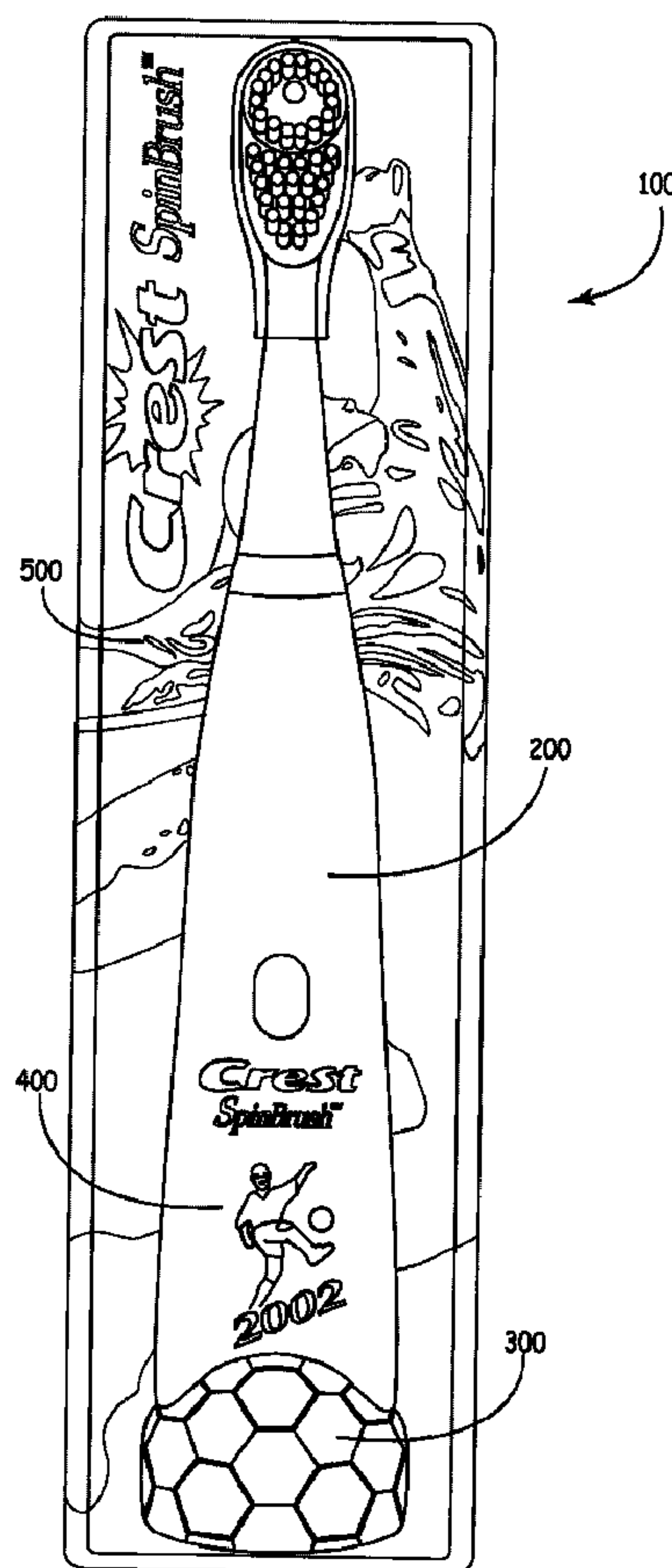




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(54) Title: TOOTHBRUSH KIT



(57) Abrégé/Abstract:

A toothbrush kit is disclosed comprising a package, a toothbrush, one or more removable end caps adapted for engaging an end of the toothbrush, and one or more emblems that may be adhesively attached to the toothbrush. Also disclosed are methods for



(57) **Abrégé(suite)/Abstract(continued):**

selectively customizing a toothbrush by use and selection of components contained in the kit. Additionally disclosed are methods for manufacturing and packaging the components of the toothbrush kit. Furthermore, a strategy is disclosed for specifically tailoring the toothbrush kit for particular markets, geographic regions, or consumer groups.

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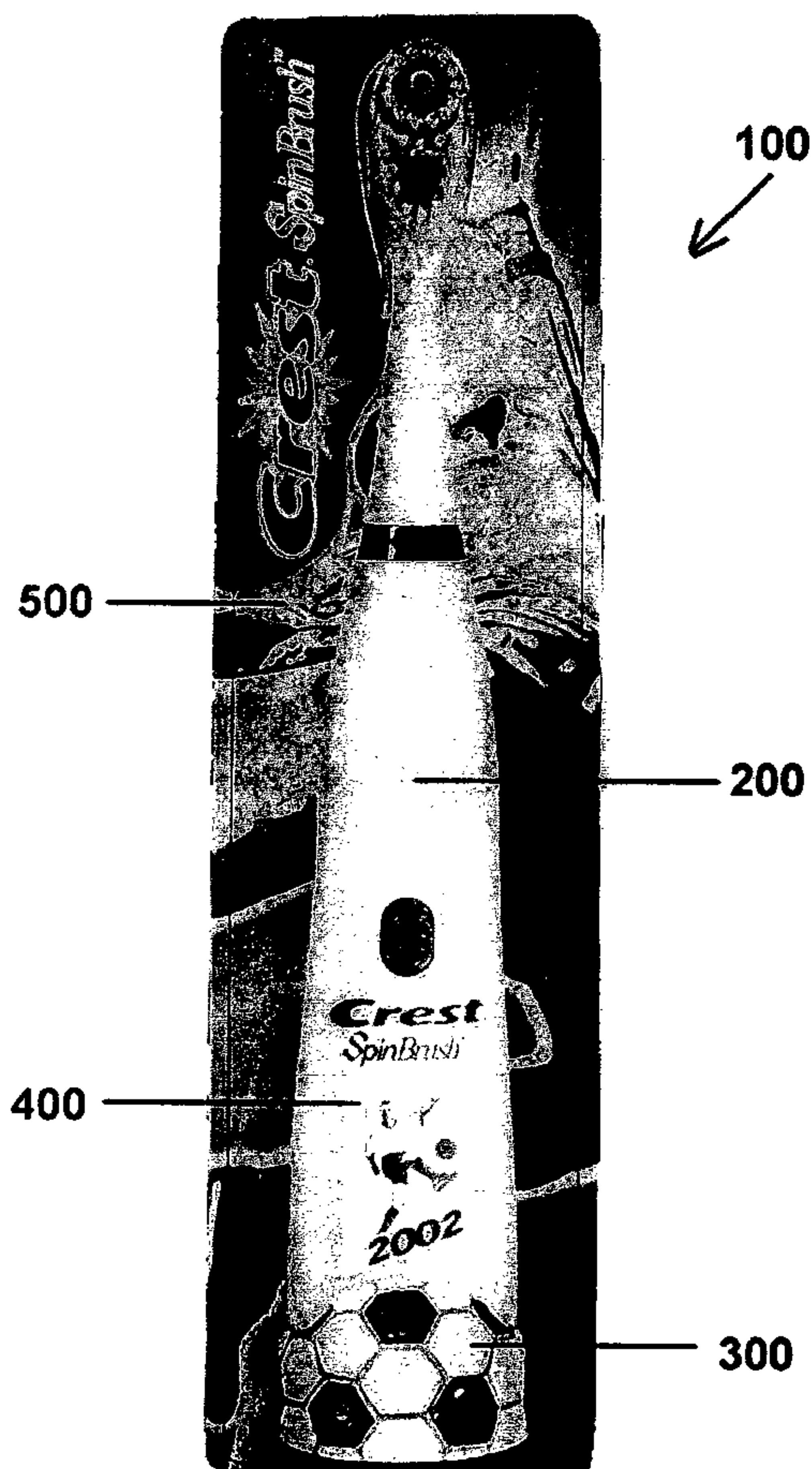
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(54) Title: TOOTHBRUSH KIT



(57) **Abstract:** A toothbrush kit is disclosed comprising a package, a toothbrush, one or more removable end caps adapted for engaging an end of the toothbrush, and one or more emblems that may be adhesively attached to the toothbrush. Also disclosed are methods for selectively customizing a toothbrush by use and selection of components contained in the kit. Additionally disclosed are methods for manufacturing and packaging the components of the toothbrush kit. Furthermore, a strategy is disclosed for specifically tailoring the toothbrush kit for particular markets, geographic regions, or consumer groups.

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TOOTHBRUSH KIT

Field of the Invention

The present invention relates to the field of toothbrushes and more particularly, the invention relates to kits for customizing and personalizing toothbrushes. The present invention also relates to methods for customizing toothbrushes and related methods for manufacturing and packaging such kits and furthermore, to specifically tailoring such kits for particular markets.

Background of the Invention

Consumers sometimes prefer conformable toothbrushes because they may be personalized or customized to one's preferences. Some designs have been directed to toothbrush assemblies for small children and often contain interchangeable character handles. Examples of such assemblies are shown in U.S. Patents 6,015,328; 6,141,815; and 5,774,921.

Most user configurable toothbrush assemblies require significant disassembly or modification of the toothbrush itself. For example, the toothbrush assembly of the previously noted '328 patent contains a relatively complex assembly of a toothbrush head and neck, an adapter component, and a character handle. Given the degree of force and movement applied to the handle during brushing, a relatively complex engagement mechanism is used to secure the toothbrush head and neck assembly to the character handle. Again, although the toothbrush assembly of the '328 patent is satisfactory in many respects, there is a need for a toothbrush assembly that may be customized by an end user in a relatively simple manner.

Other toothbrush bases or holders are known in the art. For example, U.S. Patent 6,102,203 discloses a toothbrush cover and holding assembly. Although that assembly appears to be rather useful, it requires a relatively large space for its accommodation. Furthermore, most known toothbrush holders are designed for retaining multiple brushes and thus, have a relatively large footprint

and occupy significant countertop space. As a result, it would be desirable to provide a toothbrush holder or base for a single toothbrush that was compact in size.

It is becoming increasingly important to market consumer products and particularly consumer healthcare products, to particular consumer groups. For instance, it is vastly preferred to tailor a product and its packaging for each region within which it is sold as opposed to try to distribute and sell the same product using the same packaging in the same fashion in all regions within which it is sold. However, configuring and packaging a product for each region within which it is sold generally increases the costs associated with packaging the product. Accordingly, it would be beneficial to provide a technique or strategy for uniquely tailoring a product for a particular consumer group or geographic region that would not significantly increase the costs associated with packaging the product.

Summary of the Invention

The present invention provides in a first aspect, a toothbrush kit comprising a package, an electric toothbrush, and a group of decorative end caps. The toothbrush has an elongated hollow body, a head, and a neck disposed between the body and head. Each of the end caps is attachable to the body of the toothbrush and thus serve to customize the appearance of the toothbrush. Additionally, each of the end caps is distinct from other end caps in the group.

In another aspect, the present invention provides a toothbrush kit comprising a package, an electric toothbrush and a group of decorative emblems. The toothbrush has an elongated hollow body, a head, and a neck disposed between the body and head components. Each of the emblems in the group can be attached to the hollow body of the toothbrush to thereby customize the appearance of the toothbrush. Additionally, each of the emblems is distinct from other emblems in the group.

In an additional aspect, the present invention provides a toothbrush kit for use with an electric toothbrush. The kit comprises a package and a collection of decorative end caps, each of which is attachable to the toothbrush to thereby

customize the appearance of the toothbrush. Additionally, each of the end caps is distinct from other end caps in the collection.

In yet another aspect, the present invention provides a toothbrush kit comprising an electric toothbrush, at least one end cap, at least one label assembly, and a package containing these components. The electric toothbrush includes a body having first and second ends, a brush head disposed next to one of the ends, and an interior battery chamber defined within the body that is accessible from the other end of the toothbrush body. Each of the end caps provided in the toothbrush kit has a relatively flat bottom surface and a generally arcuate outer surface extending from the bottom surface to an upper region of the end cap. Each of the end caps includes an interior receiving chamber which is accessible from an aperture extending along the upper region of the end cap. The receiving chamber and the aperture are adapted to receive and engage an end of the toothbrush. Concerning the label assembly, that assembly includes a decorative polymeric layer that is removably attached to a backing layer. The polymeric layer is adapted for selective placement and retention on the body of the toothbrush.

In a further aspect, the present invention provides a method for customizing the appearance of the toothbrush and base assembly. This method comprises the steps of providing a toothbrush kit having a collection of bases, each base being adapted to engage an end of the toothbrush, and each base containing markings or colorings different than the markings or colorings of other bases in the group of bases. The toothbrush kit further includes a collection of adhesive labels, each containing markings or colorings different than markings or colorings of other labels in the collection of labels. The method further includes a step of selecting a base having a particular marking or coloring from the group of bases. The method also includes a step of selecting a label having a particular marking or coloring from the group of labels. And the method includes a step of applying the selected label to the toothbrush.

In another aspect, the present invention includes a method for packaging and tailoring a toothbrush kit for a particular market. The method includes the steps of identifying a region in which the toothbrush kit will be sold,

identifying the primary language of that region, and identifying at least one marketing characteristic of that region. The method also includes providing inventories or sources of components for subsequent incorporation into the kit. And, the method includes a step of selecting an end cap component of the kit and a group of emblems based upon one or more of the marketing characteristics of the region. The various components are then appropriately packaged together.

In still a further aspect, the present invention includes a method of manufacturing a group of toothbrush kits. The method comprises providing a packing station having a source of a collection of a first type of emblems, a collection of a second type of emblems, and a collection of a third type of emblems. One or more different type of toothbrush kits, preferably unassembled or not yet completed, are conveyed to the packing station. Next, one or more of the first type of emblems and one or more of the second type of emblems are then associated with one of the types of the toothbrush kit packages. Then, one of the types of the first emblems, the second emblems, and the third emblems are then associated with the second type of toothbrush kit package.

In still a further aspect, the present invention provides a method of producing a group of toothbrush kits. This method comprises steps of providing a source of toothbrushes, a source of sealable packages, a source of at least one end cap, and a source of a group of label sets. Each of the label sets are distinct from the other sets in the group. And, each label set includes at least one label that is removably adhered to a backing layer. The method additionally includes steps of selecting a toothbrush from the source of toothbrushes, selecting a package from the source of packages, selecting at least one end cap from the source of end caps, and selecting at least one label set from the source of label sets. The method also includes a step of incorporating the selected toothbrush, the selected one or more end caps, and the one or more label sets into the selected package. The label set is left loose in the selected package after its incorporation therein. Finally, the method involves a step of sealing the package.

The present invention also includes a method of configuring a toothbrush kit for a particular market. This method involves identifying a region in

which the toothbrush kit will be sold. The method also involves a step of identifying a primary language of that identified region. Additionally, the method includes a step of identifying a marketing factor of that identified region. The method also includes a step of selecting components for the toothbrush kit that are associated with the identified marketing factor.

In accordance with an aspect of the present invention, there is provided a toothbrush kit comprising:

(a) an electric toothbrush having a hollow body comprising a closed first end and an open second end opposite to the first, a brush head disposed at the first end, wherein the hollow body is structured to contain a drive mechanism and an interior battery chamber;

(b) a plurality of end caps, each of the plurality of end caps being designed to engage the second open end to securely close it, and wherein at least some of the plurality of end caps are distinct from the rest of the plurality of end caps.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said plurality of end caps includes from about 2 end caps to about 10 end caps.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said hollow body of said electric toothbrush further defines an internal compartment adapted for receiving a battery, said body further defining an opening providing access into said internal compartment, and wherein each of said plurality of decorative caps are adapted to close said opening.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said opening is defined opposite said head.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein each of said end caps is provided in the shape of an item of sports equipment.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said sports equipment is non-apparel sports equipment.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said non-apparel sports equipment is a ball.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said ball is selected from the group consisting of a football, a baseball, a basketball, a bowling ball, a tennis ball, a golf ball, a soccer ball, and combinations thereof.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, further comprising a plurality of emblems, wherein each emblem is distinct from other emblems of said plurality.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein each emblem represents a country.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein each emblem represents an athletic team.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said plurality of emblems further include an adhesive for attaching said emblems to said electric toothbrush.

In accordance with another aspect of the present invention, there is provided the toothbrush kit of the present invention, wherein said elongate hollow body has an outer portion adapted for receiving at least one of said emblems.

Still other advantages and benefits of the invention will become apparent to those skilled in the art upon a reading and understanding of the following detailed description.

Brief Description of the Drawings

The present invention may take physical form in certain parts and arrangements of parts, preferred embodiments of which will be described in detail in this specification and illustrated in the accompanying drawings which form a part hereof and wherein:

Fig. 1 is a photographic front elevational view of a preferred embodiment toothbrush kit in accordance with the present invention;

Fig. 2 is a photographic perspective view of a preferred embodiment toothbrush and end cap for use in the toothbrush kit of the present invention;

Fig. 3 is a photographic front elevational view of the preferred embodiment toothbrush and end cap shown in **Fig. 2**;

Fig. 4 is a photographic side elevational view of the preferred embodiment toothbrush and end cap shown in **Fig. 2**;

Fig. 5 is a photographic side elevational view, of a side opposite that shown in **Fig. 4**, of the toothbrush and end cap shown in **Fig. 2**;

Fig. 6 is a photographic rear elevational view of the preferred embodiment toothbrush and end cap shown in **Fig. 2**;

Fig. 7 is a photographic side detail view of a lower portion of another preferred embodiment toothbrush and end cap for use in the toothbrush kit of the present invention;

Fig. 8 is a photographic front detail view of the lower portion of the preferred embodiment toothbrush and end cap shown in **Fig. 7**;

Fig. 9 is a photographic side detail view, opposite the side shown in **Fig. 7**, of the lower portion of the preferred embodiment toothbrush and end cap shown in **Fig. 7**;

Fig. 10 is a photographic rear detail view of the lower portion of the preferred embodiment toothbrush and end cap shown in **Fig. 7**;

Fig. 11 is a photographic bottom view of the preferred embodiment toothbrush and end cap shown in **Fig. 2**;

Fig. 12 is a photographic detail of an open end of the preferred embodiment toothbrush shown in **Fig. 2** and a receiving cavity defined in the preferred embodiment end cap shown in **Fig. 2**;

Fig. 13 is a perspective illustration of another preferred embodiment toothbrush for use in the toothbrush kit of the present invention;

Fig. 14 is a side elevational illustration of the preferred embodiment toothbrush depicted in **Fig. 13**;

Fig. 15 is a front elevational illustration of the preferred embodiment toothbrush depicted in **Fig. 13**;

Fig. 16 is a perspective illustration of another preferred embodiment toothbrush for use in the toothbrush kit of the present invention;

Fig. 17 is a side elevational illustration of the preferred embodiment toothbrush depicted in **Fig. 16**;

Fig. 18 is a front elevational illustration of the preferred embodiment toothbrush depicted in **Fig. 16**;

Fig. 19 is a perspective illustration of another preferred embodiment end cap for use in the toothbrush kit of the present invention;

Fig. 20 is a top view of the end cap illustrated in **Fig. 19**;

Fig. 21 is a perspective view showing the rear of the end cap illustrated in **Fig. 19**;

Fig. 22 is a bottom view of the end cap illustrated in **Fig. 19**;

Fig. 23 is a perspective illustration of a plurality of emblems on a planar backing sheet for use in the toothbrush kit of the present invention;

Fig. 24 is a perspective illustration of a plurality of emblems on a rolled backing strip for use in the toothbrush kit of the present invention;

Fig. 25 is a front elevational illustration of another preferred embodiment of the toothbrush kit of the present invention;

Fig. 26 is a side elevational illustration of the toothbrush kit depicted in **Fig. 25**;

Fig. 27 is a photographic perspective view of the preferred embodiment end cap shown in **Fig. 2**, showing a top region and an aperture;

Fig. 28 is a photographic perspective view of the preferred embodiment end cap shown in **Fig. 2**, showing a bottom region;

Fig. 29 is a photographic side elevational view of the preferred embodiment end cap shown in **Fig. 2**;

Fig. 30 is a photographic side elevational view, of a side opposite that shown in **Fig. 29**, of the preferred embodiment end cap shown in **Fig. 2**;

Fig. 31 is a photographic top view of the preferred embodiment end cap shown in **Fig. 2**;

Fig. 32 is a photographic bottom view of the preferred embodiment end cap shown in **Fig. 2**;

Fig. 33 is a photographic front elevational view of the preferred embodiment end cap shown in **Fig. 2**;

Fig. 34 is a photographic rear elevational view of the preferred embodiment end cap shown in **Fig. 2**; and

Fig. 35 is a photographic top view of the preferred embodiment toothbrush and end cap shown in **Fig. 2**.

Detailed Description of the Preferred Embodiments

The present invention provides a unique toothbrush kit that may be specifically configured to appeal to particular consumers or markets. The

toothbrush kit enables a toothbrush contained in that kit to be selectively modified and personalized by an end user according to that user's specific preferences. The present invention also provides related methods for subsequent tailorization of a toothbrush contained in the kit. In addition, the present invention provides manufacturing and packaging techniques for producing a product specifically tailored to a particular region, market segment, or consumer group. These aspects are all described in greater detail herein.

In a first aspect, the present invention provides a toothbrush kit comprising a package, a toothbrush, one or more end caps, and one or more decorative emblems. As explained herein, the toothbrush kit may include (i) one end cap and one emblem, (ii) one end cap and a plurality of emblems, (iii) a plurality of end caps and one emblem, and (iv) a plurality of end caps and a plurality of emblems. The present invention encompasses all of these variations.

The toothbrush package is generally a relatively rigid packaging container for housing the toothbrush and other components of the kit. The package is adapted for retail display and so, preferably includes a transparent front cover that enables the contents of the package, i.e. the toothbrush, one or more end caps, and one or more emblems, to be viewed by consumers. Additionally, the package preferably includes a backing member having colorful markings, indicia, and/or designs printed thereon. It will be appreciated that the package is particularly adapted for display for retail sale.

A wide array of package types, construction, and designs may be utilized for the package of the preferred embodiment toothbrush kit of the present invention. Several particularly preferred packages are disclosed in U.S. Patents 6,189,693 and 6,311,837

Generally, the package includes a relatively rigid backing member and a transparent front cover. Preferred materials for the backing member include, but are not limited to, paperboard, cardboard or other cellulose-based material. The clear or transparent front cover component is preferably formed from polyethylene terephthalate (PET) and related laminates thereof. Another preferred material for forming the transparent front cover of the preferred embodiment package is known

in the industry as GAG, which is a copolymer film of PETG/APET/PETG. PETG is polyethylene terephthalate glycol and APET is amorphous polyethylene terephthalate glycol.

The toothbrush of the preferred embodiment kits may be nearly any type of toothbrush having the features characteristic of the kits described herein. The toothbrush may be either an electric toothbrush or a manual toothbrush as long as the toothbrush may be configured with the end caps and emblems as described herein. Specifically, the toothbrush may utilize any type of bristle pattern, be either of a replaceable head or non-replaceable head type, and if electric, may utilize nearly any type of drive train and bristle arrangement. It is preferred that the toothbrush be an electric toothbrush.

A wide array of electric toothbrushes may be utilized in the preferred embodiment kits described herein. Examples of suitable electric toothbrush designs include, but are not limited to, those disclosed in U.S. Patents 6,000,083; 6,189,693; 6,178,579; 5,617,601; and 5,625,916

Specific examples of preferred embodiment electric toothbrushes are described in greater detail herein. A wide array of plastics or polymeric materials may be used for the various components of the toothbrushes described herein. Generally, it is preferred to form the toothbrush body from a relatively strong, durable, and rigid plastic. Details as to the construction, materials, and assembly of such toothbrushes are set forth in the previously noted patents.

The end cap of the preferred embodiment toothbrush kit is a component that is adapted to engage an end of the toothbrush and to further support the toothbrush when placed in a vertical position, such as on a bathroom countertop. In the event that the toothbrush used in the kit is an electric toothbrush, it is most preferred that the end cap is also adapted to serve as a battery cap. That is, in this version of the invention, an electric toothbrush is provided having an interior compartment defined within the body of the toothbrush for receiving one or more batteries. The compartment is accessible from an end of the toothbrush opposite the brush head end. Most preferably, the end cap is adapted to sealingly close the battery compartment and ideally, also include electrically conductive

battery contacts for contacting exposed ends of one or more batteries disposed in the compartment of the toothbrush body.

The end cap is preferably generally hemispherical in shape, or at least partially or substantially so, and includes a flat planar bottom surface and an optional second flat planar rear surface. The flat planar bottom surface is provided so that the end cap may serve as a base and support a toothbrush engaged therewith in a generally vertical, upright position. The flat planar rear surface of the end cap is most preferably perpendicular to the bottom surface. The flat rear surface is provided so that the end cap may be positioned relatively close to a vertical wall or surface. This enables the end cap and toothbrush to be stored next to a bathroom wall or countertop back. However, it will be appreciated that the present invention toothbrush kits may also utilize end caps that do not contain this optional flat rear surface. The end cap also defines a receiving cavity that is adapted to receive and engage an end of a toothbrush as further explained herein. The receiving cavity is accessible from an aperture defined along a top surface or region of the end cap.

As previously noted, a feature of the present invention is that the end cap component of the toothbrush kit is relatively small in size and compact. Accordingly, when the toothbrush is in its stored vertically upright position, the overall size of the toothbrush and cap assembly is relatively small.

The terms "top," "bottom," "rear," "front," and "side" although relative in definition, are used herein to refer to the preferred embodiment toothbrush kit or components thereof, when oriented in an upright position as shown in **Fig. 1**. **Fig. 1** is an elevational view of the front of a preferred embodiment toothbrush kit and shows the front of a preferred embodiment toothbrush and end cap. Accordingly, the meanings of the other terms will be understood.

It is contemplated that certain versions of the preferred embodiment toothbrush kit will include a group or plurality of different styles of end caps. That is, each of the end caps is preferably distinct from the other end caps in the group. For instance, it is envisioned that various sets of multiple end caps may be used and/or included in the toothbrush kits described herein. In this version, a set of end caps

included in a kit contains a plurality of end caps, each of a different style. It is contemplated that any number of end caps could be included in the kit, however a preferred number is from about 2 to about 10. The incorporation of multiple end caps in a kit enables a consumer or end user to select a specific cap of the enclosed set for use with the toothbrush, as may be desired. Furthermore, the consumer may readily change which end cap is used with the toothbrush as frequently as he or she wishes.

Furthermore, in this version of the toothbrush kit, it is most preferred that the end caps comprising a set, although each being distinct from the others, generally be associated or theme related to one another. However, as noted, differences may exist between each of the caps within a particular set. For example, a set of caps may be provided having a sports theme. In this example, each of the caps resembles a different type of playing ball such as a soccer ball, a football, a baseball, a basketball, a tennis ball, a golf ball, and a bowling ball, ...etc. Each of the end caps of a set is preferably shaped to resemble its intended playing ball, and most preferably contains decorative colorings and markings to further promote resemblance to the particular playing ball. For example, in the preferred embodiment set of caps having a sports theme, the caps resembling soccer balls, baseballs, basketballs, tennis balls, golf balls, and bowling balls are generally hemispherical in shape and contain colors, surface characteristics, and indicia representative of each of the respective balls. An end cap representing a football is shaped to resemble such and is colored brown and may further contain decorative stitching along its surface like that of a football. Furthermore, for sports theme end caps, it is preferred that the end caps be fashioned to resemble sports equipment rather than sports apparel. However, the present invention encompasses end caps resembling sports apparel or other ancillary sports related items.

The present invention toothbrush kit is not limited to the incorporation of a plurality of end caps in the kit. Instead, the kit may include a single end cap. This version of the preferred embodiment kit is beneficial since it is less costly to produce, assemble, and package than a kit comprising a plurality of end caps. Additionally, a kit using a single end cap but with a plurality of emblems still allows a

user to select one or more emblems based upon the characteristics of the single end cap provided in the kit. Moreover, the package component of the preferred embodiment toothbrush kit enables the style and type of end cap to be visible from the exterior of the package. Accordingly, a consumer may purchase several toothbrush kits, each having end caps of a different style or appearance and subsequently use a toothbrush from one kit with an end cap from another kit. Additionally, the emblems from each of the kits may be mixed and used in combination with components of other kits.

The end caps are formed by conventional plastic molding procedures including for example injection molding, compression molding, and reaction injection molding. It is preferred that for each of the individual end caps, details associated with a particular cap are molded or otherwise formed directly into the surface of the cap. For example, surface characteristics of certain game balls may be molded or otherwise formed into the outer surface of the end cap. Examples of surface characteristics include stitching for footballs and baseballs and dimples for golf balls. Conventional printing and painting methods are utilized for providing decorative colorings and/or markings on the end cap. Printing and painting methods are described in greater detail herein.

The preferred embodiment toothbrush kit also comprises one or more emblems or labels that may be adhesively attached to the toothbrush and optionally, to one or more end caps. The terms "emblem" and "label" are used interchangeably herein. If a plurality or group of emblems or labels are provided as a set, it is generally preferred that the number of labels ranges from about 2 to about 10. In another embodiment, the toothbrush kit contains between 2 and 4 emblems or labels. However, the preferred embodiment label sets also include 1 or more than 10 labels. The emblems preferably contain decorative markings and indicia. If a group or plurality of labels are provided, it is preferred that each of the labels be distinct from other labels in the group. Preferably, the group or plurality of labels are related to one another even though each is distinct. This is explained in greater detail herein. Most preferably, the labels are also theme related to the one or more end caps included in the kit. For example, for a sports theme toothbrush kit, a

plurality of sports emblems are provided. That is, the set of emblems in this preferred embodiment kit contain various sports related indicia, markings, logos, and/or designs. This feature of the preferred embodiment kits is described in greater detail herein.

The emblems are preferably in the form of preprinted labels that are releasably secured to a removable backing layer. The labels may be secured to a planar backing layer or backing layer in the form of a rolled sheet or a strip. Other configurations for the labels are contemplated. Preferably, the emblems or labels are formed from a material that is resistant to water and dentifrice slurry. An example of such a material is MylarTM, polyethylene, or any polymeric or wax coated substrate that imparts water repelling properties to the resulting emblem. Additional examples of polymeric materials that may be suitable for use as the label include, but are not limited to, polyethylene terephthalate (PET), and polyvinyl chloride (PVC). If PET is used, it is most preferred to use a transparent PET so that when applied to the body of a toothbrush, the label will not be readily apparent, only the printing, indicia, or markings on the label will be readily apparent. It is also contemplated to use coated paper for the label. A preferred label construction is a transparent PET film with various markings or indicia printed on it, and having a coating of transparent polyethylene to prevent or minimize degradation of the printed material or ink.

Regarding the adhesive for the label, nearly any type of adhesive is suitable so long as it is resistant to water and dentifrice slurry. A preferred adhesive is a pressure sensitive acrylic based adhesive. Other examples of adhesives that may be suitable for use in affixing the labels described herein to the toothbrush and/or end cap include the adhesives described in U.S. Patents 5,382,762; 4,074,014; and 6,312,799.

As noted, various markings, indicia, text, or designs may be printed upon one or more of the components of the present invention toothbrush kits. A wide array of printing techniques may be employed including, but not limited to, tempo printing, screen printing, transfer printing, ink jet printing, and laser techniques. These printing methods may be used to apply or form text, numbers,

logos and/or designs upon any of the components described herein. An informative description of printing techniques and materials is provided in WO 00/56,609 and WO 99/08,935

The present invention also provides methods of customizing or tailoring a toothbrush according to a user's preferences. In a preferred technique according to the present invention, a toothbrush kit is provided that comprises a package, a toothbrush, one or more end caps as described herein, and one or more emblems as described herein. Upon obtaining the toothbrush kit and removing the contents from the package, the user selects (i) an end cap for use with the toothbrush (for embodiments in which more than one end cap is provided), and (ii) an emblem for placement on the toothbrush (for embodiments in which more than one emblem is provided). For embodiments in which multiple end caps and emblems are provided, preferably, the end cap and the emblem are selected together such that they match or pertain to a common theme, such as a sport or sports team. The user then affixes the emblem to the toothbrush. Preferably, the emblem is adhesively secured to the toothbrush. As described herein, the emblem is preferably secured to the toothbrush within a designated region. The method also includes a step of engaging the end of the toothbrush with the selected end cap. Preferably, the end of the toothbrush opposite the end at which the head is located, is positioned into a receiving cavity defined in the end cap. Upon engagement between the end cap and the toothbrush, the resulting assembly may be positioned upright and stored on a flat surface.

The preferred embodiment toothbrush kit may be particularly tailored depending upon the user's preferences. Depending upon the quantity of emblems and end caps provided in a kit, an extensive number of different combinations of colors, indicia, and markings may be associated with each toothbrush and end cap in a kit.

Referring now to the drawings wherein the various photographs and illustrations are for the purposes of describing the preferred embodiments of the invention only and not for purposes of limiting same, **Fig. 1** shows a preferred embodiment toothbrush kit **100** according to the present invention. The preferred

embodiment kit **100** comprises a toothbrush **200**, one or more end caps **300**, one or more emblems or labels **400**, and a package **500**. It will be appreciated that although the preferred embodiment kit **100** shown in **Fig. 1** contains an emblem already adhered to the toothbrush, it is also preferred that the kit contain one or more emblems that have not yet been applied to the toothbrush. When such emblems or labels are supplied in that form, they are referred to herein as being supplied "loose." Each of these components of the preferred kit and their arrangement with each other is described in greater detail below.

Figs. 2-6, 11-12, and 27-35 are various views of a preferred embodiment electric toothbrush **210** and a preferred embodiment end cap **310** for use in the toothbrush kit of the present invention. Preferably, the toothbrush **210** and the end cap **310** are used in the kit **100** shown in **Fig. 1**. It will be appreciated that, although minor differences exist, the toothbrush **210** is substantially the same as the toothbrush **200** shown in **Fig. 1**.

Referring to **Figs. 2-6**, the preferred embodiment toothbrush **210** includes a first end **212** at which is disposed a brush head **214** having a plurality of bristles **216**, and a second end **218** opposite from the first end **212**. The toothbrush **210** also includes sloping sides **220** and **222** that extend between a front surface **224** and a rear surface **226**. The toothbrush **210** further includes a switch **230** for activating the drive train (not shown) enclosed within the toothbrush that operates at least a portion of the bristles **216**. **Fig. 35** illustrates the top of the toothbrush **210** and brush head **214**.

It is preferred that the lower region of the front surface of the toothbrush body be relatively smooth and adapted for adhering an emblem or label thereto. In **Figs. 2-6**, an emblem is already adhered to the toothbrush between the switch **230** and the end cap **310**. It is also envisioned that one or more emblems or labels could be adhered to the side(s) or other regions of the toothbrush.

Fig. 11 is a detailed view of a bottom surface **312** of the end cap **310** shown in **Figs 2-6**. Preferably, the end cap **310** provides a raised footing **314** extending around the perimeter of the bottom surface **312**. The raised footing **314**

promotes stability of the end cap, particularly when a toothbrush is engaged therewith and placed in an upright vertical position.

Fig. 12 is a detailed view of an end of the toothbrush **210** and the top region of the end cap **310** shown in **Figs. 2-6**. Specifically, the end **218** of the toothbrush **210** is shown as open and providing access into the interior of the toothbrush. This interior is adapted to retain batteries (not shown) used for powering the drivetrain and rotating bristles of the toothbrush **210**. Disposed at the end **218** is an engagement member **232** that assists in securing the end cap **310** to the end **218** of the toothbrush **210**. The end cap **310** defines an aperture **316** generally along a top region of the end cap. The end cap **310** further defines a receiving chamber **320** defined by an interior wall **318** extending within the interior of the end cap.

Upon engagement between the end **218** of the toothbrush **210** and the end cap **310**, the member **232** extending from the end of the toothbrush **210** partially extends into the receiving chamber **320** of the end cap **310**. Preferably, at least a portion of the member **232** contacts a portion of the interior wall **318** to further engage and secure the toothbrush **210** with the end cap **310**.

Figs. 27-34 show various additional aspects of the preferred embodiment end cap **310** shown in **Figs 2-6**. **Figs. 27-34** show the end cap **310** separate from the toothbrush **210** shown in **Figs. 2-6**. Referring to **Figs. 27-34**, the end cap **310** is generally hemispherical in shape, or at least partially so, and includes an arcuate surface **311** extending between a flat planar bottom surface **312** and a flat planar rear surface **317**. Preferably, the bottom surface **312** is perpendicular to the rear surface **317**. A footing member **314** is disposed along the bottom surface **317**. Defined along a top region of the end cap **310** is an aperture **316** that provides access to an interior cavity or receiving chamber **320**. Specifically, the receiving chamber **320** is defined by an interior wall **318**. Preferably disposed at the bottom or lower region of the chamber **320** are battery contacts **319**.

Figs. 7 and 10 are various views of the preferred embodiment end cap **300** illustrated in the kit **100** shown in **Fig. 1** engaging and supporting another

preferred embodiment toothbrush **202**, similar to the toothbrush **200** shown in **Fig. 1**. The end cap **300** includes an outer arcuate surface **302** that is generally hemispherical or at least substantially so, extending about the sides, front, and a portion of the top of the end cap **300**. The end cap also includes a planar bottom surface (not shown) and a planar rear surface **304** (best shown in **Fig. 10**). The end cap **300** defines an aperture along its upwardly facing top region that provides access to a receiving chamber (not shown) defined within the interior of the end cap **300**. As described herein, the receiving chamber facilitates engagement with a toothbrush.

Figs. 13-15 illustrate another preferred embodiment toothbrush **250** for use in the present invention toothbrush kit. As shown in **Fig 13**, the toothbrush **250** includes an elongated body portion **252**, which has a first end **254** and a second end **256**. A brush head **258** is attached to or otherwise formed along the first end **254** and a handle **260** is attached to or otherwise formed along the second end **256**. The toothbrush **250** also includes a switch **253** for activating the drivetrain (not shown) and operating the moving bristles.

The head **258** has a traditional relatively large brush head shape which permits the user to brush his or her teeth in the typical manner of an up and down fashion. The design of the brush head **258** allows for inexpensive manufacture and assists in bringing effective motorized rotational toothbrushes within the financial reach of a large portion of the population.

Defined along the second end **256** of the toothbrush **250** is an aperture **257** that provides access to an interior battery compartment (not shown) defined within the body **252**. The aperture **257** is defined by an outwardly extending member **259** that is adapted to engage an end cap as described herein.

Referring now to **Figs. 14-15**, the head **258** further includes a longitudinal axis **262**, a circular or moving portion **264** of brush head **258** and a static portion **266** of brush head **258**. The static portion **266** is located on opposite sides of the circular portion **264**. The circular portion **264** is located at the center of the brush head **258**. The circular portion **264** rotates, swivels, oscillates or reciprocates

about an axis approximately normal to the longitudinal axis **262** of the brush head **258**. The circular portion **264** may rotate 360° or partially rotate or oscillate or reciprocate in a back and forth manner.

The circular portion **264** includes stiff bristles **268**. The static portion **266** includes soft bristles **270**. The stiff bristles **268** are slightly recessed with respect to the soft bristles **270**. The stiff bristles **268** aid in the deep cleaning and plaque removal process, while the stationary soft bristles **270** are softer so as to not damage the gums.

Referring again to **Figs. 14 and 15**, the elongated body portion **252** further includes an angled shaft **272**, located between the head **258** and the handle **260**. The angled shaft **272** provides an ergonomic benefit. The angle is well known for its ergonomic benefit in permitting easier access into the back recesses of the mouth while still contacting the tooth surface.

Fig. 15 also illustrates a region along the outer surface of the toothbrush **250** that is well suited for subsequent application of one or more emblems or labels. This region is generally defined between the switch **253** and the end **256**. As previously noted, the emblems may be applied to other regions of the toothbrush **250** such as along the sides of the toothbrush.

Another preferred embodiment electric toothbrush **280** for use in the kit of the present invention is shown in **Figs. 16-18**. The toothbrush **280** includes an elongated body portion **282** which has a first end **284** and a second end **286**. A head **288** is attached to or otherwise formed along the first end **284** and a handle **290** is attached to or otherwise formed along the second end **286**. The body **282** also provides an outwardly extending member **285** that provides access to a battery compartment defined within the body **282**. As explained herein, the member **285** is adapted to engage an end cap (not shown).

The head **288** further includes a circular or moving portion **292** of brush head **288**, and a static portion **294** of brush head **288**. However, it is to be appreciated that the circular portion **292** and the static portion **294** can be arranged in different configurations. The circular portion **292** rotates, swivels, oscillates or

reciprocates about an axis approximately normal to the longitudinal axis of the brush head **288**.

Referring again to **Figs. 16-18**, a switch **281** is provided to control operation of the electric toothbrush **280**. The switch **281** includes a molded actuator button **283**. The switch **281** is manually depressed by pressing the actuator button **283** down, which then completes an electrical circuit and provides momentary operation of the toothbrush. The switch **281** also allows continuous operation through a ramp design, sliding the button **283** forward toward the head **288** to provide for continuous operation. The toothbrush then continuously operates until the button **283** is slid back into an off position toward the handle **290**.

The preferred embodiment toothbrush **280** also utilizes a battery (not shown). To install the battery into the interior of the toothbrush **280**, the battery is inserted into an open end defined by the member **285** and an end cap as described herein is engaged over the open end.

If desired, raised grip areas **287** can be molded into or otherwise formed or applied to the housing as shown in **Fig. 16** and **Fig. 18**. The raised portions **287** are used to support a user's thumb and forefinger or other fingers to facilitate use of the electric toothbrush. Raised portion **289** may also be molded into the toothbrush housing to aid in gripping.

All of the preferred embodiment electric toothbrushes **200**, **202**, **210**, **250**, and **280** can also be packaged in a package in which the consumer can depress the button through the packaging and see its operation while still inside the packaging, and then be able to operate it continuously once out of the packaging.

Figs 19-22 illustrate another preferred end cap **350** for use with the present invention toothbrush kit. The end cap **350** includes a planar bottom surface **352**, a planar rear surface **354**, and a generally arcuate surface **356** extending between the bottom and rear surfaces **352** and **354**. The end cap **350** defines an aperture **360** generally along a top region of the cap, opposite from the bottom surface **352**. The aperture **360** provides access to a receiving chamber **362** defined within the interior of the end cap. As explained herein, the receiving chamber is

adapted, i.e. sized and shaped, to engage and receive an end of a toothbrush, and particularly to engage and receive an engagement member extending from an end of a toothbrush such as members **232** shown in **Fig. 12**, member **259** shown in **Figs. 13-15**, and member **285** shown in **Figs. 16-18**. In the event the end cap **350** is used as a battery cap for an electric toothbrush, it is most preferred that the end cap **350** contains one or more battery contacts (not shown) disposed in the receiving chamber **362**.

Figs. 23 and **24** illustrate additional preferred embodiments of emblems, and particularly a plurality of emblems or a set of emblems, for use in the present invention toothbrush kit. Specifically, **Fig. 23** illustrates a preferred embodiment set **450** of emblems. The set **450** includes a plurality of emblems or labels **452**, each releasably retained on a backing sheet **454**. An adhesive is applied to the rear or contacting face of the labels **452** to aid in their retention on the backing sheet **454** and for their subsequent application to a toothbrush or end cap. As will be appreciated, each of the labels **452** disposed on the sheet **454** contains different markings, indicia, or coloring. As previously explained, an end user may select one or more labels **452** and place those labels on the outer surface of a toothbrush and/or end cap(s) provided in a toothbrush kit. **Fig. 24** illustrates another preferred embodiment set **480** of emblems. In this embodiment, a plurality of emblems or labels **482** are provided on a rolled backing strip **484**. It will be appreciated that although **Figs. 23** and **24** illustrate labels with various country flags exhibited thereon, the preferred embodiment labels may contain nearly any marking, indicia, design or text. Other emblems or labels can be used which share a common characteristic or theme with the end cap. For instance, the emblems or label might contain a sports figure, such as a soccer player, that coordinates with an end cap provided in the form of sports equipment, such as a soccer ball.

As explained herein, the present invention toothbrush kit may, instead of utilizing a plurality of emblems such as sets **450** or **480**, utilize a single emblem or label releasably retained on a relatively small sized backing sheet. The single label assembly may be included in the toothbrush kit in a loose fashion, i.e. the label

being free and unattached to the toothbrush or end cap. The use of a single emblem may be preferable since a single emblem is typically less expensive than a set of multiple emblems.

The present invention also includes embodiments in which a single emblem is applied to the toothbrush prior to packaging. And, furthermore, it is contemplated that such step of label application could be replaced by adopting a printing operation and directly printing the desired text or indicia on the outer body of the toothbrush.

Figs. 25 and 26 illustrate another preferred embodiment toothbrush kit **150** comprising a package **510**, a toothbrush, an end cap, and a label. Since details of the preferred toothbrush, end, cap, and label have been previously discussed herein, these components and their incorporation in the kit **150** are not specifically addressed here. Instead, details of a preferred package **510** are described as follows. The package **510** includes a relatively rigid backing member **512** and a contoured member **520** that is preferably transparent which engages the backing member **512** to sealingly enclose the interior and contents of the package **510**. As will be understood by reference to **Figs. 25 and 26**, the contoured member **520** is sized and shaped to efficiently enclose the contents of the package **510**. Accordingly, when engaged with the backing member **512**, the contoured member **520** closely follows the outer surface of the toothbrush and end cap as those components are stored within the package. The contoured member **520** may optionally include one or more strengthening ribs **522**. The one or more emblems or labels, if supplied loose within the package **510** of the kit **150**, are preferably placed alongside the backing member **512** so that they are viewable from the exterior of the package.

As previously noted, other aspects of the present invention include manufacturing and packaging techniques for producing a product, *i.e.* the toothbrush kit, that is specifically tailored to a particular region, market segment, or consumer group. As explained below, this is accomplished by producing certain components of the toothbrush kit to have one or more common themes or characteristics. And

further, by organizing or matching these theme-based components with one another, a toothbrush kit is produced that has particular features to appeal to a desired region, market segment, or consumer group. Furthermore, manufacturing and/or packaging costs associated in producing these highly market specific and uniquely tailored toothbrush kits are less than what would be expected since some degree of tailorization or customization is left for the end user to perform, if desired.

In a most preferred embodiment, the emblems if provided in a set or group, are related to or associated with one another by a theme or common characteristic. An example of an associative characteristic is language. For instance, labels having different country flags representing countries in which English is a language, or even a primary or first language, could be grouped together and included in a toothbrush kit. More preferably, such a set of labels would be incorporated in a toothbrush kit containing instructions or text in English also. Thus, a label set would be provided containing labels having flags of the United Kingdom, United States, Canada...etc. printed thereon. Continuing with this example, labels having country flags representing countries in which German is a language, or even a primary or first language, could be grouped together and included in a toothbrush kit in which any accompanying instructions or text is in German also. Therefore, a label set would be provided containing labels of the flags of Germany, Austria...etc.

As previously noted, it is also contemplated to include single labels within a package as part of the present invention toothbrush kit. For language-based packaging themes, as described above, a single label containing the flag of Italy could be provided for a package containing text or instructions in Italian. Similarly, a single label containing the flag of France could be provided for a package containing text or instructions in French. Of course, if desired, a set of multiple labels could be included in which other labels would contain flags of other French speaking countries or jurisdictions.

Instead of providing toothbrush kits or label sets having a language-based theme, such kits could be geography-based. In this version of the invention, a plurality of labels are provided that contain related or associated indicia or

markings indicative of geographical regions. For instance, the labels could contain flags of certain countries of particular regions. For example, a set of labels could be provided that contain flags of countries within a particular region. For instance a set of labels for Europe could be provided on a common backing sheet, the labels containing the flags of the U.K., Germany, France, Italy...etc. Another example of a set of labels having a geographical theme, would be that for North America in which a set of labels would be provided containing the flags of Canada, United States, and Mexico. Furthermore, a set of labels containing the flags of the states of the United States is contemplated. Other possible geographic regions include Latin America, Central America, the Middle East, . . . etc. Another geographic based theme could be countries that share a common border.

Instead of providing toothbrush kits or label sets having a language-based theme, or a geography-based theme, the associative characteristic for a set of labels could be based upon a business's distribution network or area. For example, if a business distributed the present invention toothbrush kits in two different regions, a first label set containing flags of countries in one region could be used for toothbrush kits intended to be sold and/or distributed in that region, and a second label set containing flags of countries in the other region could be used for toothbrush kits intended for sale or distribution in that other region. Thus, the theme might be a common distribution center or warehouse that services a particular region or set of countries.

This feature in which multiple emblems or labels are related to one another is also preferably further related with the type of end cap(s) that is provided in the toothbrush kit. For instance, if the end cap is suggestive of a particular type of sport, the accompanying set of emblems or labels could include logos, designs or text indicative of various teams associated with that sport. An example of this configuration is if the end cap represented a soccer ball, the associated emblems would relate to various soccer teams. Another example is if the end cap represented a football, the associated emblems would relate to various football teams.

This feature of matching a set of labels to one or more end caps of a particular toothbrush kit may further be extended to also relate to the markings, designs, logos and/or language of text used in printing the package of the kit. An example of this feature would be (i) the identification of an intended region in which the toothbrush kit will be distributed and sold, (ii) the identification of a common language, or even the primary language of that region, and (iii) the identification of a marketing factor such as a popular sport within that region. In this scenario, an example would be a toothbrush kit provided for distribution and sale in the United States, containing text in English, relating to American-style football. Alternatively, the toothbrush kit could be configured for distribution and sale in Germany and Austria and so, would contain text in German, and might further relate to soccer.

A method for packaging and tailoring a toothbrush kit for a particular market is as follows. Identification analyses are performed to determine the region in which the kit will be sold, and one or more marketing characteristics or theme(s) associated with that region. Inventories or sources for the components of the kit are provided. Next, at least one of the end cap components and emblem sets are selected based upon the marketing characteristic(s) of that region. The selected components and all remaining components of the kit are then packaged in a suitable packaging container as described herein, preferably containing text a common language, or even the primary language, of that region. The marketing characteristics may for example include one or more popular sports of that region, the common or primary language of that region, the geographical proximity of countries or states within that region, or a business's distribution network within that region. Other common themes or factors associated with or common within the region can be utilized. These can be utilized alone or in combination. And, the identification analyses may be performed in any order.

A preferred manufacturing and packaging process for producing a toothbrush kit that is specifically tailored for a certain market is as follows. An inventory or source of toothbrushes is provided. Also, an inventory or source of either a single type or multiple types of end caps is provided. The type or types of end caps that are provided depends upon the identification analyses, *e.g.* the

determination of a characteristic or marketing factor of the planned sales region. From these sources, a toothbrush and one or more end caps are matched with a suitable package or component thereof such as a transparent front cover. The language of any text or indicia that is either preprinted or that may be subsequently printed on the package depends upon the identification analyses, e.g. the determination of the primary language of the planned sales region. The resulting package assembly is directed to one or more packing stations at which one or more emblems are placed into the package. The type or types of labels, or rather the nature of the theme or common characteristic of the labels, depends upon the identification analyses, e.g. the determination of a characteristic or marketing factor of the planned sales region. In addition, consideration is also given to the theme or characteristic(s) of the one or more end caps provided in the kit, and the language of text that may be provided on the package. Depending upon the type of theme or characteristic to be followed for the toothbrush kit, either a single label or a set of a plurality of labels is placed in the package assembly. It is contemplated that in some versions of the toothbrush kit, it may be desired to include a plurality of labels, each on a separate backing layer. After deposit of one or more labels within the package assembly, the remaining backing member of the package, i.e. the cardboard member, is then applied and engaged with the transparent front cover and the package is sealed.

In manufacturing or assembly of the preferred embodiment toothbrush kits described herein, the assembly techniques are based upon selective matching of certain components of the kit with other components. Preferably, matched combinations of components are selectively further matched with particular packages so that numerous styles of toothbrush kits may be produced from only a few and most preferably from a single assembly line. For example, at least two types or styles of a package for a preferred embodiment toothbrush kit are conveyed to a packing station. The kits may share a common marketing characteristic or theme(s) such as sports. However, the kits are different in that they utilize different marketing characteristics such as language, geography, or distribution aspects. Provided at that packing station are an inventory or source of different various types

or styles of label sets. One or more of these label sets are then matched or associated with one of the toothbrush kit packages. These labels preferably reflect the marketing characteristic by which the kits differ. Additional components of the kit may also be incorporated therein. Examples of other components include electric toothbrushes and one or more end caps as described herein. Most preferably, the matching of labels to toothbrush kit packages could be based upon the intended distribution center or warehouse, area, language, geography or region in which the toothbrush kit will be sold or otherwise commercialized.

Another significant feature of the preferred embodiment toothbrush kit is that the kit and/or its components may be used in conjunction with other compatible toothbrushes. It is contemplated that a consumer might use more than one end cap, such as with a second toothbrush. Additionally, after selecting one or more emblems for use with the toothbrush contained in the kit, any remaining emblems could be used in conjunction with a second, third, or more similar toothbrushes. Therefore, although the preferred embodiment kit is generally self-contained and designed for use with the toothbrush contained in that kit, the end cap and emblem components of the kit may be used in conjunction with other toothbrushes similar to the toothbrush supplied in the kit.

It is also contemplated that the toothbrush kit may additionally include two or more toothbrushes for use with the various end caps and emblems. Hence, in this embodiment, the package component would be adapted to retain the plurality of toothbrushes.

It will be understood that any and all of the features of each preferred embodiment may be combined or used in conjunction with each of the preferred embodiments described herein.

The invention has been described with reference to the preferred embodiments. Obviously, modifications and alterations will occur to others upon a reading and understanding of this specification. It is intended to include all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

What is claimed is:

1. A toothbrush kit comprising:
 - (a) an electric toothbrush having a hollow body comprising a closed first end and an open second end opposite to the first, a brush head disposed at the first end, wherein the hollow body is structured to contain a drive mechanism and an interior battery chamber;
 - (b) a plurality of end caps, each of the plurality of end caps being designed to engage the second open end to securely close it, and wherein at least some of the plurality of end caps are distinct from the rest of the plurality of end caps.
2. The toothbrush kit of claim 1, wherein said plurality of end caps includes from about 2 end caps to about 10 end caps.
3. The toothbrush kit of claim 1, wherein said hollow body of said electric toothbrush further defines an internal compartment adapted for receiving a battery, said body further defining an opening providing access into said internal compartment, and wherein each of said plurality of decorative caps are adapted to close said opening.
4. The toothbrush kit of claim 3, wherein said opening is defined opposite said head.
5. The toothbrush kit of claim 1, wherein each of said end caps is provided in the shape of an item of sports equipment.
6. The toothbrush kit of claim 5, wherein said sports equipment is non-apparel sports equipment.
7. The toothbrush kit of claim 6, wherein said non-apparel sports equipment is a ball.

8. The toothbrush kit of claim 7, wherein said ball is selected from the group consisting of a football, a baseball, a basketball, a bowling ball, a tennis ball, a golf ball, a soccer ball, and combinations thereof.

9. The toothbrush kit of claim 1, further comprising a plurality of emblems, wherein each emblem is distinct from other emblems of said plurality.

10. The toothbrush kit of claim 9, wherein each emblem represents a country.

11. The toothbrush kit of claim 9, wherein each emblem represents an athletic team.

12. The toothbrush kit of claim 9, wherein said plurality of emblems further include an adhesive for attaching said emblems to said electric toothbrush.

13. The toothbrush kit of claim 12, wherein said elongated hollow body has an outer a portion adapted for receiving at least one of said emblems.

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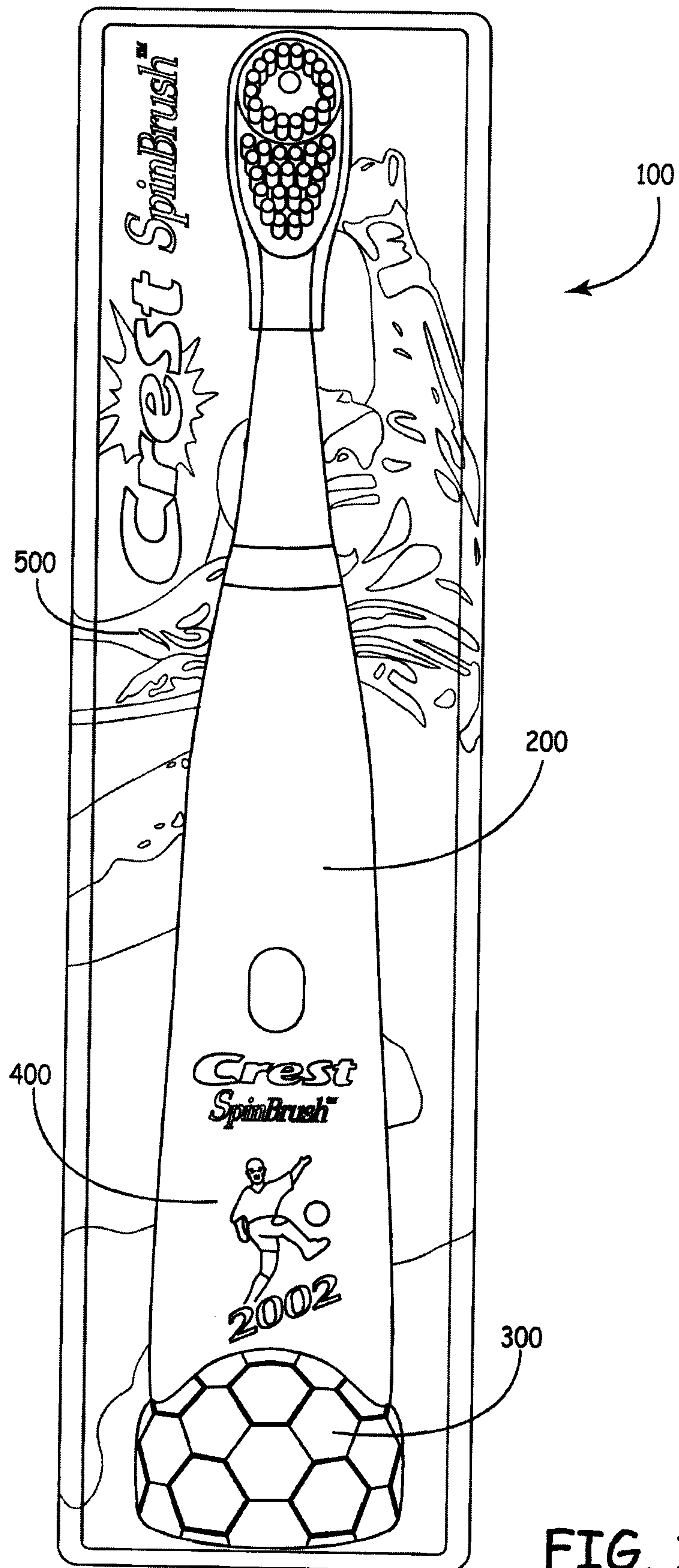


FIG. 1

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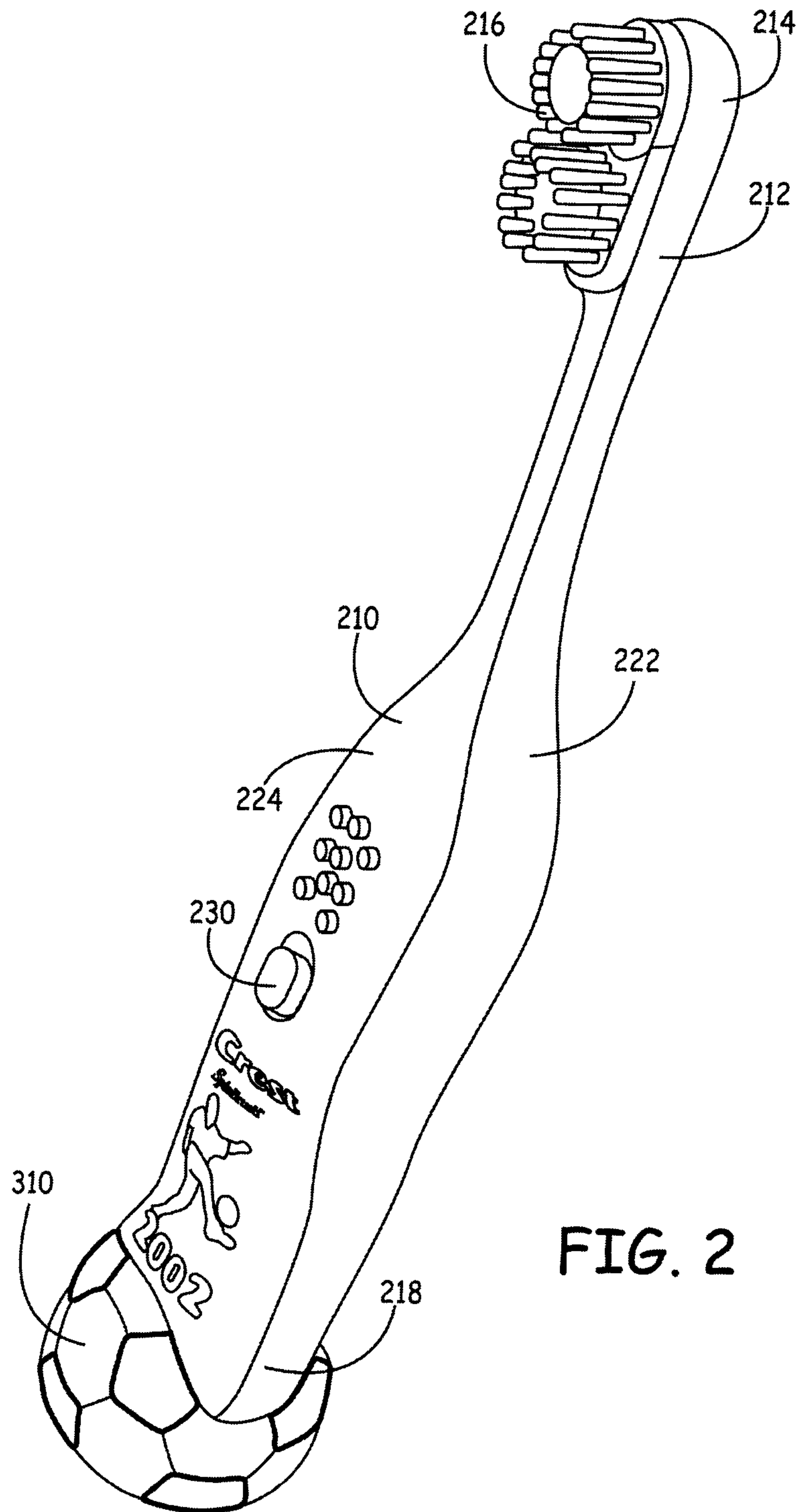


FIG. 2

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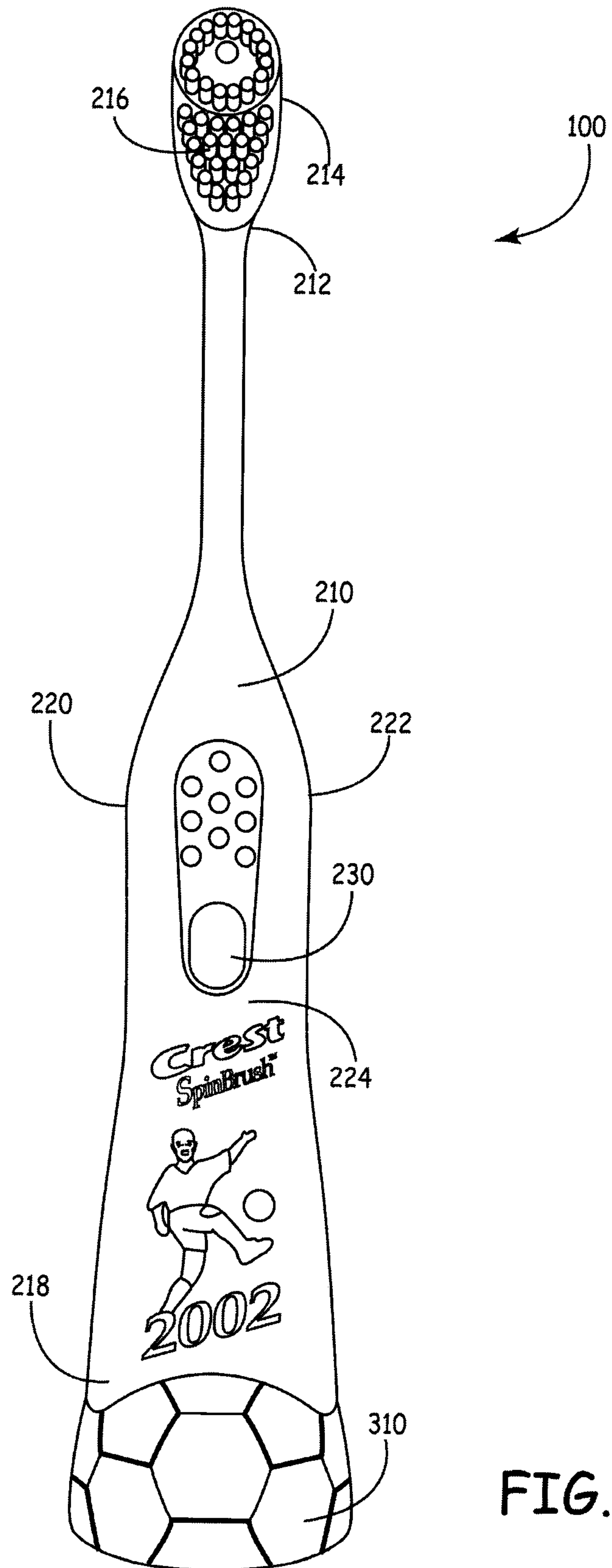


FIG. 3

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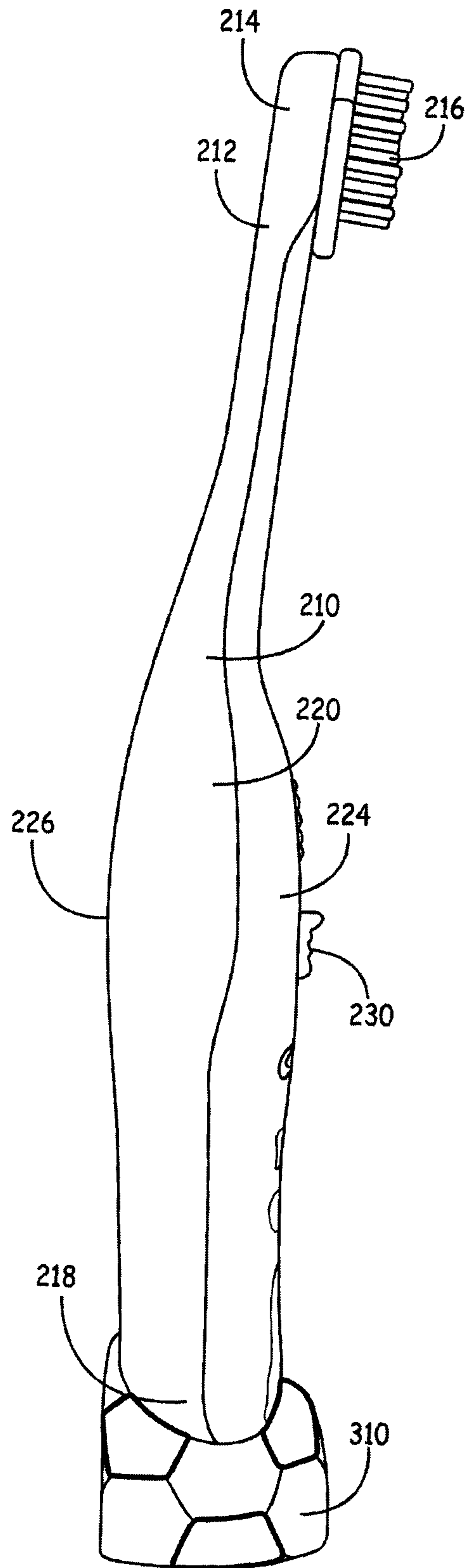


FIG. 4

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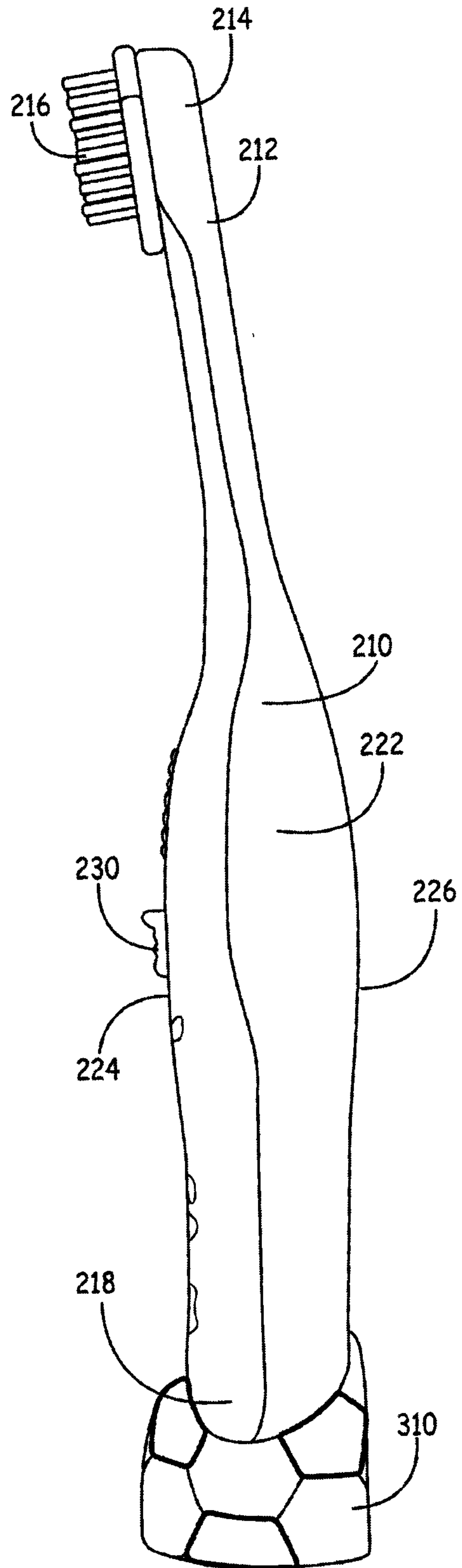


FIG. 5

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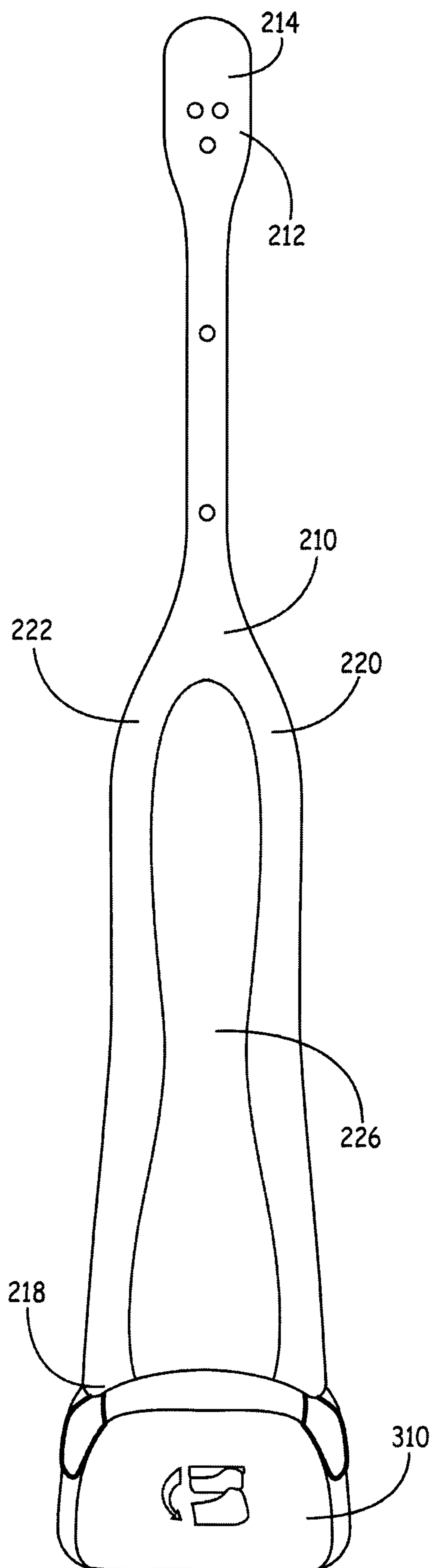


FIG. 6

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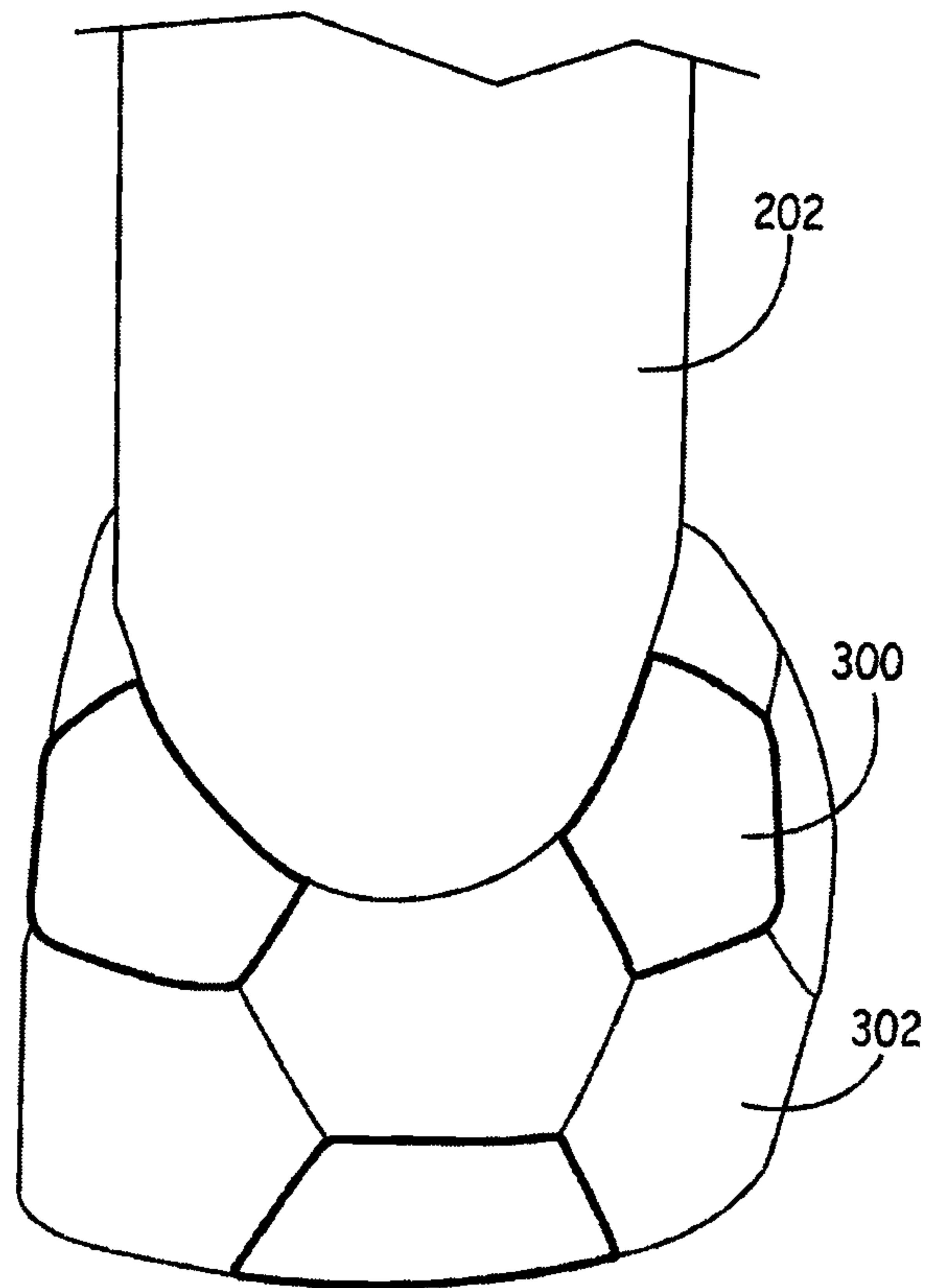


FIG. 7

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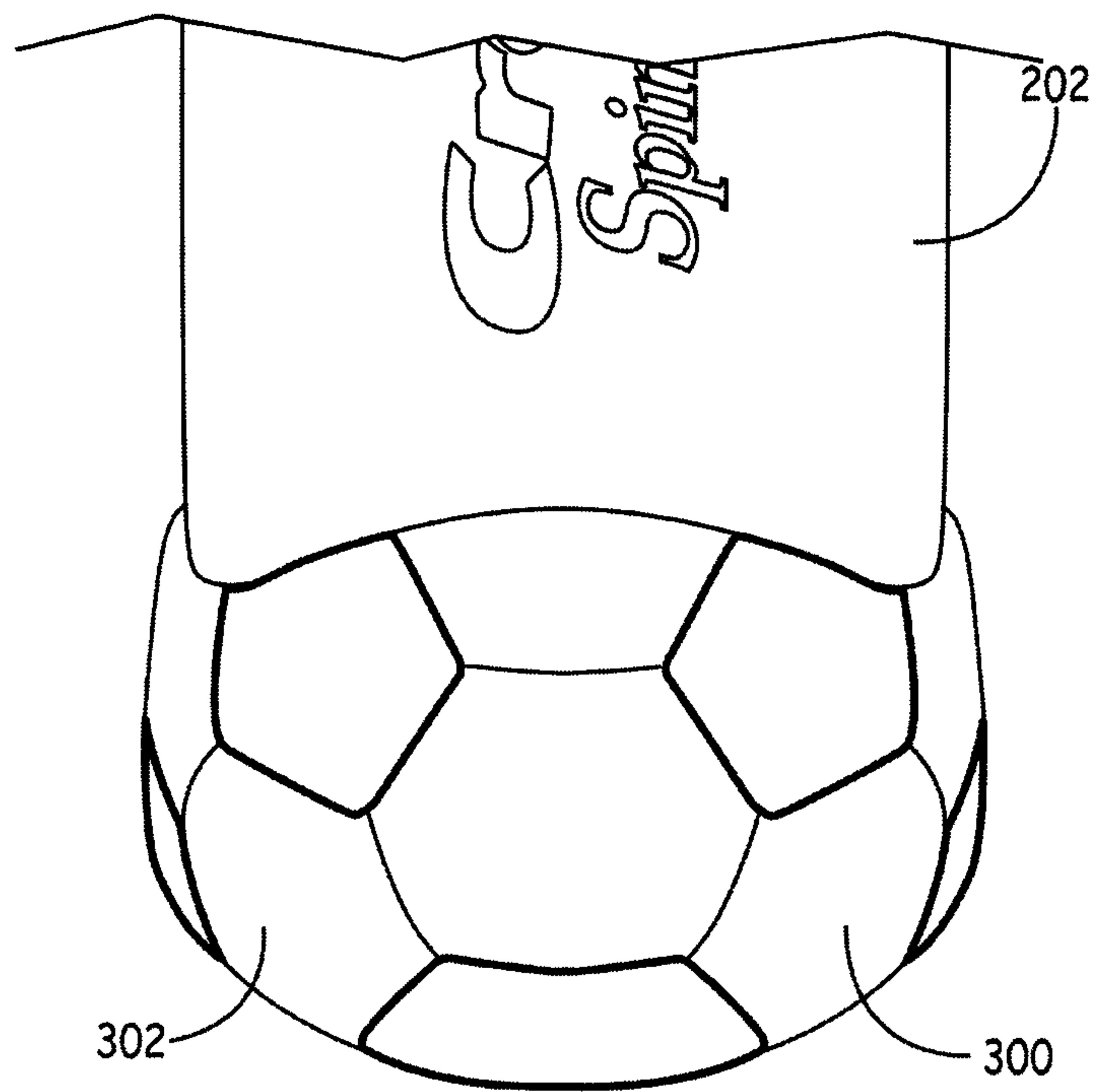


FIG. 8

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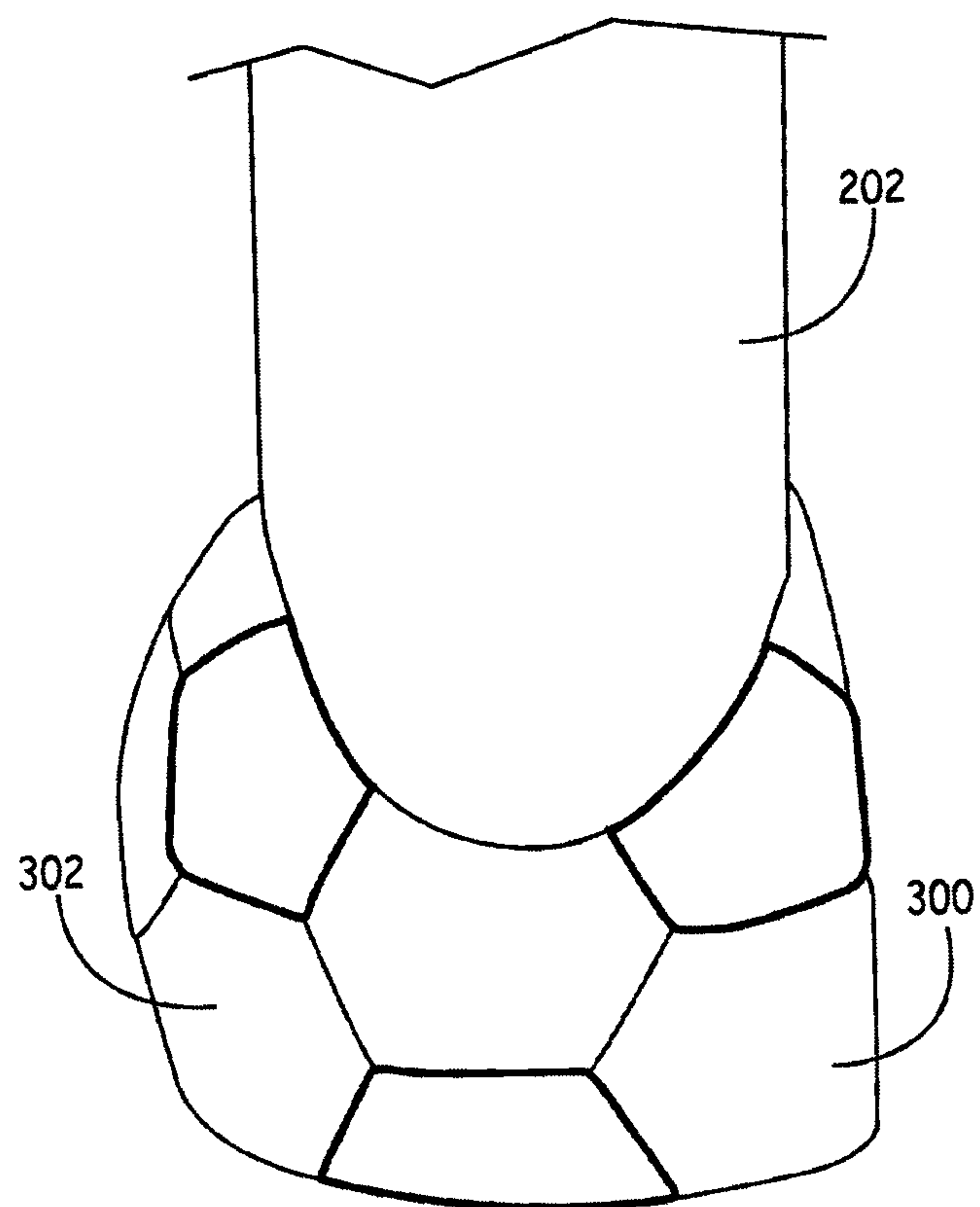


FIG. 9

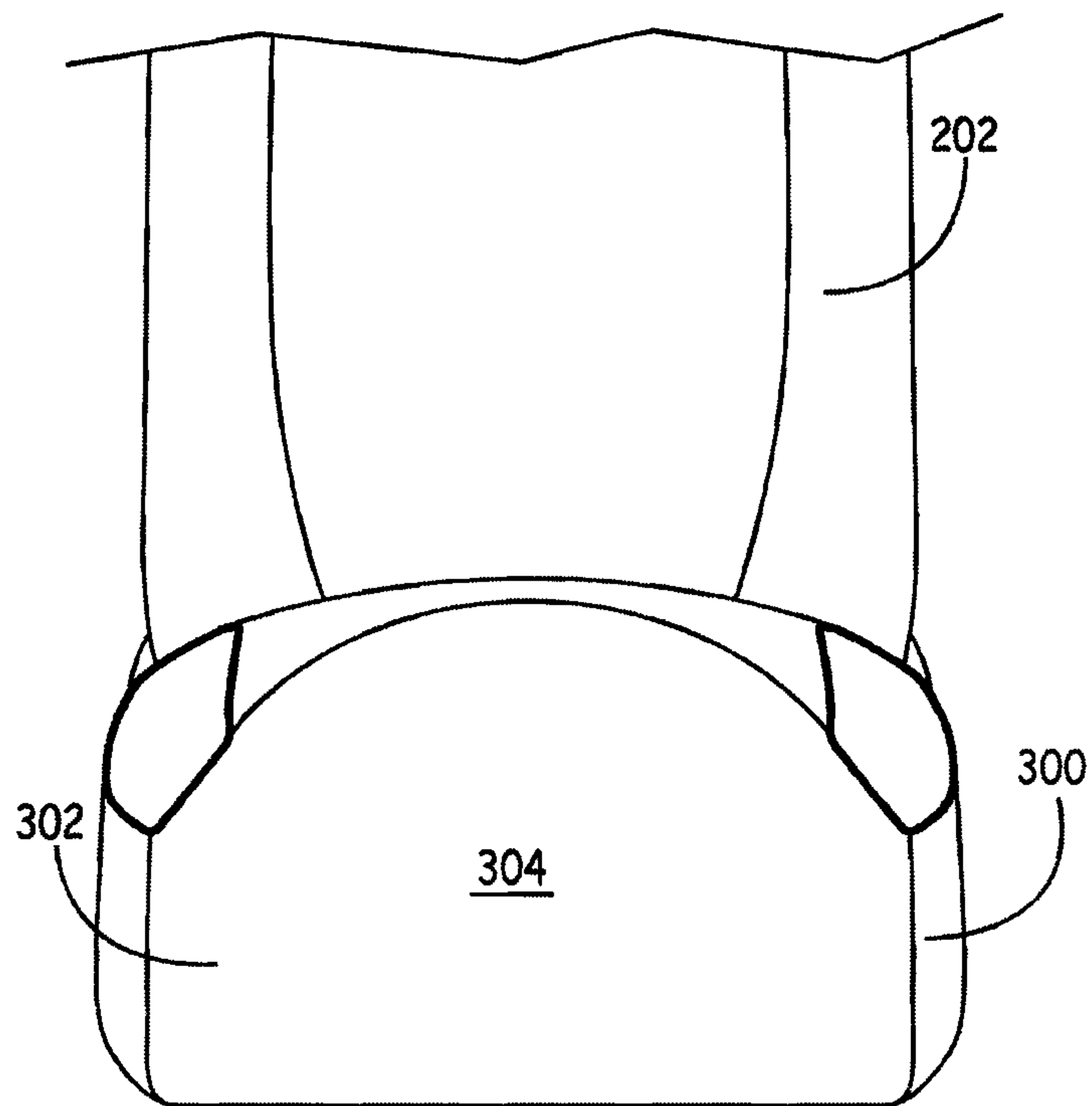


FIG. 10

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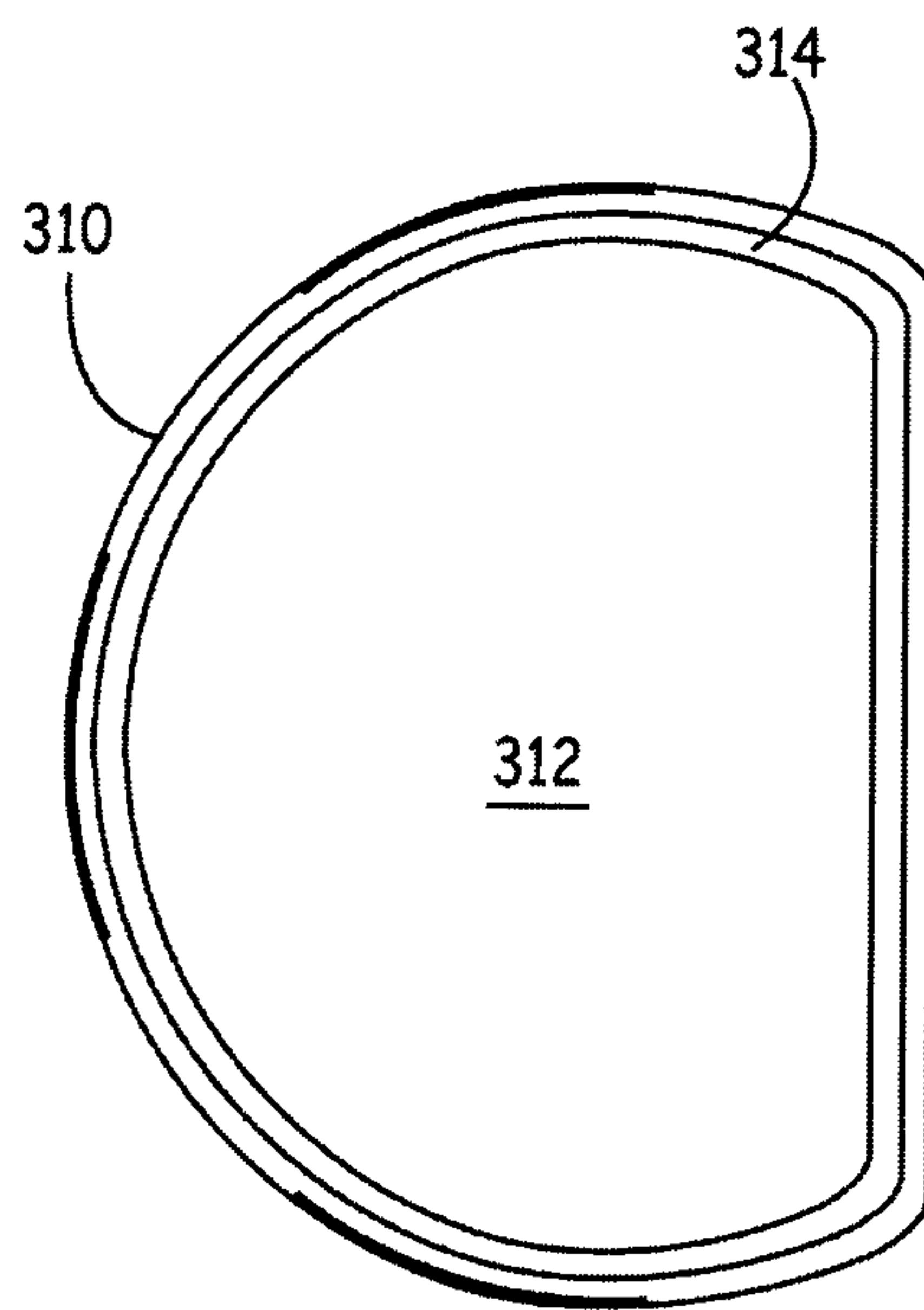


FIG. 11

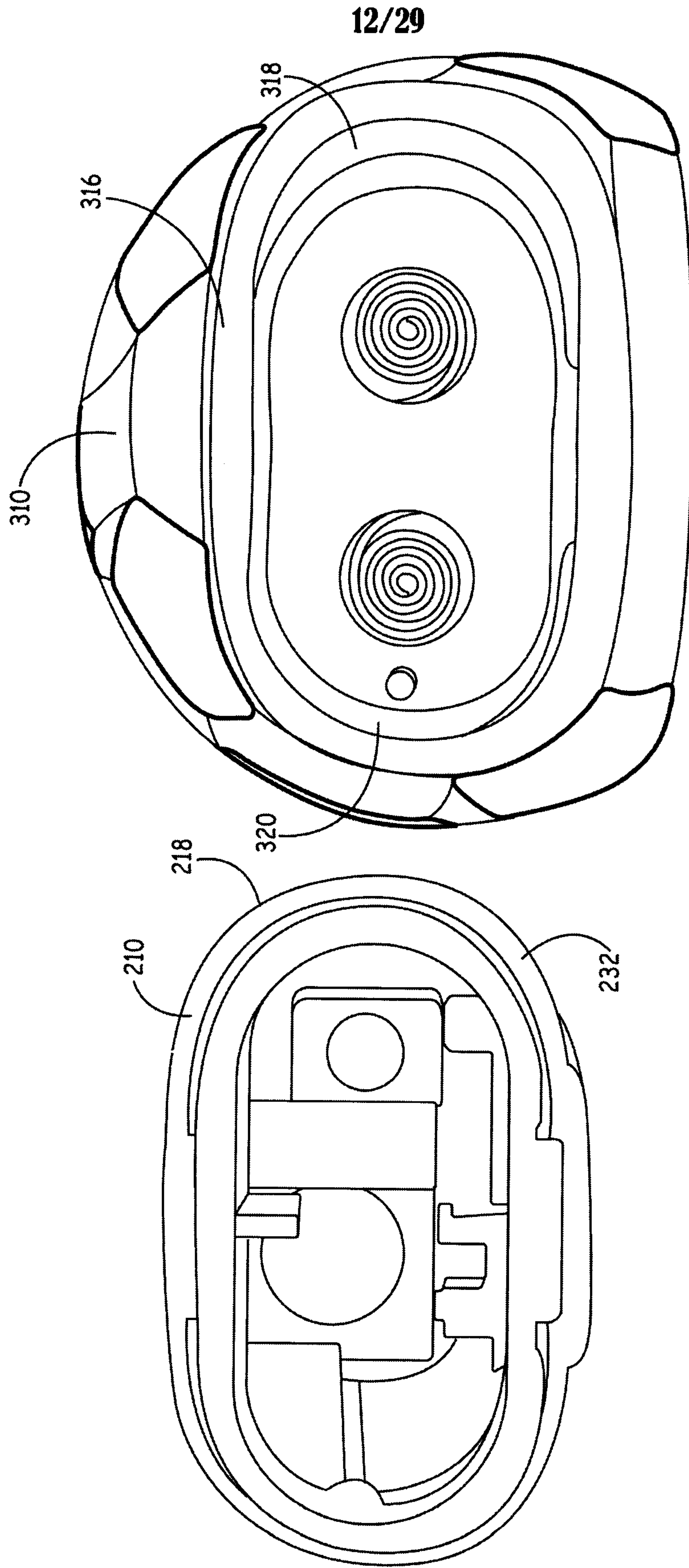


FIG. 12

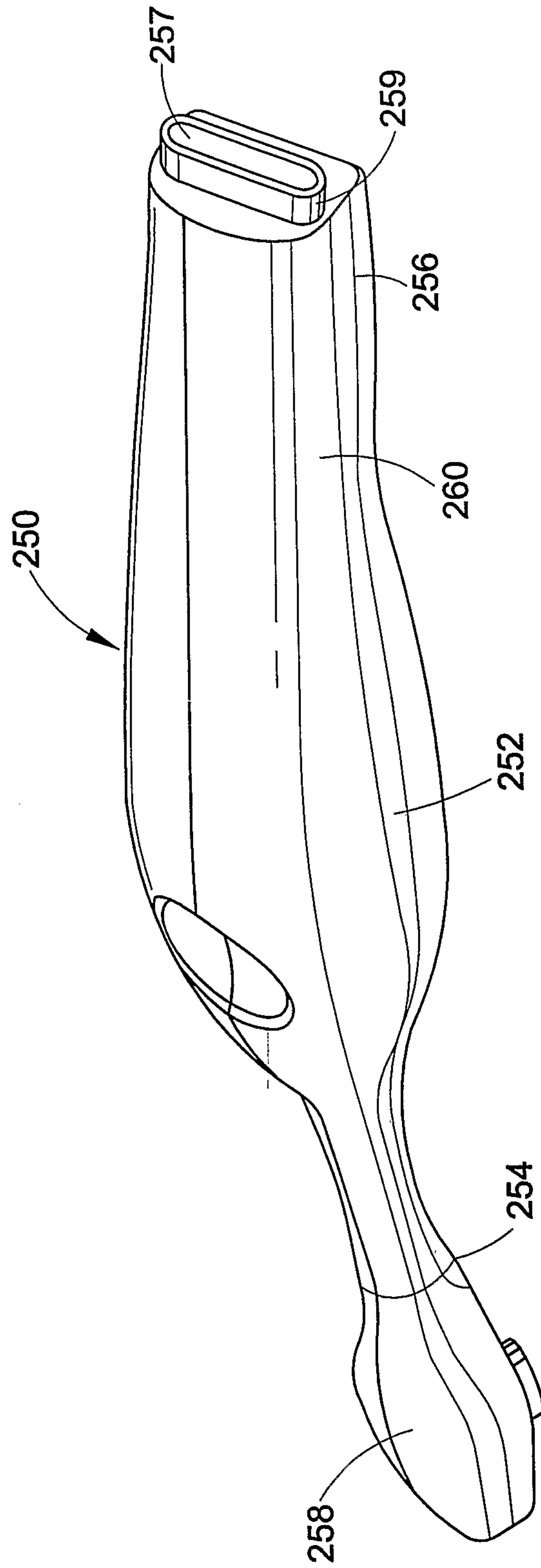
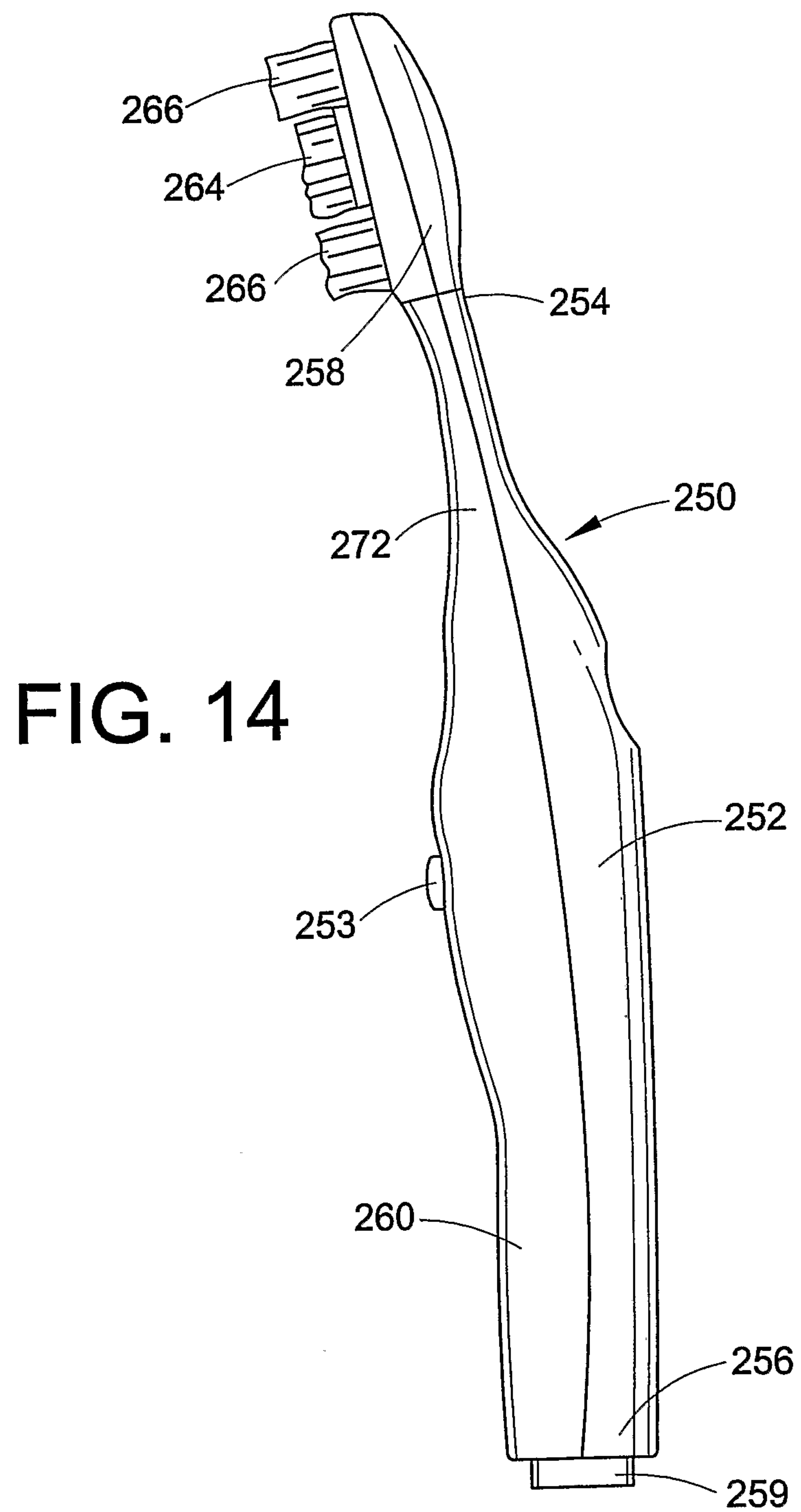
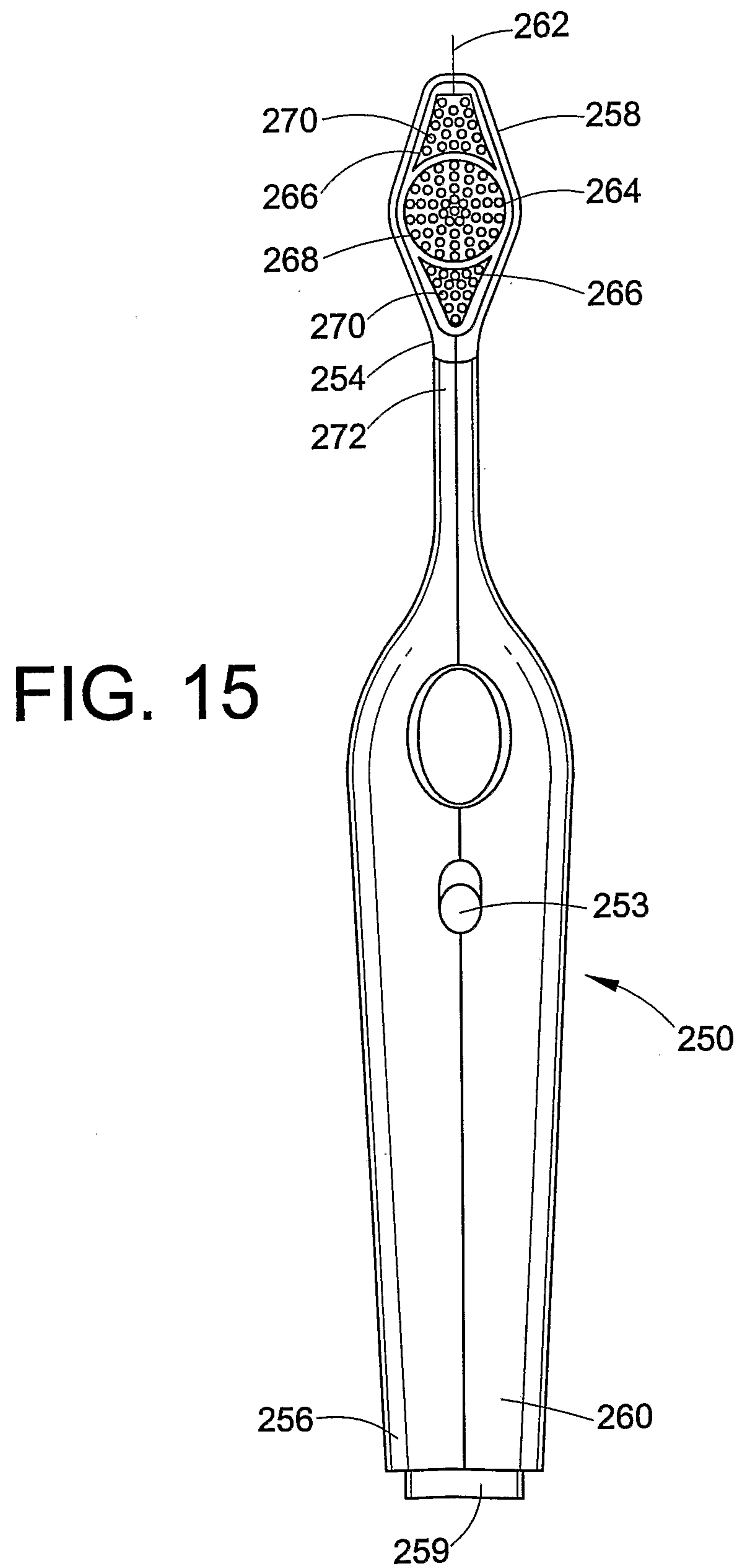
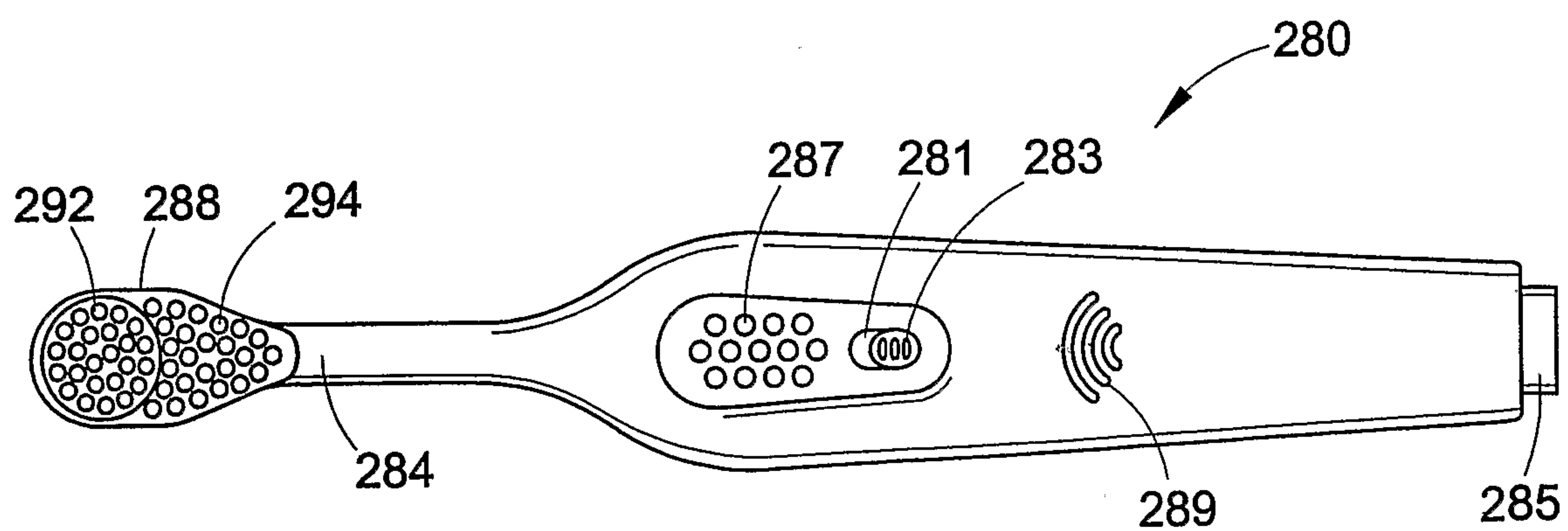
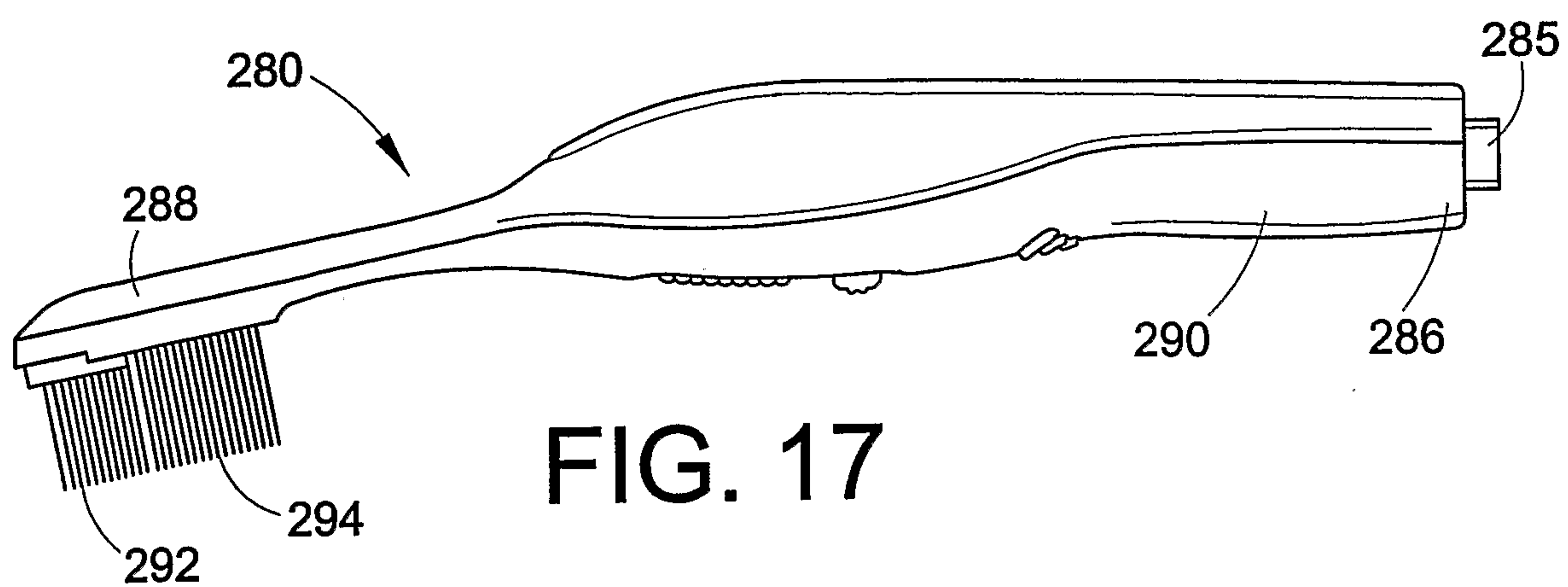
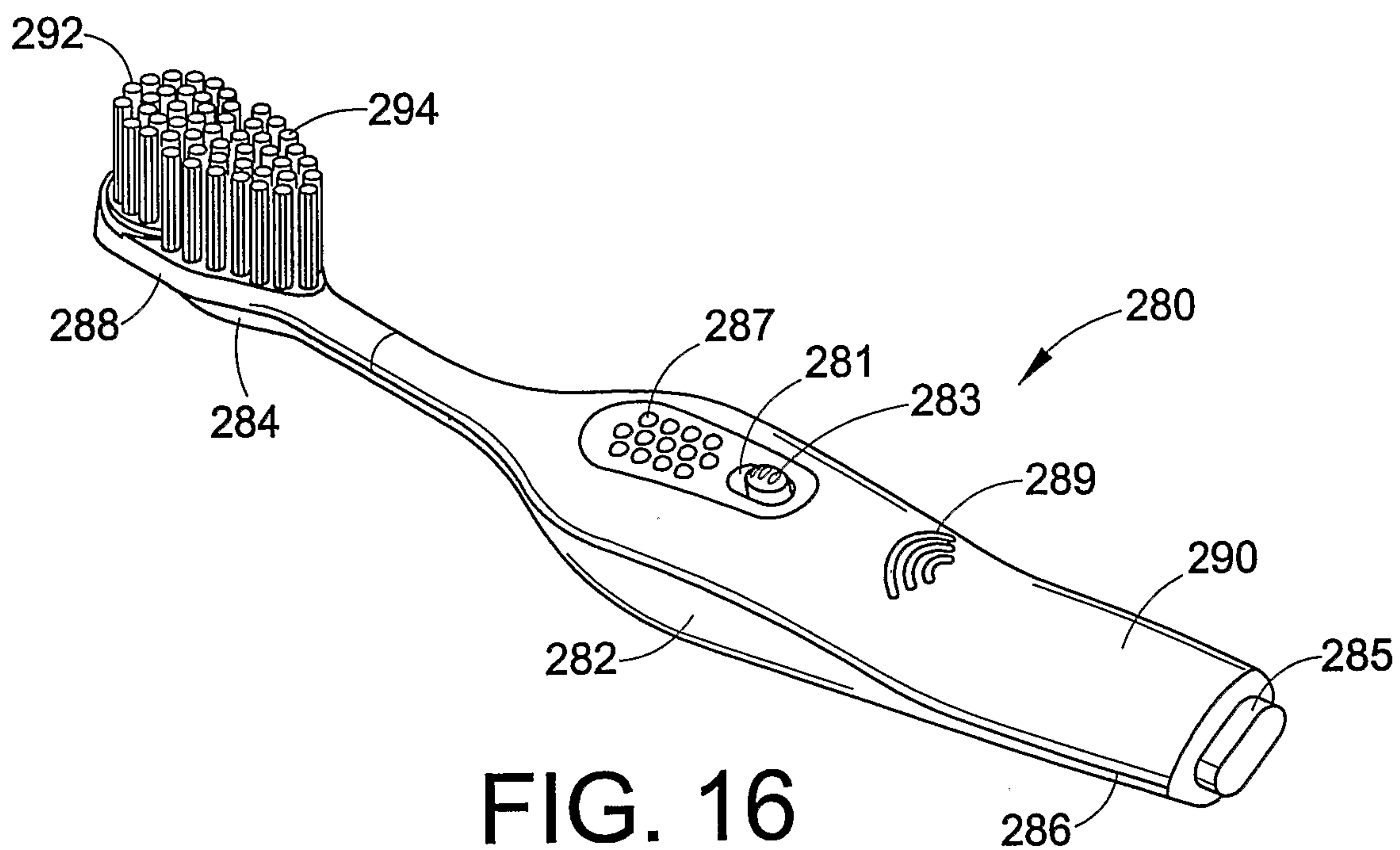


FIG. 13







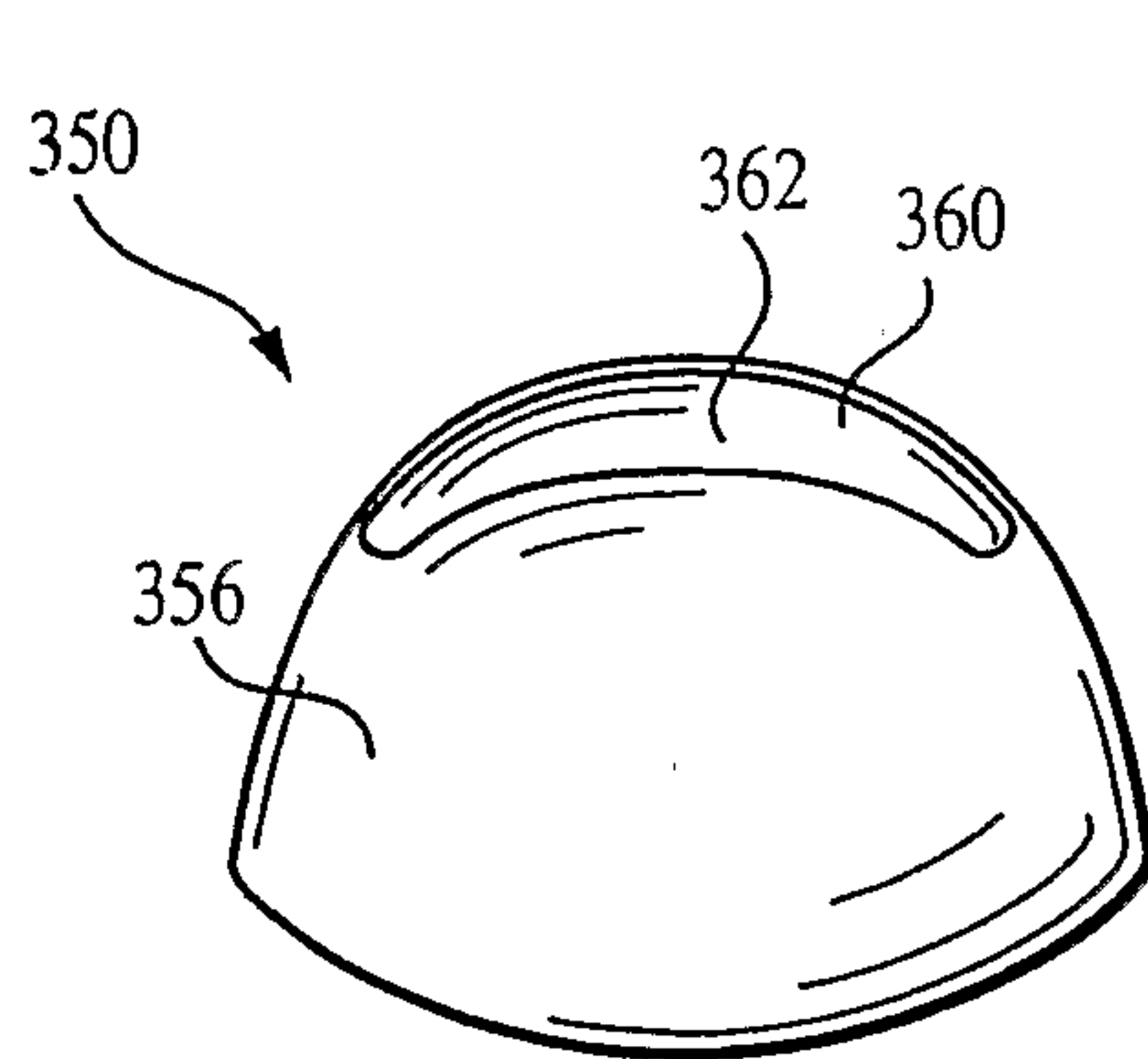


FIG. 19

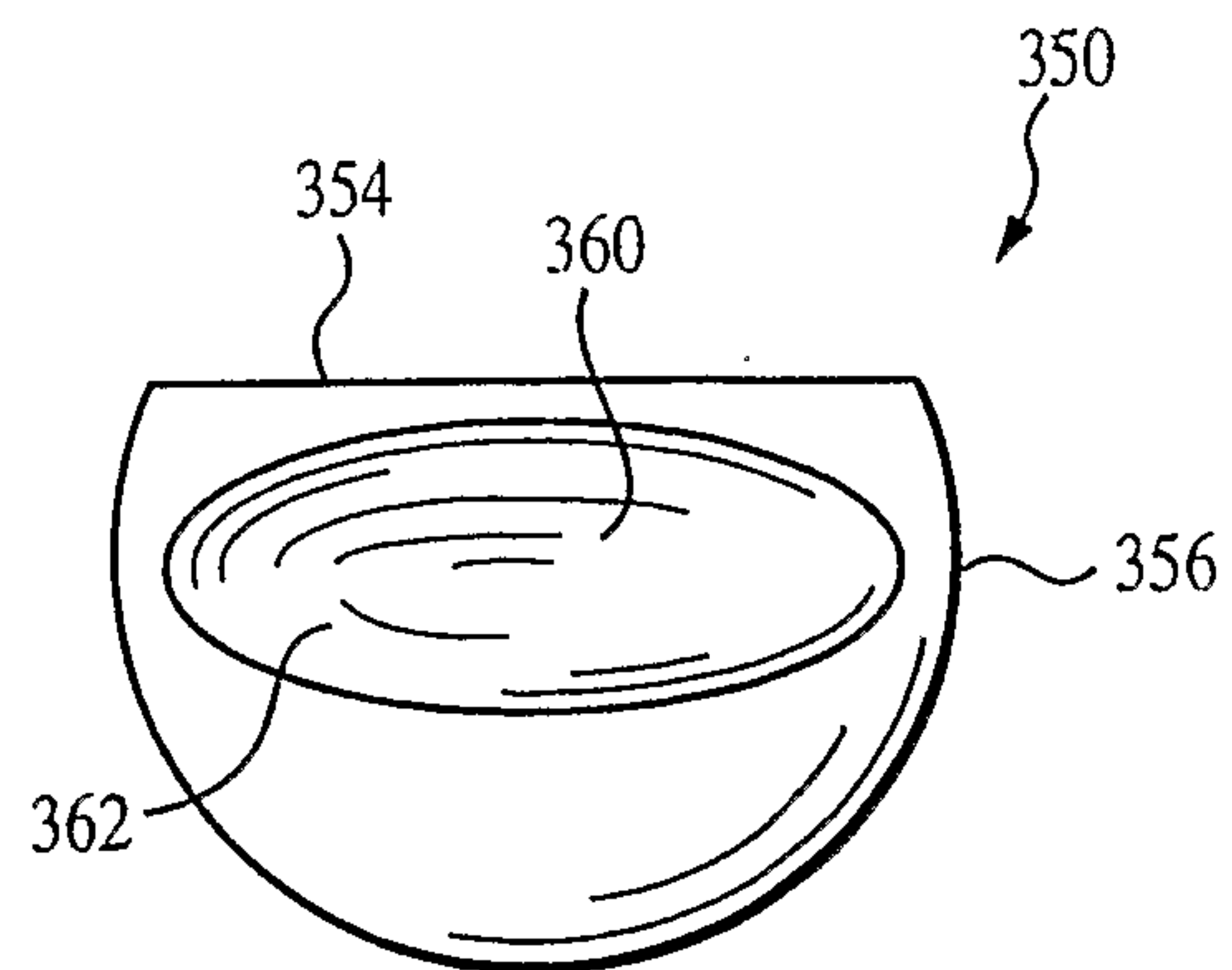


FIG. 20

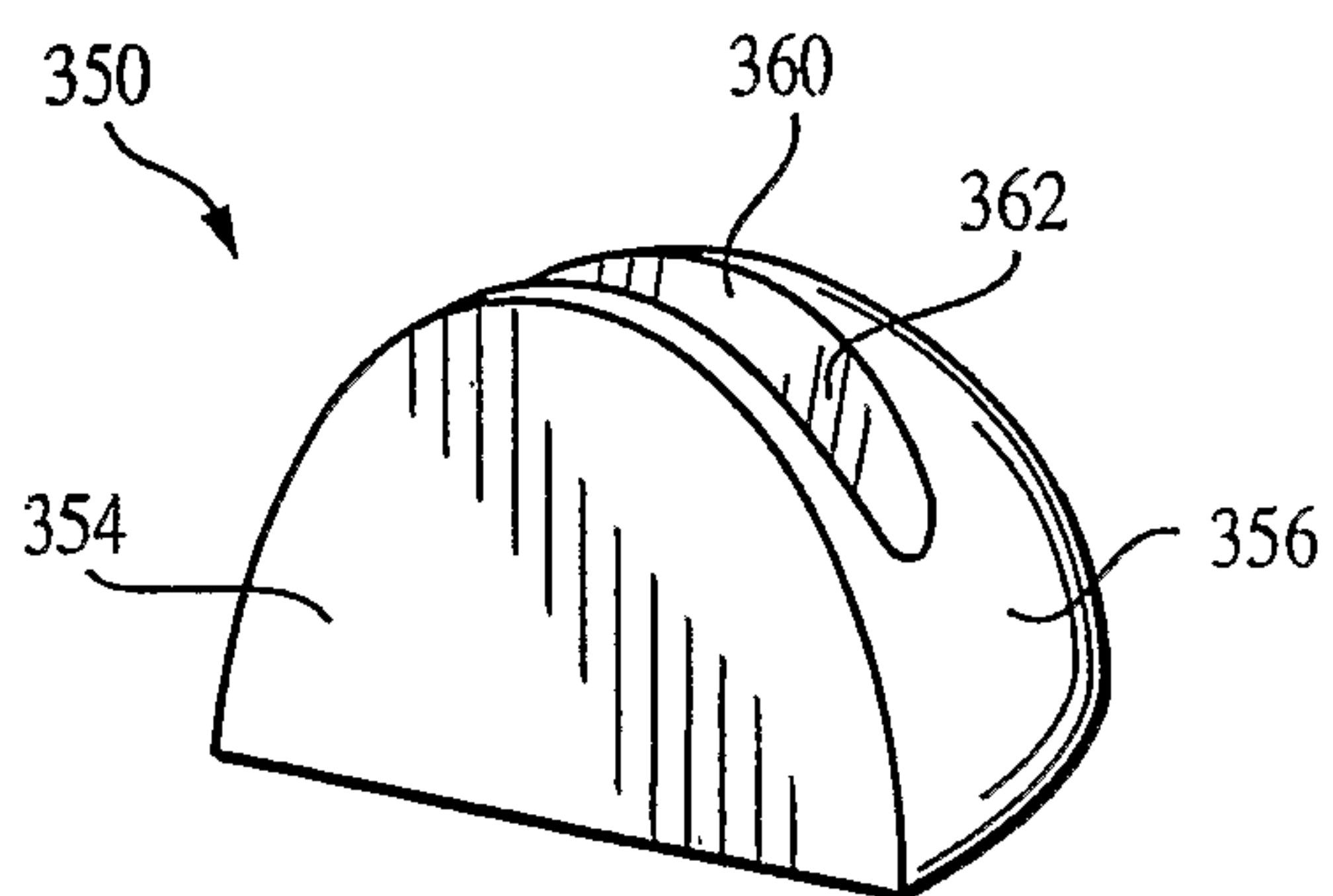


FIG. 21

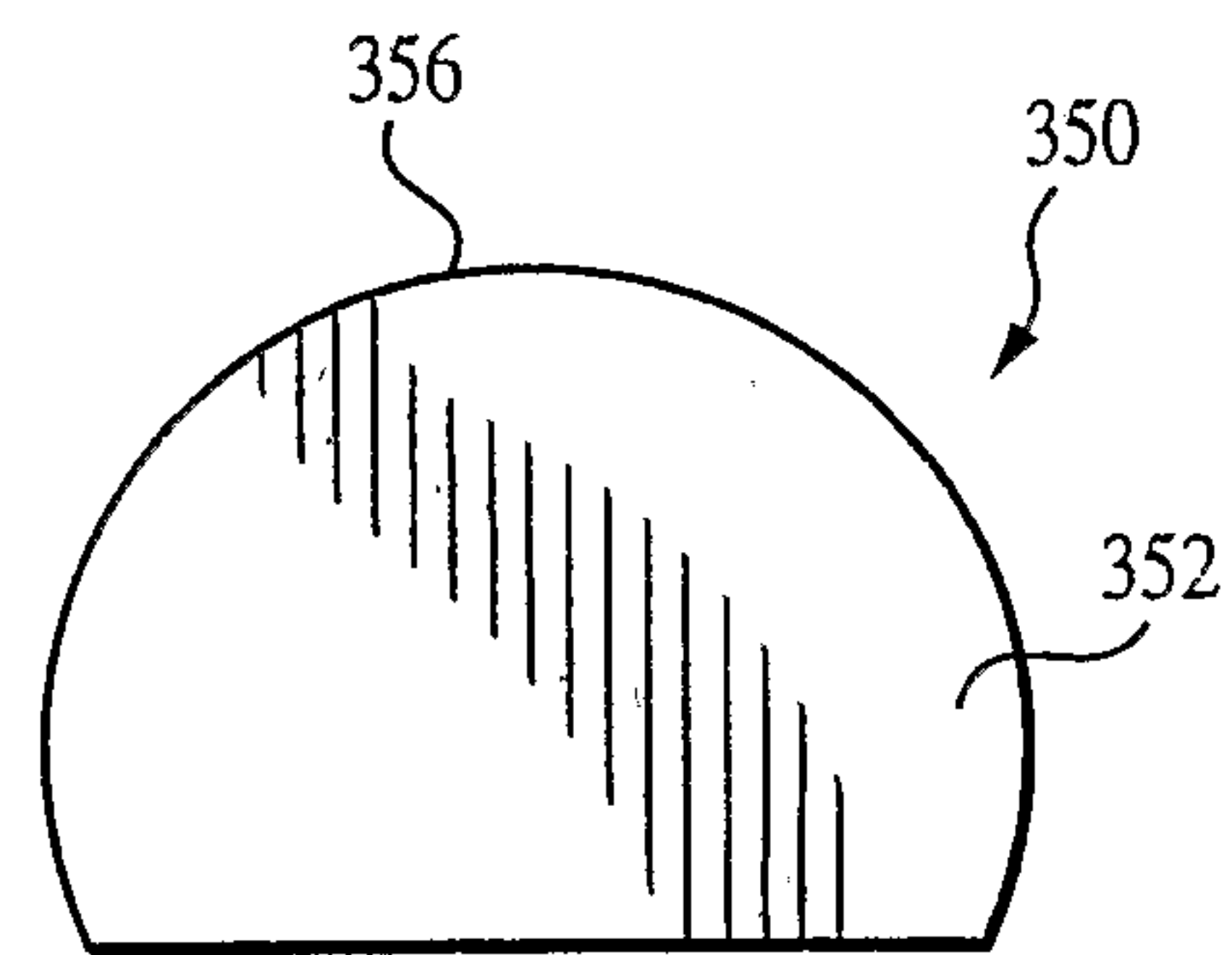


FIG. 22

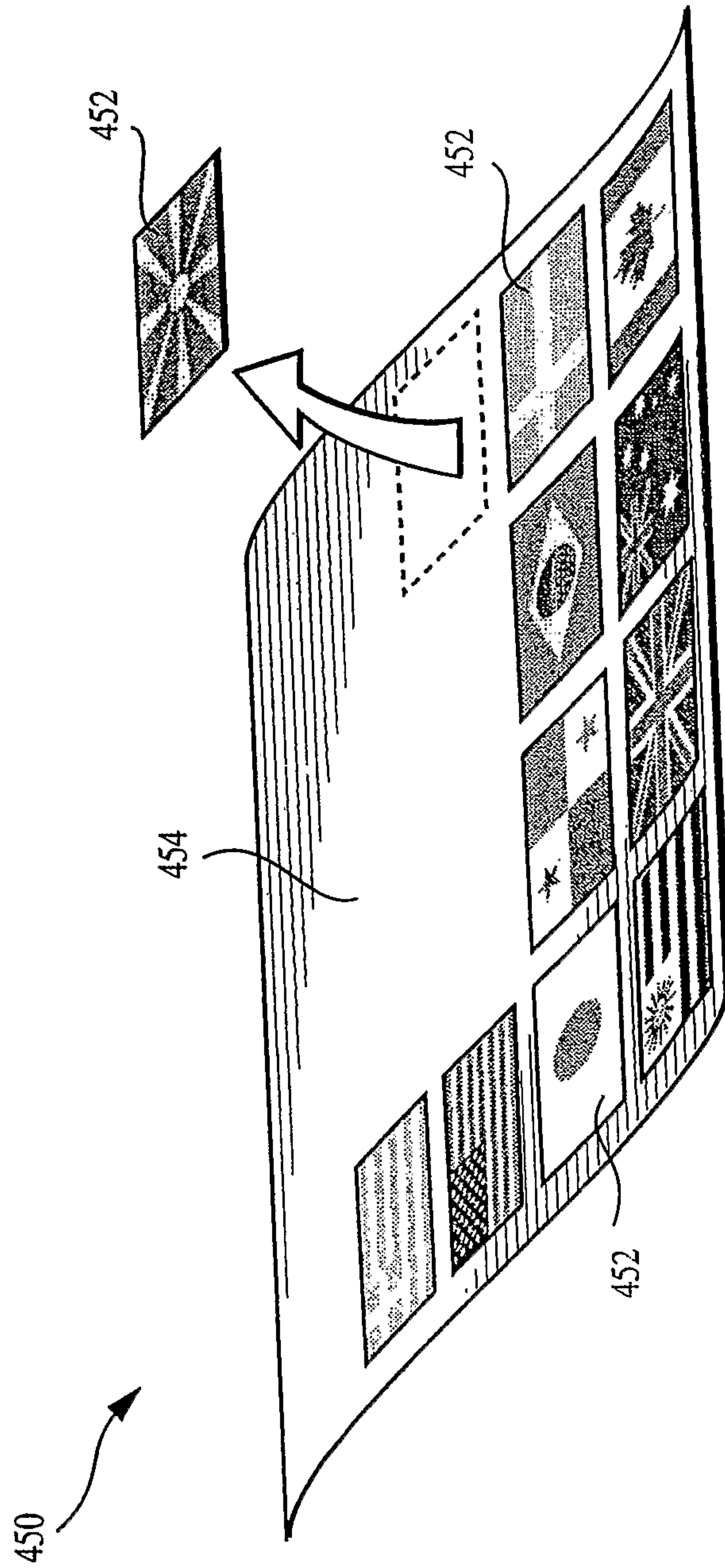


FIG. 23

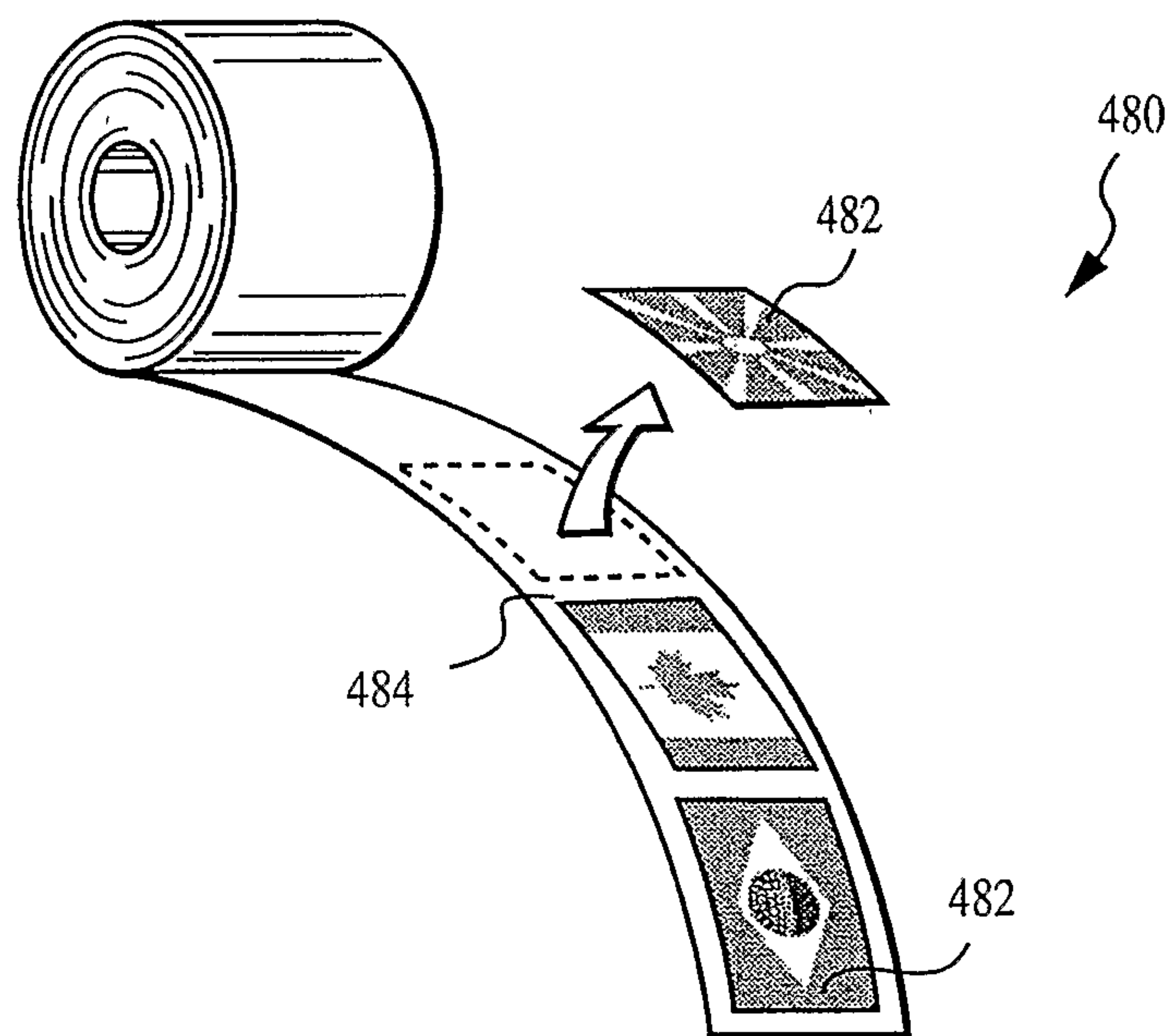


FIG. 24

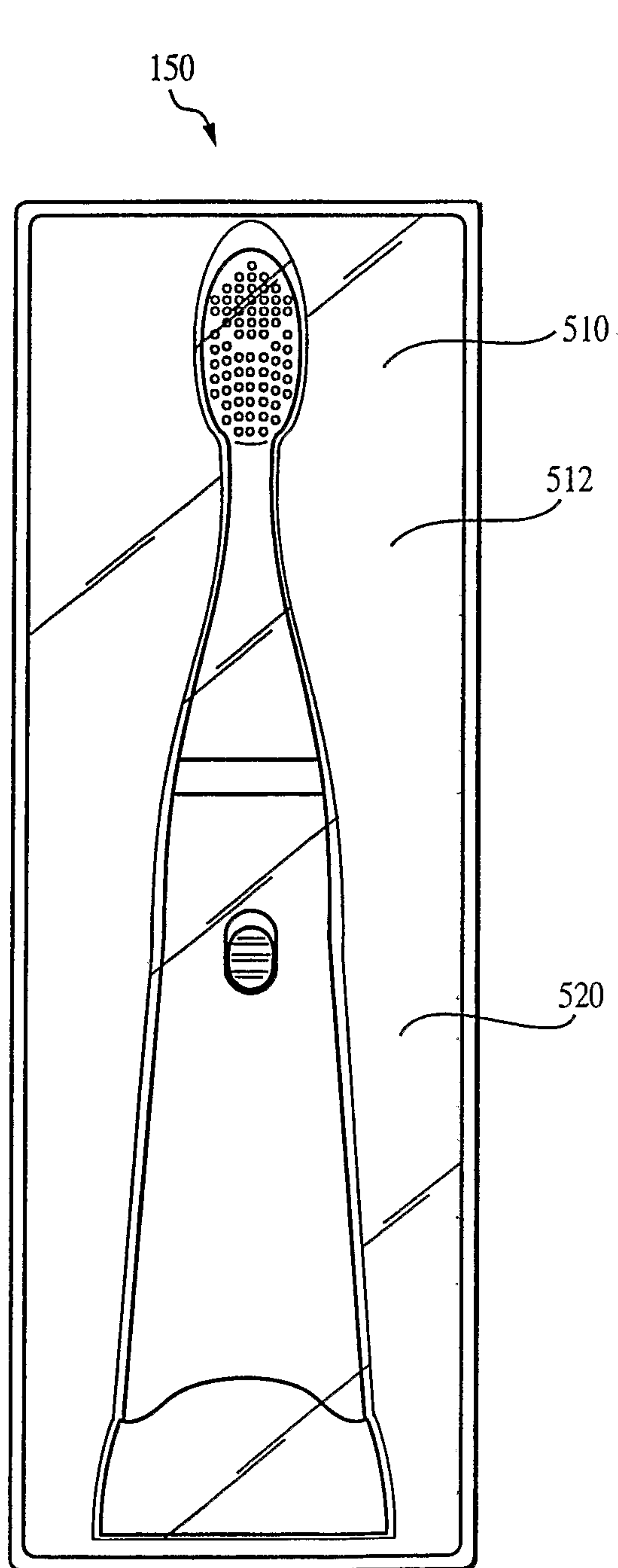


FIG. 25

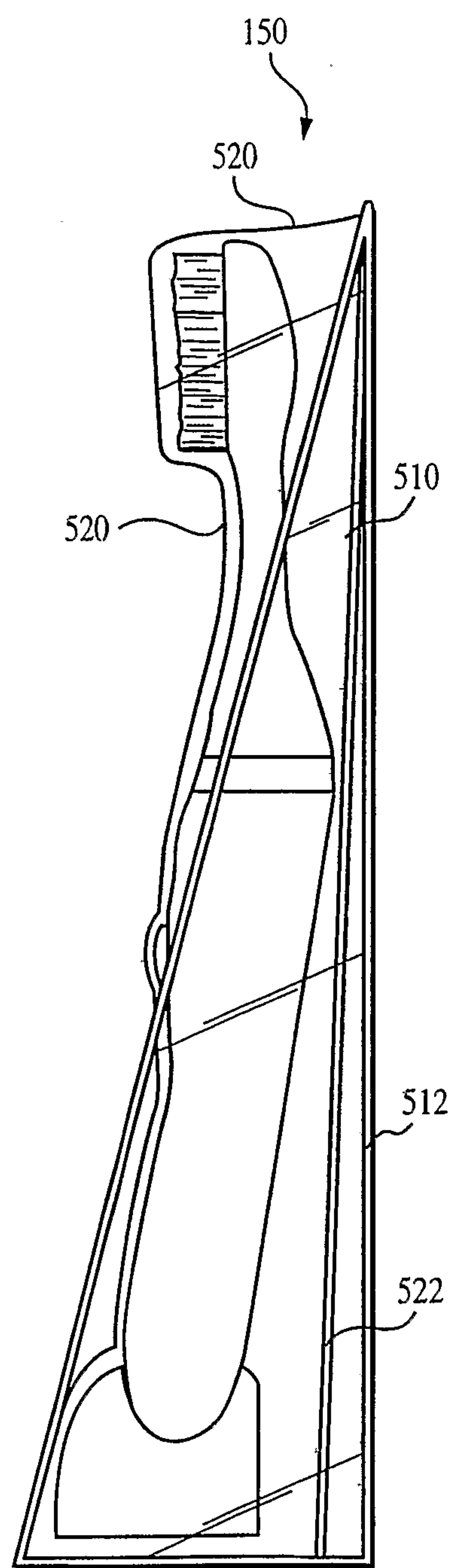


FIG. 26

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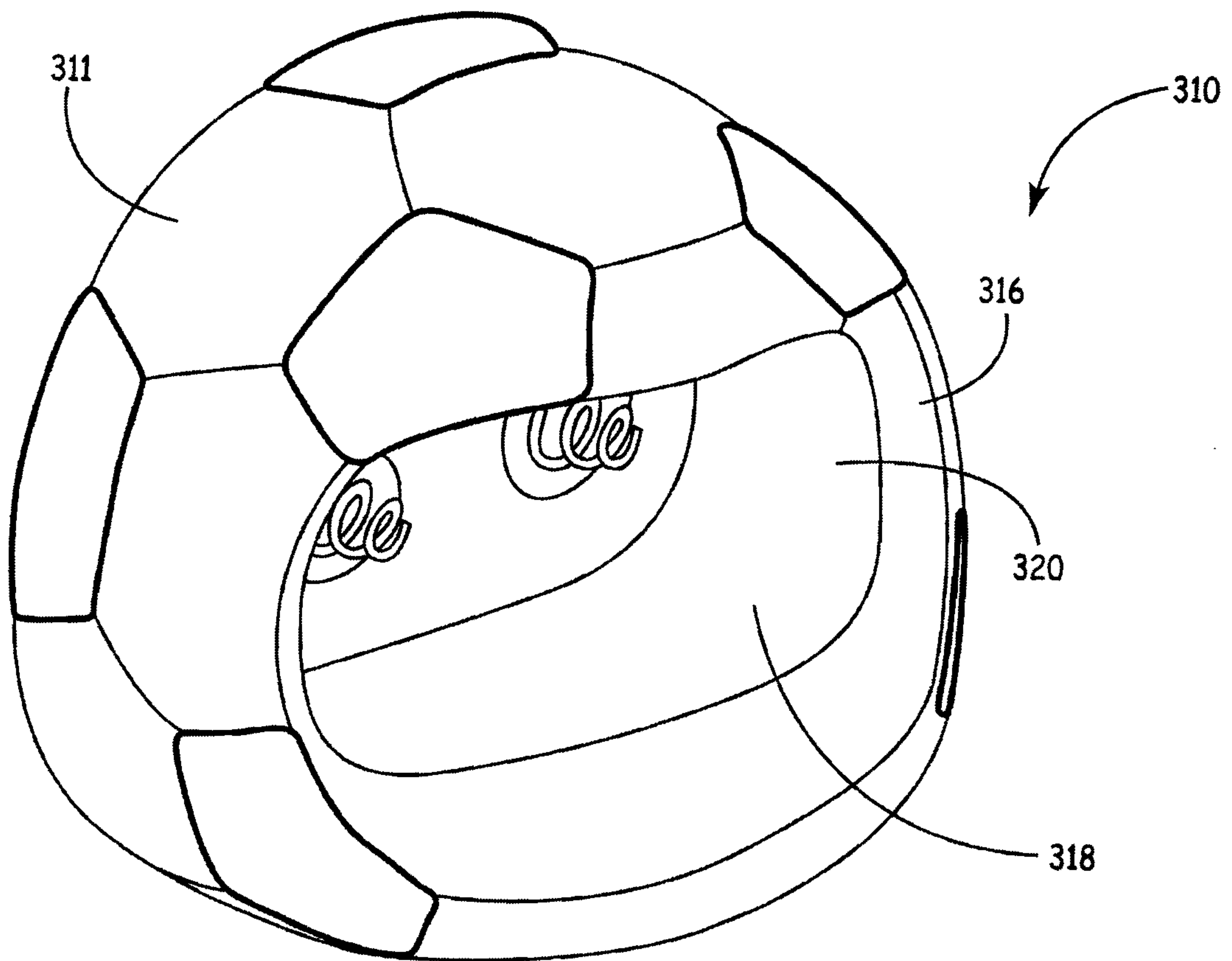


FIG. 27

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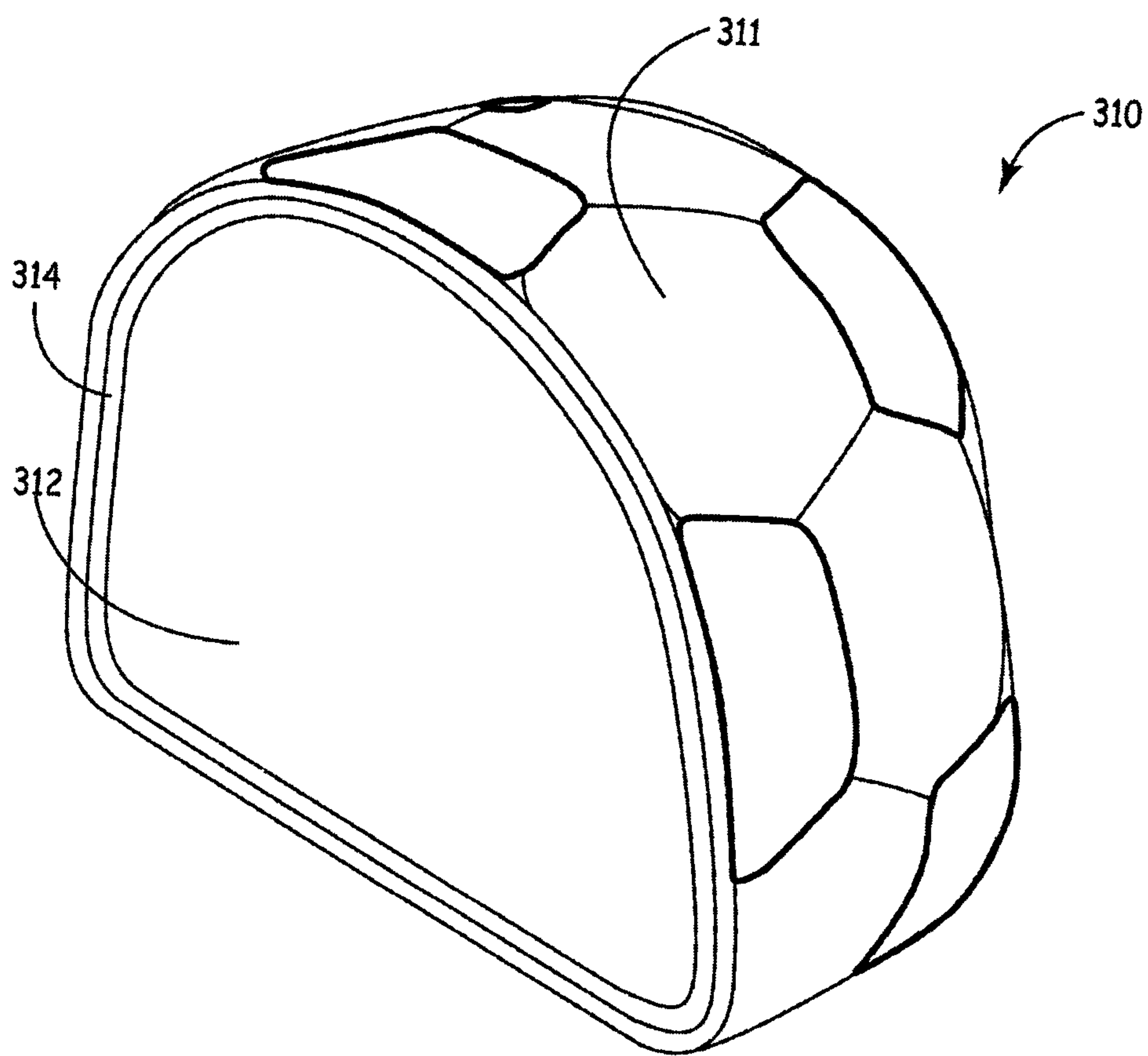


FIG. 28

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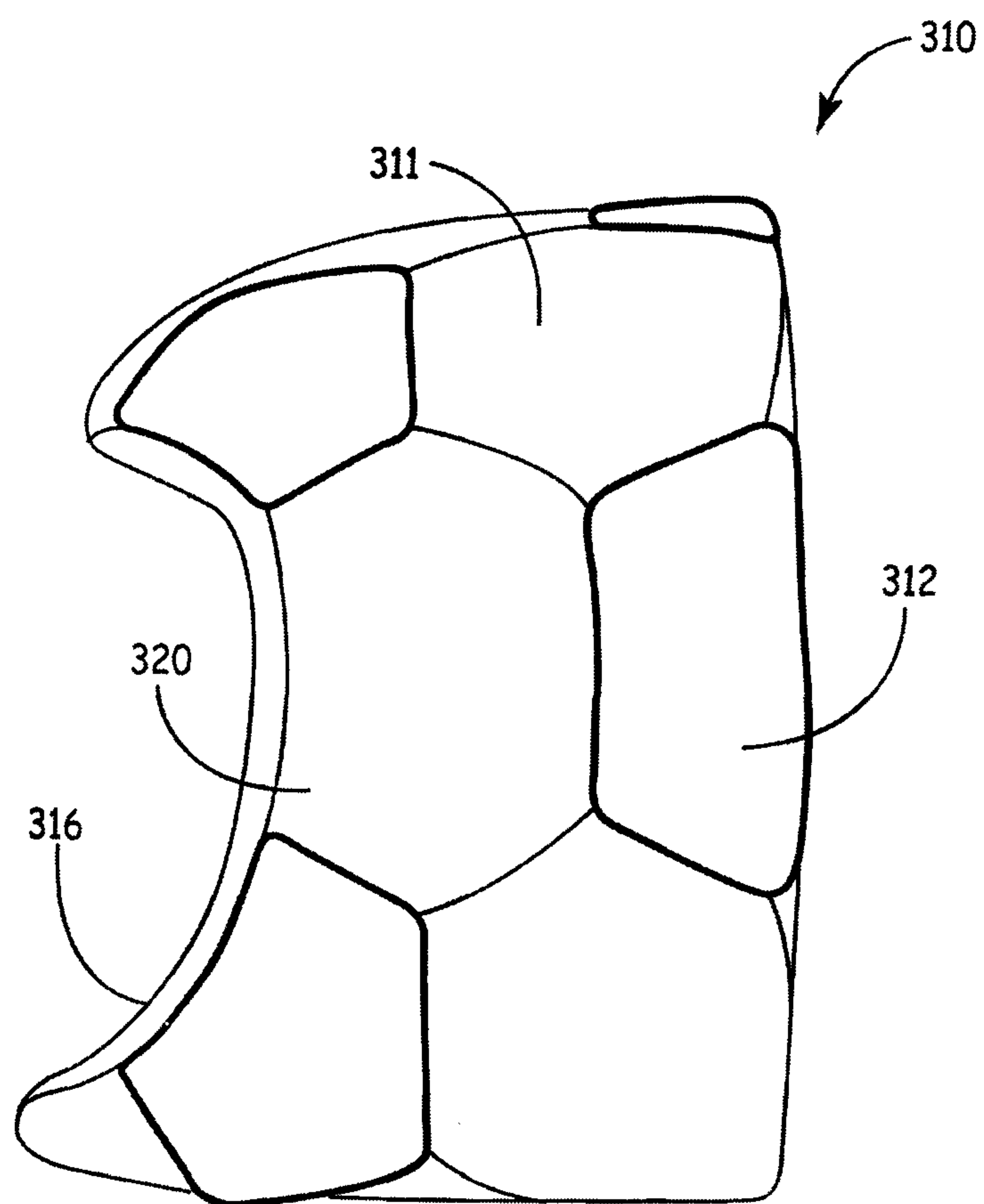


FIG. 29

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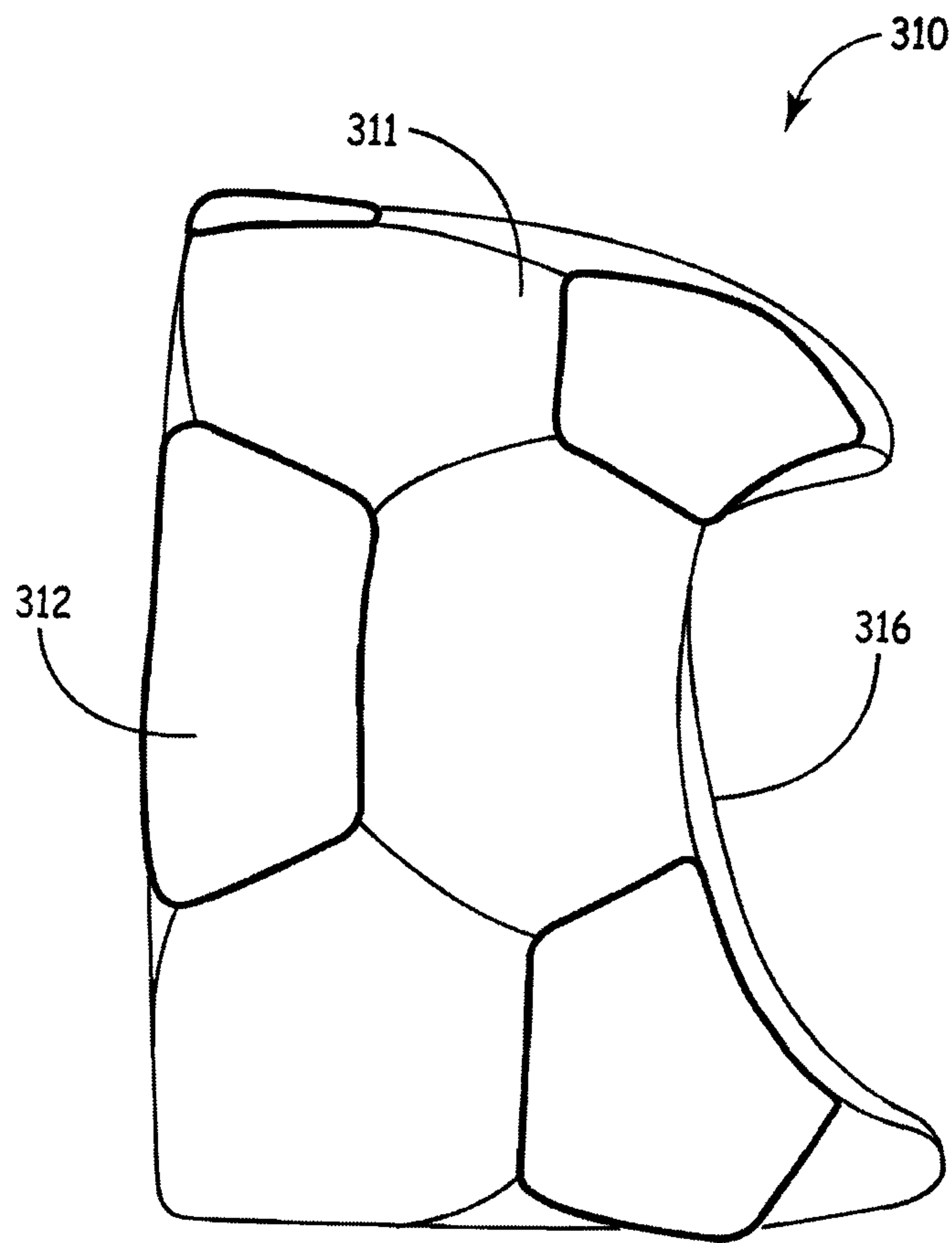


FIG. 30

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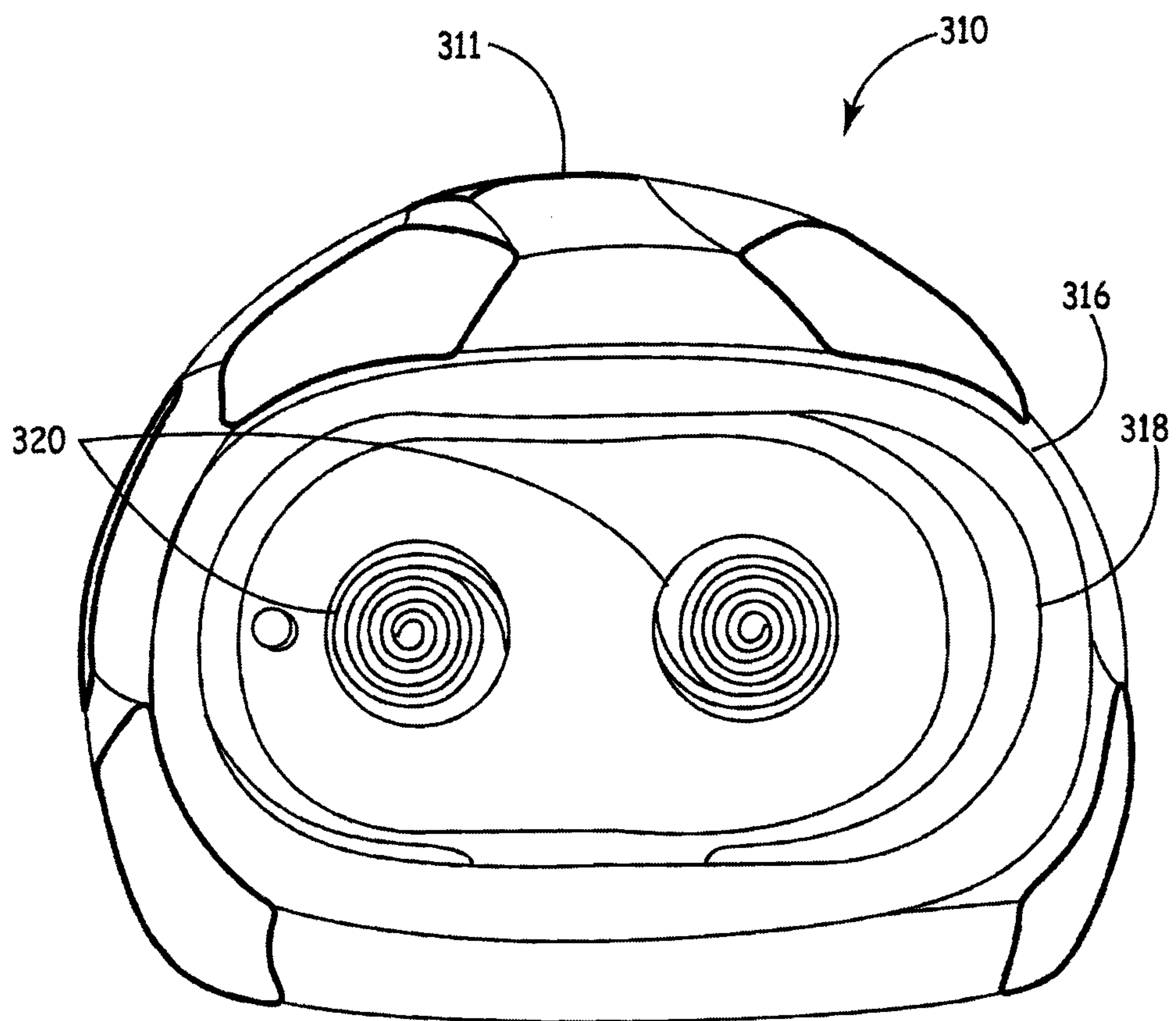


FIG. 31

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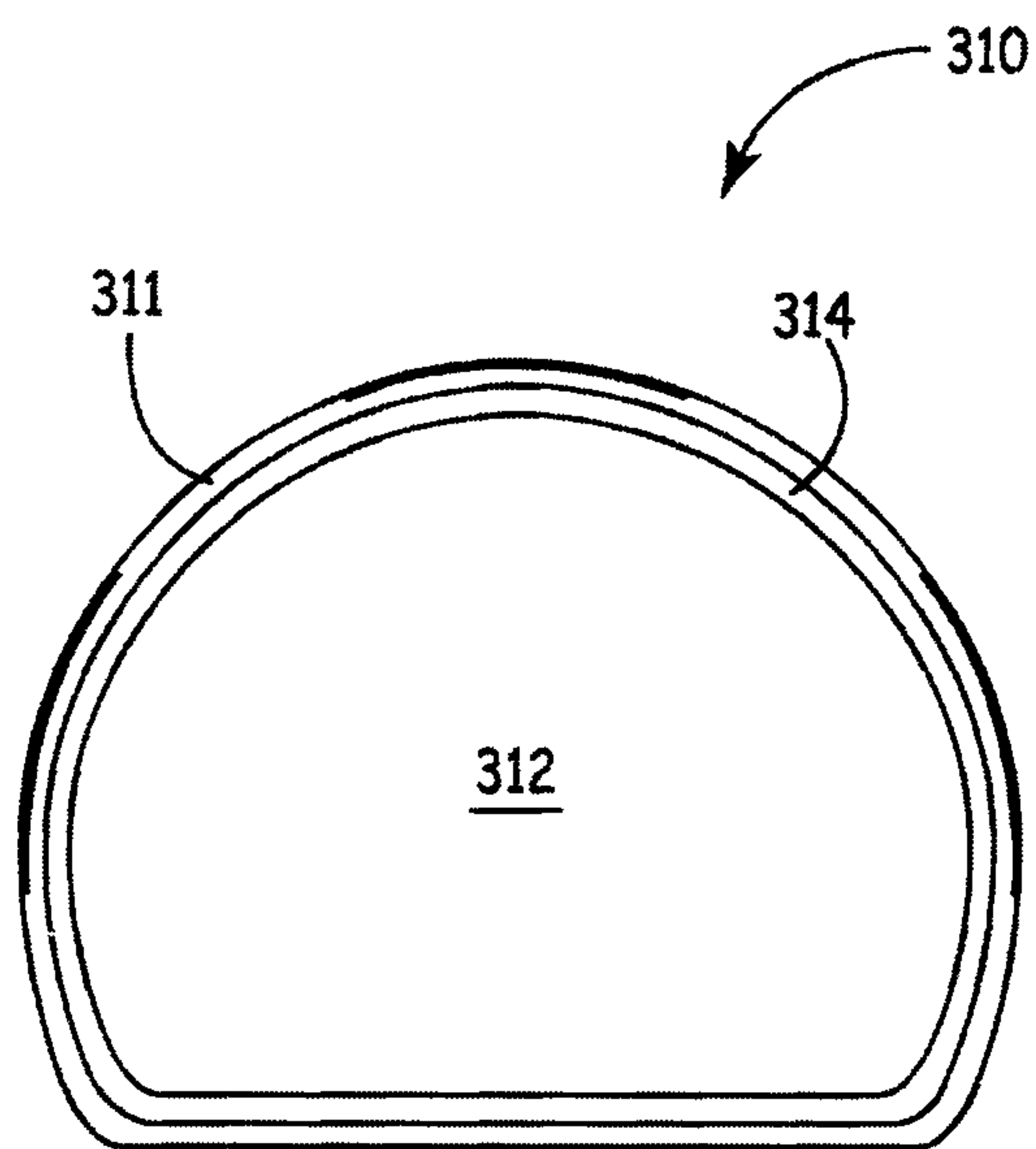


FIG. 32

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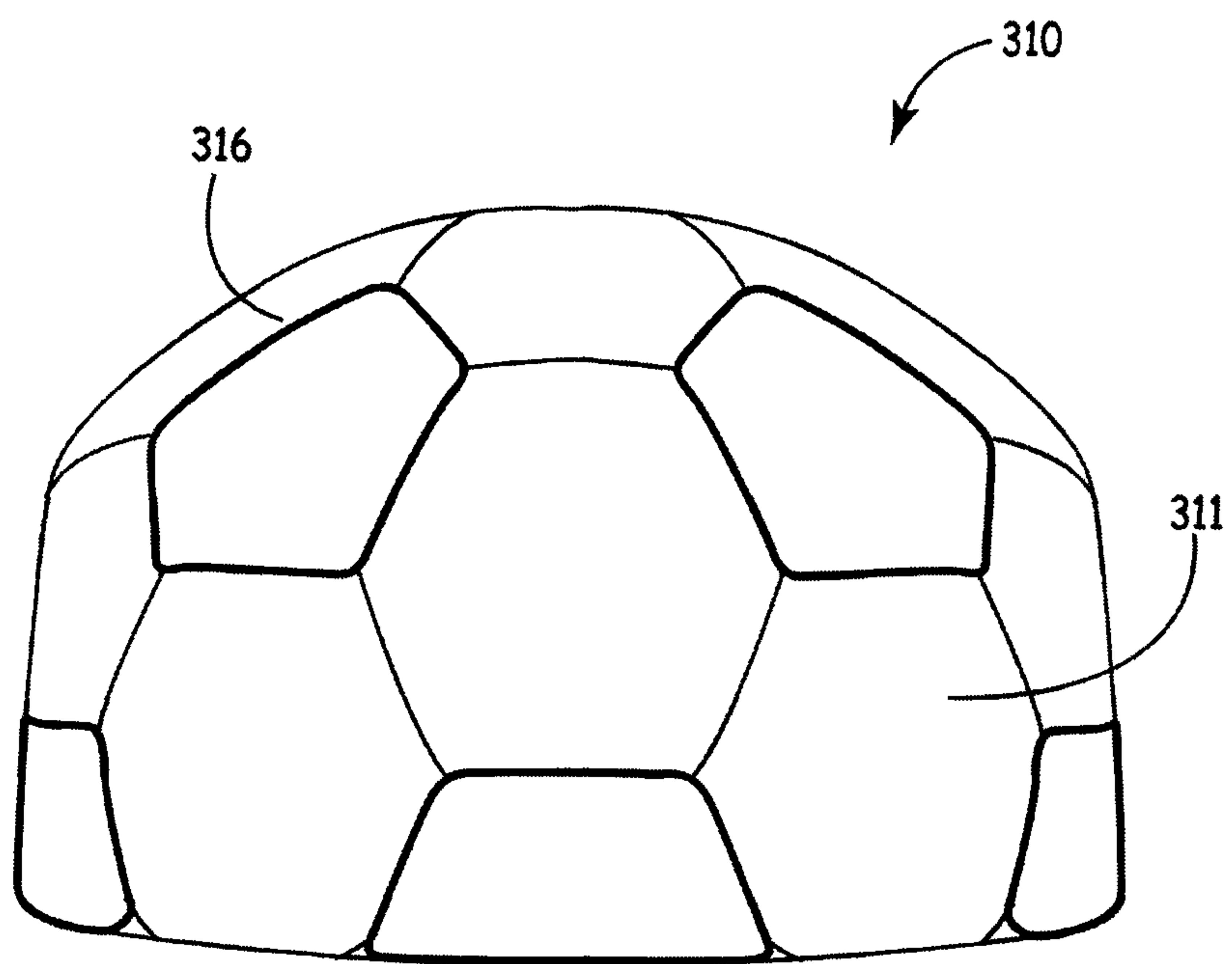


FIG. 33

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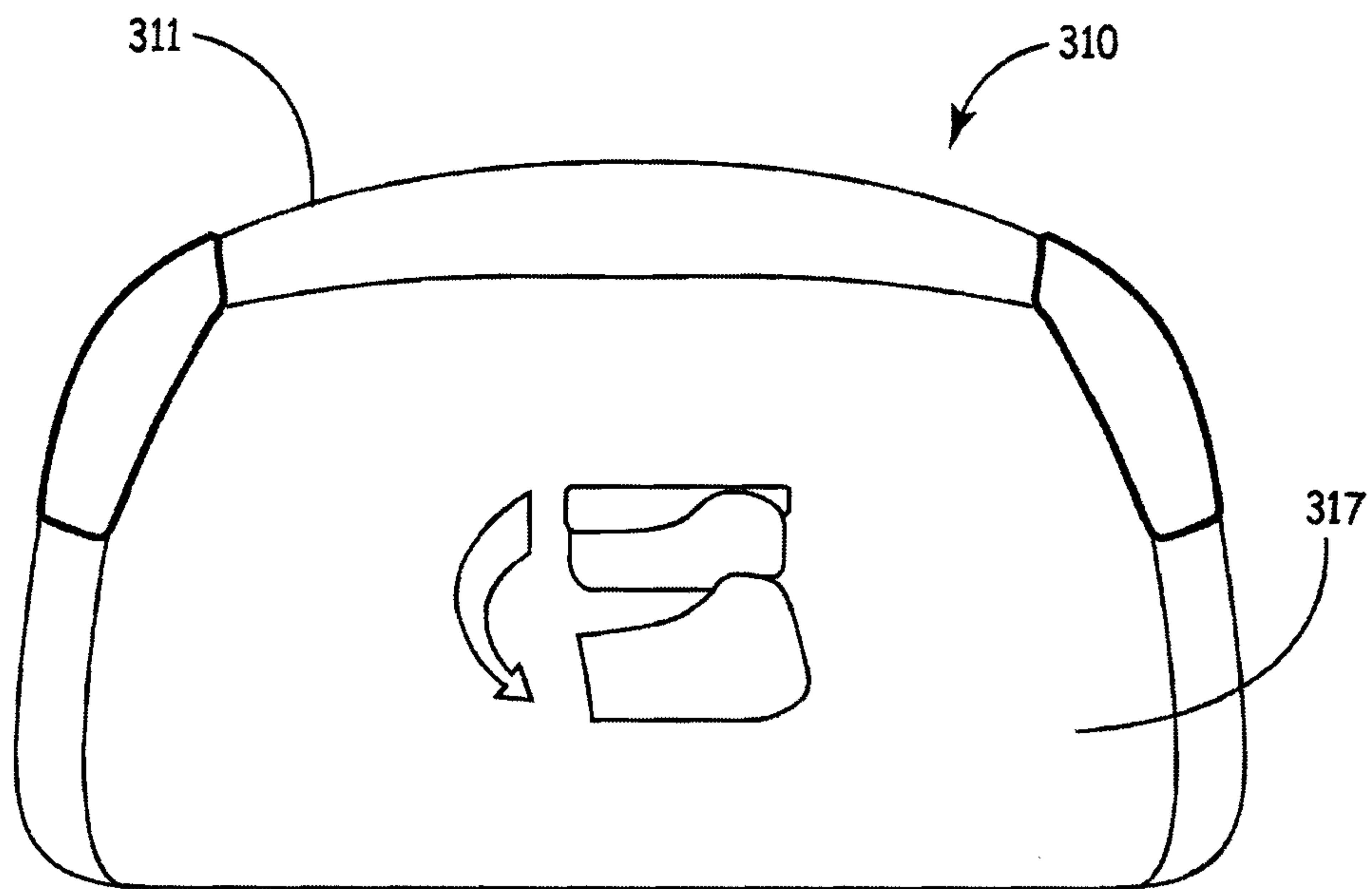


FIG. 34

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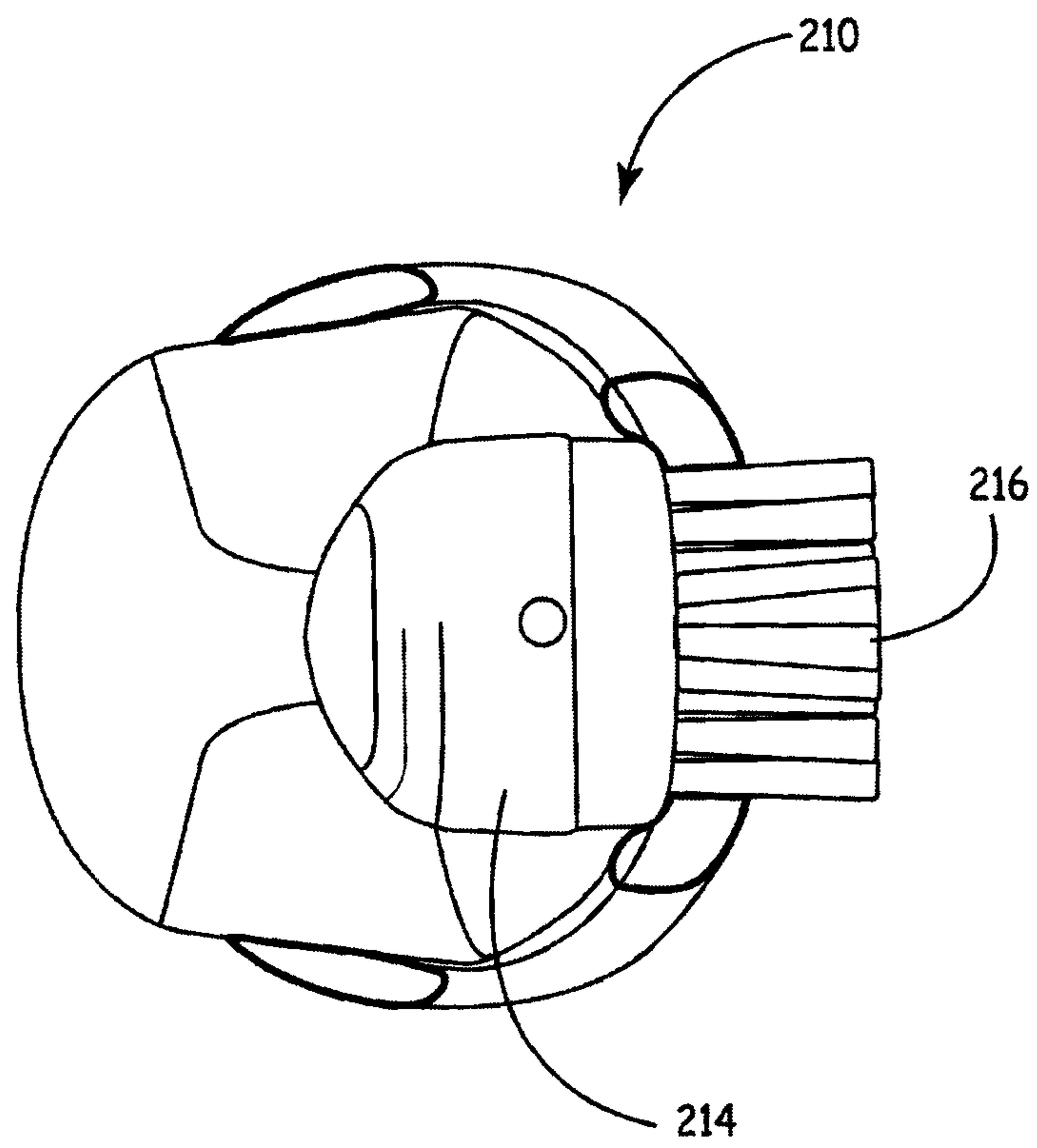


FIG. 35

