(2) *Switch marking.* Any toy having one or more moving parts which perform an inherent function of the toy and which may cause personal injury shall have a switch that can deenergize the toy by a simple movement to a plainly marked ''OFF'' position. Momentary contact switches which are normally in the ''OFF'' position need not be so marked.

(3) *Electrically operated sewing machines.* Electrically operated toy sewing machines shall be designed and constructed to eliminate the possibility of a child's finger(s) being pierced by a needle. For the purpose of this paragraph, a clearance of not more than five thirty-seconds of an inch below the point of the needle when in its uppermost position or below the presser foot, if provided, shall be considered satisfactory.

(4) *Pressure relief valves.* A pressurized enclosure shall have an automatic pressure relief device and shall be capable of withstanding hydrostatic pressure equal to at least five times the relief pressure.

(5) *Containers for heated materials.* Containers intended for holding molten compounds and hot liquids shall be designed and constructed to minimize accidental spillage. A pot or pan having a lip and one or more properly located pouring spouts and an adequately thermally insulated handle may provide satisfactory protection. Containers intended solely for baking need not be designed and constructed to minimize accidental spillage. Containers shall be of such material and construction t+at they will not deform or melt when subjected to the maximum operating temperature occurring during normal use or after reasonably foreseeable damage or abuse.

(6) *Water.* Electrically operated toys (such as toy irons) shall not be designed or manufactured to be used with water except for toy steam engines or other devices in which the electrical components are separate from the water reservoir and are completely contained in a sealed chamber. Toys requiring occasional or repeated cleaning with a wet cloth shall be constructed to prevent seepage of water into any electrically active area that may produce a hazardous condition.

§ 1505.5 Electrical design and construction.

(a) *Switches.* (1) Switches and other control devices of electrically operated toys shall be suitable for the application and shall have a rating not less than that of the load they control (see § 1505.6(e)(5)(ii) regarding electrical switch overload). A switch that controls a replaceable incandescent lamp, electrode, or lampholder contact which is at a potential of more than 30 volts r.m.s. (42.4 volts peak) to any other part or to ground shall open both sides of the circuit and shall have a marked ''OFF'' position. A switch that may reasonably be expected to be subjected to temperatures higher than 50 °C. (122 °F.) shall be constructed of materials which are suitable for use at such temperatures.

(2) Switches shall be located and protected so that they are not subject to mechanical damage that would produce a hazard in normal use or from reasonably foreseeable damage or abuse (see § 1505.6(b)).

(b) *Lamps.* (1) A replaceable incandescent lamp having a voltage of more than 30 volts r.m.s. (42.4 volts peak) between any of its electrodes or lampholder contacts and any other part or ground shall be in an enclosure that has at least one door or cover permitting access to the lamp. Such door(s) or cover(s) of the enclosure shall be so designed and constructed that they cannot be opened manually or with a flat bladed screwdriver or pliers.

(2) With all access doors and covers closed, the lamp enclosure shall have no opening that will permit entry of a straight rod 6 inches long and one-fourth inch in diameter if such entry would present an electrical hazard. The lamp shall be located no less than one-half inch from any ¼-inch-diameter opening in the enclosure.

(3) A toy having one or more lampholders shall be designed and constructed so that no live parts other than the contacts of the lampholders are exposed to contact by persons removing or replacing lamps. The shells of all lampholders for incandescent lamps shall be at the same potential.

(4) If the potential between the contacts of a lampholder for a replaceable

incandescent lamp and any other part or ground is greater than 30 volts r.m.s. (42.4 volts peak), the contacts shall be located in an insulating husk or equivalent.

(c) *Transformers.* Transformers that are integral parts of toys shall be of the 2-coil insulated type.

(d) *Automatic controls.* Automatic controls for temperature regulations shall have the necessary capacity and reliability for their particular application.

(e) *Power supply connections* (*cords and plugs*). (1) A toy shall be provided with a suitable means for attachement to the power supply circuit.

(2) A toy requiring a power cord shall have a flexible cord that is permanently attached to the toy.

(3) The perimeter of the face of the attachment-plug cap shall be not less than five-sixteenths of an inch from any point on either blade of the plug.

(4) The body of the attachment-plug cap shall decrease in cross section from the face but shall have an expansion of the body, after a suitable distance from the face, sufficient to provide an effective finger grip.

(5) A flexible electrical power cord provided on a toy shall be type SP–2 (as defined in the ''National Electrical Code,'' Chapter 4, article 400, pages 230–241 (1978)[1], or its equivalent, or a heavier general-use type, and shall be not less than 5 feet nor more than 10 feet in length when measured as the overall length of the attached cord outside the enclosure of the toy, including fittings, up to the face of the attachment-plug cap. However, hand-held educational or hobby-type products intended for heating such as woodburning tools, shall use one of the type cords designated below, in accordance with the weight of the product without the cord:

WEIGHT OF APPLIANCE (WITHOUT CORD) AND CORD TYPE

½ lb. (0.227 kg) and lighter: SP–1, SPT–1, HPD. Heavier than ½ lb. (0.227 kg): SP–2, SPT–2, SV, SVO, SVT, SVTO, HPD, HPN, SJ, SJO, SJT, SJTO.

(6) A flexible cord and plug shall have a current-carrying capacity of not less than the ampere rating of the toy, and the conductor of the cord shall have a cross sectional area no less than No. 18 AWG (American wire gauge).

(7) Cords on toys which are intended to come in direct contact with water or other liquids during use shall be of a jacketed type. Cords on toys with which water or other liquids are to be indirectly used (such as for cooling a mold) shall be plastic covered.

(8) Transformers in which the primary coil connects directly to the branch circuit outlet shall not be subject to the requirements of paragraphs (e) (2), (4), and (5) of this section.

(f) *Bushings.* (1) At the point where a power supply cord passes through an opening in a wall, barrier, or the overall enclosure of a toy, a suitable and substantial bushing, insulating bushing, or equivalent shall be reliably secured in place and shall have smooth surfaces and well-rounded edges against which the cord may bear.

(2) If a cord hole is in wood, porcelain, phenolic composition, or other suitable insulating material, the surface of the hole is acceptable without a bushing if the edges of the hole are smooth and well-rounded. Where a separate insulating bushing is required, a bushing made of ceramic material or a suitable molded composition is acceptable if its edges are smooth and well-rounded.

(3) In no instance shall a separate bushing of wood, rubber, or any of the hot-molded shellac-and-tar compositions be considered acceptable.

(g) *Wiring.* (1) The internal wiring of a toy shall consist of suitable insulated conductors having adequate mechanical strength, dielectric properties, and electrical capacity for the particular application.

[1] NFPA No. 70–1978, 1978 edition of National Electrical Code, Article 400, ''Flexible Cords and Cables,'' pages 70–230 through 70–240, published by the National Fire Protection Association, which is incorporated by reference. Copies of this document are available from the National Fire Protection Administration, 60 Batterymarch Park, Quincy, Massachusetts 02269. This document is also available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC. This incorporation by reference was approved by the Director of the Federal Register. These materials are incorporated as they exist in the edition which has been approved by the Director of the Federal Register and which has been filed with the Office of the Federal Register.

(2) Wireways shall be smooth and entirely free of sharp edges, burrs, fins, and moving parts that may abrade conductor insulation. Each splice and connection shall be mechanically secure, shall provide adequate and reliable electrical contact, and shall be provided with insulation at least equivalent to that of the wire involved unless adequate spacing between the splice and all other metal parts is permanently assured.

(3) A wire connector for making a splice in a toy shall be a type that is applied by a tool and for which the application force of the tool is independent of the force applied by the operator.

(4) Soldered connections shall be made mechanically secure before soldering.

(5) Current-carrying parts shall be made of silver, copper, a copper alloy, or other electrically conductive material suitable for the particular application.

(h) *Strain relief.* (1) A means of strain relief shall be provided to prevent mechanical stress on a flexible cord from being transmitted to terminals, splices, or interior wiring.

(2) If suitable auxiliary insulation is provided under a clamp for mechanical protection, clamps of any material are acceptable for use on Type SP–2 (as defined in the ''National Electrical Code,'' chapter 4, article 400, pages 184–194 (1971)[2]) or equivalent rubber-insulated cord. For heavier types of thermoplastic-insulated cord, clamps may be without auxiliary insulation unless the clamp may damage the cord insulation.

(3) A flexible cord shall be prevented from being pushed into the toy through the cord-entry hole if such displacement would result in a hazardous condition.

(4) A knot in the cord shall not be considered an acceptable means of strain relief, but a knot associated with a loop around a smooth, fixed structural component shall be considered acceptable.

(i) *Additional requirements.* Except for the electrodes of a replaceable incandescent lamp and its lampholder contacts, a potential of more than 30 volts r.m.s. (42.4 volts peak) shall not exist between any exposed live part in a toy and any other part or ground.

(Sec. 30(a), 86 Stat. 1231 (15 U.S.C. 2079(a)))

[38 FR 27032, Sept. 27, 1973, as amended at 43 FR 45552, Oct. 3, 1978; 46 FR 63251, Dec. 31, 1981]

§ 1505.6 Performance.

(a) *General.* Electrically operated toys and components thereof shall be tested by the appropriate methods described in this section and shall pass the tests in such a manner as to provide the necessary assurance that normal use and reasonably foreseeable damage or abuse will not produce a hazard or a potentially hazardous condition. The toy shall be capable of passing all applicable tests with any door, cover, handle, operable part, or accessory placed in any normal position. A toy shall not present a fire, casualty, or shock hazard when operated continuously for 6 hours under conditions of normal use and reasonably foreseeable damage or abuse, including the most hazardous position in which the toy can be left.

(b) *Enclosures.* For the purposes of this section, the term *enclosure* means any surface or surrounding structure which prevents access to a real or potential hazard. An enclosure shall withstand impact, compression, and pressure tests (see paragraphs (b)(1), (2), and (3) of this section) without developing any openings above those specified, reduction of electrical spacings below those specified, or other fire, casualty, or shock hazards, including the loosening or displacement of

[2] NFPA No. 70–1971, 1971 edition of National Electrical Code, Article 400, ''Flexible Cords and Cables,'' pages 70–184 through 70–194, published by the National Fire Protection Association, which is incorporated by reference. Copies of this document are available from the National Fire Protection Association, 60 Batterymarch Park, Quincy, Massachusetts 02269. This document is also available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC. This incorporation by reference was approved by the Director of the Federal Register. These materials are incorporated as they exist in the edition which has been approved by the Director of the Federal Register and which has been filed with the Office of the Federal Register.