polyurethane core softballs exceeds . Heald Aff't, CX 1(C), at 3. Specifically, for 1981, gross profit on softballs equaled , or percent of total company gross profit of ; for 1982, , or percent of total company gross profit of ; and for 1983, , or percent of total company gross profit of . CX 3(C); see Heald Aff't, CX 1(C), at 3. (Gross profits is defined as the difference between selling price and cost of sales, which includes direct labor and materials. Dale, Tr. 617.)

172. Gross profits for Worth Sports' polyurethane core softballs have because the average selling price per unit has . One possible explanation for the in Worth Sports' gross profits is that the . Dale, Tr. 621-22, 646-47.

173. Lannom's net profits for the sale of polyurethane softballs exceeds . Heald Aff't, CX 1(C), at 3; Dale Aff't, CX 10, at 5; Dale, Tr. 619-20. (Net profits is defined as gross profits less expenses. Dale, Tr. 619.)

174. Lannom has steadily increased its sale of polyurethane core softballs over the last four years as reflected below:

C	(a) July 1, 1980 - June 19, 1981:	dozen valued at
C	.	
C	(b) July 1, 1981 - June 29, 1982:	dozen valued at
C	.	
C	(c) July 1, 1982 - June 17, 1983:	dozen valued at
C	.	
C	(d) July 1, 1983 - April 27, 1984:	dozen valued at
C	.	

Dale Aff't, CX 10, at 3-4; CX 13(C).

175. Lannom's estimated output of polyurethane softball cores for 1984 is approximately dozen. Dale Aff't, CX 10, at 4; Dale, Tr. 583-84.

176. Lannom's maximum capacity for producing polyurethane softball cores, working one shift five days per week, is approximately dozen per year. Dale Aff't, CX 10, at 4.

177. Lannom, by adding a second shift to its current facilities, could expand its rate of polyurethane core production to approximately dozen per year. Dale Aff't, CX 10, at 4.

178. Lannom, by adding a third shift to its current facilities while operating those facilities at their maximum potential, could produce approximately dozen polyurethane softball cores per year. Dale Aff't, CX 10, at 4.

179. The United States market for all types of softballs of any core composition is approximately dozen per year. Dale Aff't, CX 10, at 4.

180. The following companies have purchased from Lannom polyurethane cores for the purpose of producing finished softballs:

(a) McGregor Athletic Products: 1980, dozen valued at
; 1981, dozen valued at . Dale Aff't, CX 10, at

4.

(b) Wilson Division of PepsiCo, Inc.: July 1, 1981 -
December 31, 1981, dozen valued at ; January 1,
1982 - December 31, 1982, dozen valued at ;
January 1, 1983 - December 31, 1983, dozen valued at
; January 1, 1984 - April 30, 1984, dozen valued at
; July 1, 1984 - 1985, dozen. Dale, Aff't, CX 10,
at 4; see Heald, Tr. 219-22; Dale, Tr. 653.

(c) Spaulding Sports Company. SX 45(C); FF 109.

(d) Rawlings Sporting Goods Company. See Heald, Tr. 222-25;
Dale, Tr. 656-57; FF 112.

(e) Regent Sports Company.

(f) Steele Sports. See Heald, Tr. 226-27.

(g) Seamco. See Heald, Tr. 232-33.

(h) AMF. See Dale, Tr. 656.

Complainant supplied these companies with polyurethane cores with an "implied" license to manufacture polyurethane core softballs with leather covers.

CX 10, para. 13; SX 115.

181. Complainant supplies polyurethane cores to Wilson with an "implied" license to manufacture polyurethane core softballs with leather covers. CX 10, para. 13. For the years 1981 to present, sales of polyurethane cores to Wilson have been as follows:

	<u>Year</u>	<u>Quantity</u>	<u>Value (in Dollars)</u>
C	July 1981-Dec. 31, 1981	dozen	
C	Jan. 1, 1982-Dec. 31, 1982	dozen	
C	Jan. 1, 1983-Dec. 31, 1983	dozen	
C	Jan. 1, 1984-April 30, 1984	dozen	

182. Since April 30, 1984, complainant has received orders from Wilson for more cores. Dale, Tr. 653.

183. Wilson manufactures and sells leather cover polycore balls and vinyl cover polycore balls. Dale, Tr. 654.

184. The cost to Wilson of obtaining polyurethane softball cores from complainant is about per dozen cores. Dale, Tr. 658. The cost to Worth Haiti in 1984 for polycores is per dozen. CX 21(C).

185. percent of the polyurethane core softballs produced by Lannom are sold under private labels. Dale, Tr. 614-15.

186. Polyurethane core softballs are primarily used in slow pitch softball games. Slow pitch softball comprises 90 percent of the softball played. Hardy, Tr. 268-69; see id. at 458-59; FF 33-35.

187. The polyurethane core softballs sold by Worth Sports has been approved for organized league play by the Amateur Softball Association of America, the United States Slow-Pitch Softball Association, the NCAA, the National High School Federation, and Little League, Inc. Heald, Tr. 31; Heald Aff't, CX 1(C), at 4; Dale Aff't, CX 10, at 5; CX 17; CX 18.

188. The number one ranked company according to sales of softballs in the United States is Worth Sports; number two is Dudley; number three is a toss-up between Wilson, deBeer, and Diamond Sports. The above companies are then followed by small companies such as Steele, Westar, Regent, Franklin Sports, and McGregor, with Steele being the number one company for this small company sales group. "After that you are getting ~~some~~ some really bad junk" and small sales, \$0.59 to \$1.00 balls at discount stores. Mr. Dale just recently heard of a company named Baden selling softballs. Dale, Tr. 670-72; see Muhlfelder Dep., SPX 33, Tr. 10.

189. The number one ranked company according to sales of polyurethane core softballs in the United States is Worth Sports; number two is Wilson; tied for number three is Diamond Sports and Steele. Mr. Dale understands that Coast Marketing and Baden both sell polyurethane core softballs, but since he is not sure about them he would have to put them on the bottom. Dale, Tr. 674-75.

VII. Injury

190. There are no substantial differences between the polyurethane core softballs with leather covers manufactured and sold by complainant and the polyurethane core softballs with leather covers imported and sold by Diamond Sports. Heald, Tr. 46; Hardy, Tr. 424.

191. The following customers of complainant have purchased softballs from Diamond Sports:

C
C
C
C
C
C
C
C
C
C
C
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. Heald, Tr. 49-51. The record is uncertain, however, as to the precise type of softball each of these companies purchased from Lannon and the precise type of softball they subsequently purchased from Diamond Sports. Heald, Tr. 81-82; see Hardy, Tr. 413-14.

192. Diamond Sports has replaced Worth Sports as the supplier for polyurethane core softballs in one league. Hardy, Tr. 414.

193. Mr. Heald, President, Worth Sports, is not aware of any lost sales of the polyurethane core softball to any company other than Diamond Sports. Heald, Tr. 84.

194. Worth Sports has lost some sales because of the gaining popularity of the surlyn core softballs sold by Dudley. Heald, Tr. 102; see Muhlfelder Dep., Tr. 11.

195. Worth Sports has lost some sales because of the introduction of a new plastic composition ball by the deBeer Company. Heald, Tr. 102-03.

196. From December 1983 until October 2, 1984, Diamond Sports C imported into the United States approximately dozen polyurethane core softballs. Hardy Aff't, CX 23(C), at 19; see Hardy, Tr. 267.

197. Diamond Sports' present inventory of polyurethane core C softballs is approximately dozen. Hardy, Tr. 267.

198. In its 1984 catalog for baseballs and softballs, Diamond Sports offered four types of polyurethane core softballs: (1) D100-W POLY-D (traditional lively flight, white stitch, recommended for fast or slow pitch, adopted by the ASA); (2) D100-B POLY-D (traditional lively flight, blue stitch, recommended for slow pitch, licensed by USSSA); (3) D100-R POLY-D (traditional lively flight, red stitch, recommended for slow pitch); and (4) D200-G POLY-D (gold stitch, recommended for slow pitch, ASA licensed RF80). All of the above softballs also feature chrome white lacquered leather. CX 24.

199. In its 1985 catalog for baseballs and softballs, Diamond Sports offered seven types of polyurethane core softballs featuring the "Special Molded Poly-D Cores." Three of the softballs corresponded directly to softballs offered in the 1984 catalog: D100-W; D100-R; D200-G ASA. The four other softballs had the following distinguishing characteristics:

(1) D100-B-MID (blue stitch, recommended for slow pitch, USSSA licensed with a coefficient of restitution equal to 0.48); (2) D100-B-MAX (same

characteristics as D100-B-MID except with a coefficient of restitution equal to 0.52); (3) D200-G USSSA (same characteristics as D200-G ASA except it is licensed by USSSA); (4) D111-B-MAX (same characteristics as D100-B-MAX except that this is an eleven-inch softball). The 1985 catalog listed the coefficient of restitution for the D100-W softball as 0.52, D100-R as 0.48, and the D200-G ASA as 0.44. All of the above softballs also feature chrome white lacquered leather. CX 26; see Hardy, Tr. 262-63.

200. Diamond Sports 1984 catalog listed eight "Manufacturers Reps" from which its products could be purchased and their respective sales territories: (1) Keith Kleppe & Associates (Hawaii, California, Nevada, Arizona); Team West (Alaska, Washington, Oregon, Idaho, Montana); (3) George Tyler Enterprises (Utah, Wyoming, Colorado); (4) B.O. Mickelson & Associates (North Dakota, South Dakota, Nebraska, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio); (5) Dan Spika & Associates (New Mexico, Texas, Oklahoma, Kansas, Arkansas, Louisiana, Mississippi); (6) Metts-Rupp, Inc. (Kentucky, Tennessee, Alabama, Florida, Georgia, South Carolina, North Carolina, Virginia, West Virginia); (7) Dave Middleton & Associates (Maryland, Delaware, New Jersey, Pennsylvania, New York); and (8) Paul Shaughnessy & Associates (Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine. CX 24. Diamond Sports' 1985 catalog lists only seven "Manufacturers Reps." Team West no longer sells Diamond Sports' products; instead, Keith Kleppe & Associates represents Diamond Sports in Team West's five state sales territory. It also appears from the 1985 catalog that some of the manufacturer representatives changed their location and one representative, B.O. Mickelson & Associates, is now known as The Mickelson Group. CX 26.

201. Diamond Sports Early Order Program listed prices good through November 30, 1983, for orders of the D100-W Poly-D, D100-B Poly-D, and D200-G Poly-D softballs as follows: (1) 1-99 dozen, per dozen; (2) 100-299 dozen, per dozen; (3) 300-599 dozen, per dozen; and (4) 600-1499 dozen, per dozen. First time orders placed by a Dealer after December 1, 1983, had added to all quantity-based prices. Dealers were extended a percent discount on their order if payment accompanied the order. CX 25(C).

202. Diamond Sports Early Order Program for 1985 listed prices for orders accepted from August 1, 1984, to November 30, 1984, for orders of the D100-W Poly-D, D100-D Poly-D MAX or MID Range, D100-R Poly-D, and D200-G Poly-D as follows: (1) 1-99 dozen, per dozen; (2) 200-399 dozen, per dozen; (3) 400-599 dozen, per dozen; and (4) 600-999 dozen, per dozen. Orders placed after November 30, 1984, had added to all quantity-based prices. Dealers were extended a percent discount on their order if payment accompanied the order or a percent discount if payment was within 30 days. CX 27(C).

203. Diamond Sports first began importing polyurethane core softballs from in . Hardy Aff't, CX 23(C), at 8.

204. Diamond Sports obtains all of its completed polyurethane core softballs from Tusa Corporation located in Taiwan. Hardy, Tr. 273-74. Tusa may subcontract out to another company for stitching purposes, but Diamond Sports only purchases polyurethane core softballs from Tusa. Id. at 274.

205. Diamond Sports decided to import polyurethane core softballs
C from because of . That is, the price Mr.
C Hardy was quoted for a polyurethane core softball produced in Haiti was
a dozen, F.O.B. Haiti, whereas the price he was quoted for a finished product
C produced in Taiwan was a dozen. Hardy Aff't, CX 23(C), at 8-9; see
Hardy, Tr. 282-84, 288-89.

206. Diamond Sports has purchased polyurethane core softballs from
C two companies located in Korea, . Hardy Aff't, CX 23(C), at 15.

207. Tusa, located in Kaohsiung, Taiwan, has a facility
C approximately square feet in size.

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Hardy, Tr. 273, 325.

208. Tusa's maximum capacity for the production of polyurethane core
C softballs is approximately dozen per month. Hardy, Tr. 325-26,
357.

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209. Tusa's number one customer is

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Hardy, Tr. 325.

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210.

Diamond

C Sports purchases softballs from Tusa for per dozen. Diamond Sports has
C been quoted per dozen by others. Hardy, Tr. 333.

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211. Diamond Sports does not have

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Hardy, Tr. 333-34.

C 218.

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Hardy, Tr. 356-57.

219. There are only two companies in Taiwan that produce
C polyurethane cores for balls in Taiwan, Success Chemical and Mansui.
C ; see Hsu Dep., Tr. 45.

220. Tusa purchases its polyurethane core for its softballs from
C Success Chemicals. ; Hardy, Tr. 273-74.

221. Success Chemical, located in Hsinchu, Taiwan, has a
square foot facility. Success Chemical produces a polyurethane core within
C its facilities and . Success Chemicals has
C ; see Hsu
Dep., Tr. 10-11, 34.

222.
C Hardy, Tr. 372, 374, 375-79; see
C Hsu Dep., Tr. 34.

223.
C Success Chemical is capable of producing
C 8,500-10,000 dozen polyurethane cores per month. ; see
C Hsu Dep., Tr. 11-12.

C 224.

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Hardy, Tr. 359-60, 369-70; see id., at 389-90.

225.

Hardy, Tr. 360-61, 389-90; SX 3, at 25.

226.

Hardy, Tr.

376, 378-79; see also Hsu Dep., Tr. 14.

227. Success Chemicals stated that its product list includes CS-101W, CS-101B, and CS-202G, which refer to RED DOT, BLUE DOT, and GOLD DOT, respectively. Success Chemicals used the phrase "Superior to Worth RED DOT/BLUE DOT/GOLD DOT." CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984); see CX 30.

235. Mansui Chemplas Co., Ltd., has been established for five to six years and began producing polyurethane cores for softballs and baseballs since 1983. All of Mansui's polyurethane cores are supplied to local Taiwanese softball and baseball factories. Hsu Dep., Tr. 26D-28F, 44-46; CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984).

236. The durability of a Mansui polyurethane core is approximately half that of the durability of a polyurethane core produced by Success Chemicals, and the core's COR is unreliable and low. Hardy, Tr. 400-01, 451-52; SX 3, at 26-28.

C 237.

C Mansui currently has two pour machines.

C ; see Hsu Dep., Tr. 27E, 46.

C 238.

C There are two
C possible sources from which these companies can acquire polyurethane cores,
C Success Chemicals and Mansui.

C 239.

C Id., at 24.

240. The primary market for polyurethane core softballs is the United States. Hardy Aff't, CX 23(C), at 15.

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Hardy Aff't, CX 23(C), at 16-18.

242. The wage rate for a stitcher in Taiwan is approximately \$1.40 per dozen. ; Hardy, Tr. 282, 341.

243. An experienced stitcher in Taiwan is capable of stitching 40 balls a day. ; Hardy, Tr. 341-42.

244. There are no companies in the United States that produce baseballs and softballs that have been sewn in the United States. Dale, Tr. 553-54.

245. There are no substantial barriers which would inhibit a company already in the business of selling softballs from importing polyurethane core softballs into the United States from Taiwan. Hardy, Tr. 270; see Muhlfelder Dep., SPX 33, Tr. 48-49.

246. In a letter dated December 29, 1983, Complete Merchants Corporation, located at P.O. Box 55-123, Taipei, Taiwan, Republic of China, informed Midway Sporting Goods Mfg. Co. of Milwaukee, Wisconsin, that it was the only company in Taiwan who manufactured "the P.U. Softball Cores and the complete Balls." Complete Merchants offered three polyurethane core softballs, which it labeled as the "Poly-D Core Softball": (1) CS-101W with white stitch, "Recommended use for A.S.A. traditional lively flight softball," "Superior to Worth Red Dot," and "Adopting in Diamond D-100W Poly-D softballs"; (2) CS-101 B with blue stitch, "Recommended use for U.S.S.S.A. traditional lively flight softball," "Superior to Worth Blue Dot," and "Adopting in Diamond D-100B Poly-D softball"; and CS-202 G with gold stitch,

"Recommended use for A.S.A. RF-80 restricted flight softball," "Superior to Worth Gold Dot," and "Adopting in Diamond D-200G Poly-D softball." CX 14.

See FF 250.

247. The polyurethane core softballs offered for sale by Complete Merchants were made in Taiwan by Success Chemical Co., Ltd. CX 14.

248. The polyurethane core softballs were offered for sale by Complete Merchants at the price of \$22.92 per dozen, F.O.B. Taiwan. An extra charge of \$0.60 per dozen was added for a designed individual box. Complete Merchants also offered "different discount in different order." CX 14.

C 249. Complete Merchants has offered to
C sell as low as per dozen polyurethane core softballs.
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250. The statements made by the "responsible person" representing Complete Merchants that Complete Merchants had a purchasing agency agreement with Diamond Sports and had purchased polyurethane core softballs from Sakurai Athletic Mfg. Co., Ltd., Tayang Sporting Goods Co., Ltd., and Well-Sun Sports Mfg. Co., Ltd, are not reliable evidence given that Complete Merchants has not yet obtained a corporate license in Taiwan and that Mr. Hardy has never spoken with anyone at Complete Merchants and purchases softballs only from Tusa. See Hsu Dep., Tr. 14-16, 34-35; CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984); Hardy, Tr.. 440; FF 203.

C 251. Cortina,
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C 252. Cortina

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C 253.

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Hardy, Tr. 289-90, 291.

C 254. employs 12 to 15 persons on its premises. brings in

chrome white tan leather and does its own cutting and glues the cover to the

C core. also has a warehouse or packaging/stamping area. Hardy, Tr. 290.

C 255. The stitching performed by relies entirely on the cottage

C industry.

C estimates, according to Mr. Hardy, that it could produce dozen

stitched softballs per month, and believes that by January 1, 1985, it can

C stitch dozen per month, polyurethane core or any combination of core

types. Hardy, Tr. 291; see id., at 435.

256. Mr. Hardy has seen boxes of leather-covered, polyurethane core

C softballs destined for at the facility. Hardy, Tr. 294,

297-98, 434-35.

257. In a discussion held between Jesse H. Heald, Jr., President,

Worth Sports, and an individual named John Chung, during early September 1984,

Mr. Chung represented that he had access to a capacity to provide 240,000

dozen softballs per year. Mr. Chung was involved with a trading company which

had tried to establish export sales to the United States. The company name

was Kooney, Inc. Mr. Chung also indicated that he had been affiliated with

Complete Merchants Corp. in the past and had been involved with Diamond Sports in their early efforts to establish manufacturing in Taiwan. Heald, Tr. 43-45; see also CX 1(C), at 6; Hardy, Tr. 440.

C 258. , located in Taiwan, has a square feet facility
C and employs individuals who are not stitchers. production capacity
C for the stitching of balls is approximately dozen per month. Hardy,
Tr. 295-97.

259. In a letter dated March 27, 1984, Morrison Enterprises Corp., located at 123 Kung Kuan Road, Taichung, Taiwan 400, Republic of China, informed Lannom that it had been in the sporting goods industry for over ten years and was able to offer Lannom a "SOLID PU CORE" softball with a waterproof leather cover for \$26.20 per dozen, F.O.B. Taiwan. CX 8; see Heald, Tr. 39-40.

260. Sakurai, located in Taiwan, has recently purchased a
C square feet facility. Sakurai production capacity for the
C stitching of balls is approximately dozen per month.
C

261. Sakurai Athletic Mfg. Co., Ltd.'s, factory had specialized in the manufacture of softballs and baseballs for up to three years. Sakurai Athletic purchased its polyurethane cores from Success Chemicals. Inspection of Sakurai Athletic's facilities revealed that they were manufacturing products for Steele and Diamond Sports. Hsu Dep., Tr. 16-19; CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984).

262. In an undated price quotation, Kaohsiung Tayang Co., Ltd., located at Factory 9-21, Song Bun Road, Lann Bun Isuen, Meau Song Shiang, Kaohsiung Hsien, Taiwan, Republic of China, and Tayang Sporting Goods Co., Ltd., located

at Office 87-2, Chung San, 1 Road, Kaohsiung, Taiwan, Republic of China, P.O. Box 562, offered the following solid polyurethane core softballs with chrome tanned leather covers: P12G, Gold stitch, restricted flight, \$21.50 F.O.B. Taiwan; P12R, Red stitch, traditional flight, slow pitch, \$21.50 F.O.B. Taiwan; and P12W, White stitch, traditional lively flight, fast and slow pitch, \$21.50 F.O.B. Taiwan. The above prices are based on a minimum purchase of 500 dozen. If the minimum purchase is less than 500 dozen, the above prices are F.O.R. Kaohsiung. CX 9; see Heald, Tr. 42-43.

263. Tayang's factory in Taiwan prepares balls for stitching of the covers to the cores by cutting and punching holes in the leather, winding baseballs and yarn, and adhering the cover to the core. After the balls return from the stitching factories/stations, employees at Tayang package the

C balls and

C The size of Tayang's facilities are approximately square

C feet.

264. Tayang Sporting Goods Co., Ltd., has been established for ten years and produced mainly baseballs for export. Tayang had produced polyurethane core softballs for one to two years but the orders and quantity were not large. Tayang's did business with a U.S. company, CEMID or CEMIG, that used the mark L.M.G. Tayang's polyurethane cores may have been purchased from Success Chemical. Hsu Dep., Tr. 19, 39-40; CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984); see CX 31.

265. Well-Sun, located in Taiwan, has a production capacity for the

C stitching of balls of dozen per month.

266. Well-Sun Sports Mfg. Co., Ltd., has been established for six to seven years and their products, including softballs, are exported mainly to Europe and the United States. Well-Sun has produced polyurethane core balls, and one of their big clients, according to Ms. Hsu, is Diamond Sports, but currently they are only producing BADEN branded polyurethane core softballs. Hsu Dep., Tr. 23A-25C, 40-44; CX 29, Letter from M.S. Lin, Attorney-at-Law, to Paul F. Kilmer, Esq. (May 15, 1984).

C 267.

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Hardy, Tr. 422-25; see id., at 278, 301.

268. Coast Marketing, located in San Jose, California, is a catalog-type company. Coast Marketing to determine its price on softballs, was quoted \$32.50 per dozen for softballs with leather covers and \$22.50 per dozen for softballs with PVC covers. Coast Marketing sells a softball with what is called a synthetic core.

269. Coast Marketing has been selling a leather covered polyurethane core softball for a year and a half to two years longer than Diamond Sports. Hardy, Tr. 433.

270. CPX 1, a disassembled Regent Sports' softball, was inspected by complainant to determine the softball's composition and physical characteristics. After this inspection, complainant concluded that Regent Sports' softball had a leather cover with a core formed of polyurethane foam plastic and demonstrated the same rebound, weight, size, and hardness characteristics as a conventional softball. Heald, Tr. 33-37.

271. CPX 2, the package which contained the Regent Sports' softball, states that the softball has a "Polycore" and is produced under U.S. Patent 3,976,295. CPX 2; see Heald, Tr. 37-38.

272. The polyurethane core of CPX 1, the disassembled Regent Sports' softball in which complainant inspected the softballs composition and physical characteristics, has a 1979 date on it that indicates a possibility that the core was purchased from Lannom. Tr. 109-10; Dale, Tr. 659-60.

C 273.

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Hardy, Tr. 331.

274. The market for softballs outside the United States is as follows: Europe, 10,000-20,000 dozen per year; New Zealand, a few thousand dozen per year; Central America, 20,000-30,000 dozen per year; Australia, a few thousand dozen per year. Canada is the largest market outside the United States, but no estimate of the market size appears in the record. Heald, Tr. 78-79; cf. id., at 470-71.

275. There is no evidence of record which demonstrates that there are facilities in Haiti for the production of polyurethane cores. It appears that for those softballs manufactured in Haiti that feature polyurethane cores, the cores are produced first in the United States, shipped to Haiti to be combined with covers, then shipped back to the United States. See Hardy Aff't, CX 23(C), at 8.

276. Though Indonesia, Korea, Mainland China, and the Philippines are places where softballs could be produced because of low labor rates, no polyurethane core softballs are currently being manufactured in those countries. Hardy, Tr. 444-45; see id., at 284.

CONCLUSIONS OF LAW

1. The U.S. International Trade Commission has jurisdiction as pertains to the subject matter of this investigation and in rem jurisdiction over the polyurethane core softballs with leather covers that have been imported into or sold in the United States. 19 U.S.C. § 1337(a).

2. Patents are presumed valid. 35 U.S.C. § 282.

3. The presumption of validity afforded patents does not have independent evidentiary value, but rather alters the burden of persuasion such that the evidence must demonstrate invalidity. SSIH Equipment, S.A. v. Int'l Trade Comm'n, 218 U.S.P.Q. 678 (Fed. Cir. 1983). See Opn., at 22-23.

4. The '295 patent is invalid under 35 U.S.C. § 112 for failure to provide: (1) in full, clear, concise and exact terms the manner and process of making and used the invention so as to enable any person skilled in the relevant prior art to make and use the invention (Opn., at 23-27); and (2) claims that particularly point out and distinctly claim the invention (Opn., at 28-41).

5. The '295 patent is invalid under 35 U.S.C. § 103 because the subject matter of the patent as a whole would have been obvious to a person having ordinary skill in the art. Opn., at 41-55.

6. Even if the '295 patent was valid, only those leather covered softballs of COR 0.48 manufactured with polyurethane cores produced by Success Chemicals would infringe the patent. Opn., at 56-62. The polyurethane cores produced by Mansui are unusable in organized league play and therefore do not infringe claims 3, 4, or 5 of the '295 patent. Opn., at 56-62.

7. Sales by respondents Tusa and Success Chemicals to settled respondent Diamond Sports do not constitute an unfair act. Opn., at 71-79.

8. Pursuant to § 337, industry is defined as the domestic operations of the owner and licensees devoted to the exploitation of the intellectual property right at issue examined in light of the realities of the marketplace. Opn., at 63-68.

9. The domestic operations of complainant related to the manufacture, research, and development of the component parts for the production of a polyurethane core softball with a leather cover demonstrating the characteristics of a conventional softball usable in official league play, and the distribution and sale of this same finished softball, constitute a domestic industry under § 337. Opn., at 63-68.

10. The domestic industry must be, pursuant to § 337, efficiently and economically operated through use of modern equipment and facilities, investment in research and development, profitability of the relevant product line, substantial expenditures in advertising, promotion, and development of goodwill, and effective quality control. Opn., at 69-71.

11. The relevant domestic industry is efficiently and economically operated. Opn., at 69-71.

12. Respondents' unfair methods of competition and unfair acts must have the effect or tendency under § 337 to destroy or substantially injure the domestic industry. Opn., at 71-94.

13. The importation and sale of allegedly infringing polyurethane core softballs does not have the effect or tendency to substantially injure the relevant domestic industry. Opn., at 79-94.

INITIAL DETERMINATION AND ORDER

Based on the foregoing opinion, findings of fact, conclusions of law, and the record as a whole, and having considered all pleadings and arguments as well as proposed findings of fact and conclusions of law, it is the administrative law judge's INITIAL DETERMINATION ~~that~~ there is no violation of § 337 of the Tariff Act of 1930, as amended, in the importation into or sale in the United States of certain softballs and polyurethane cores therefor.

The administrative law judge hereby CERTIFIES to the Commission this Initial Determination together with the record of the exhibits accepted into evidence during the course of the hearing in this investigation.

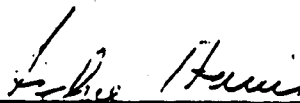
In accordance with Rule 210.44(b), all material found to be confidential by the administrative law judge under Rule 210.6(a) is to be given in camera treatment for five years from the termination date of this investigation.

The Secretary is instructed to serve a public version of this Initial Determination upon all parties of record and the confidential version upon all counsel of record who are signatories to the protective order issued by Administrative Law Judge Donald K. Duvall on May 11, 1984.

This Initial Determination shall become the determination of the Commission 30 days after its date of service unless the Commission within those 30 days shall have ordered review of this Initial Determination, or certain issues herein, pursuant to 19 C.F.R. §§ 210.54(b) or 210.55.
19 C.F.R. § 210.53(h).

Any party to this investigation may request a review by the Commission of this Initial Determination by filing with the Secretary a petition for review, except that a party who has defaulted may not petition for review of any issue regarding which the party is in default. A petition of review shall be filed within 10 days after the service of this Initial Determination. 19 C.F.R. §§ 210.54(a).

So ordered.

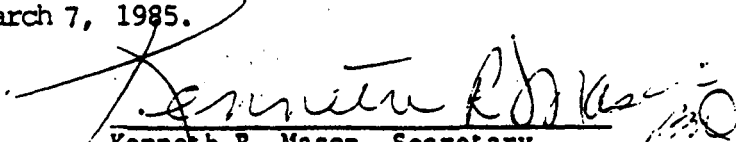


Sidney Harris
Administrative Law Judge

Issued: February 19, 1985

CERTIFICATE OF SERVICE

I, Kenneth R. Mason, hereby certify that the attached Order was served upon Robert D. Litowitz, Esq., and upon the following parties via first class mail, and air mail where necessary, on March 7, 1985.


Kenneth R. Mason, Secretary
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