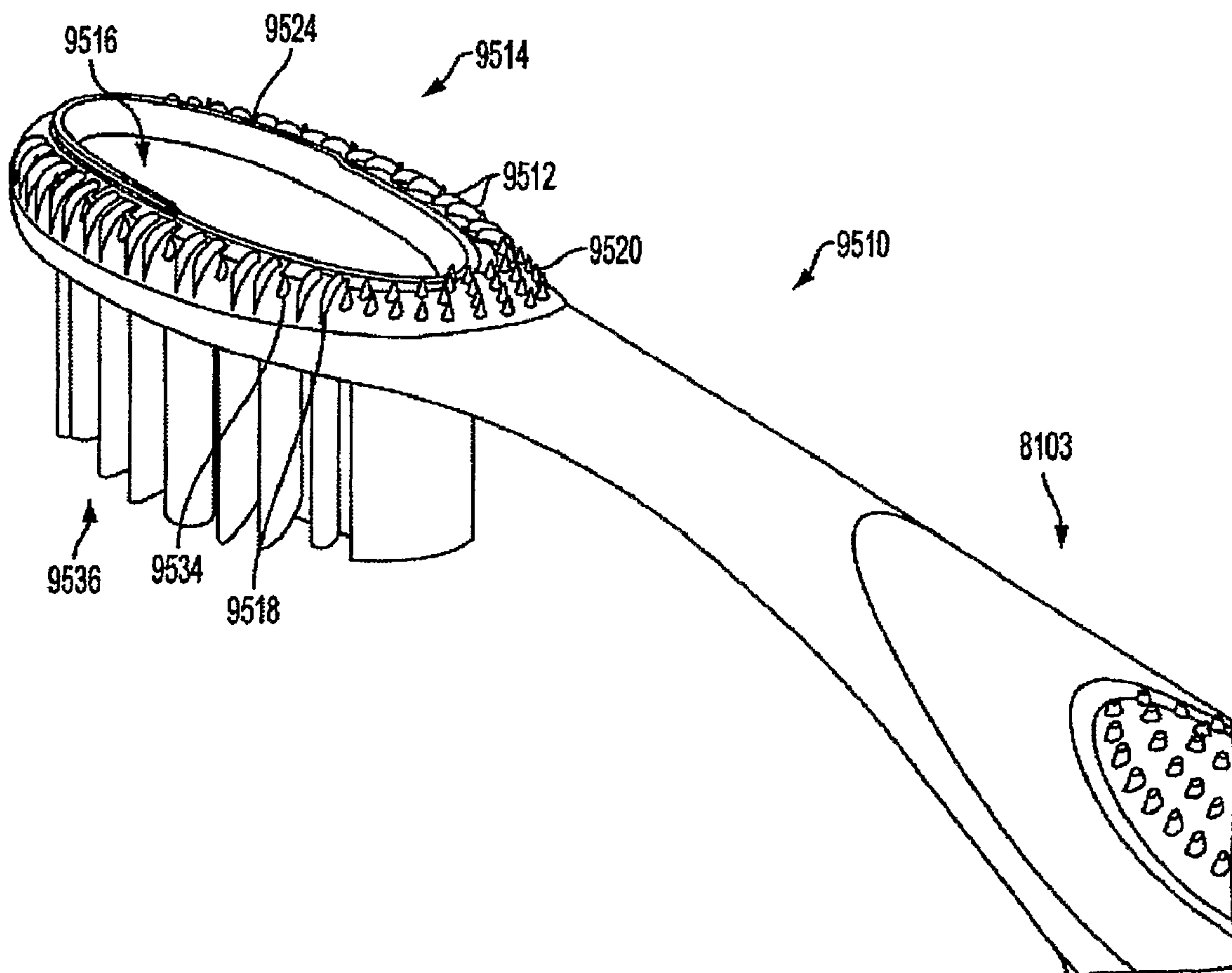




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 (71) Demandeur/Applicant:  
 COLGATE PALMOLIVE COMPANY, US  
 (72) Inventeurs/Inventors:  
 MOSKOVICH, ROBERT, US;  
 RUSSELL, BRUCE M., US;  
 CASINI, LUCA, IT;  
 HOHLBEIN, DOUGLAS J., US;  
 KUCHLER, THOMAS, CH;  
 LANGGNER, TANJA, GB;  
 MINTEL, THOMAS E., US;  
 ...  
 (74) Agent: SMART & BIGGAR

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 An oral care implement is provided having a handle and a head with a soft tissue cleanser and/or tooth cleaning elements. The tissue cleanser may include a plurality of projections for cleaning the soft tissue, which may include cleaning between the papillae of

(72) Inventeurs(suite)/Inventors(continued): ROONEY, MICHAEL, US; STORZ, JOACHIM, AT

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a user's tongue. The soft tissue cleanser may have an elongate ridge projecting from the head in generally the same direction as the projections. The handle may include a base with a gripping region and a projection protruding from the base in the gripping region. The handle may also have a grip surface with a plurality of spaced slot openings exposing portions of the base. The grip body may form opposite finger grips on the handle.

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(71) Applicant (for all designated States except US): COLGATE-PALMOLIVE COMPANY [US/US]; 300 Park Avenue, New York, New York 10022 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MOSKOVICH, Robert [US/US]; 20 Jensen Street, East Brunswick, New Jersey 08816 (US). RUSSELL, Bruce, M. [US/US]; 30 Flintlock Drive, Howell, New Jersey 07731 (US). CASINI, Luca [IT/IT]; Via B. Eustachi, I-52 Milan

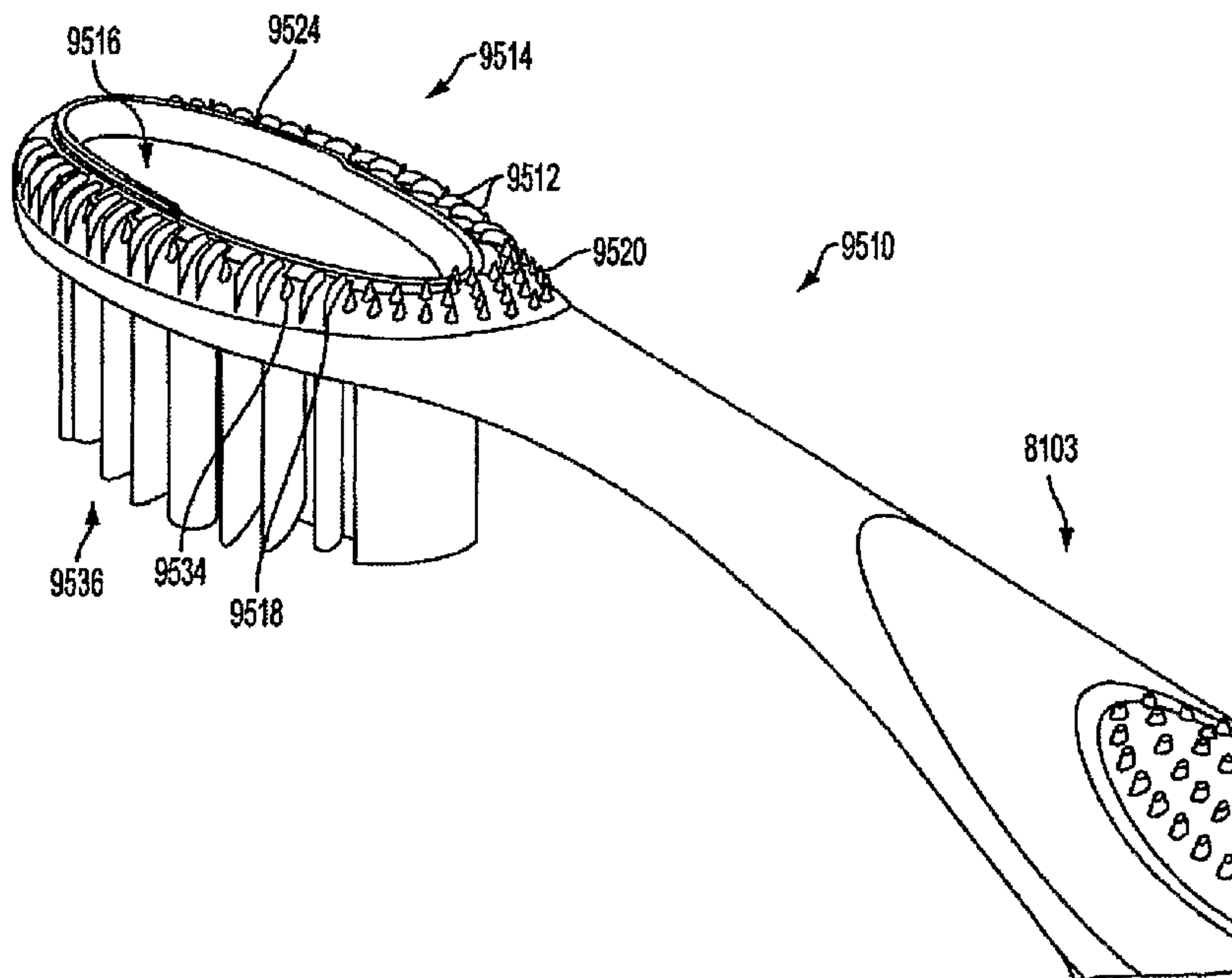
(IT). HOHLBEIN, Douglas, J. [US/US]; 45 Diverty Road, Pennington, New Jersey 08534 (US). KUCHLER, Thomas [CH/CH]; Spuhlihalde 17, CH-3098 Schliern (CH). LANGGNER, Tanja [AT/GB]; 63 Canal Building, 135 Shepherdess Walk, London Greater London N1 755 (GB). MINTEL, Thomas, E. [US/US]; 439 Central Avenue, Rahway, New Jersey 07065 (US). ROONEY, Michael [US/US]; 63 Locust Avenue, Milburn, New Jersey 07041 (US). STORZ, Joachim [DE/AT]; Wiesenweg 18, A-5700 Zell am See (AT).

(74) Agent: WOLIN, Harris, A.; COLGATE-PALMOLIVE COMPANY, 909 River Road, P.O. Box 1343, Piscataway, New Jersey 08855 (US).

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[Continued on next page]

(54) Title: ORAL CARE IMPLEMENT



(57) Abstract: An oral care implement is provided having a handle and a head with a soft tissue cleanser and/or tooth cleaning elements. The tissue cleanser may include a plurality of projections for cleaning the soft tissue, which may include cleaning between the papillae of a user's tongue. The soft tissue cleanser may have an elongate ridge projecting from the head in generally the same direction as the projections. The handle may include a base with a gripping region and a projection protruding from the base in the gripping region. The handle may also have a grip surface with a plurality of spaced slot openings exposing portions of the base. The grip body may form opposite finger grips on the handle.



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## ORAL CARE IMPLEMENT

### FIELD OF THE INVENTION

[01] The present invention pertains to an oral care implement having various features that may include a cleanser for cleaning soft tissue surfaces in a user's mouth, tooth cleaning or tooth treating elements, movable cleaning features, vibratory mechanisms, and/or handle gripping features.

### BACKGROUND OF THE INVENTION

[02] A variety of toothbrush configurations exist that have stationary and/or mechanically-driven movable cleaning elements. These conventional toothbrushes are dedicated to tooth cleaning/polishing operations and typically include a head portion directed to the cleaning/polishing operations, and a handle portion. The head typically has a flat or slightly altered surface to which the cleaning elements are attached, or to which mechanically-driven movable carriers for the cleaning elements are attached. The cleaning elements of these toothbrushes are configured for cleaning and/or for polishing a user's teeth, but are not configured for effective cleaning of soft tissue in a user's mouth, such as the user's tongue.

[03] Tongue scrapers exist as devices for removing micro debris disposed on a user's tongue. Conventional tongue scrapers are stand-alone devices directed to the singular purpose of scraping a user's tongue. These conventional devices typically include a handle and scraper portion without including other cleaning elements.

[04] Users manipulate conventional toothbrushes and tongue scrapers by grasping their handle portions. The handles are typically simple, linear rods of a relatively rigid material, which are neither comfortable for the user nor given to easy manipulation. As these devices are commonly used in wet conditions, their handles are often slippery during use.

[05] Many people use multiple oral care implements, such as toothbrushes and tongue scrapers, on a daily basis to accomplish multiple oral care tasks. For instance, a user may use a toothbrush to clean his teeth and then use a tongue scraper to remove debris from his tongue. The user may then re-use the toothbrush to further clean his tongue. Thus, the user may switch between various oral care implements during a single session in a wet environment.

### BRIEF SUMMARY OF THE INVENTION

[06] The present invention pertains to an oral care implement that provides several advantages and that may be used for multiple functions. In one embodiment of the invention, an oral care implement is provided that has a soft tissue cleanser with a ring of projections for dislodging microbial and other debris from soft tissue of a user's mouth. The ring of projections may include nubs and ridges for engaging the soft tissue. The ring may border a central portion on a face of the oral care implement, which may have a depth in comparison with the height of the projections.

[07] Embodiments of the invention may be multi-functional and include various combinations of features in advantageous combinations. Some embodiments include a soft tissue cleanser in combination with tooth cleaning features and/or in combination with gripping features on the handle that improve the user's grip and handling thereof. The embodiments may be manual or mechanically-driven devices, or combinations thereof. These and other aspects are discussed in relation to the following figures.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[08] A more complete understanding of the present invention and the advantages thereof may be acquired by referring to the following description in consideration of the accompanying drawings, in which like reference numbers indicate like features.

[09] Figure 1 shows a side view, partially in section, of an embodiment of a toothbrush according to the invention and of a handle-closure part separated from one another (without a battery).

[10] Figure 2 shows a bottom view, partially in section, of another embodiment of a toothbrush according to the invention shown in the assembled state.

[11] Figure 3 shows a side view, partially in section, of the toothbrush according to Figure 2 and the closure part separated from one another (without a battery).

[12] Figure 4 shows a side view of a further embodiment of a toothbrush according to the invention shown in the assembled state.

[13] Figure 5 shows a front part of the toothbrush according to Figure 4 with different embodiments of exchangeable treatment heads.

[14] Figure 6 is a perspective view of a head of a further embodiment of the invention.

[15] Figure 7 is a partial cross-sectional view taken along line IX-IX in Figure 6.

[16] Figure 8 is a partial cross-sectional view of another embodiment of the invention taken along line IX-IX in Figure 6.

[17] Figure 9 is a partial cross-sectional view of a further embodiment taken along line IX-IX in Figure 6.

[18] Figure 10 is a partial cross-sectional view of an additional embodiment taken along line IX-IX in Figure 6.

[19] Figure 11 is a partial perspective view of yet another oral care implement in accordance with the present invention.

[20] Figure 12 is a partial cross-sectional view taken along line XIV-XIV in Figure 11.

[21] Figure 13 is a perspective view of a head of a further toothbrush embodiment in accordance with the present invention.

[22] Figure 14 is a top plan view of the head of Figure 13.

[23] Figures 15 and 16 are top plan views of the head illustrating alternative concave-shaped ridges for the head of Figure 13.

[24] Figure 17 is a partial cross-sectional view taken along line II-II in Figure 13.

[25] Figure 18 is a partial cross sectional plan view of an alternative structure taken along line II-II of Figure 13.

[26] Figures 19A and 19B are partial cross-sectional views of alternative ridge shapes for the embodiment of Figure 13.

[27] Figures 20-33 are each a top plan view of the head illustrating an alternative ridge construction for the embodiment of Figure 13.

[28] Figures 34-38 are each a perspective view of a further embodiment of a head of an oral care implement in accordance with the invention.

[29] Figure 39 is top plan view of a further oral care implement in accordance with the present invention.

[30] Figure 40 is partial perspective view of a head portion of the oral care implement of Figure 39.

[31] Figure 41 is side view of a further oral care implement in accordance with the present invention.

[32] Figure 42 is partial perspective view of a head portion of the oral care implement of Figure 41.

[33] Figure 43 is side view of a further oral care implement in accordance with the present invention.

[34] Figure 44 is partial perspective view of a head portion of the oral care implement of Figure 43.

[35] Figure 45 is side view of a further oral care implement in accordance with the present invention.

[36] Figure 46 is partial perspective view of a head portion of the oral care implement of Figure 45.

[37] Figure 47 is partial perspective view of a head portion of yet another oral care implement in accordance with the present invention.

[38] Figures 48A-C show an additional oral care implement in accordance with the invention.

#### DETAILED DESCRIPTION OF THE INVENTION

[39] The following embodiments describe aspects of the invention in the form of various oral care implement configurations that provide a variety of features and functions. Although these aspects are disclosed in the context of particular exemplary embodiments, the invention provides an oral care implement that includes one or more of the features described herein. The oral care implement may include a first feature described in one example configuration herein, as well as a second feature described in another example configuration herein.

[40] In other words, the invention contemplates mixing and matching features from the disclosed embodiments in various combinations into a single oral care implement. The present invention thus makes it possible to select a combination of cleaning/treating element configurations, tissue cleanser configurations, handle features, gripping features, mechanical driving features, materials and orientations, etc. to achieve intended results, and to deliver additional oral health benefits, such as enhanced cleaning, tooth polishing, tooth whitening, tongue cleansing, massaging of gums, etc.

[41] Oral care implements of various configurations are provided that generally include a handle and one or more cleaning features. The handle may include a mechanically-driven



feature, such as rotating, vibrating, and/or moving cleaning elements. In one configuration, a toothbrush is provided with a mechanical vibratory element and a head having a plurality of different types of cleaning/treating elements and cleaning areas which provide for an enhanced cleaning and/or treating effects. The cleaning/treating elements move by the mechanical vibratory device and/or independently of the mechanical vibratory device. Such a toothbrush, therefore, provides for synergistic and enhanced cleaning, scrubbing and massaging experience on the teeth and gums.

[42] In a powered configuration, the toothbrush has a power source. The power source may be at least one battery, for example, 1, 2 or more batteries. The battery may be removable or fixed, rechargeable, non-rechargeable or rechargeable from an external source. Further, the battery may be of any size, such as, for example, AA, AAA, 9V and C. Alternatively, the power source may from an external source, for example via an AC adapter.

[43] Turning to the Figures, both the toothbrush illustrated in FIG. 1 and that according to FIGS. 2 and 3 each have a handle 1, a front bristle-carrying head part 3 and a neck part 4, which connects the head part 3 to the handle 1. The bristles combined to form clusters of bristles 6 are anchored in a bristle carrier 5 and form a profiled brushing surface with their free ends. In the embodiment illustrated, the bristle carrier 5 with the clusters of bristles 6 is positioned, in a manner which is known per se and thus is not described in detail, on a retaining part 2 of the head part 3 such that it can be exchanged. Also, as noted above, any of the arrangements of teeth cleaning elements disclosed herein could be used in place of the illustrated bristle pattern.

[44] The neck part 4 is provided with neck-part zones 7 which are preferably made of an elastically relatively compliant material component and provide for, or additionally increase, the elasticity of the neck part 4, with the result that, during use of the toothbrush, the bristle-carrying head part 3 can be forced back resiliently in the case of forces acting in the direction of the brushing surface. Optionally, the neck-part zones 7 are designed as notches which extend over part of the neck circumference and are filled with elastically compliant material (e.g., with a thermoplastic elastomer). It is understood that the form and number of neck-part zones can be different. It is also conceivable to have a flexible neck zone without using elastic material components, e.g., by providing constrictions or by way of a bellows.

[45] Integrated in the front head part 3, or in that region of the neck part 4 which is adjacent to the head part 3, is a mechanical vibratory device 50, by means of which vibrations

which effect or enhance the teeth-cleaning action may be imparted to the bristle-carrying head part 3. The vibratory device 50 can be connected to an electric power source, accommodated in the handle 1, via electrical connections running in the neck part 4, as is described herein below. In one embodiment, neck-part zones 7 are made of an elastically compliant material which dampens the vibration between the vibrating head part 3 and the handle 1, with the result that the vibratory action is produced, in particular, in the head part and is transmitted to the handle 1 to a slight extent. This means that slight vibrations can be felt in the handle 1 during the teeth-cleaning operation, and the toothbrush is thus comfortable to handle. In another embodiment, the vibration produced is not damped by the handle 1 and can act to full effect in the head part 3. Instead of the neck-part zones 7 having elastically compliant-material, however, other vibration-damping elements could also be used. Further, the dampening may also be achieved, for example, by using a basic material, by the neck part being configured in a particular form, for example by the presence of a bellows/accordion part, etc. Alternatively, the neck could be formed with reduced thickness and/or of dual materials as disclosed in U.S. Patent application no. 11/053589.

[46] Accommodated in the handle 1 is a sheath or sleeve 60 which extends in the longitudinal direction of said handle and is made of electrically conductive material. Both the handle 1 and the sleeve 60 are open to the rear, this forming a cavity 21 which can be closed from the rear by a closure part 52 and into which it is possible to insert a battery 55, in the preferred embodiment illustrated a commercially available, non-rechargeable cylindrical battery, with a defined power (e.g. 1.5 V) as the power source for the vibratory device 50. It would also be possible, however, for a button cell or for a rechargeable storage battery to be used as the power source.

[47] A spring contact 59 for the positive pole 30 of the battery 55 (see FIG. 2) is fitted in the sleeve 60, on a transverse wall 58, and is connected to the vibratory device 50 via an electric line 61, a switch 32, which is installed in the sleeve 60 and can be actuated from the outside of the handle 1, and an electric line 33 running in the neck part 4. The electrical connection can be interrupted by means of the switch 32.

[48] The closure part 52 is provided with a threaded stub 52a made of an electrically conductive material and can be screwed into the handle 1 and/or into the sleeve 60 by way of said threaded stub. The threaded stub 52a is provided with a contact surface 52b which, with the closure part 52 screwed in, comes into abutment against the negative pole 35 of the battery 55 inserted into the sleeve 60. The negative pole 35 is electrically connected to the

vibratory device 50 via the threaded stub 52a, the sleeve 60 itself and a line 34, which connects the sleeve 60 to the vibratory device 50 and runs in the neck part 4.

[49] Instead of being transmitted via the electrically conductive sleeve 60, it would also be possible for the power to be transmitted in some other way, for example using wires or an electrically conductive plastic.

[50] In the embodiment illustrated in FIG. 1, the vibratory device 50 comprises a vibratory element 11' which functions preferably in the manner of a vibratory armature, can be electrically connected directly to the power source via the lines 33, 34 and, with the power source connected, is made to vibrate.

[51] In the case of the toothbrush variant illustrated in FIGS. 2 and 3, the vibratory device 50 comprises a vibratory element 11 in the form of an eccentric, which produces mechanical vibrations and can be rotated about an axis located in the longitudinal direction of the toothbrush, and also comprises a drive which is arranged directly adjacent and is designed as a micromotor 15. The vibratory element 11 is connected to the shaft 15a of the micromotor 15, which can be electrically connected to the power source via the lines 33, 34. The micromotor 15 and the eccentric may be accommodated as a structural unit in a housing 62.

[52] Instead of an eccentric which can be driven in rotation, it would also be possible to have a vibratory element 11 which can be driven in a translatory manner. It would be possible, in the case of the toothbrush according to the invention, to arrange the bristle-carrying head part 3 such that it can be moved in relation to the neck part 4 in order for the latter, in the case of vibrations produced by means of the vibratory device 50, to be made to move in relation to the rest of the toothbrush.

[53] The electric lines 61, 33, 34 could also be realized by electricity-conducting plastic tracks. The switch 32, which connects or interrupts the lines 61, 33, may also be, for example, a magnetic switch. A preferred configuration of the switch 32, however, has a pulse switch arranged on a printed circuit board as well as further electronic components which store the switching state.

[54] It is also possible, however, for the electrical connection between the battery 55 and the vibratory element 11' (FIG. 1) or the drive 15 (FIGS. 2 and 3) to be produced or interrupted not by the switch 32, but by the closure part 52, which can be screwed into the handle and/or into the sleeve 60 or connected to the same in a bayonet-like manner, being turned (i.e., the switch 32 is dispensed with in the case of such a configuration).

[55] Instead of the rear closure part 52 being screwed to the handle 1, it would, of course, also be possible to have some other type of releasable connection (e.g., plug-in connection, bayonet connection, etc.) and a corresponding configuration of the contact part interacting with the negative pole 35.

[56] It would also be possible for the closure part 52 to be in a form which is quite different to that illustrated in the drawing. For example, the closure part could be provided with a set-down surface or a foot part and thus serve as an element on which the toothbrush can be set down.

[57] The toothbrush illustrated in FIG. 4 corresponds essentially to that according to FIGS. 2 and 3. According to FIG. 4, the vibratory device 50 is arranged directly in the front head part 3. In this exemplary embodiment, the sleeve 60 is dispensed with; the battery 55 is connected directly to the vibratory device 50 via the lines 33, 34. It is also the case with this toothbrush that use is preferably made of an exchangeable bristle carrier 5, which can be positioned on a retaining part 2 of the head part 3, e.g., in the manner of a snap-in connection. The capacity for changing the bristle carrier 5 provided with the clusters of bristles 6 is particularly advantageous since the toothbrush provided with the vibratory device 50 can be used irrespective of the service life of the bristles, which is usually even shorter than the service life of the battery 55.

[58] As can be seen from FIG. 5, it is possible, instead of the bristle carrier 5 or 5a, which forms part of a conventional brush head and is provided with respective clusters of bristles 6 or 6a, to position other, optionally different bristle carriers or adapters 5b to 5d on the retaining part 2, these being provided with different interdental brushes 6b, 6c or interdental treatment parts 6d for effective cleaning of the spaces between the teeth. The interdental brush 6b may be designed, for example, as a helical brush made of coated wire with plastic filaments twisted in. The interdental brush 6c comprises bristles which, together, form a cluster tip. The treatment part 6d may be designed, for example, as a plastic element which has a tip and may preferably be provided with an abrasive coating for removing plaque and tartar from the spaces between the teeth. Of course, it would also be possible to use any other desired treatment heads. It is also the case with the variant according to FIGS. 4 and 5 that the bristle carrier 5 could be configured such that a vibration-induced movement in relation to the retaining part 2 were possible.

[59] For the introduction of the vibratory device 50, the connecting lines 33, 34 and further electronic components, it is possible for a toothbrush according to the invention, or the housing thereof, to be produced in two parts and for the two parts to be welded in a water-tight manner once the abovementioned parts have been positioned therein. It is also possible, however, for a toothbrush according to the invention to be produced by injection molding preferably involving two or more components. The abovementioned parts are advantageously positioned as a unit in an injection molding made of a first material component and then encapsulated in the second material component (or in the further material component) by injection molding. It is not necessary here for full encapsulation to take place. Certain parts may be exposed, as a result of which it is possible to achieve an esthetic effect.

[60] It would also be possible, however, for the abovementioned electronic components to be inserted into a ready-molded handle 1. In a preferred embodiment, since it is not only the vibratory element 11, 11' itself but also the drive, i.e. the micromotor 15, which are arranged in the front head part 3, or in the directly adjacent front region of the neck part 4, it is not necessary for a mechanical drive element to be led through the flexible neck part 4 in order to connect the micromotor to the vibratory element 11. In this embodiment, electric lines 33, 34 (e.g., wires, cables or electrically conductive plastic tracks) run through the neck part 4.

[61] According to one embodiment of the invention, use is made of a mechanical vibratory device 50 which has a diameter of less than about 15 mm preferably less than about 6 mm, and is less than about 35 mm, preferably less than about 20 mm, in length. This ensures that the toothbrush may be of ergonomic configuration and is easy to handle. A toothbrush according to the invention corresponds, in size, more or less to the conventional manual toothbrushes, which makes them more straightforward to handle in comparison with the commercially available, considerably larger electric toothbrushes. A number of head configurations can produce an enhanced cleaning effect when the mechanical vibratory device is engaged.

[62] Figure 6 shows an additional embodiment of the invention that is discussed in terms of a toothbrush. Nevertheless, the invention could be used in other oral care implements including simply a tissue cleansing implement. They also could be as powered brushes.

[63] As shown in Figure 6, toothbrush 5000 includes a plurality of nubs or other projections 5002 protruding from a back side 5004 of head 5006 as a cleanser 5008 of soft

tissue in the mouth. Teeth cleaning elements 5016 preferably extend from a front side 5005 of head 5006. The projections 5002 are preferably arranged seriatim along at least one narrow base or pad in the form of a strip 5010 fixed to the head 5006. In the illustrated example, a plurality of generally parallel strips 5010a, 5010b, 5010c, 5010d are fixed in a generally concave shape facing away from the handle. In this one construction, the strips extend along back side 5004 of head 5006 and each sidewall 5011, although extensions along the sidewalls are not necessary. Any number of strips could be included. The strips could define virtually any shape or orientation on the head. For example, strips 5010 could have any of the shapes disclosed for the ridges in co-pending U.S. Application 10/989,267. In the illustrated construction, strips 5010 are interconnected by an axial stem 5012 which extends into the handle and forms a part of the grip for the user. Further, this handle extension or even the stem is of course not necessary.

[64] In one construction, each projection 5002 is generally columnar and formed with a width W of about 1.1 mm and a height H of about 1.7 mm (FIG. 7). The projections are spaced apart from each other along strip 5010 a distance of about 1.0 mm. These height, width and spacing dimensions could, however, vary widely. In the illustrated embodiment, projections 5002 each includes a peripheral wall 5013 protruding outward from base 5010, and an inclined distal end surface 5014 at an angle of about 50 degrees to side surface 5004 of head 5006. The inclined end surface 5014 defines a narrow top edge 5016 along a portion of peripheral wall 5013, which is advantageous for cleansing the tongue and other soft tissue. Although the end surfaces 5014 are shown to be inclined in the same direction, they could be inclined in different directions.

[65] In an alternative construction (FIG. 11), head 5006 is additionally formed with at least one elongate ridge 5025. With this arrangement, the user is provided with a cleanser that obtains a beneficial dual cleaning effect by moving the discrete projections 5002 and the ridge 5025 across the tongue or other tissue. In the illustrated example, ridge 5025 is a curved, elongate projection protruding generally outward along the outer edge of the remote end 5027 of the head. Nevertheless, other arrangements, locations and shapes are possible. Additional ridges could also be provided. In one preferred construction, ridge 5025 is molded as one-piece with the head and formed of a relatively hard plastic such as polypropylene. The ridge, however, could be formed separately from the head and/or composed of other materials that are compatible for oral care implements.

[66] In one construction, ridge 5025 is, as noted above, formed of a relatively hard material (e.g., polypropylene), while projections 5002 are formed of a relatively soft material (e.g., a thermoplastic elastomer). This use of dual materials enables the benefits of both materials to be gained. The cleanser includes the firm engagement of the relatively hard scraper blade in ridge 5025 and the relatively soft discrete projections that flex and turn as they dig into the tongue or other tissue.

[67] As seen in Figures 11 and 12, ridge 5025 is defined by a pair of opposite sidewalls 5033, 5034 which meet to form a scraper edge 5035. While edge 5035 is relatively narrow in this construction, it could be substantially widened. In one embodiment, sidewalls 5033, 5034 are formed with different slopes relative to side 5004 of head 5006, though they could have the same slope. In one preferred construction, sidewall 5033 is formed with a steeper slope than sidewall 5034 to define a more aggressive scraping action as the head is pulled across the tongue by the user. The shallower slope of sidewall 5034 facing generally away from the handle, makes the ridge less prone to pushing the tongue biofilm farther back in the throat as the ridge is pushed back toward the throat. In a preferred embodiment, sidewall 5033 is oriented at an angle  $\alpha$  of 62 degrees relative to side 5004, whereas sidewall 5034 is oriented at an angle  $\beta$  of 43 degrees. Other angles could also be used for both sidewalls.

[68] In another alternative construction (FIG. 8), each projection 5002a is provided with an end surface 5014a having two inclined end face portions 5015a, 5017a and a top edge 5016a. As with ridge 5025, end face portion 5015a, generally facing toward the handle, is preferably inclined at a steeper angle relative to side 5004a than end face portion 5017a, although other arrangements including end face portions having the same inclination can be used. As one example, end face portion 5015a is oriented at an angle  $\alpha$  of 62 degrees relative to side 5004a, and end face portion 5017a is oriented at an angle  $\beta$  of 43 degrees. The steeper angle of end face portion 5015a provides a more aggressive scraping action as the head is dragged out of the mouth. The shallower angle of end surface 5017a makes the projection less prone to pushing the tongue biofilm farther back in the throat.

[69] Of course, other projections can be used. For example, each projection could include a non-inclined distal end or an end that tapers to a pointed tip. The projections could have a wide variety of shapes beyond the cylindrical shape shown in Figure 6. For example, the projections could have a conical shape, irregular cross sections, or be inclined to the back side 5004. Moreover, the projections may also be ridge shaped to extend entirely or partially along the length of strip 5010.

[70] In a preferred construction, projections 5002 and strip 5010 are formed as a one piece member molded or otherwise secured to head 5006. The projections and strip are preferably formed as a one-piece member of a resilient thermoplastic elastomer such as styrene-ethylene/butylene-styrene block copolymer (SEBS) manufactured by GLS Corporation, but could be composed of other resilient materials, hard materials, or a combination of materials such as disclosed in U.S. Patent Application Serial No. 11/011,605, incorporated herein by reference. The projections and strips could also be formed of the same substance as head 5006 (e.g., polypropylene), but have a different color or the like to define it a different material from the head and thereby create at least a visually appealing brush.

[71] In one construction, strips 5010 are molded to overlie a generally planar surface 5004 of head 5006 (FIG. 7). Nevertheless, channels 5007 could be formed in side 5004 to receive strips 5010 therein so that side 5004 and the outer surfaces 5012 of strips 5010 having projections 5002 are generally co-planar (FIG. 9). Additionally, the strips of resilient material could be formed as an integral part of the head construction (FIG. 10). More specifically, in this alternative construction, the head includes a plurality of first members 5020 joined together by a resilient second member 5022 that acts as a living hinge to permit the first members to move relative to each other during use of the toothbrush. The second member also forms the base 5010c of soft tissue cleanser 5006 provided with projections 5002. Additionally, as discussed in regard to toothbrush 5000, projections 5002 or 5002a can be integrally formed as a one-piece member with elastomeric tooth cleaning elements extending in an opposite direction from the head.

[72] Referring now to Fig. 13, an oral care implement in accordance with the present invention is further illustrated in the form of a toothbrush 10 including a head 12 and a handle 14. Although discussed in terms of a toothbrush, it is understood that the device could be in the form of other oral care implements including simply a tissue cleansing implement.

[73] An oral care implement in accordance with the present invention is illustrated in the form of a toothbrush 10 including a head 12 and a handle 14. While figure 13 only illustrates the connection of the handle to the head, the handle is preferably an elongate member to be grasped by the user. The handle 14 could have any known shape adapted for the manipulation needed to clean the teeth and/or tongue of a user.

[74] The head 12 with a pair of opposite sides 16, 17 is shown with a generally oblong shape, although other known shapes could be used. A plurality of teeth cleaning elements 20



extend from one side 16 of the head 12. The teeth cleaning elements could be bristles and/or elastomeric members of various shapes and sizes. Any form or combination of elements 20 suitable for cleaning a user's teeth could be used.

[75] The other side 17 of head 12 includes at least one ridge and preferably a plurality of elongate ridges 22 to cleanse the tongue and other soft tissue of the mouth (e.g., the inner surfaces of the cheeks). While the ridges are preferably formed on a head also provided with teeth cleaning elements, they could also be formed on other implements or other parts of the toothbrush. A head of the implement is simply meant to be the operative portion of the implement that is inserted into the mouth for cleaning of the tongue, and does not refer to a particular shape or structure of the head.

[76] In one construction of the invention, each ridge 22 projects orthogonally from a back surface 17a of the head and has a generally square-like cross-sectional configuration (Fig. 17). The ridge includes a distal end 29 remote from surface 17a that forms a contact region 29a adapted to contact and clean the tongue or other soft tissue in the mouth. In this embodiment, the contact region 29a is defined between and includes protruding corners or edges 25, 27. As can be appreciated, the contact region 29a has a width  $W$  extending transverse to the extension of the ridge across surface 17a. The width  $W$  of ridge 22 is at least as large as the height  $H$  of the ridge (i.e., the distance the ridge extends from surface 17a). With this width to height relationship, the risk of the ridge cutting or injuring the soft tissue of the tongue or other parts of the mouth is reduced. A narrow ridge that extends outward from head 12 a distance greater than its width has an increased risk of cutting or otherwise injuring the user as compared to a similarly narrow ridge (i.e., one with the same width) that extends from the head a distance less than the width of the ridge; such a ridge will not tend to cut or hurt the user. The tongue and other soft tissue in the mouth will give and bend some distance around the ridge so long as the ridge is not too tall for the width of the ridge engaging the tissue. In one exemplary embodiment, ridges 22 have a width  $W$  that is preferably about 0.8 mm and a height  $H$  about 0.6 mm. Nevertheless, a wide range of relative sizes are possible.

[77] Additionally, ridge 22 also includes a base 28 where the ridge is fixed to surface 17a. In a preferred construction, base 28 defines a width  $W_1$  that is at least as large as the height  $H$  of the ridge. In this way, the ridges do not experience undue bending as they are dragged over the tongue. Rather, ridges 22 are stably supported so that they tend to remain generally

in a protruding orientation. As a result, edges 25, 27 are stably supported to dig into recesses in the tongue to effectively remove bacteria and debris.

[78] Alternatively, the ridges could have other shapes. For example, Figure 18 illustrates ridges 22' that are substantially wider than they are tall, i.e., base 28' and contact region 29a' each has a width W2 that is substantially greater than the height H2 of the ridge. In one example, the width is about twice the distance of the height. The increased width to height ratio of ridge 22' provides for a stiffer, smaller ridge to effectively cleanse the tongue. Such ridges are beneficial in that they reduce the size of the head, which is preferred by some users. A shorter, wider ridge also further reduces the prospect of users injuring themselves. Moreover, such ridges can be made of softer materials without losing the desired stability.

[79] In another example (FIG. 19A) ridge 22'' has a rounded distal end. Accordingly, the contact region 29a'' has an arcuate, convex surface to engage the tongue or other soft tissue. In this example, the contact region 29a'' (i.e., the surface adapted to engage the tongue) has a width W3 that is at least as large as the height H3 of the ridge. In this embodiment, the base 28'' of ridge 22'' also has a width W4 that is at least as large as height H to present a stable ridge. Of course, numerous variations may be formed in the shape of the ridge while maintaining the benefits of the invention.

[80] In addition, the ridges may be formed to gain only some of the benefits of the invention. For instance, ridge 22''' can be formed to taper to a narrowed distal end 29''' (Fig. 3b). In this instance, contact region 29a''' has a width W5 that is less than the height H5. However, the base 28''' of ridge 22''' has a width W6 that is at least as large as the height to form a stable ridge construction.

[81] Although the illustrated ridges have all been shown to extend generally perpendicular from surface 17a, they could be inclined relative to surface 17a. A perpendicular extension is preferred to provide effective cleaning regardless of whether the tongue cleaner is pushed or pulled over the tongue. The sides 24, 26 could also be inclined, curved, angular, irregular or otherwise shaped. Additionally, the ridges could project from a non-planar surface. As one example, surface 17a and ridges 22 could have an undulating configuration.

[82] Regardless of the cross-sectional shape of the ridge, each ridge 22 is preferably curved to define a concave side 24 facing toward handle 14 and a convex side 26 facing in the opposite direction. Although ridges that are continuously curved are preferred (Fig. 14), such concave-shaped ridges could be defined by non-continuous ridges (Fig. 15) or angular

ridges (Fig. 16). Further, in one preferred construction, ridges 22 are progressively less curved as they are formed farther from handle 14. In one illustrated construction (Figs. 13 and 14), the ridges are generally concentric to each other curving generally about a common point near the connection of handle 14 to head 12.

[83] In use, the user grips the handle and typically pulls the tongue cleanser repeatedly over the tongue from back to front so that the concave sides 24 are scraped against the tongue to effectively gather and remove bacteria and debris on the tongue. Alternatively, the user may also commonly move the tongue cleanser forward and backward over the tongue. In either event, the different curvatures of the ridges enable aligned segments of the ridges (i.e., along lines generally parallel to longitudinal axis 30) to engage the tongue surface at different angles for effective cleaning of the tongue. Nevertheless, the tongue cleansing ridges can be moved over the tongue in a number of ways to clean the tongue.

[84] Further, other ridge constructions could be used. For example, the oral care implement could include ridges 22a that are reversed so that the concave sides face away from the handle (e.g., Fig. 20), ridges 22b, 22g, 22i, 22j, 22s with different curved shapes (e.g., Figs. 21, 26-28 and 36), ridges 22c, 22d, 22k and 22r that are linear (e.g., Figs. 22, 23, 29 and 35), ridges 22e, 22l, 22m, 22n and 22o that include a mixture of curved and linear ridges (e.g., Figs. 24 and 31-33), or one continuous ridge member 22f, 22g forming successive ridges 22f', 22g' (e.g., Figs. 25 and 26). The ridges could be non-concentric or curved at all the same radius of curvature. While the ridges preferably extend substantially across the entire side 17 of head 12, they could extend only part way across the head. For example, ridges 22p, 22r, 22t, 22v could be provided only along the sides of surface 17a (Figs. 34-35 and 37-38). Ridges along the sides of head 12 could also be used with central ridges; i.e., side ridges 22p, 22t, 22v could be used with a central ridge(s) such as an oval or partially oval ridge 22q, 22u, 22w (Figs. 34, 37 and 38), any of the ridge patterns illustrated in Figures 14-16 and 20-33, or another ridge pattern. Any of the ridges could also be used with various projections, e.g., conical projections 31 (see, e.g., Figs. 32 and 34-38). Regardless of whether the ridge 22 each form a continuous segment across the head (e.g., Fig. 14) or is defined by aligned ridge sections 22h separated by gaps 23 (e.g., Fig. 15), they are in this application each considered a ridge. Also, regardless of whether successive ridges 22 are separated (e.g., Fig. 14) or interconnected to define a single ridge member 22f (e.g., Fig. 25), the successive sections extending laterally across the head are each considered to be

a ridge. Concepts of this invention can be used in connection with ridges having virtually any shape or orientation along surface 17a.

[85] As shown in Figures 13 and 17, head 12, handle 14 and ridges 22 can be molded together as a one-piece member of the same material, for example, polypropylene. Nonetheless, other arrangements are possible. For example, head 12 could be detachable from handle 14. Further, ridges 22 could be separately molded, glued or otherwise attached to side 17 of head 12. The ridges as well as the head and the handle could each be made from a material different from the other parts. Soft materials, such as TPE or the like, can be fixed to head 12 to form the ridges (see, e.g., Figs. 34-38). The ridges could be made of virtually any known material used to make oral care implements.

[86] Figures 39-48C show additional embodiments of the invention that further illustrate the combinability of various aspects, features and functions disclosed herein into single oral care implement configurations. Figures 39-48C disclose oral care implement configurations that provide tongue cleanser functionality and include handle gripping features. As such, the oral care implements of Figures 39-48C generally include the aspects discussed along with Figures 6-38 pertaining to soft tissue cleansers (e.g., tongue cleansers). Further, it is understood that other features may be used along with these configurations.

[87] As an example of potential embodiments based on combinations of features disclosed herein, the mechanical drive features discussed along with Figure 1-5 and/or tooth cleansing features discussed throughout the specification may be combined with the soft tissue cleansers of Figures 39-48C. Thus, as illustrated in Figures 48A-C, embodiments of the invention include any one of heads 9014, 9214, 9414, 9614 and 9514 discussed hereafter in combination with handle 1 and neck part 4 shown in Figures 1-4 instead of bristle-carrying head part 3 shown in Figures 1-5. These embodiments provide powered oral care implement configurations that can provide enhanced cleansing benefits. For example, such combination devices can provide the functions of two devices in a single device. Further, these devices can simultaneously provide dual cleaning functionality. For instance, toothbrush features may be used to clean a user's teeth while the soft tissue cleanser features simultaneously clean soft tissues, such as the inside of a user's cheeks.

[88] Figures 39 and 40 disclose an oral care implement 9010 including a soft tissue cleanser for removing microbial and other debris from the soft tissue of a user's mouth, such as the user's tongue and inside of their cheeks and lips. As shown, implement 9010 generally

includes a handle 8103 attached to a head 9014. The head and handle may be molded together as a one-piece member of the same material, for example, polypropylene or another thermoplastic elastomer. In addition, the head may be detachable from the handle.

[89] In general, head 9014 includes a plurality of tissue engaging elements 9012 disposed about a central portion 9016 of the head. Elements 9012 include projections in the form of ridges 9018 and nubs 9020, which extend from the head to engage the soft tissue in a user's mouth. The ridges and nubs may be separately molded, glued or otherwise attached to head 9014. In addition, they may be integrally formed therewith. The ridges and nubs could each be made from a material different from each other and/or different from other parts. Soft materials, such as TPE or the like, can be fixed to head 9014 to form the ridges. However, a harder material or virtually any known material used to make oral care implements may be appropriate for the ridges and nubs. Ridges 9018 and nubs 9020 could have a variety of shapes, patterns, cross-sections, configurations, etc., as discussed along with Figures 6-38.

[90] Central portion 9016 is shown as a generally elliptically-shaped region on a face of head 9014 about which cleaning elements 9012 are disposed that has a bottom surface 9017 generally disposed below the tips of the ridges and nubs. It is understood, however, that the central portion may have a variety of shapes, sizes and depths. In the configuration shown, central portion 9016 is a relatively shallow depression that extends into the head about 10% to about 30% of the thickness of the head. In another configuration, the central portion may be shallow and may not extend into the head. For instance, the central portion may be formed by a surface 9017 of the head upon which the cleaning elements are disposed along with a ring of cleaning elements 9012 bounding the central portion. In such a configuration, the central portion would be a depressed region with respect to the protruding cleaning elements disposed about it, but would not otherwise extend into the head. In other configurations, the central portion may be depressed into the head about 0 to 10% of its thickness, or it may be depressed about 30% to 50% or more of its thickness.

[91] As shown, surface 9017 may be continuous to provide a non-interrupted boundary for the central portion 9016 and it may be relatively smooth. In alternate configurations, surface 9017 may include interrupting or undulating features, such as one or more notches, contour features, or features to permit partial flow of materials therethrough, such as a mesh or screen. In addition, surface 9017 may include irregular features, such as cleaning elements, projections, etc.

[92] Central portion 9016 and the ring of protruding cleaning elements 9012 cooperate to translate a downward force applied by the user into a concentrated force at the cleaning elements. Thus, the cleaning elements penetrate more deeply into the user's soft tissue than would be provided by a relatively uniform contact surface or a uniform field of cleaning elements. This permits ridges 9018 and nubs 9020 to more effectively penetrate the soft tissues. In an alternative construction in which the head includes toothbrush features on an opposite side thereof (see Figures 48B and 48C), the ring of protruding cleaning elements configuration can effectively engage soft tissues in the inside of a user's cheeks and lips without the user applying significant force in the direction of the ring, as may be the case when the user cleans their teeth via the toothbrush features. As further shown, central portion 9016 includes a bottom surface 9017 for contacting soft tissue during use. The bottom surface can act as a guide to limit the penetration depth of the nubs and ridges when excessive downward force is applied by the user. In addition, it can provide a collector for micro debris scraped during use of the oral care implement.

[93] A variety of ridges, nubs, or other cleaning element configurations may be used. In the configuration shown for oral care implement 9010, ridges 9018 are generally oriented away from a center of central portion 9012 in a radial manner. Central portion 9016 is elliptically shaped and is aligned with a longitudinal axis of handle 8103. As such, ridges 9018 are oriented generally perpendicular to the longitudinal axis of the handle, which provide blades oriented transverse to the scraping direction for most users. When a user scrapes the oral care implement 9010 forward and backward in a direction substantially parallel to the longitudinal axis of handle 8103, ridges 9018 act as small blades to scrape micro debris from the soft tissue. As also shown in Figures 39 and 41, the ridges may be angled upward toward engagement with soft tissue during use. Thus, inner portions 9022 of ridges 9018 engage soft tissue when the user applies a light downward pressure, and the ridges more fully engage the soft tissue when additional pressure is applied. As such, variable cleaning and scraping functionality is provided as desired by the user via their selection of a downward force.

[94] As further shown in Figures 39 and 40, nubs 9020 are provided along a portion of central portion 9016 disposed between handle 8103 and a distal end of head 9014. Nubs provide concentrated penetration into the user's soft tissue during use. In addition, in their location along central portion 9016 as shown in Figure 40, they can encourage dislodged micro debris into central portion 9016 to be captured therein and removed by the user. It is

understood that various nub configurations, positions and orientations, as well as ridge and central portion configurations, positions and orientations, can provide various advantages and functionality.

[95] Figures 41 and 42 illustrate another possible configuration of cleaning elements in an example oral care implement 9210. Oral care implement 9210 generally includes the same aspects and features of oral care implement 9010, except that it additionally includes a narrow protrusion 9224 erected around the perimeter of central portion 9216. The narrow protrusion may be a semi-flexible, "blade-like" structure that assists with scraping a user's tongue or other soft tissue. In alternative constructions, it may be a rigid structure or relatively flexible structure. Narrow protrusion 9224 may be made from a flexible or semi-flexible, thermoplastic elastomer, a hard plastic structure or another rigid material, such as metal. As shown in Figures 42 and 43, blade-like protrusion 9224 may be continuous structure disposed about the central portion. In other configurations, it may be a partial structure, such as an arc. It may also exist apart from or without the central portion, and it may include a truncated shape or shapes. The blade-like protrusion provides an effective blade for scraping micro debris from a user's soft tissue. In a continuous configuration, it may further encourage micro debris scraped from the user's soft tissue to be retained within central portion 9216.

[96] Figures 43 and 44 illustrate another possible configuration of cleaning elements in an example oral care implement 9410. Oral care implement 9410 generally includes the same aspects and features of oral care implement 9210, except that cleaning elements 9412 only include nubs 9420 disposed about central portion 9416. The nubs provide concentrated penetration into the user's soft tissue, which can act to dislodge micro debris and thereby assist blade-like protrusion 9416 with scraping micro debris from the user's soft tissue.

[97] Figures 45 and 46 illustrate another possible configuration of cleaning elements in an example oral care implement 9610. Oral care implement 9610 generally includes the same aspects and features of oral care implement 9010, except with respect to cleaning elements 9612 and blade-like structure 9624. As shown, cleaning elements 9612 include a combination of blades 9618 extending substantially radially from the center of central portion 9616, as well as blades 9630 oriented substantially perpendicular to blades 9618. The mixture of blades in alternating orientations can improve scraping effectiveness of the oral care implement. In addition, blade-like structure 9624 includes notches 9632 spaced about its blade, which can further improve the scraping effectiveness of the oral care implement.

[98] Figure 47 illustrates a further possible configuration of an oral care implement. Oral care implement 9510 generally includes the same aspects and features of oral care implement 9210, except with respect to cleaning elements 9512 and blade-like structure 9524. As shown, cleaning elements 9512 include short blades 9534 interposed between pairs of longer blades 9518, which can further improve the scraping effectiveness of the blades. In addition, blade-like structure 9524 is truncated such that it only extends around a distal portion of central portion 9516, which can encourage dislodged micro debris to be retained within central portion 9516 when the oral care implement 9510 is scraped across soft tissue while being withdrawn from the user's mouth. Oral care implement 9510 further includes tooth cleaning elements 9536 extending from an opposite side of the head from cleaning elements 9512. Thus, a user can use the single oral care implement 9510 to effectively clean their teeth and to scrape their tongue, for which the handling of the implement is improved via gripping features of handle 8103. In addition, the user can simultaneously clean their teeth via cleaning elements 9536 and engage the inside of their cheeks and lips via 9512.

[99] Figures 48A-C show an oral cleaning implement 9810 that includes a dual function head 4900 or 9514, and a powered handle 1. The handle is generally the same as powered handle 1 discussed along with Figures 1-5, which may be used to move or vibrate tooth cleaning features of the head, and/or soft tissue cleanser features of the head. Although the head is shown as either head 4900 or head 9514, the head may include any one of heads 9014, 9214, 9414, 9614 and 9514 or other dual function heads. As discussed above, these embodiments can provide enhanced cleansing benefits by simultaneously engaging proximate oral surfaces, such as cleaning a user's teeth, and cleaning or stimulating the inside of their cheeks and lips. Moreover, such combination devices can provide the functions of two devices in a single device.

[100] As various changes could be made in the above methods, compositions and structures without departing from the scope of the invention, it is intended that all matter contained in this application, including all mechanisms and/or modes of interaction described above, shall be interpreted as illustrative only and not limiting in any way the scope of the appended claims. Further, as noted above, it is intended that oral care implements according to the invention and associated methods may utilize various combinations of aspects, features and configurations discussed within the application.



What is claimed is:

1. An oral care implement comprising:  
a handle;  
a head having a first face; and  
a soft tissue cleanser disposed on the first face of the head for cleansing soft tissue in a user's mouth, the soft tissue cleanser comprising a ring of projections protruding outwardly from the first face for dislodging microbial and other debris from the soft tissue.
2. The oral care implement of claim 1, wherein the soft tissue cleanser further comprises a central portion on the first face substantially bordered by the ring of projections and by a surface on the first face, the projections of the ring of projections extending from the first face further than the surface of the central portion.
3. The oral care implement of claim 1, wherein the ring of projections comprise ridges and nubs.
4. The oral care implement of claim 3, wherein the ridges include first ridges laterally oriented to generally radiate from a center of the central portion.
5. The oral care implement of claim 3, wherein the ridges include second ridges laterally oriented to be generally aligned with the ring.
6. The oral care implement of claim 3, wherein the ridges each include a top edge angled away from the first face to provide increasing engagement with the soft tissues as the first face is pressed into the soft tissues.
7. The oral care implement of claim 1, wherein the ring of projections is substantially elliptically shaped.
8. The oral care implement of claim 2, wherein the soft tissue cleanser further comprises an elongate ridge projecting from the first face in generally the same direction as the projections of the ring of projections, the elongate ridge disposed between the ring of projections and the central portion.
9. The oral care implement of claim 8, wherein the elongate ridge forms a substantially continuous boundary around the central portion.
10. The oral care implement of claim 8, wherein the elongate ridge forms a boundary around a distal portion of the central portion opposite the handle and proximate a tip portion of the oral care implement.
11. The oral care implement of claim 1, further comprising tooth cleansing elements extending from a second face of the head for cleaning a user's teeth.

12. The oral care implement of claim 11, wherein the tooth cleansing elements extend in a direction substantially opposite the direction in which the ring of projections protrude outwardly from the first face to permit simultaneous engagement of a user's teeth via the tooth cleansing elements along with engagement of soft tissues opposed to the teeth via the soft tissue cleanser.

13. The oral care implement of claim 11, further comprising a drive mechanism for moving at least one of the tooth cleansing elements and projections of the ring of projections.

14. The oral care implement of claim 13, wherein the drive mechanism includes a mechanical vibratory device.

15. The oral care implement of claim 13, wherein the drive mechanism simultaneously moves both the tooth cleansing elements and projections of the ring of projections.

16. The oral care implement of claim 2, wherein the central portion includes a depression within the head on the first face.

17. An oral care implement comprising:

a head having a first face;

a soft tissue cleanser for cleansing soft tissue in a user's mouth disposed on the first face of the head, the soft tissue cleanser comprising first elongate ridge projecting from the first face for dislodging microbial and other debris from the soft tissue; and

a handle comprising a base with a gripping region and a second elongate ridge protruding from the base in the gripping region, the second elongate ridge being formed as an extension of the first elongate ridge.

18. The oral care implement of claim 17, wherein the soft tissue cleanser further comprises a central portion on the first face substantially bordered by the elongate ridge and by a surface of the first face, the central portion having a depth at least partially formed by the height of the elongate ridge.

19. The oral care implement of claim 17, wherein the first and second elongate ridges includes a substantially continuous top edge.

20. The oral care implement of claim 17, wherein the first elongate ridge includes a top edge having notches formed therein.

21. The oral care implement of claim 17, wherein the first and second elongate ridges are formed from the same material.

22. The oral care implement of claim 17, wherein the first and second elongate ridges are formed from a thermoplastic elastomer.

23. The oral care implement of claim 17, further comprising projections extending from the first face in substantially the same direction as the first elongate ridge.

24. The oral care implement of claim 23, wherein the projections include nubs and ridges.

25. An oral care implement comprising:  
a handle;  
a head having a first face and an opposite second face;  
a soft tissue cleanser for cleansing soft tissue in a user's mouth disposed on the first face of the head, the soft tissue cleanser comprising:

a ring of projections protruding outward from the first face for dislodging microbial and other debris from the soft tissue, the ring of projections comprising nubs and ridges;

an elongate ridge projecting outward from the first face for dislodging microbial and other debris from the soft tissue, the elongate ridge disposed within the ring of projections; and

a central portion on the first face substantially bordered by the elongate ridge and by a surface of the first face, the central portion having a depth formed by the elongate ridge extending further from the first face than the surface; and

tooth cleansing elements extending from the second face in a direction substantially opposite the elongate ridge and the ring of projections.

26. An oral care implement comprising:  
a handle;  
a head having a face and a central axis generally aligned with the handle and traversing a central portion of the face; and  
a soft tissue cleanser disposed on the first face of the head for cleansing soft tissue in a user's mouth, the soft tissue cleanser comprising soft tissue cleanser elements disposed generally symmetrically about the central axis.

27. The oral care implement of claim 26, wherein the soft tissue cleanser elements include a ring of projections protruding outwardly from the face.

28. The oral care implement of claim 27, wherein the ring generally forms an ellipse.

29. The oral care implement of claim 26, wherein the soft tissue cleansing elements include nubs and ridges projecting from the first face.

30. The oral care implement of claim 26, further comprising tooth cleansing elements extending from a second face of the head for cleaning a user's teeth.

31. The oral care implement of claim 30, wherein the tooth cleansing elements extend in a direction substantially opposite the direction in which the soft tissue cleanser elements are oriented outwardly from the first face to permit simultaneous engagement of a user's teeth via the tooth cleansing elements along with engagement of soft tissues opposed to the teeth via the soft tissue cleanser.

32. An oral care implement comprising:

a handle having a grip feature;

a head having a first face; and

a soft tissue cleanser disposed on the first face of the head for cleansing soft tissue in a user's mouth, the soft tissue cleanser having a cleansing element that is similar in character to the grip feature of the handle.

33. The oral care implement of claim 32, wherein the grip feature includes a thumb grip having first projection thereon and the cleansing element includes a second projection similar in character to the first projection.

34. The oral care implement of claim 33, wherein the first and second projections each include a nub.

35. An oral care implement comprising:

a handle;

a head having a first face;

a soft tissue cleanser disposed on the first face of the head for cleansing soft tissue in a user's mouth, the soft tissue cleanser comprising:

a first group of soft tissue cleanser elements disposed on the first face;

a second group of soft tissue cleanser elements disposed on the first face, the second group being spaced apart from the first group; and

a void between the first group and the second group on the first face, the void lacking soft tissue cleanser elements.

36. The oral care implement of claim 35, wherein the soft tissue cleansing elements of the first and the second groups are arranged generally seriatim.

37. The oral care implement of claim 36, wherein the first and the second groups combine to generally form a ring of projections.

38. The oral care implement of claim 37, wherein the ring of projections is substantially elliptically shaped.

39. The oral care implement of claim 35, wherein the soft tissue cleanser elements comprise nubs.

40. The oral care implement of claim 35, wherein the soft tissue cleanser elements comprise ridges.

41. The oral care implement of claim 35, wherein the soft tissue cleanser further comprises an elongate ridge projecting from the first face in generally the same direction as the soft tissue cleanser element.

42. The oral care implement of claim 41, wherein the elongate ridge forms a substantially continuous boundary around the void.

43. The oral care implement of claim 35, further comprising tooth cleansing elements extending from a second face of the head for cleaning a user's teeth.

44. The oral care implement of claim 43, wherein the tooth cleansing elements extend in a direction substantially opposite the direction in which the soft tissue cleanser elements are oriented outwardly from the first face to permit simultaneous engagement of a user's teeth via the tooth cleansing elements along with engagement of soft tissues opposed to the teeth via the soft tissue cleanser.

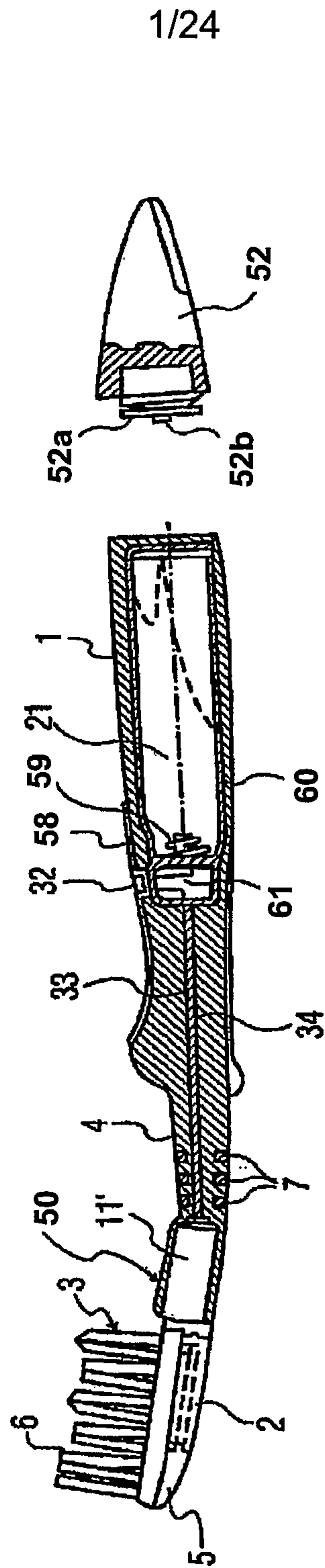


FIG. 1

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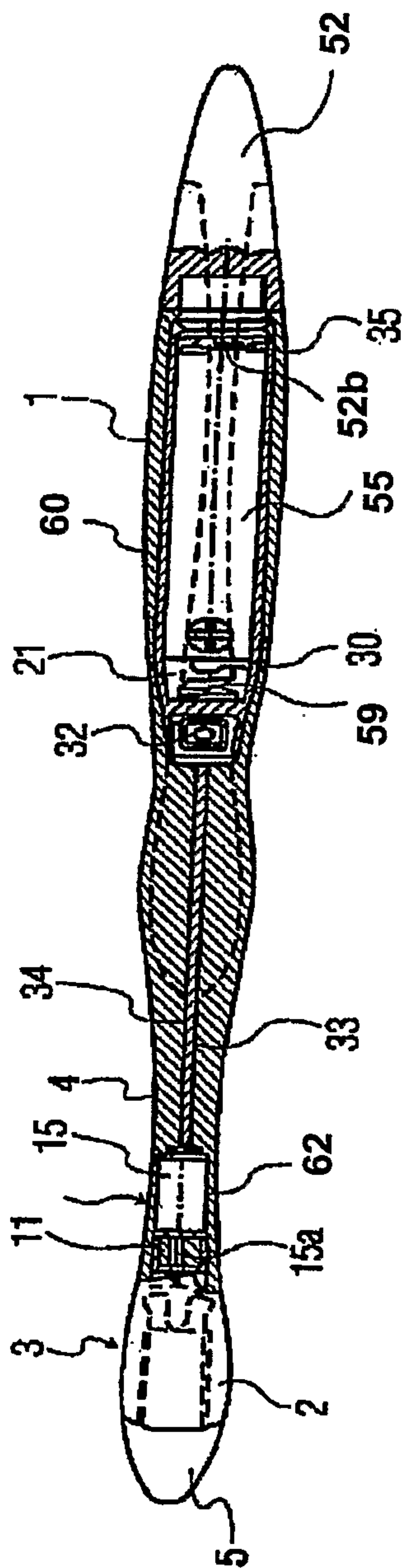


FIG. 2

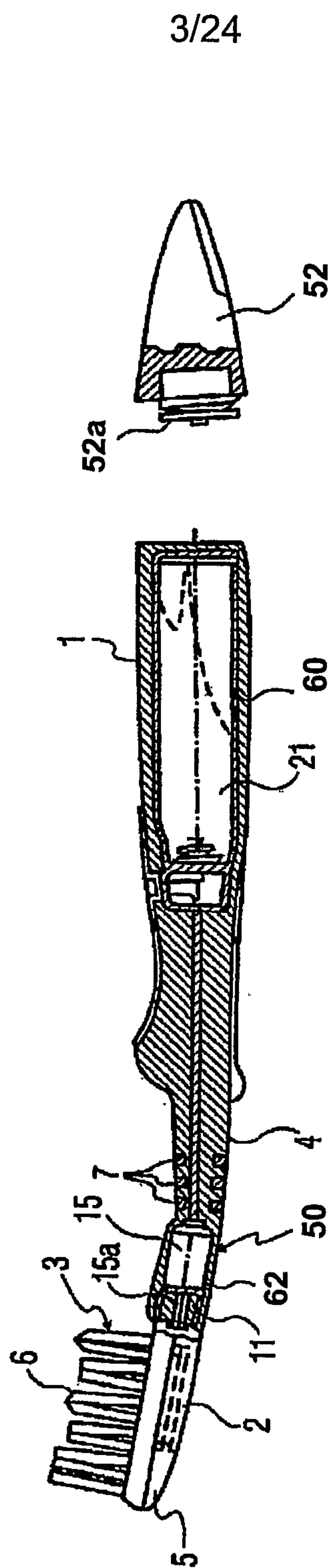


FIG. 3



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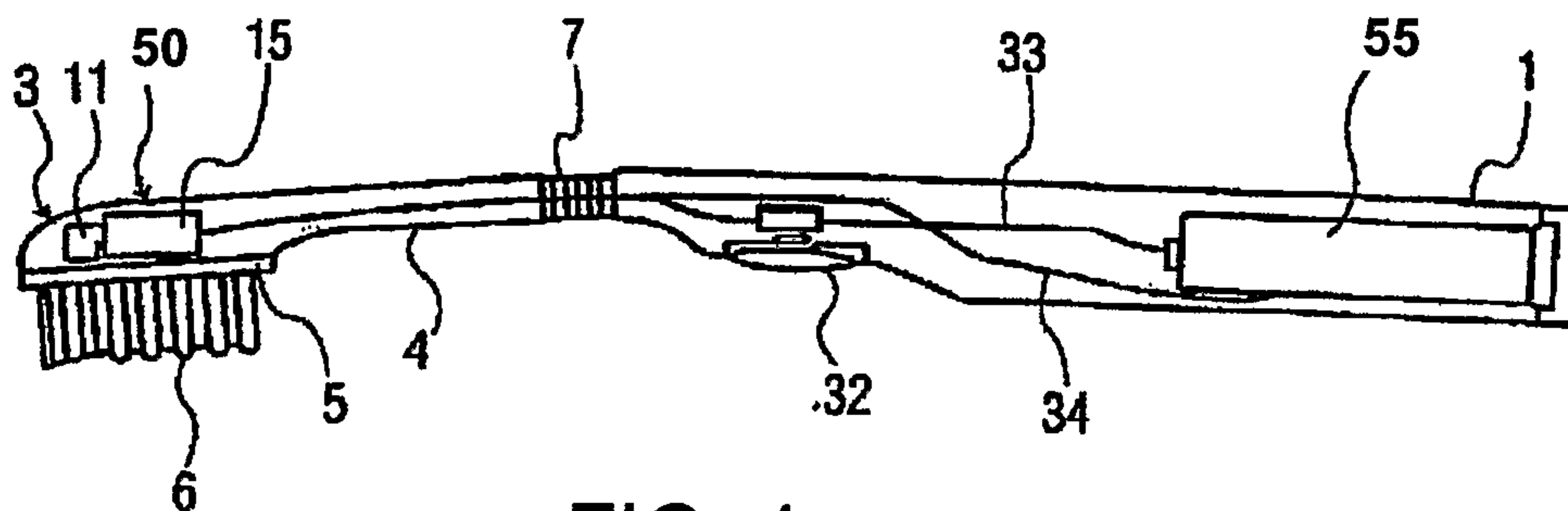


FIG. 4

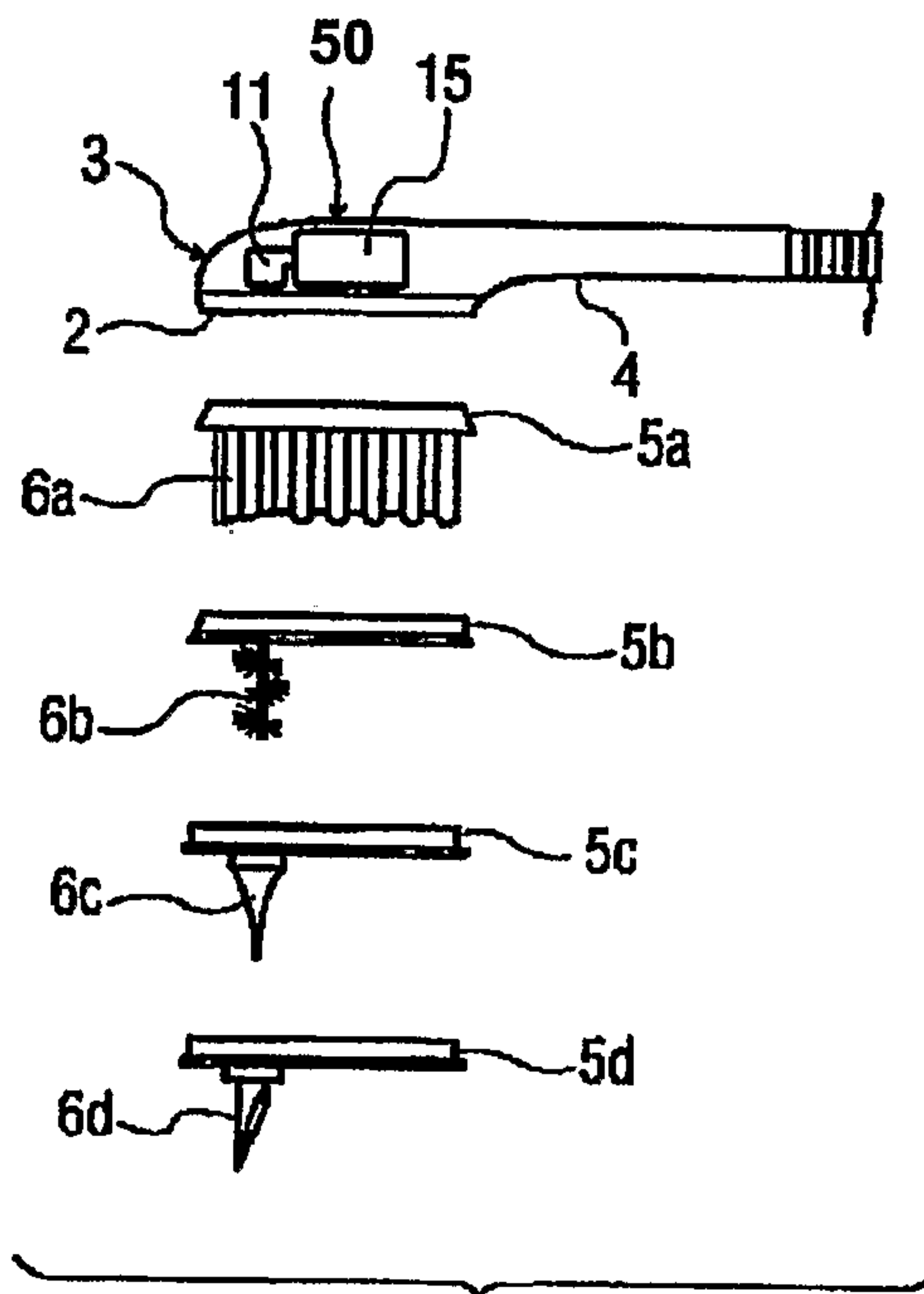


FIG. 5

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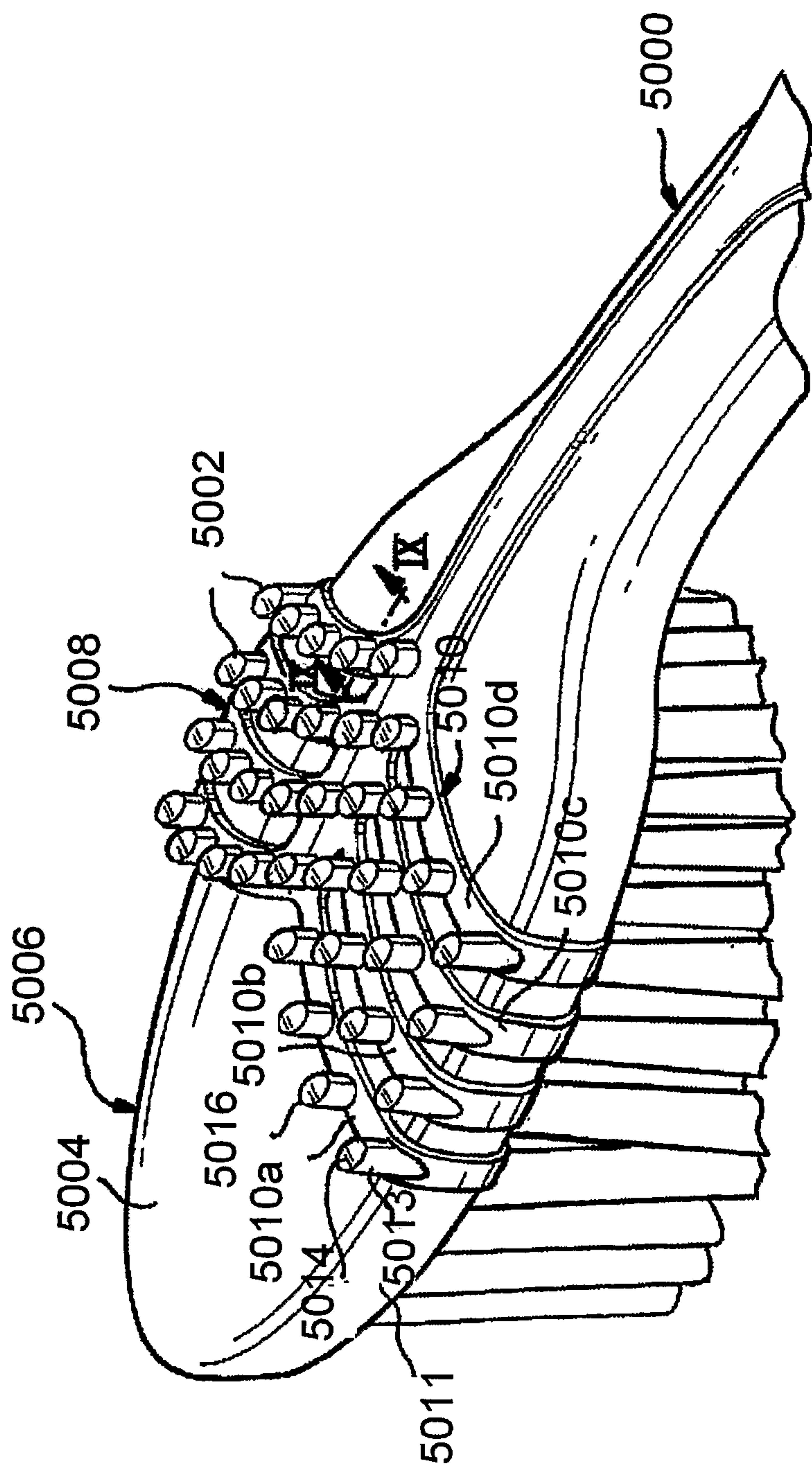


FIG. 6

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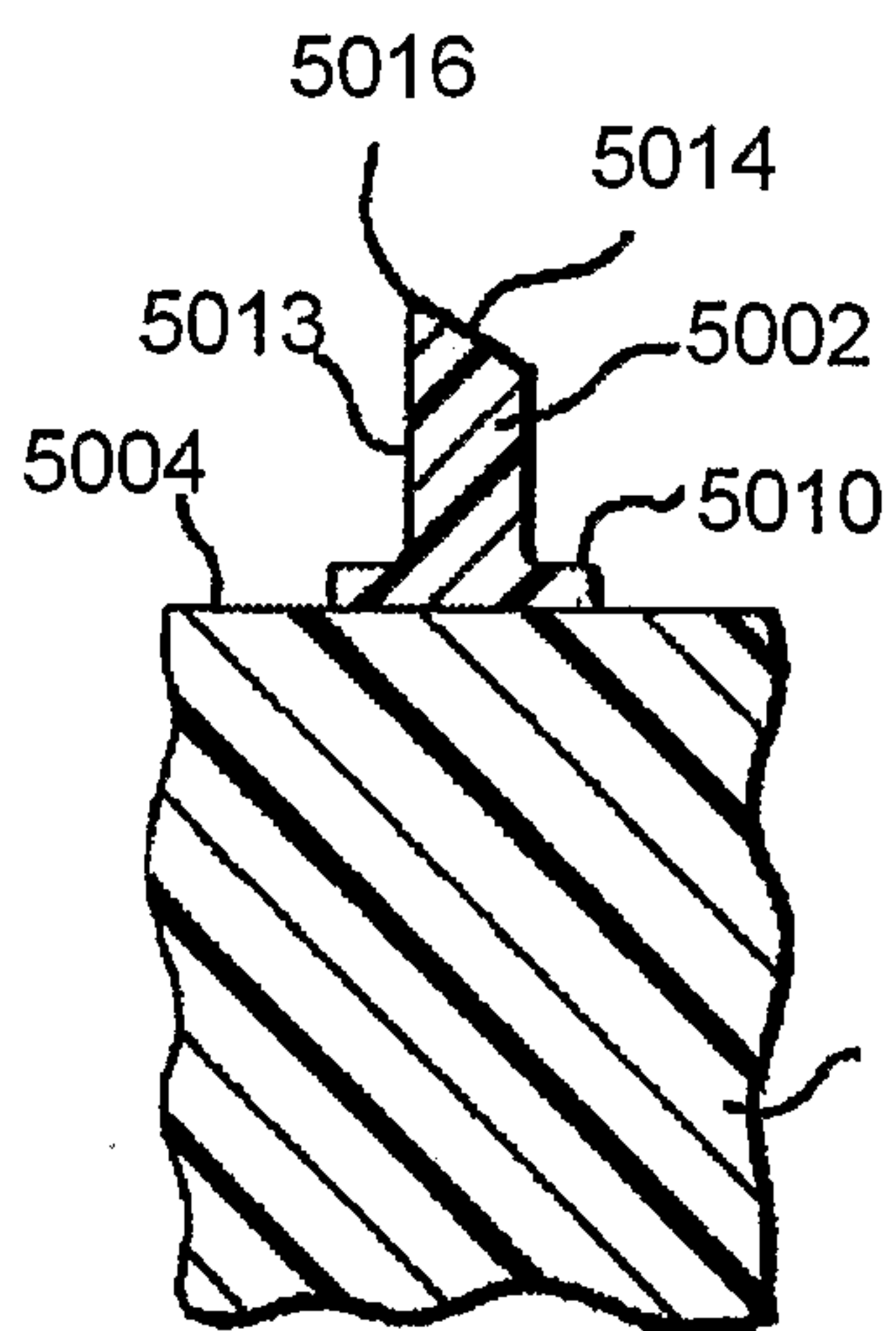


FIG. 7

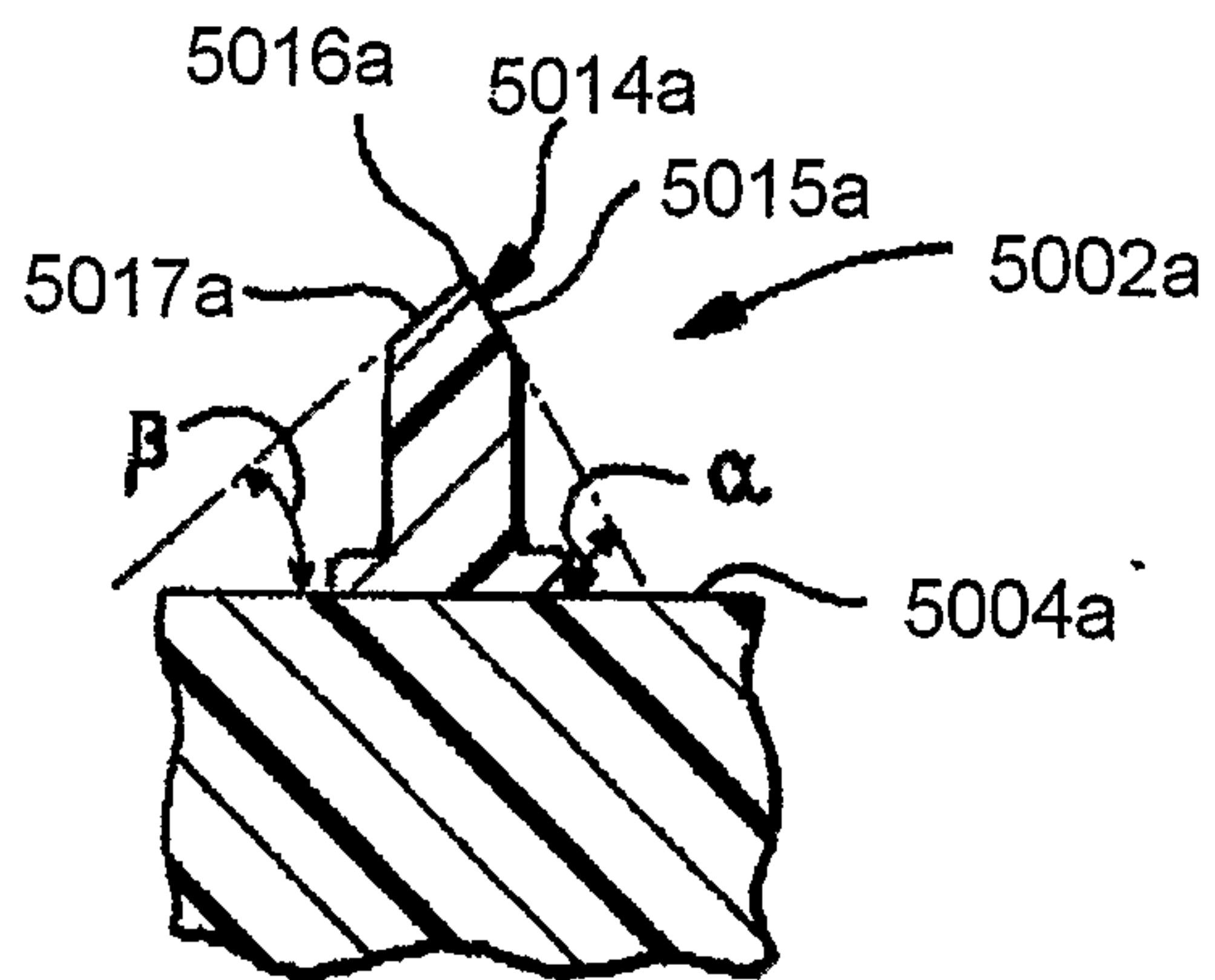


FIG. 8

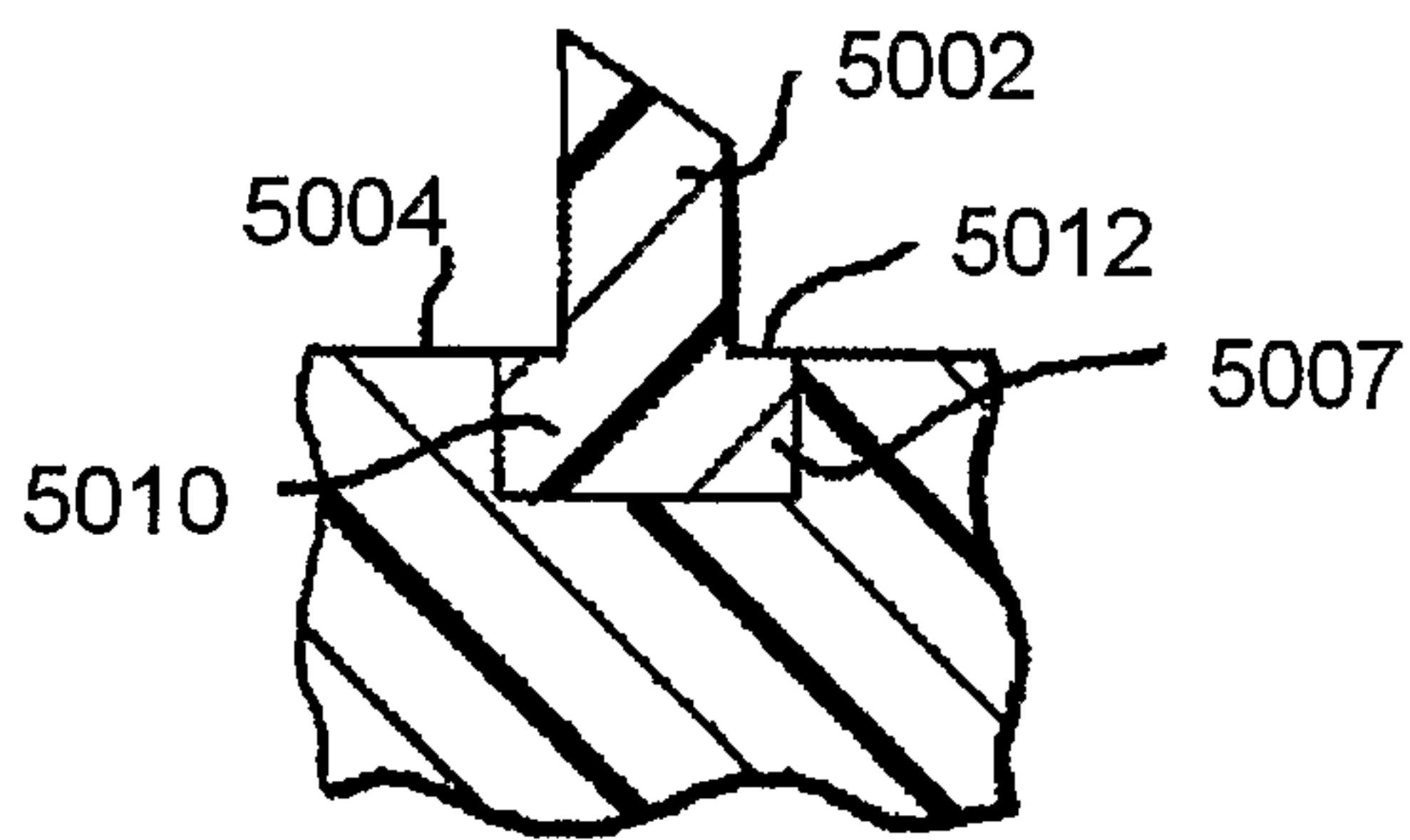


FIG. 9

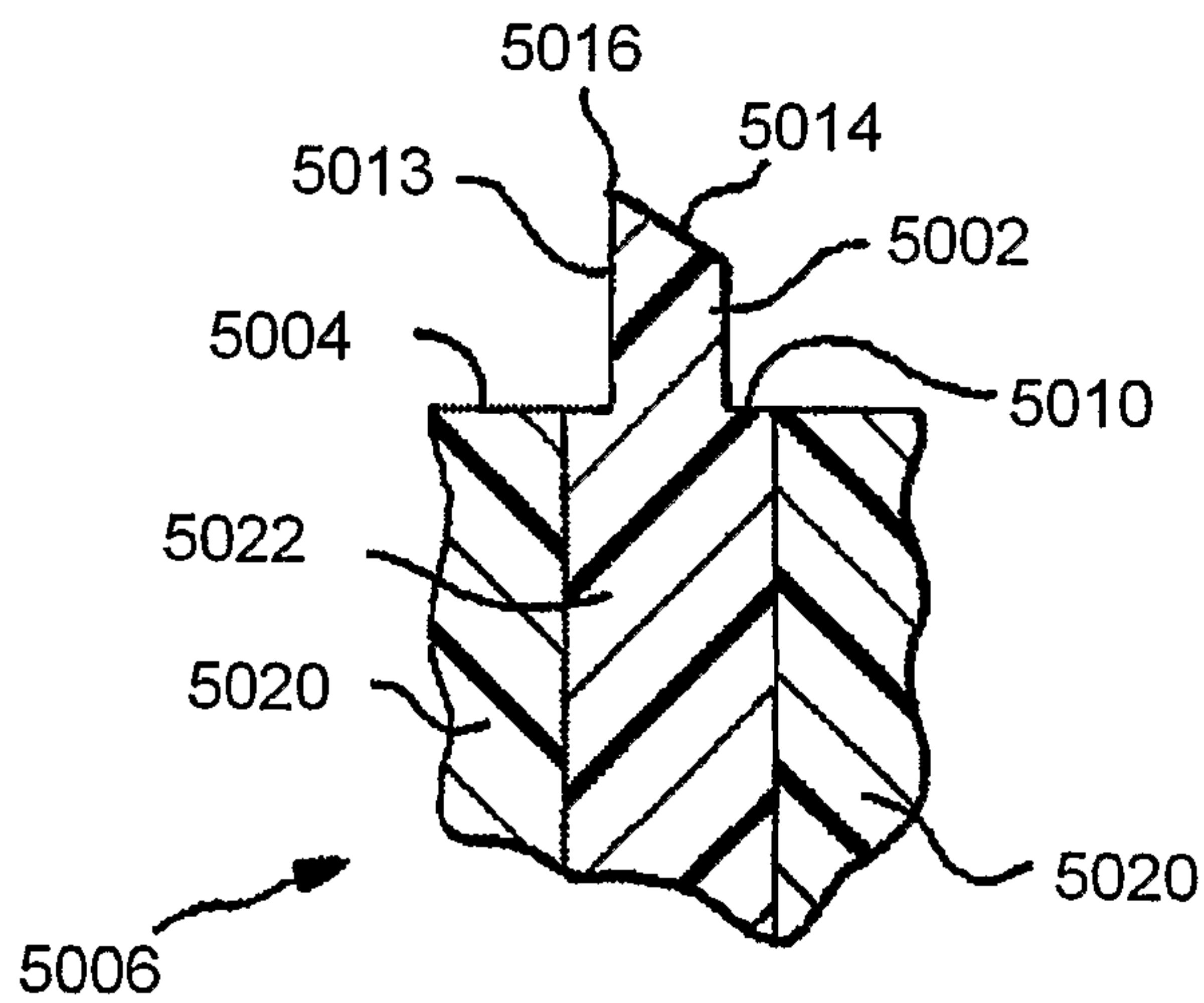


FIG. 10

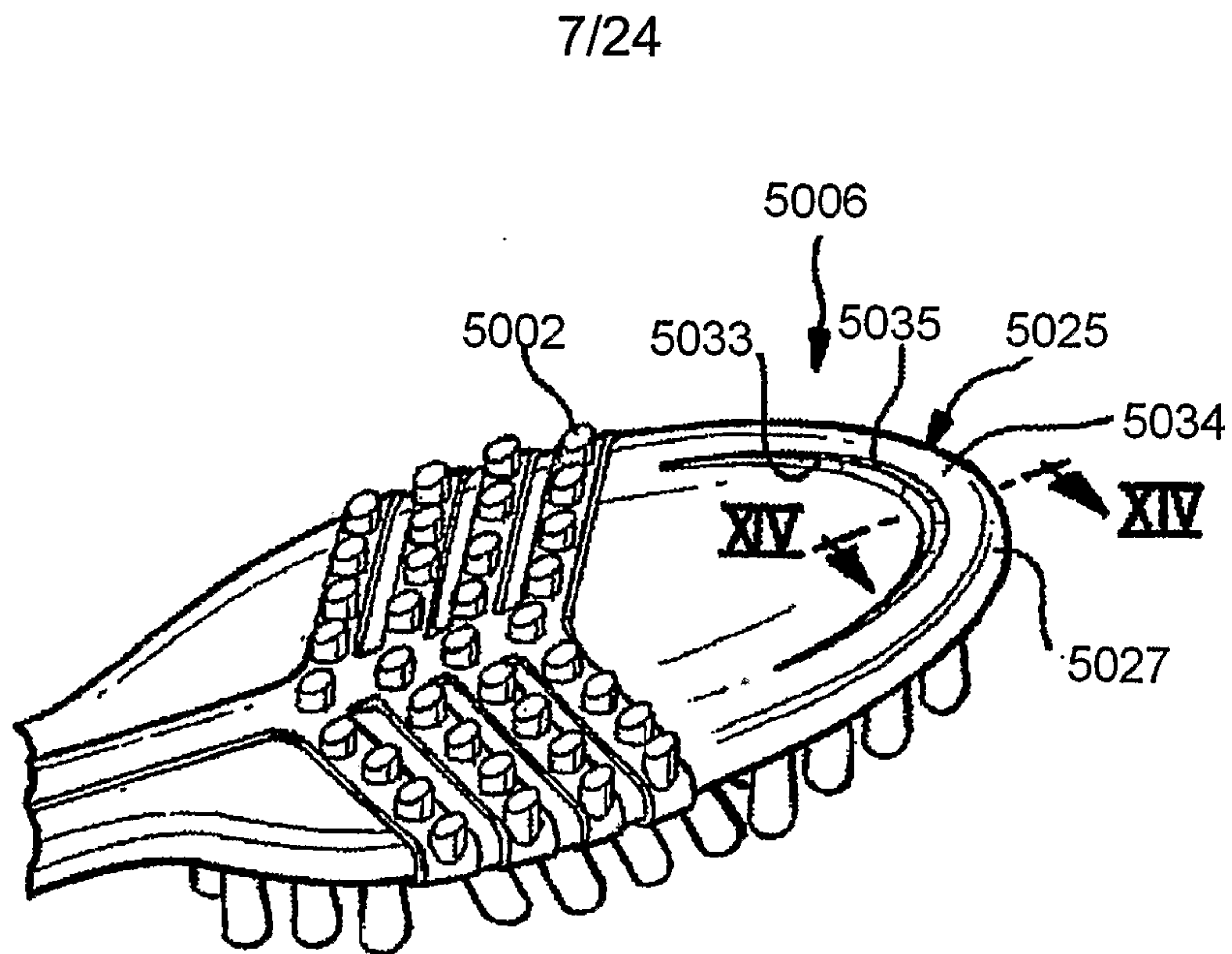


FIG. 11

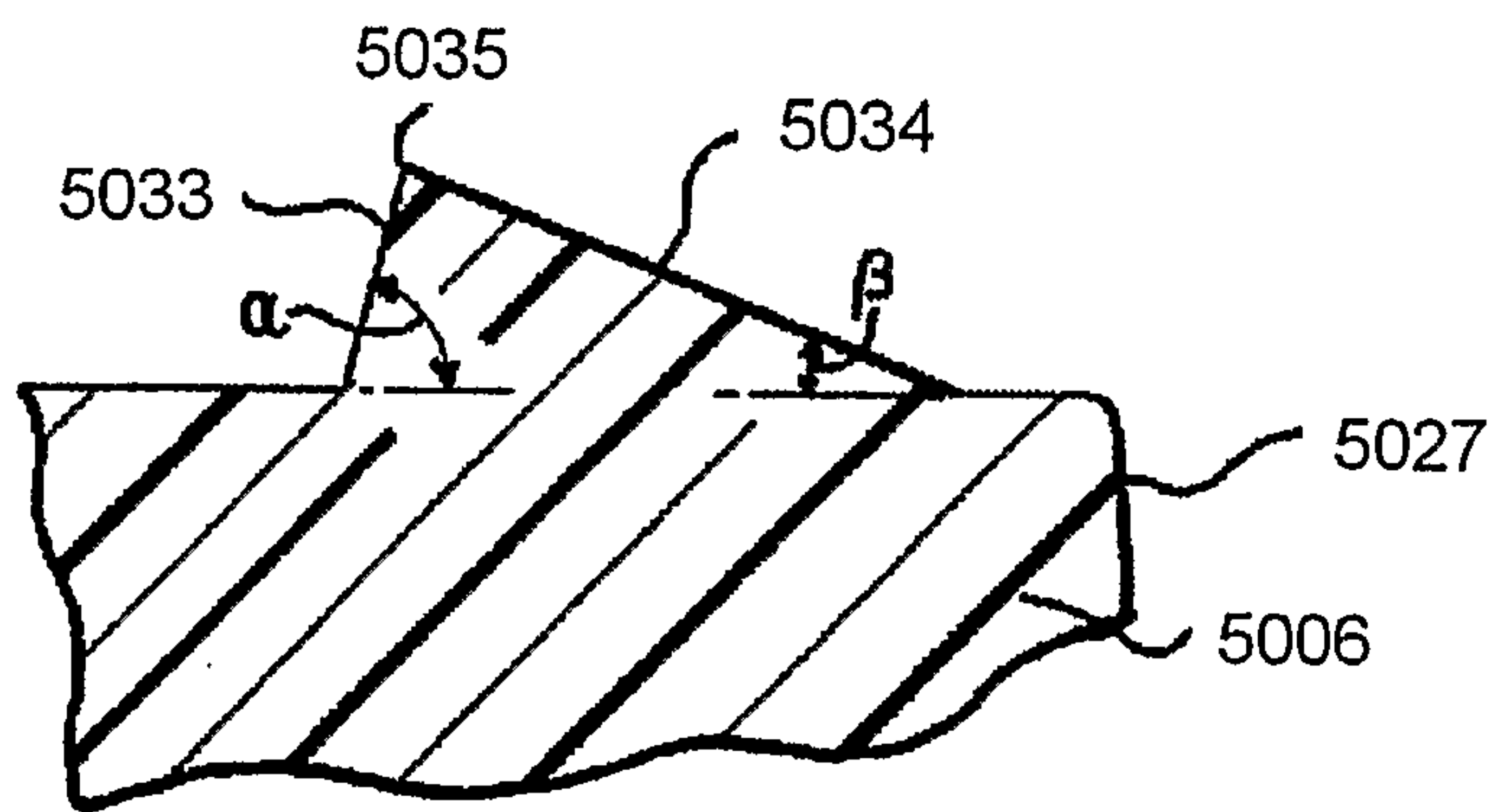


FIG. 12

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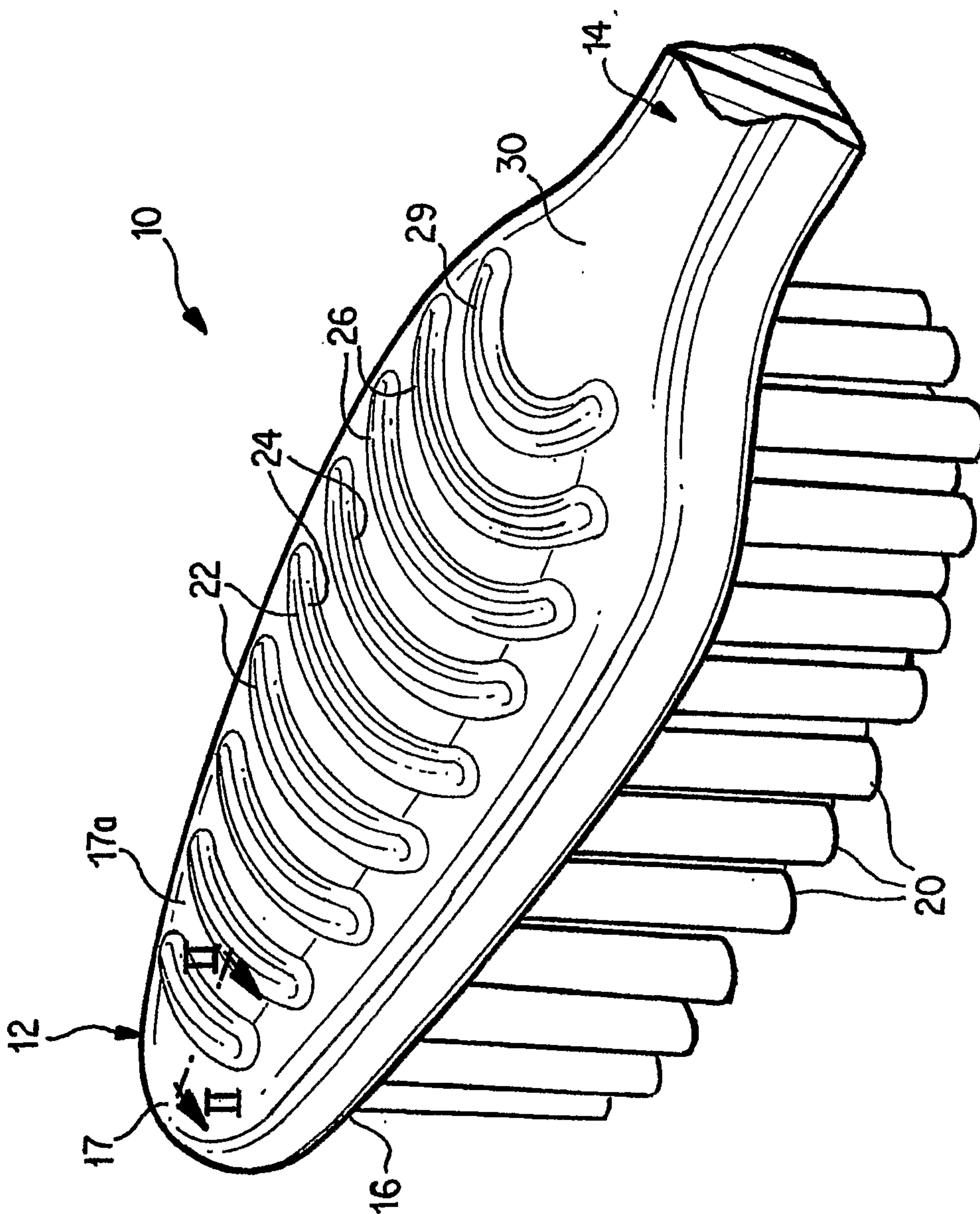


FIG. 13

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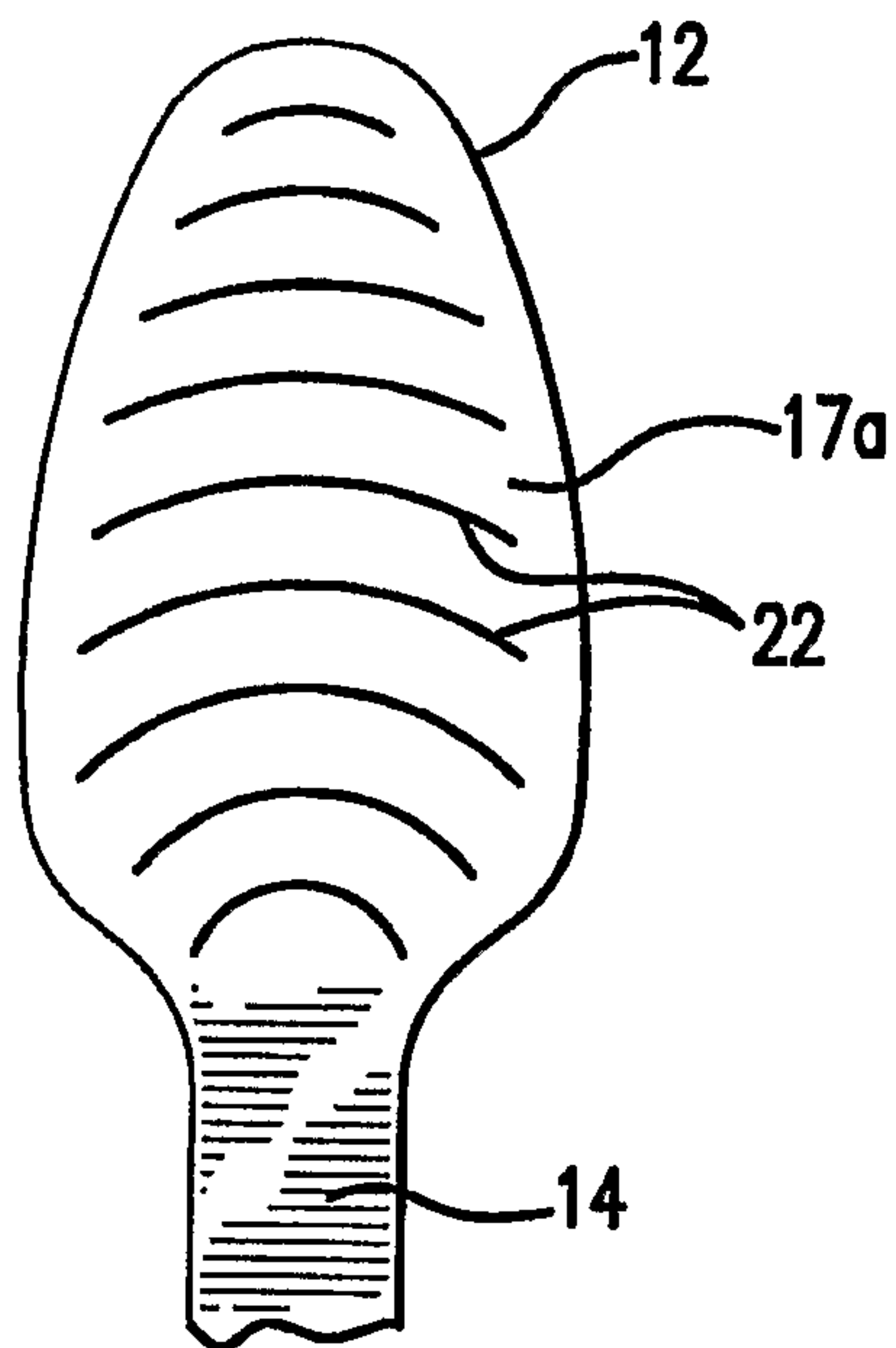


FIG. 14

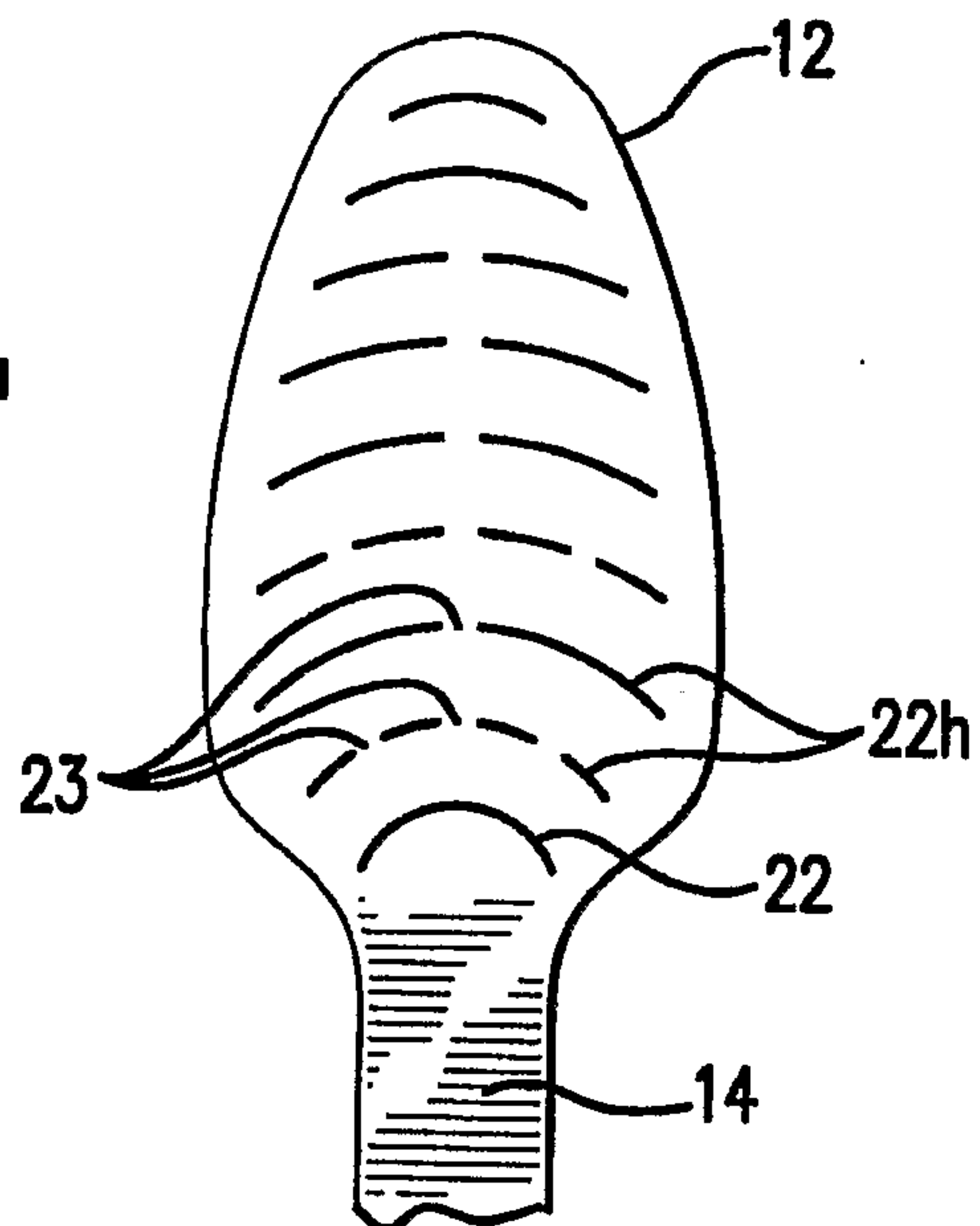


FIG. 15

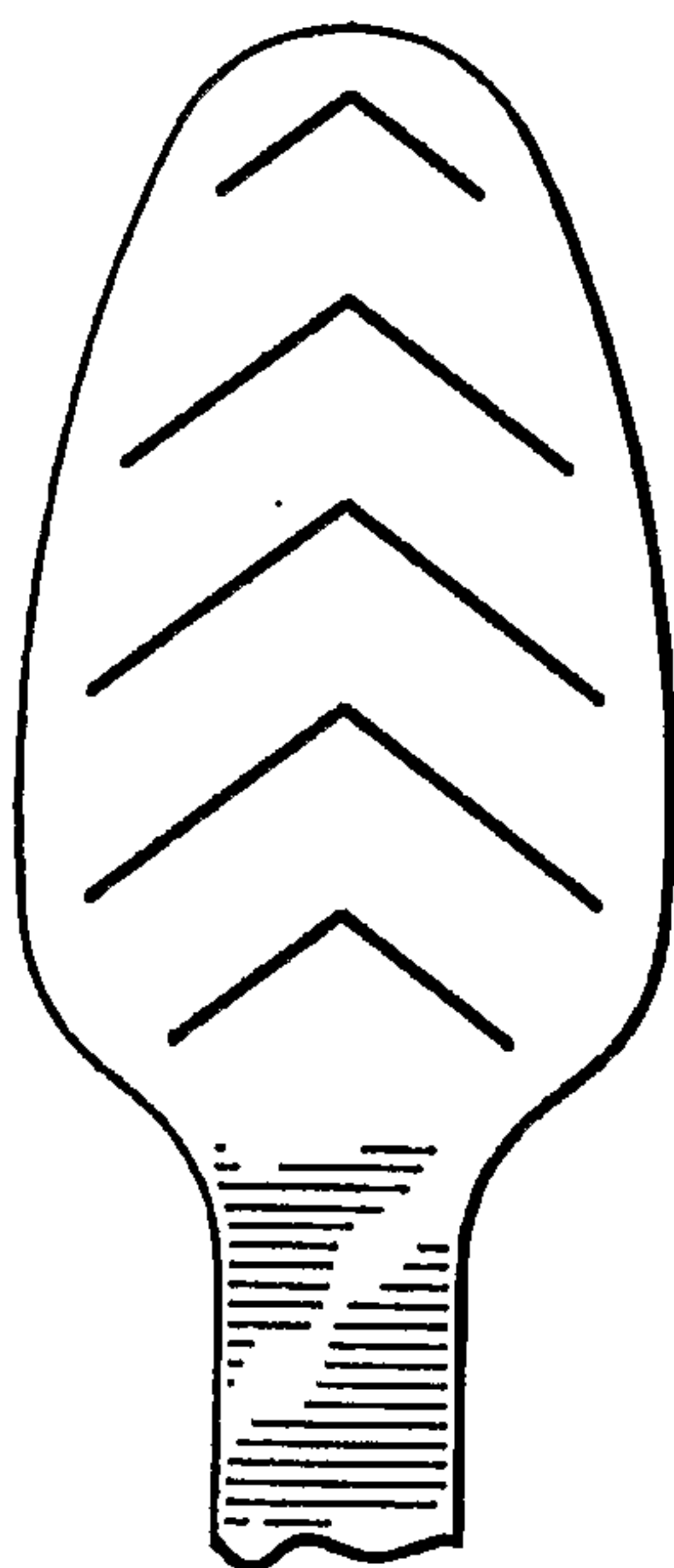


FIG. 16

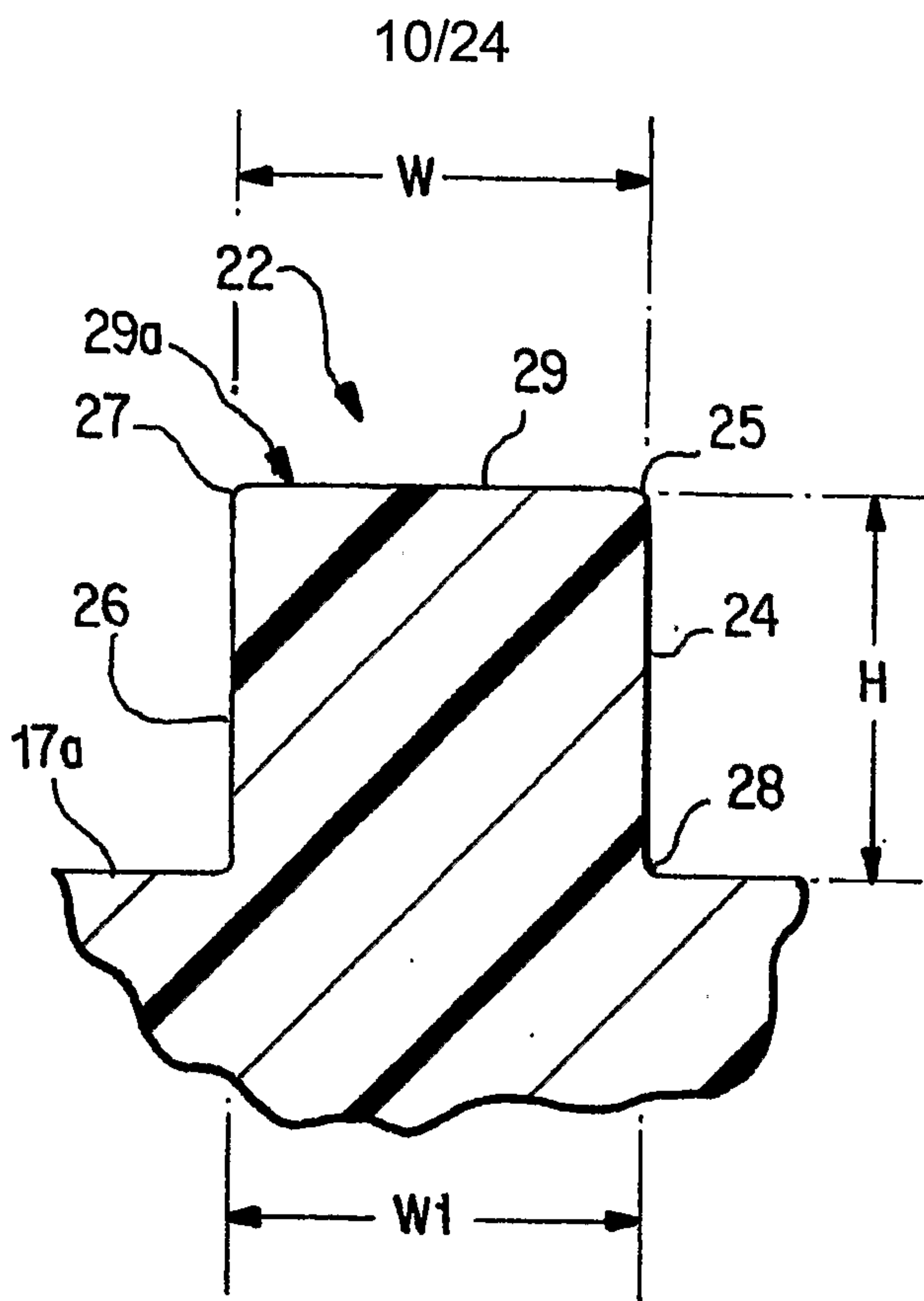


FIG. 17

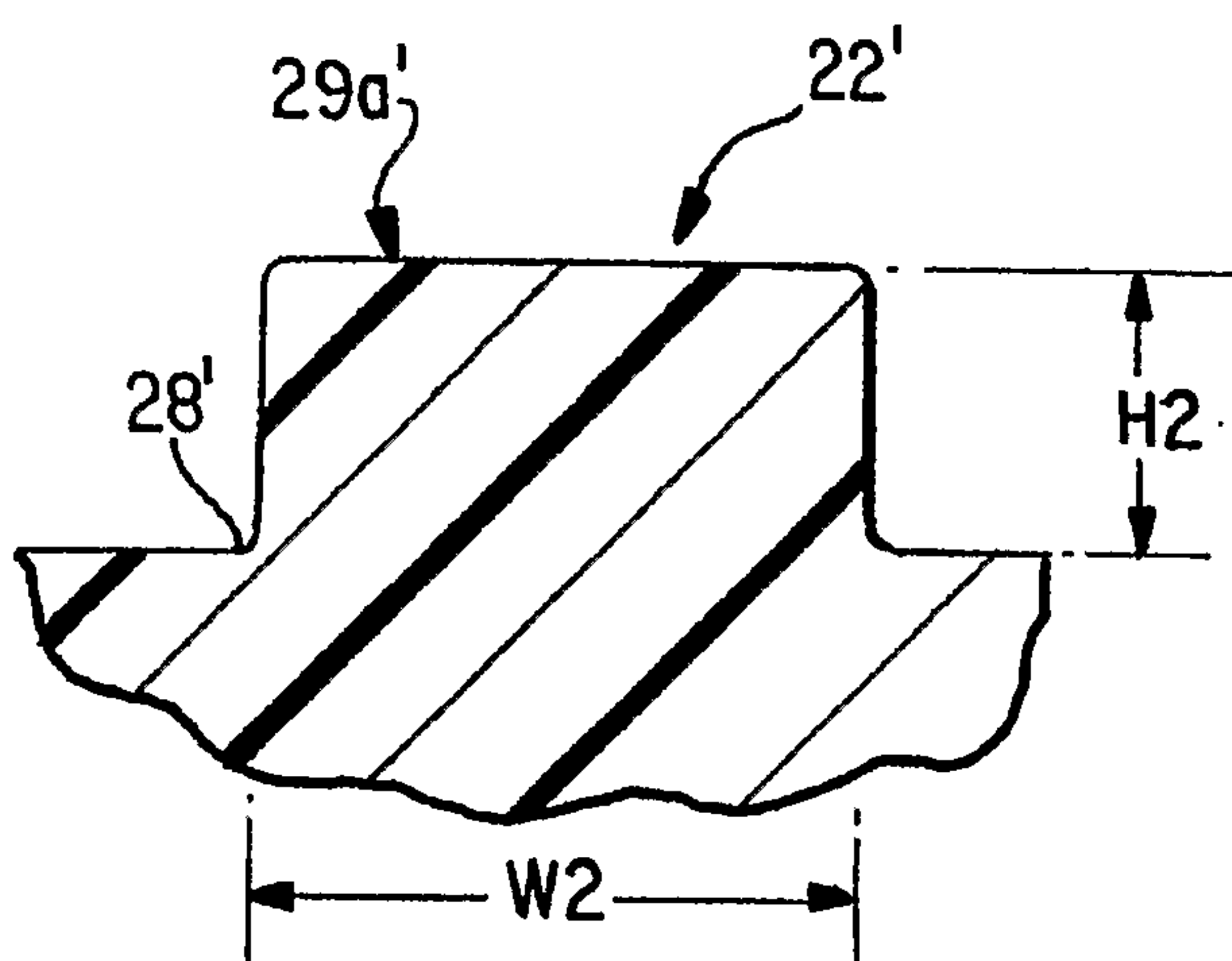


FIG. 18

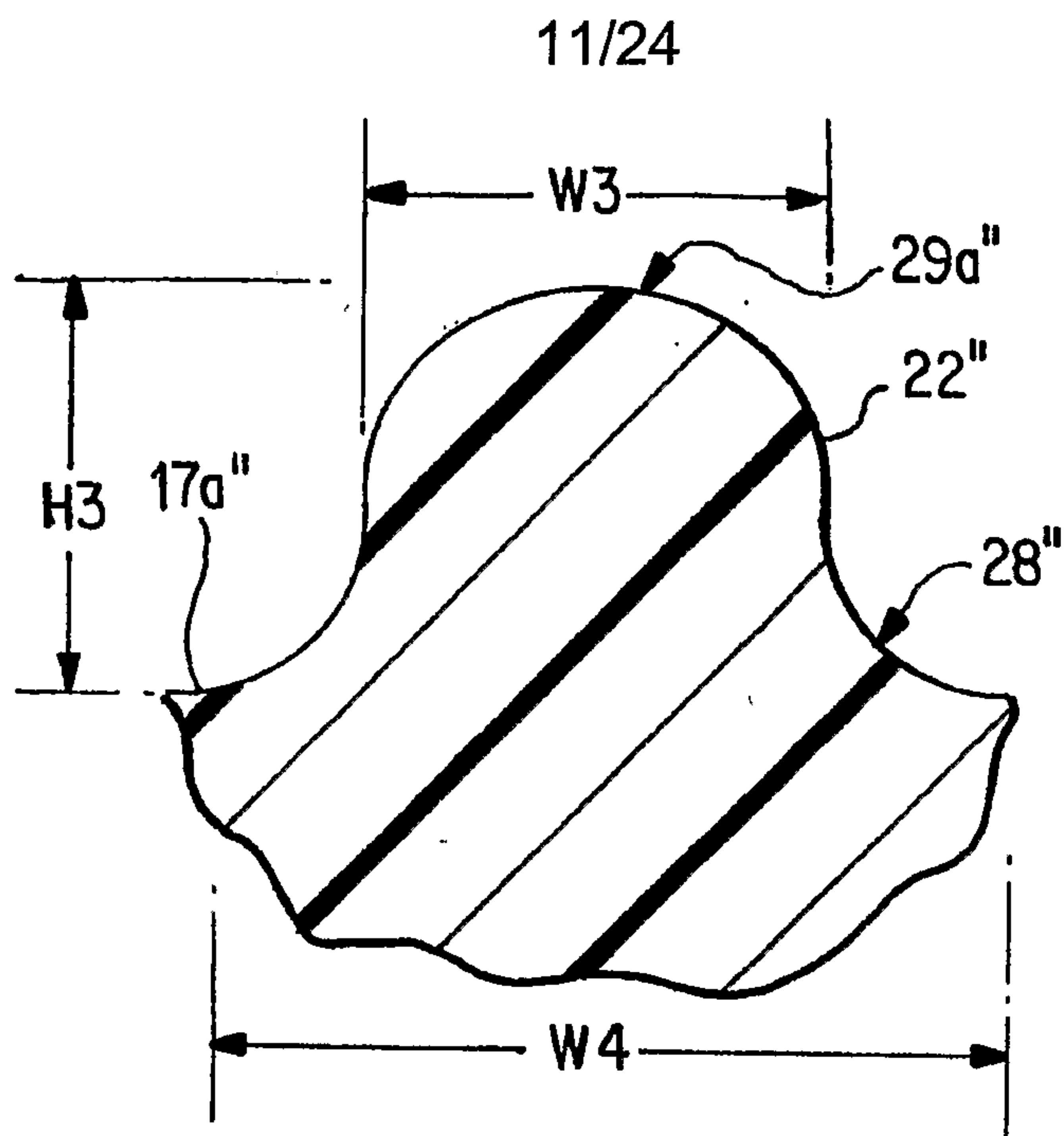


FIG. 19A

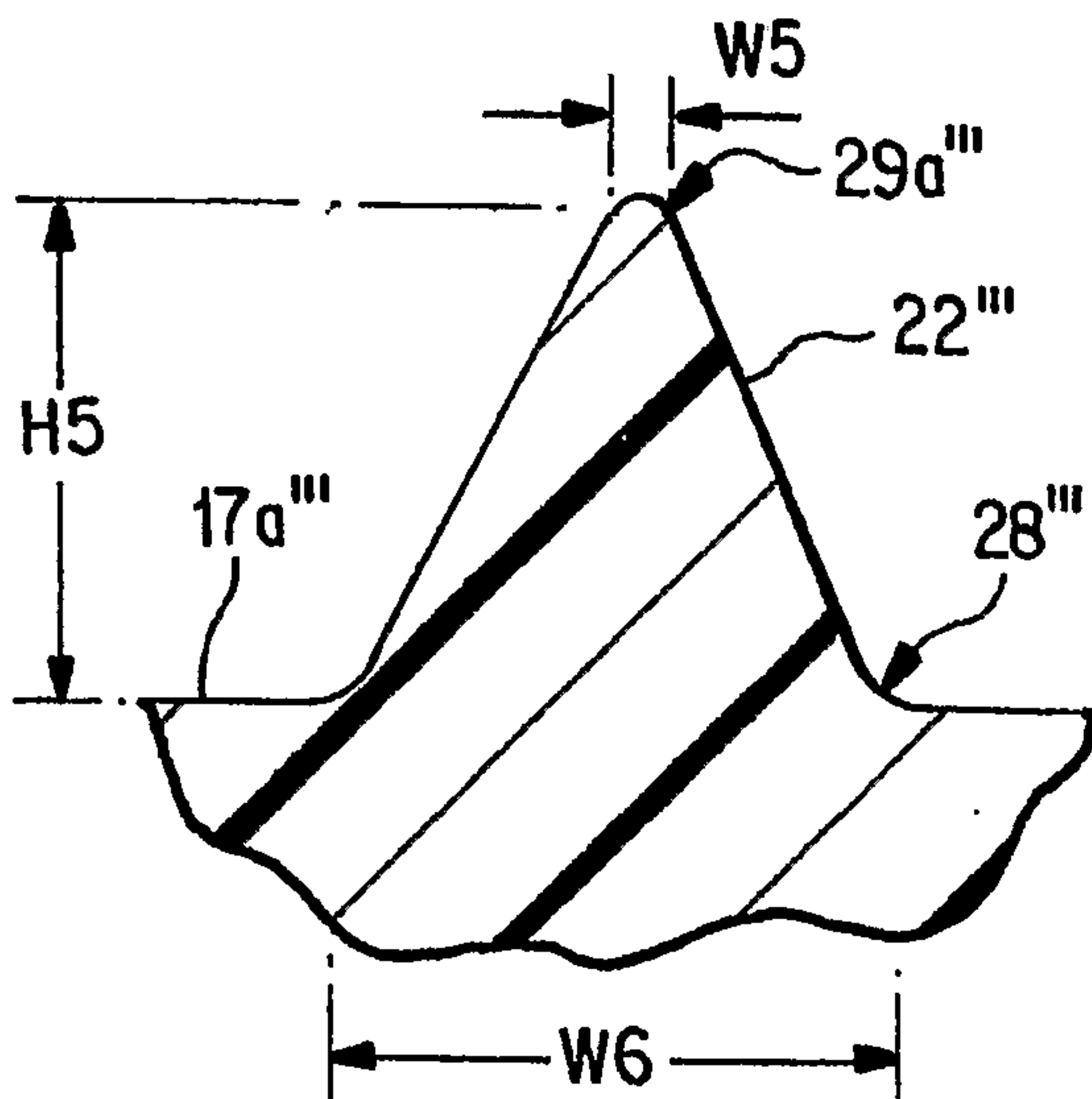


FIG. 19B



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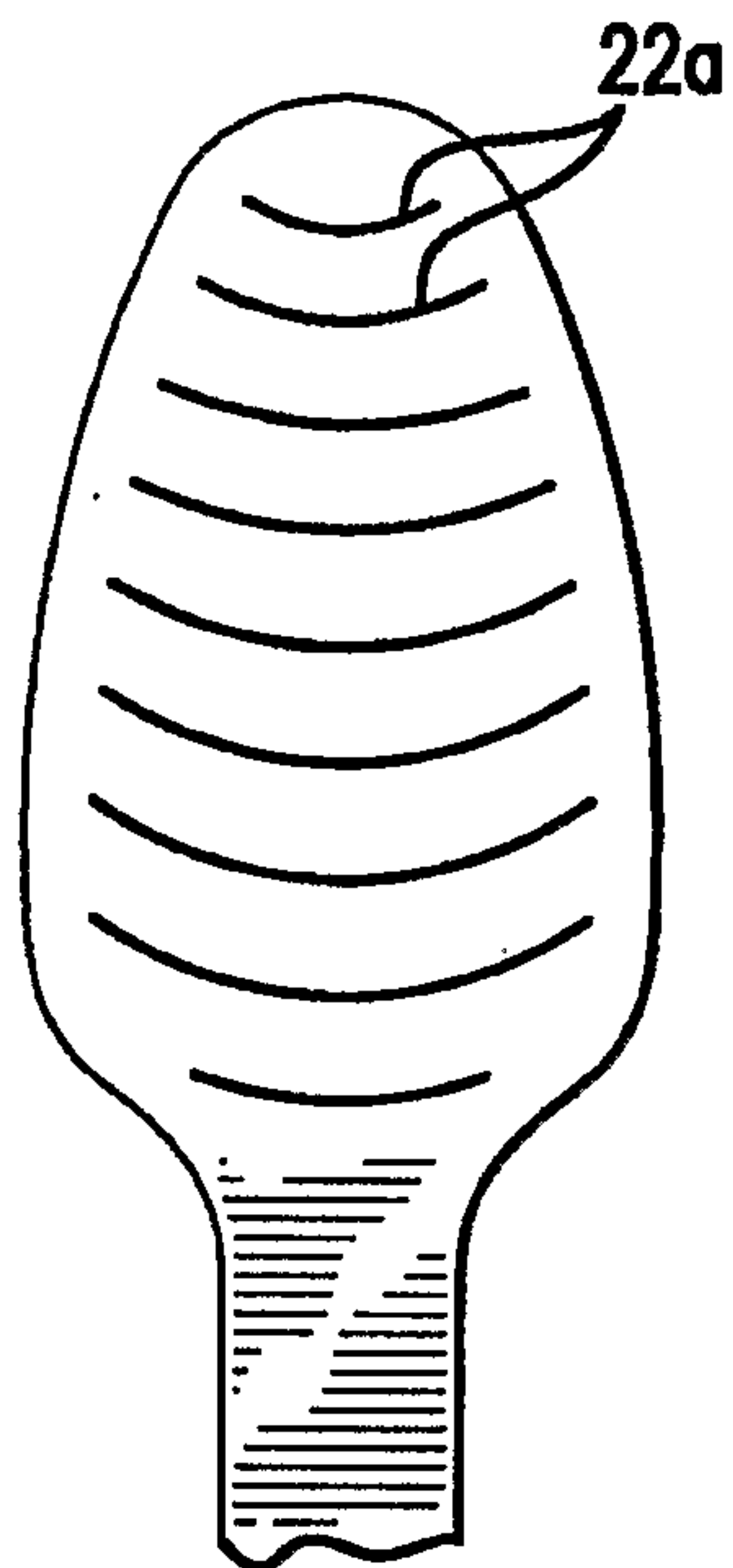


FIG. 20

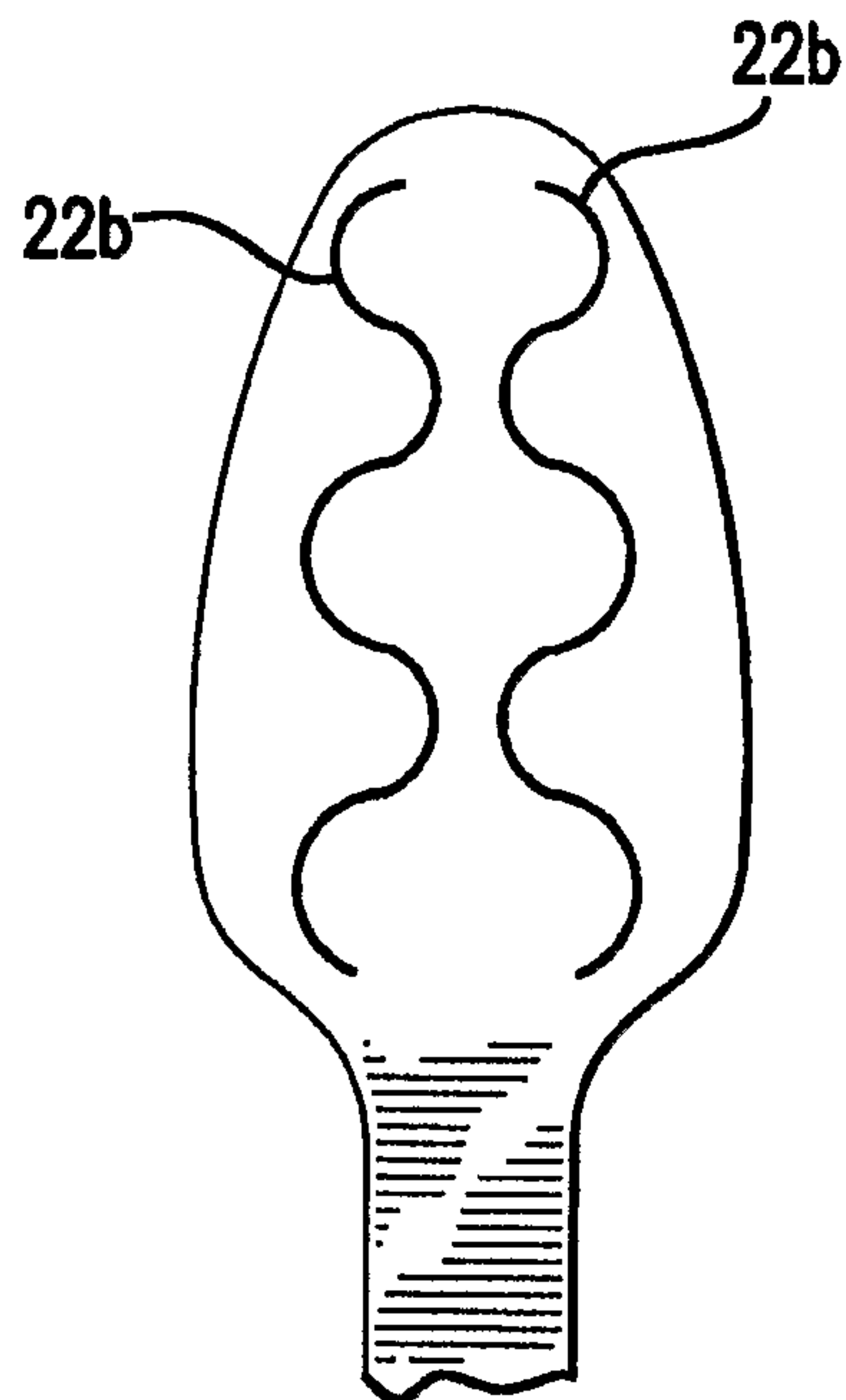


FIG. 21

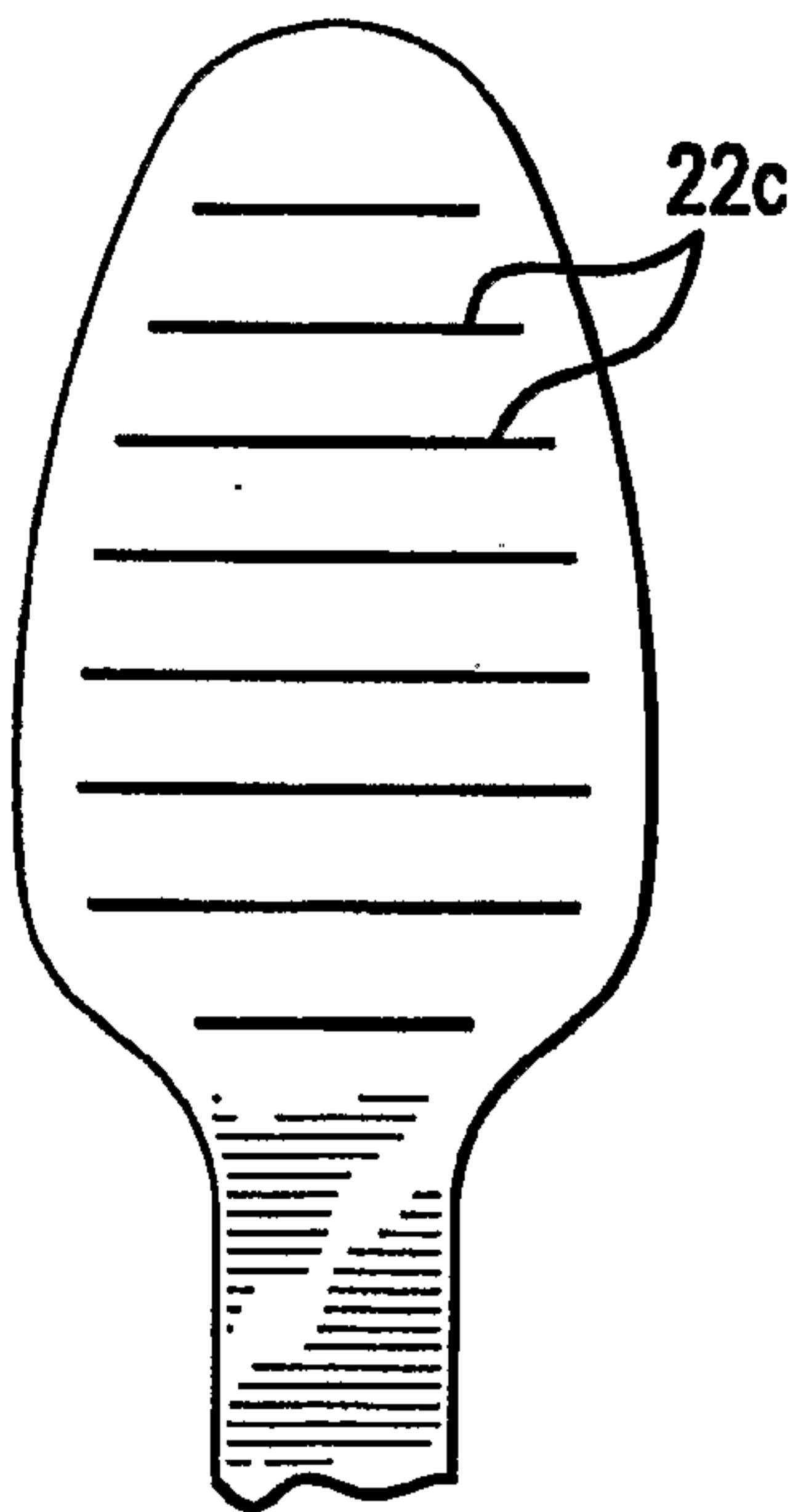


FIG. 22

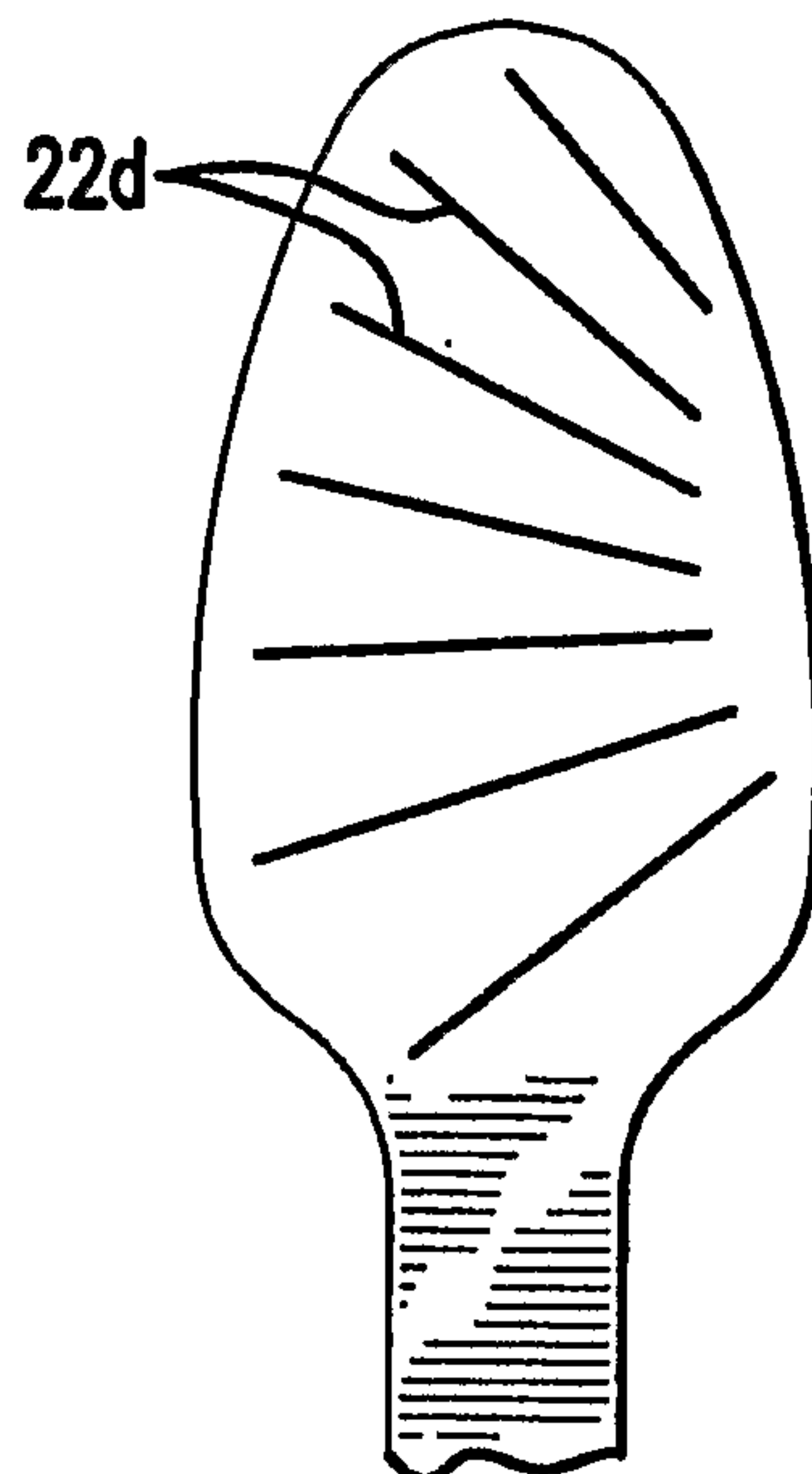


FIG. 23

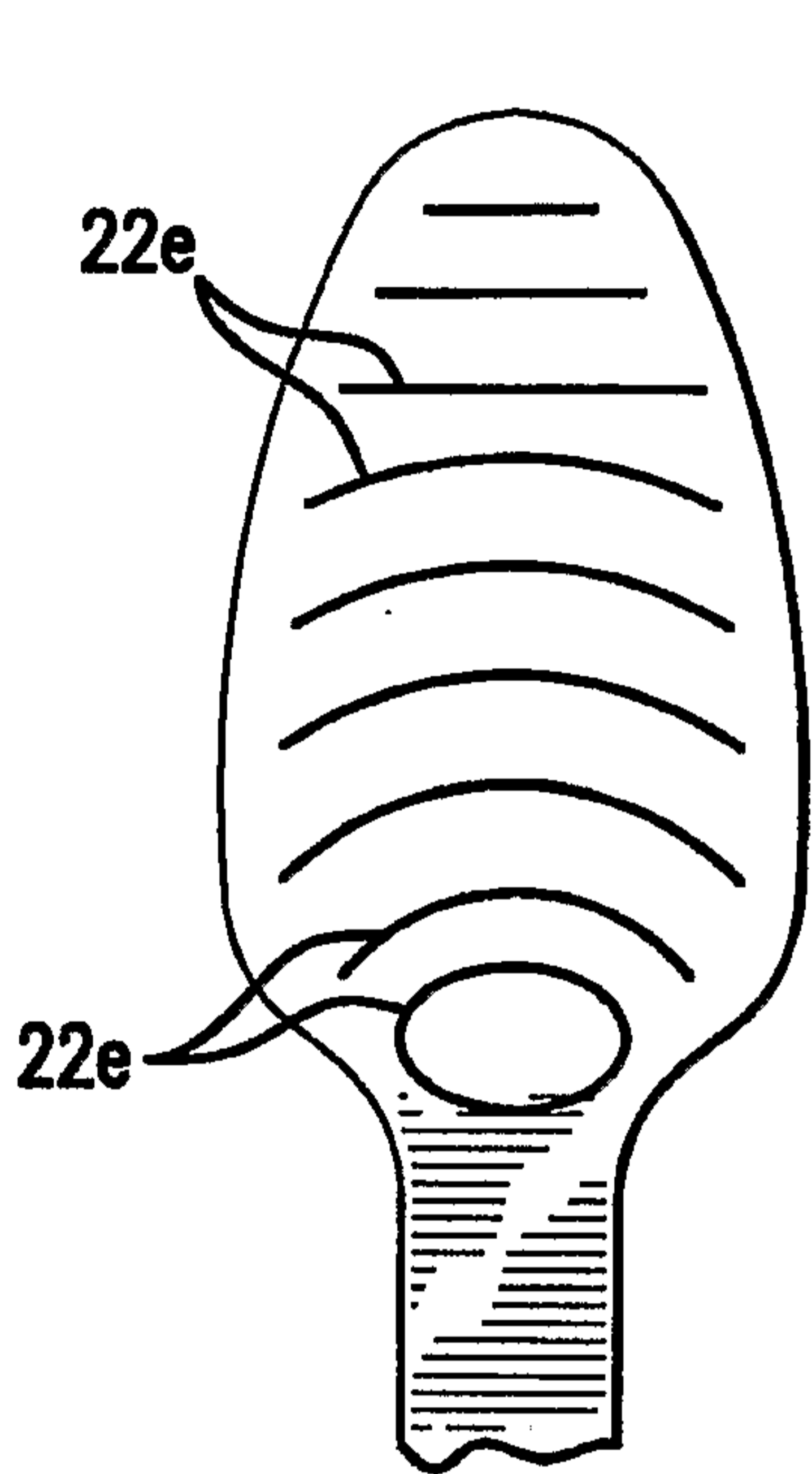


FIG. 24

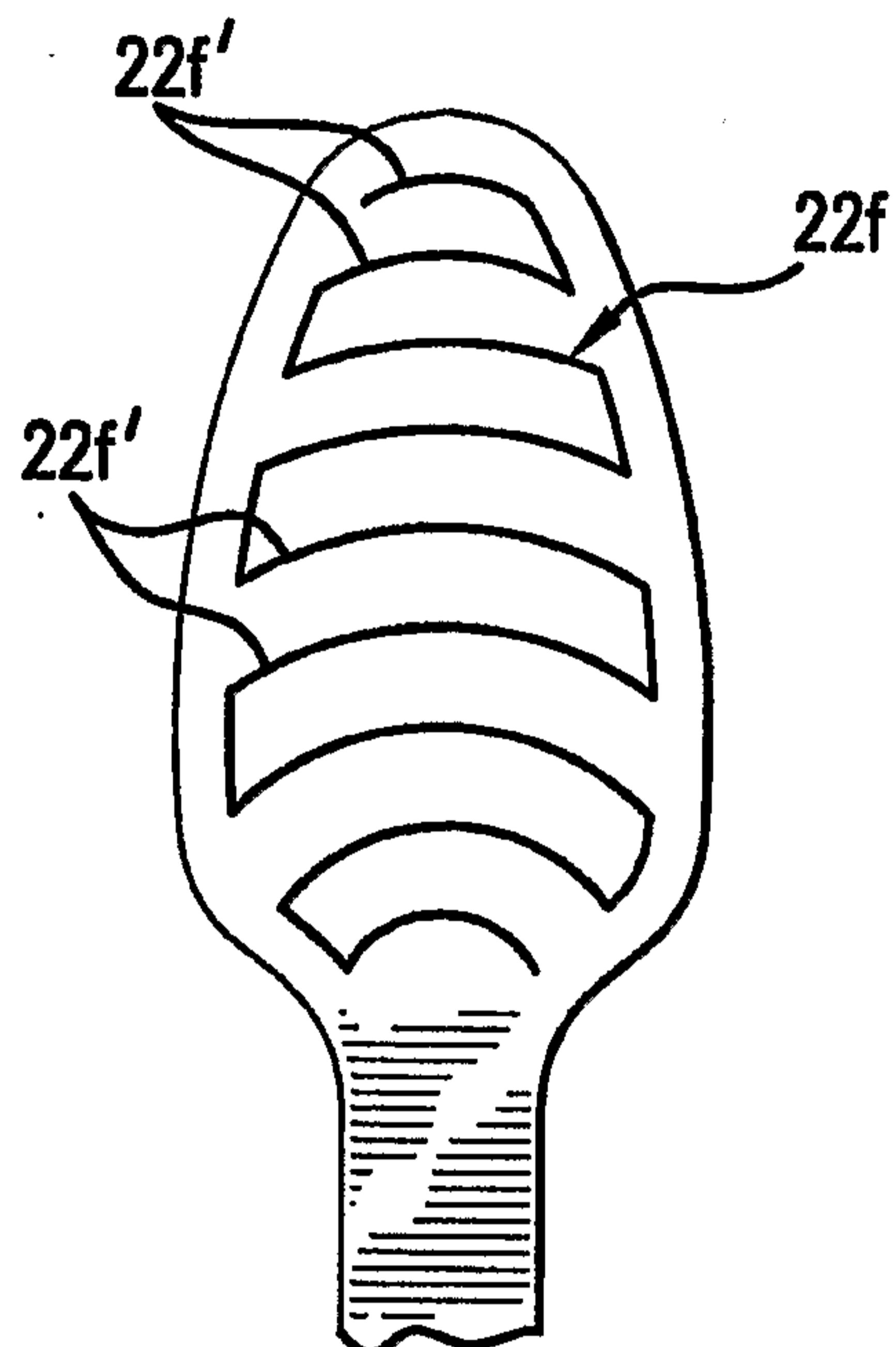


FIG. 25

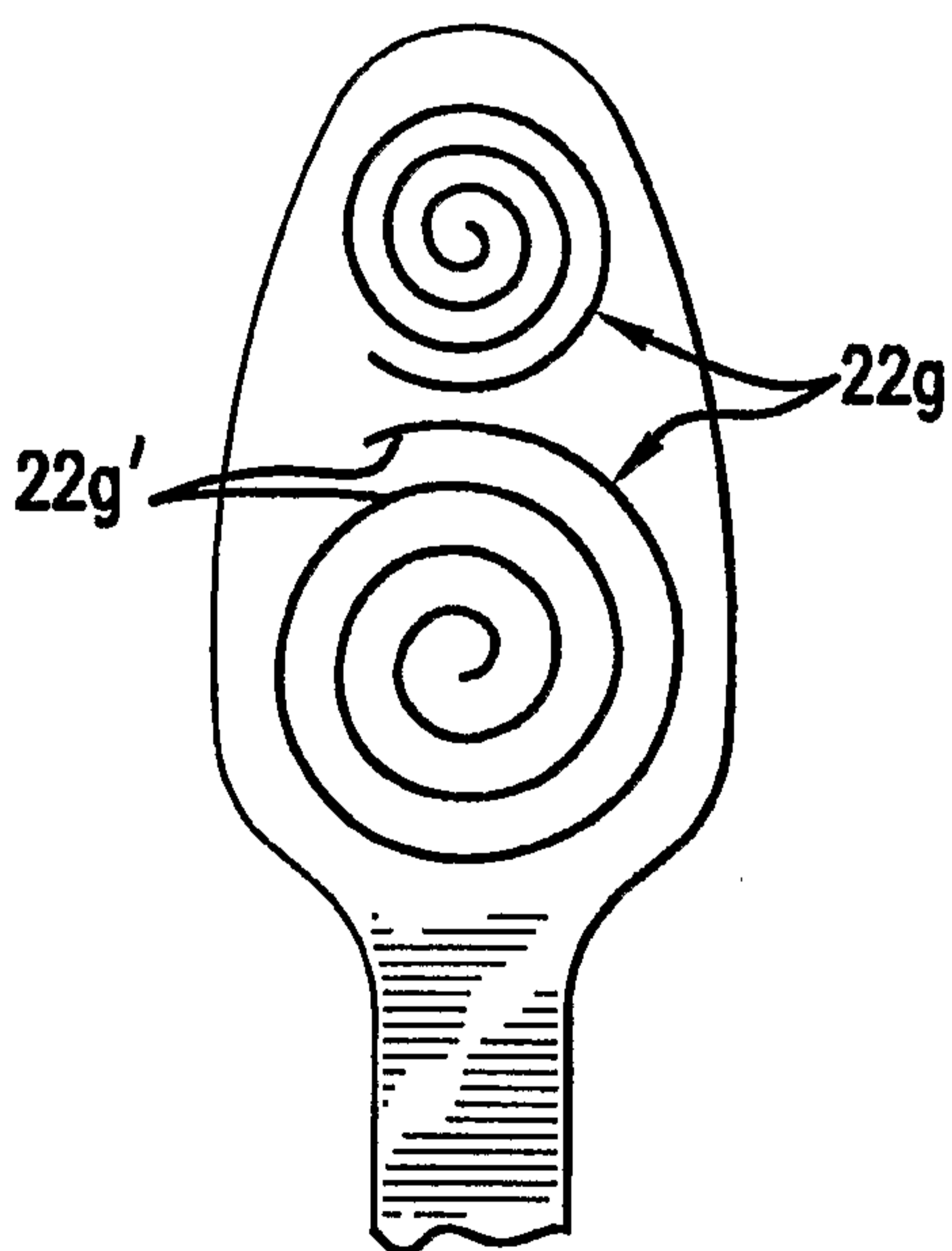


FIG. 26

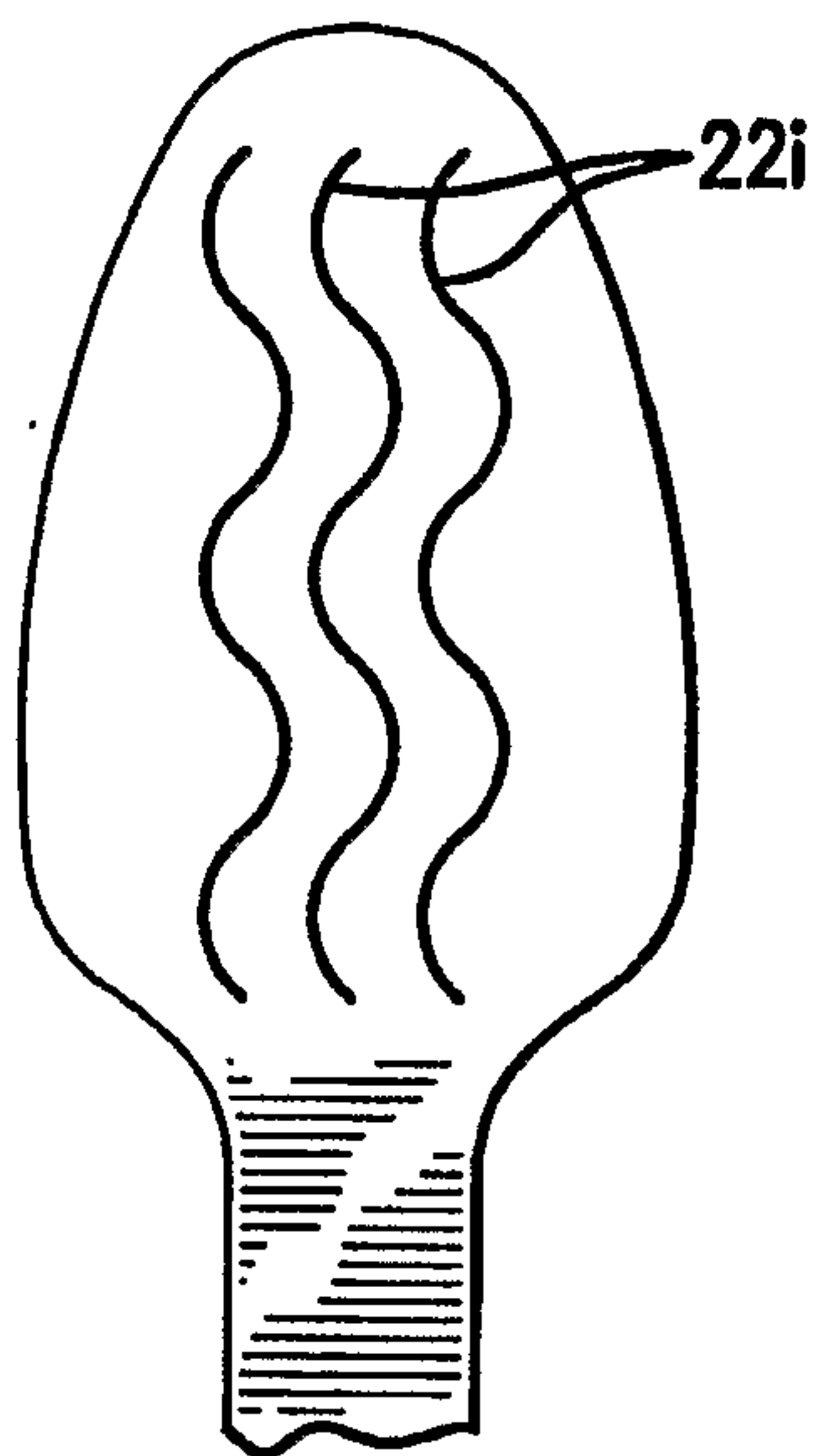


FIG. 27

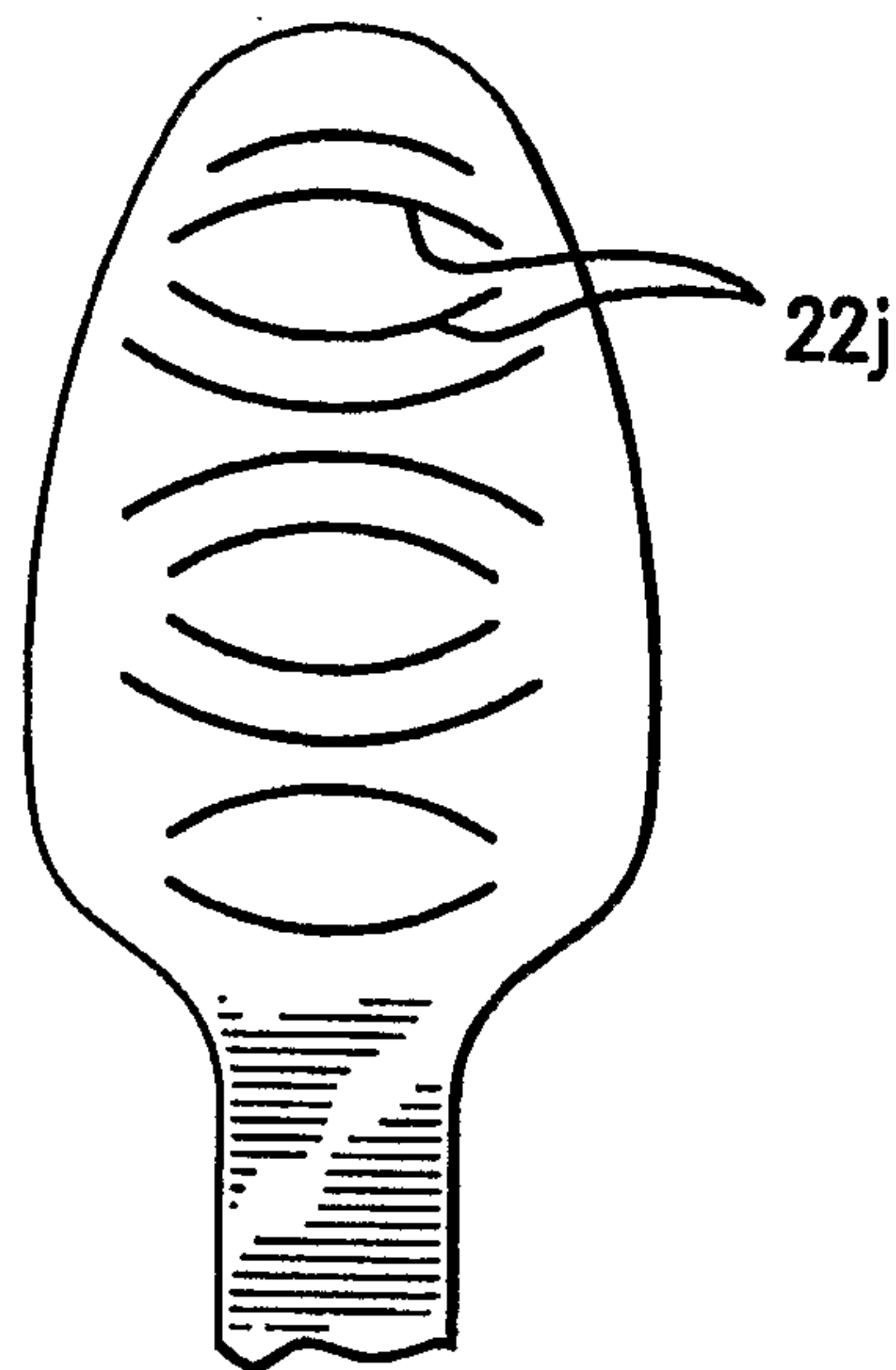


FIG. 28

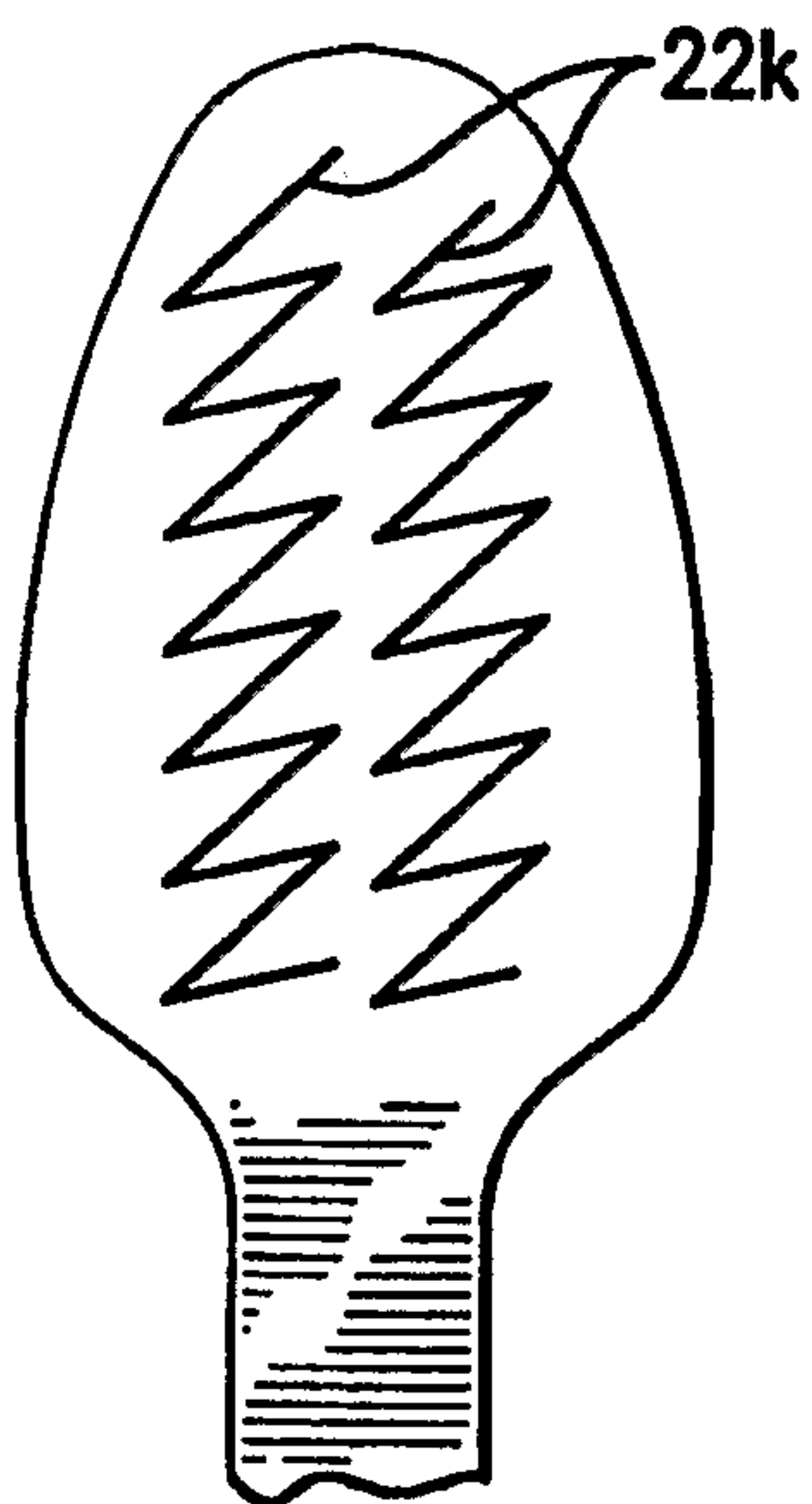


FIG. 29

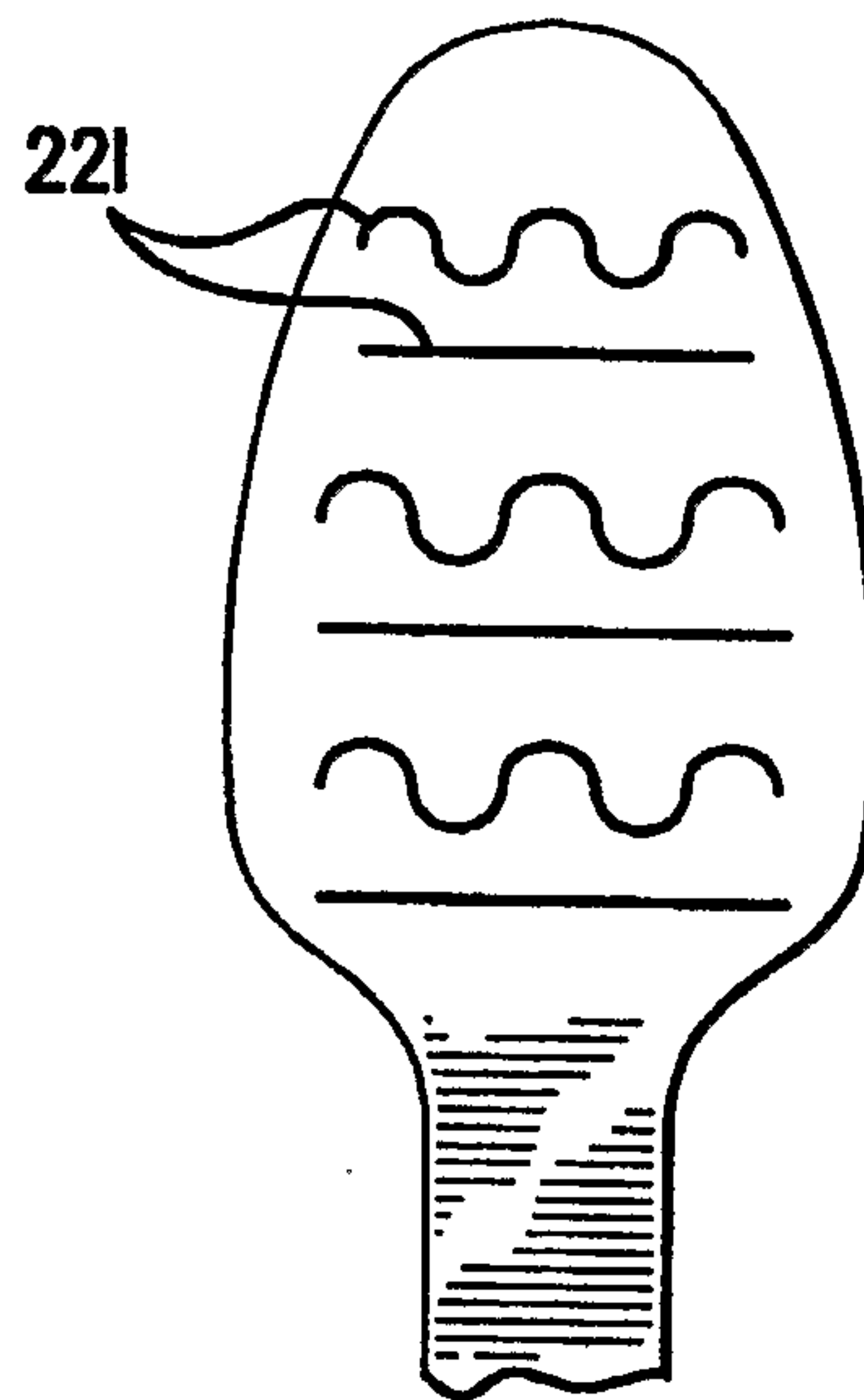


FIG. 30

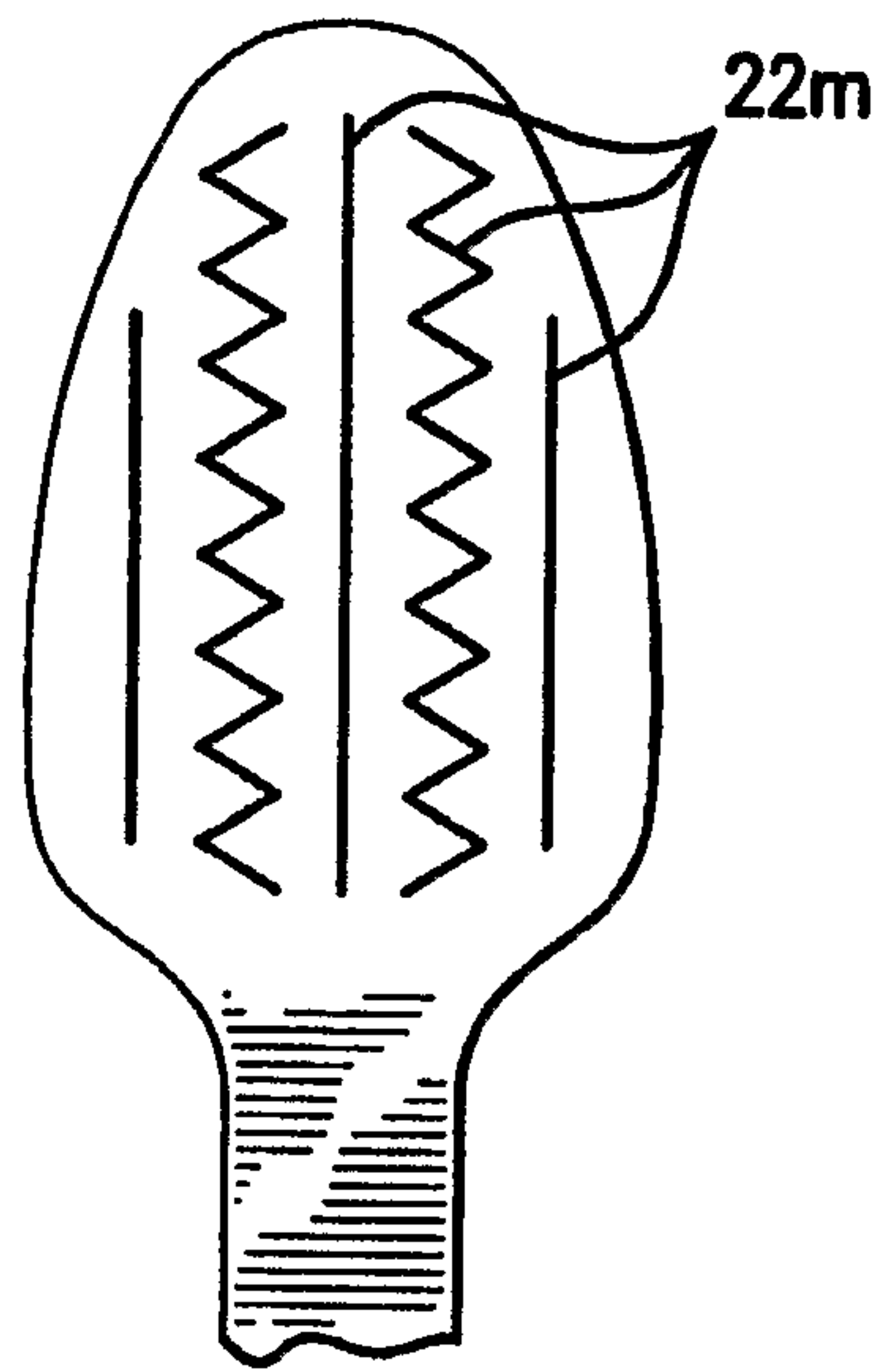


FIG. 31

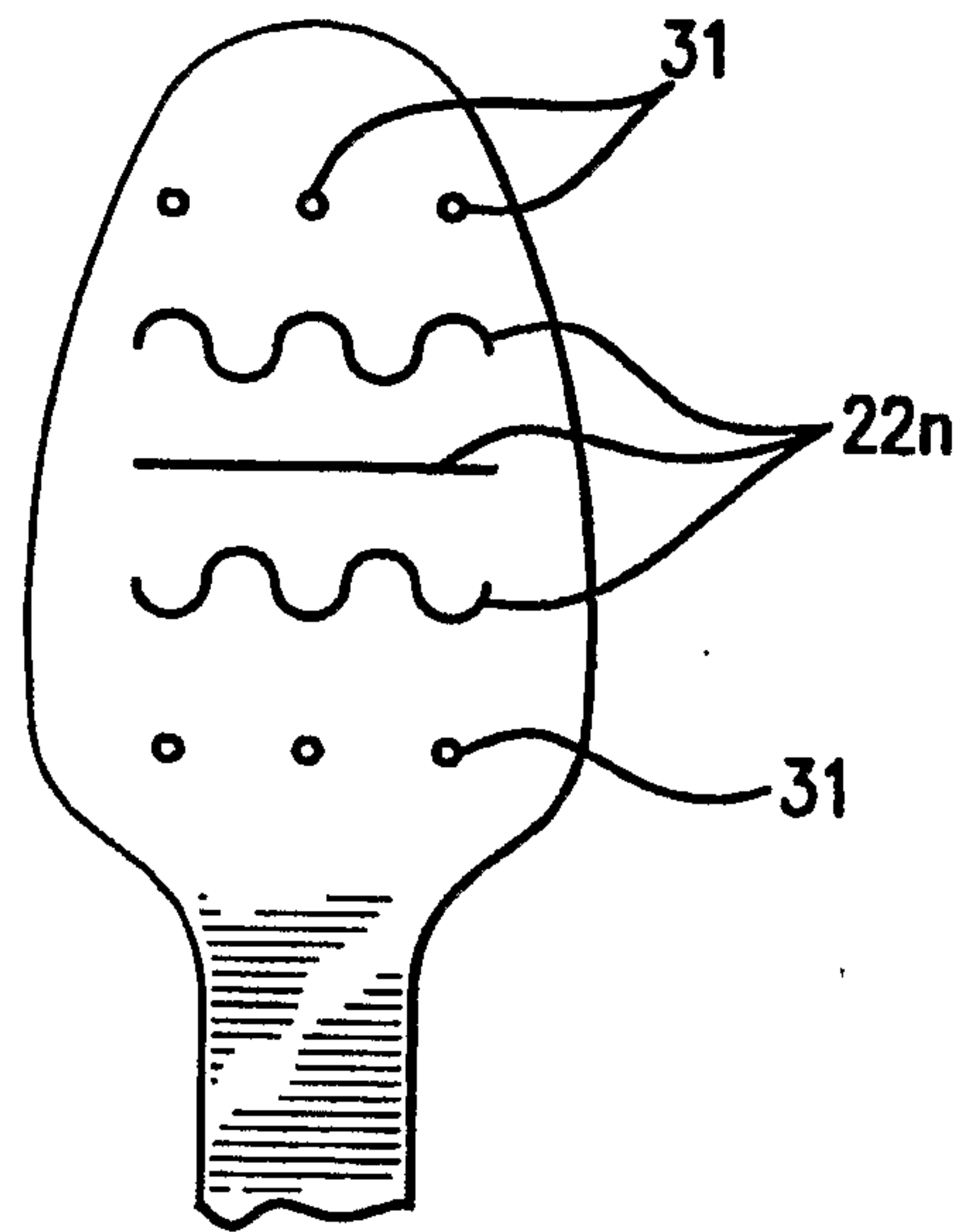


FIG. 32

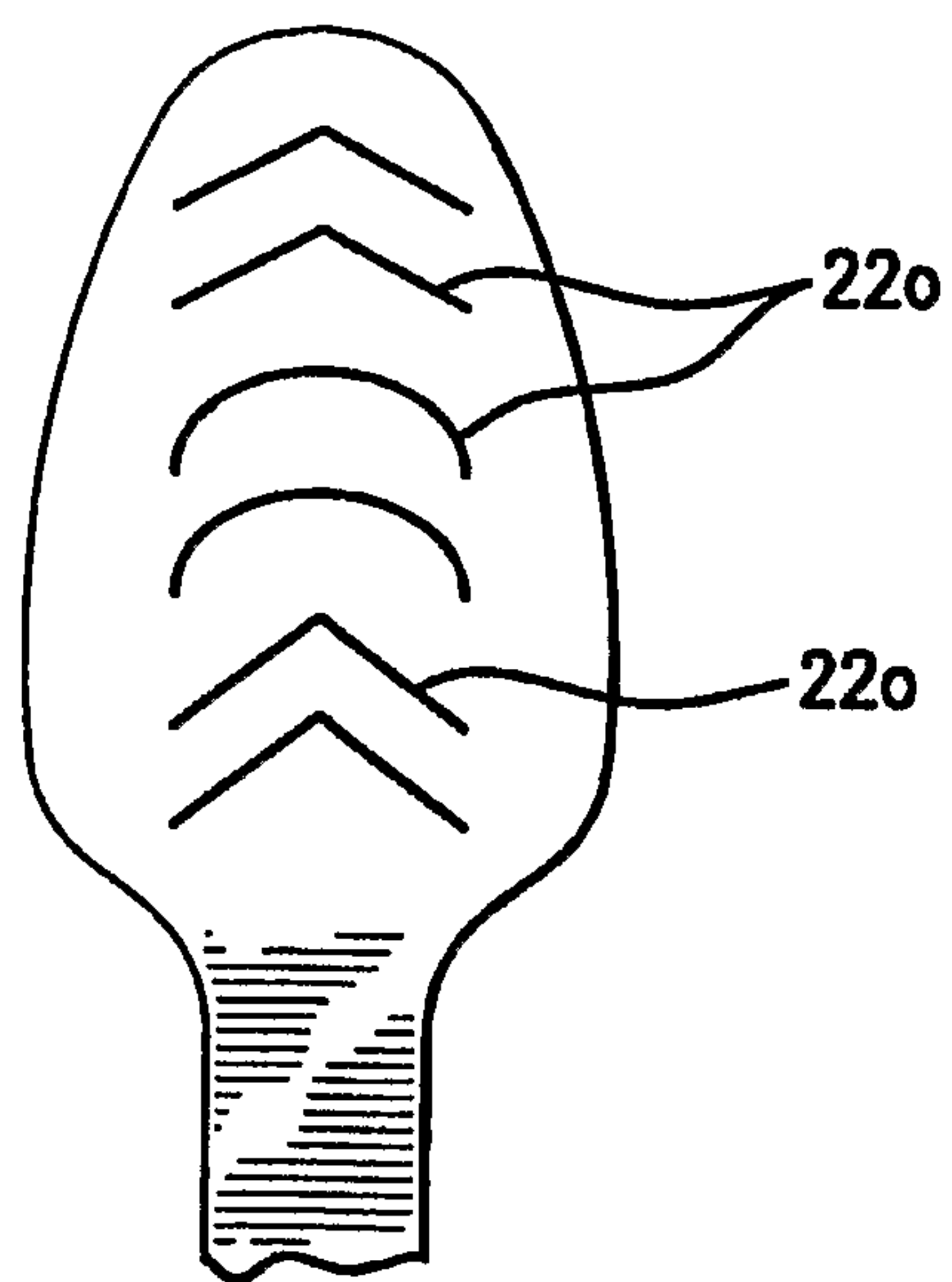
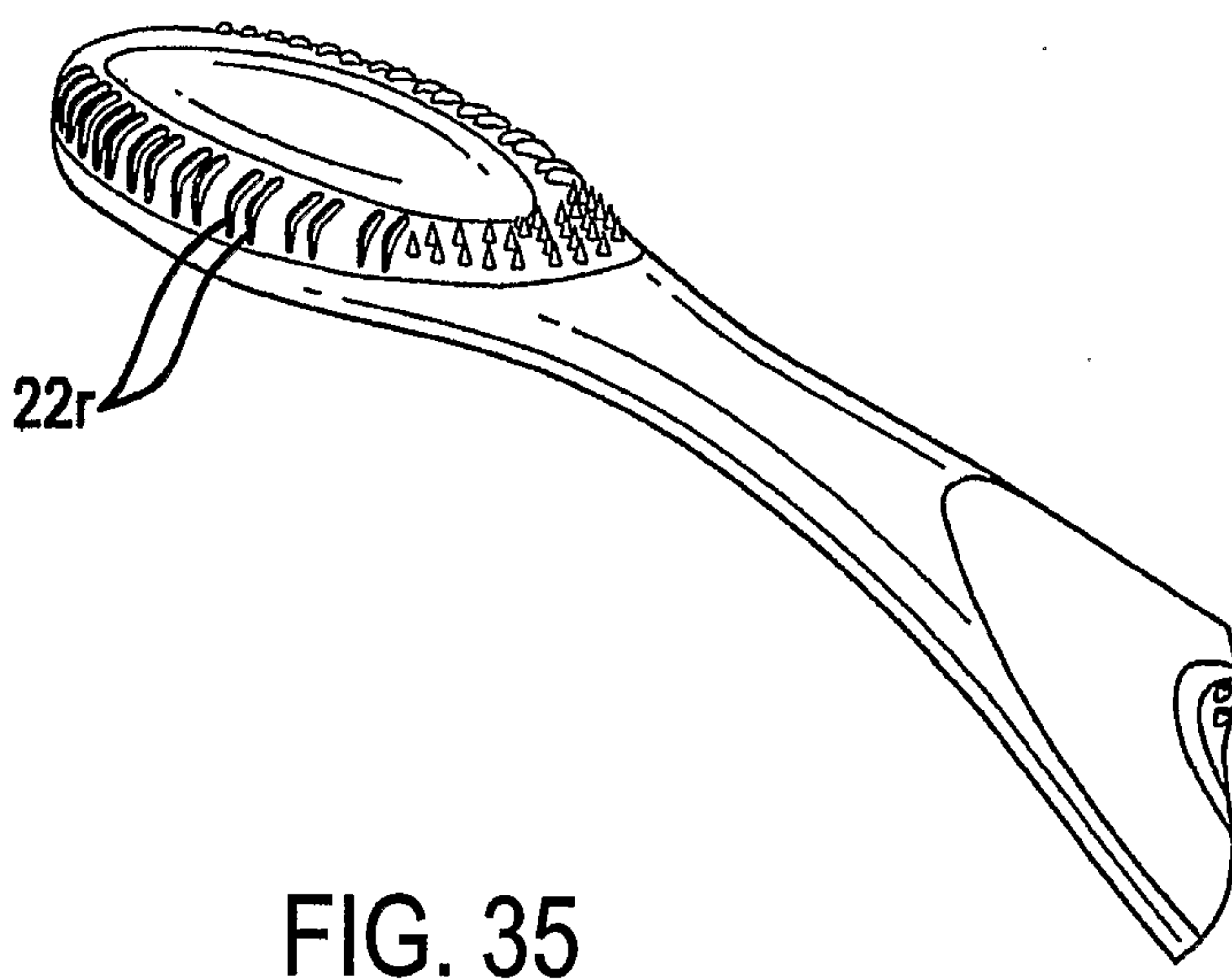
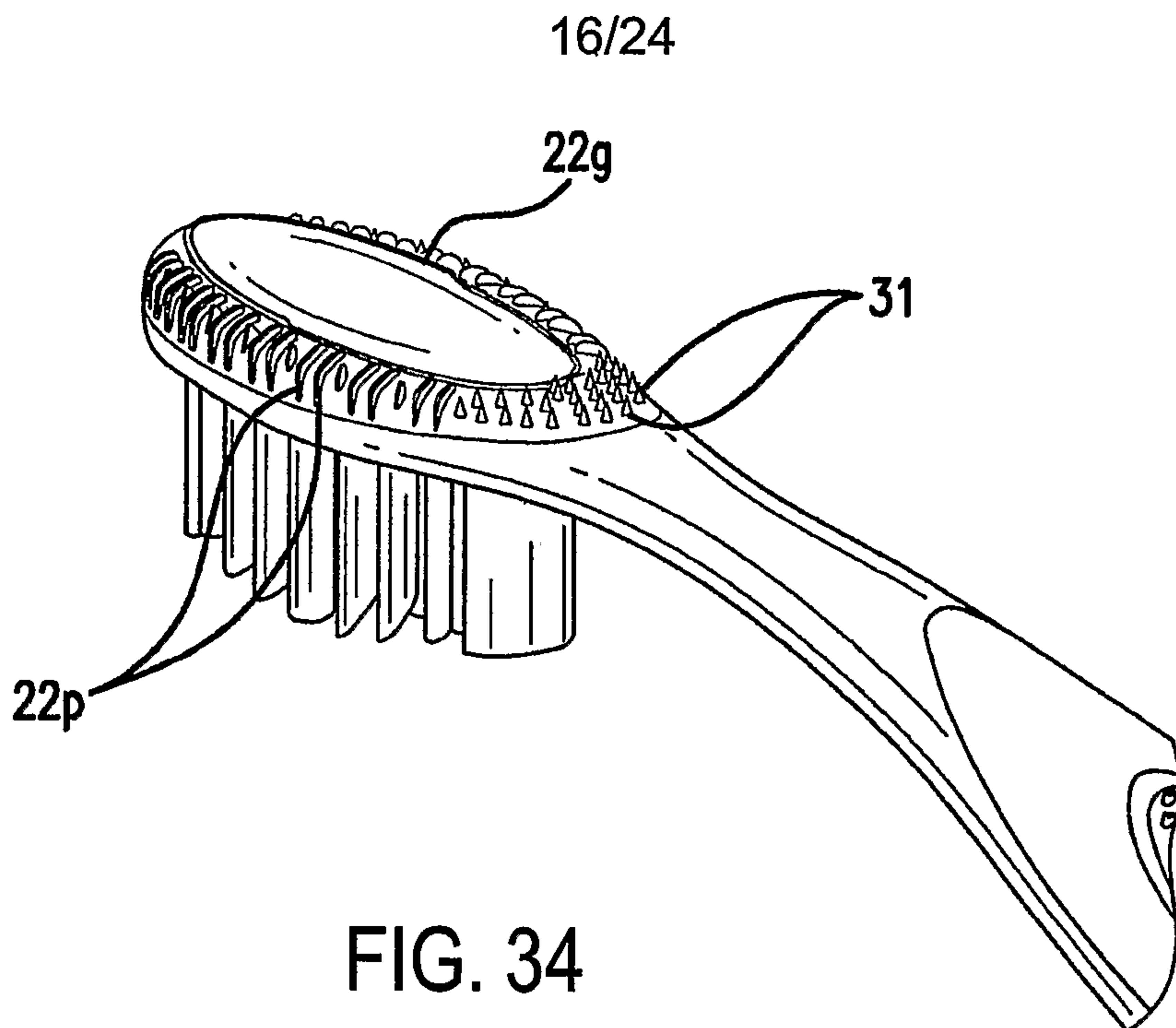


FIG. 33



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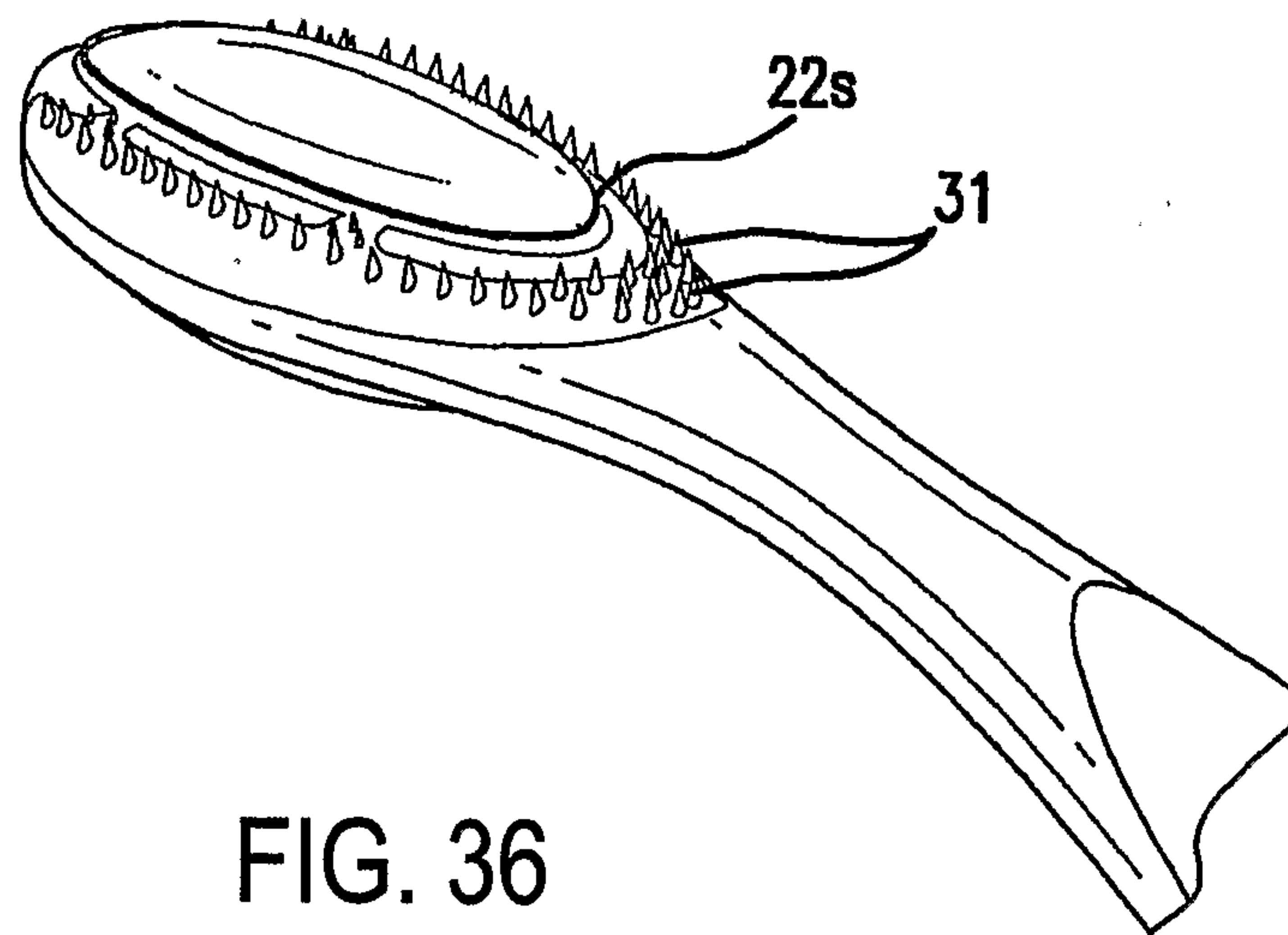


FIG. 36

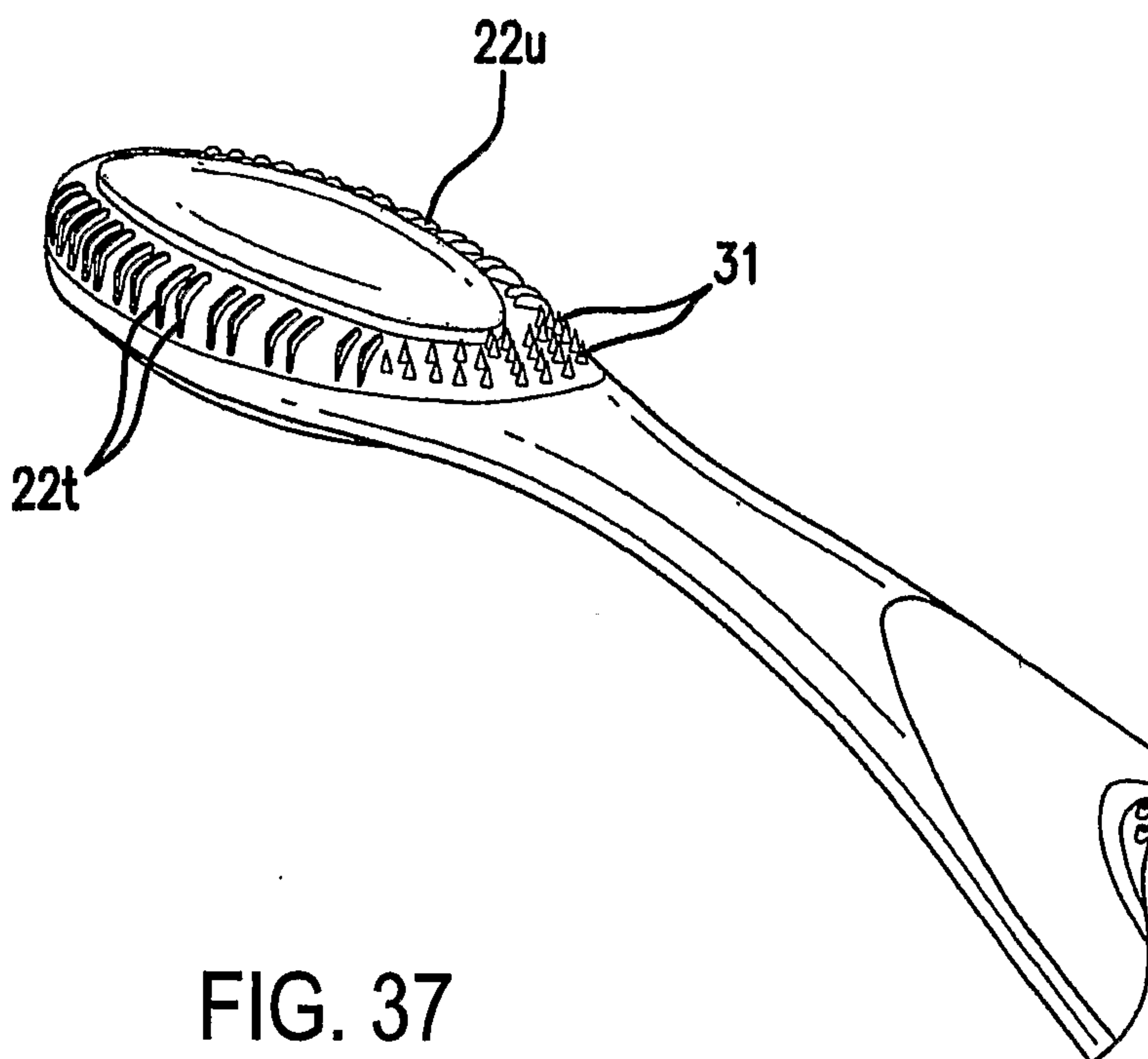


FIG. 37

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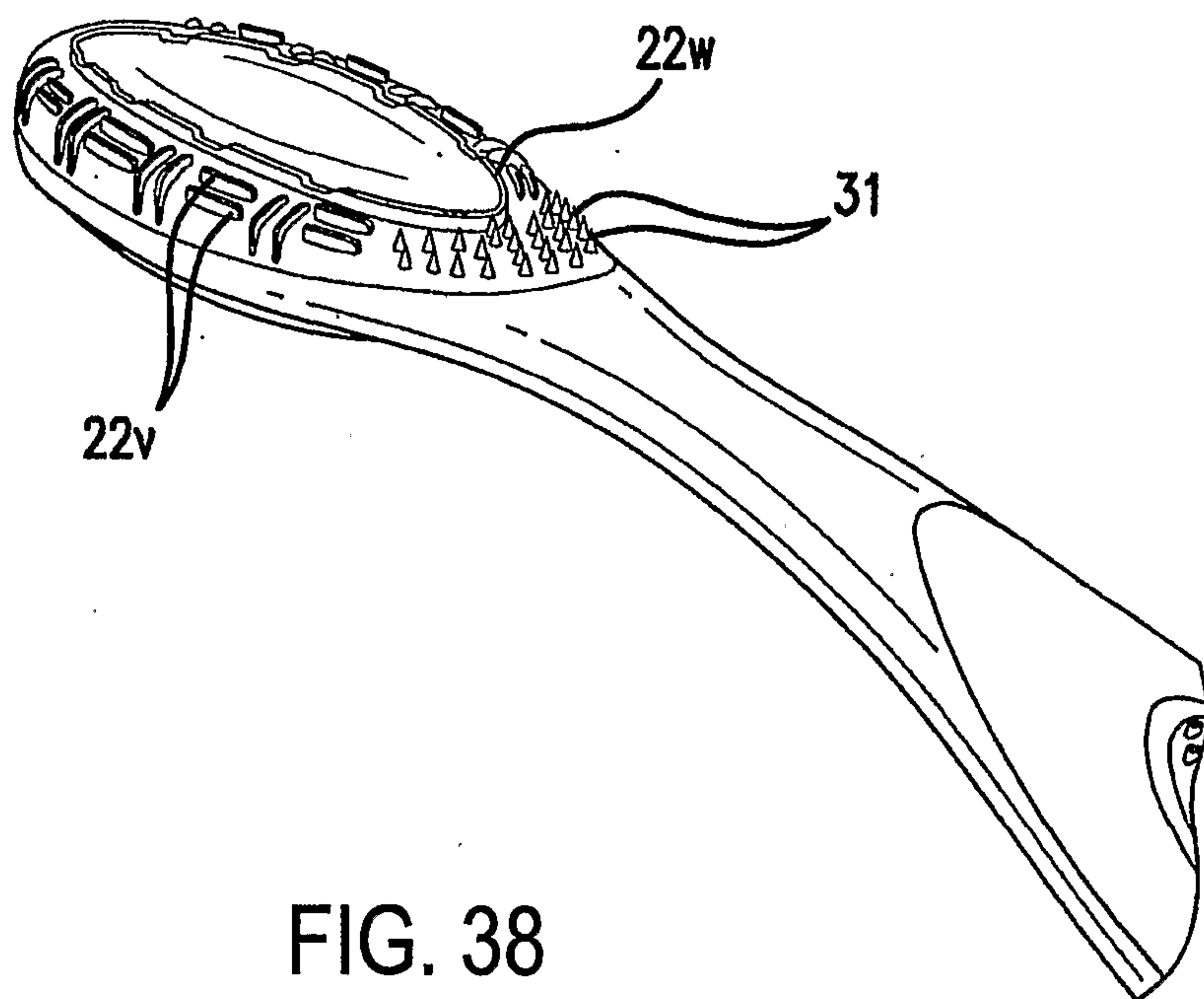


FIG. 38

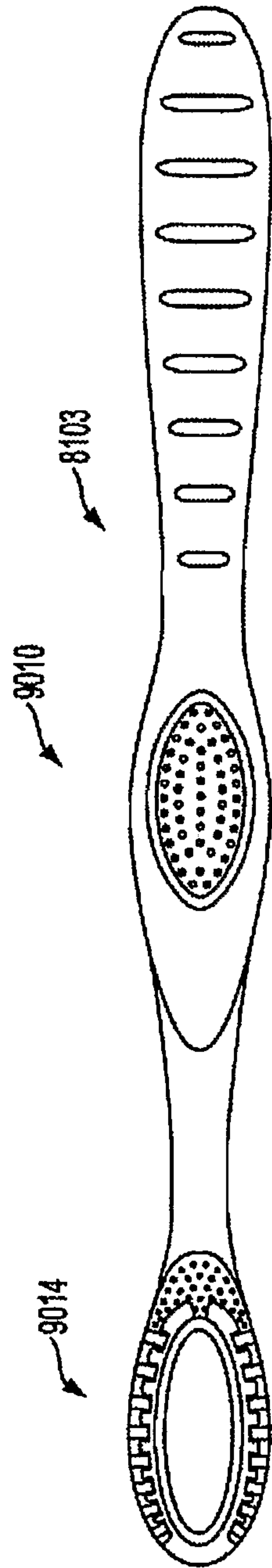


FIG. 39

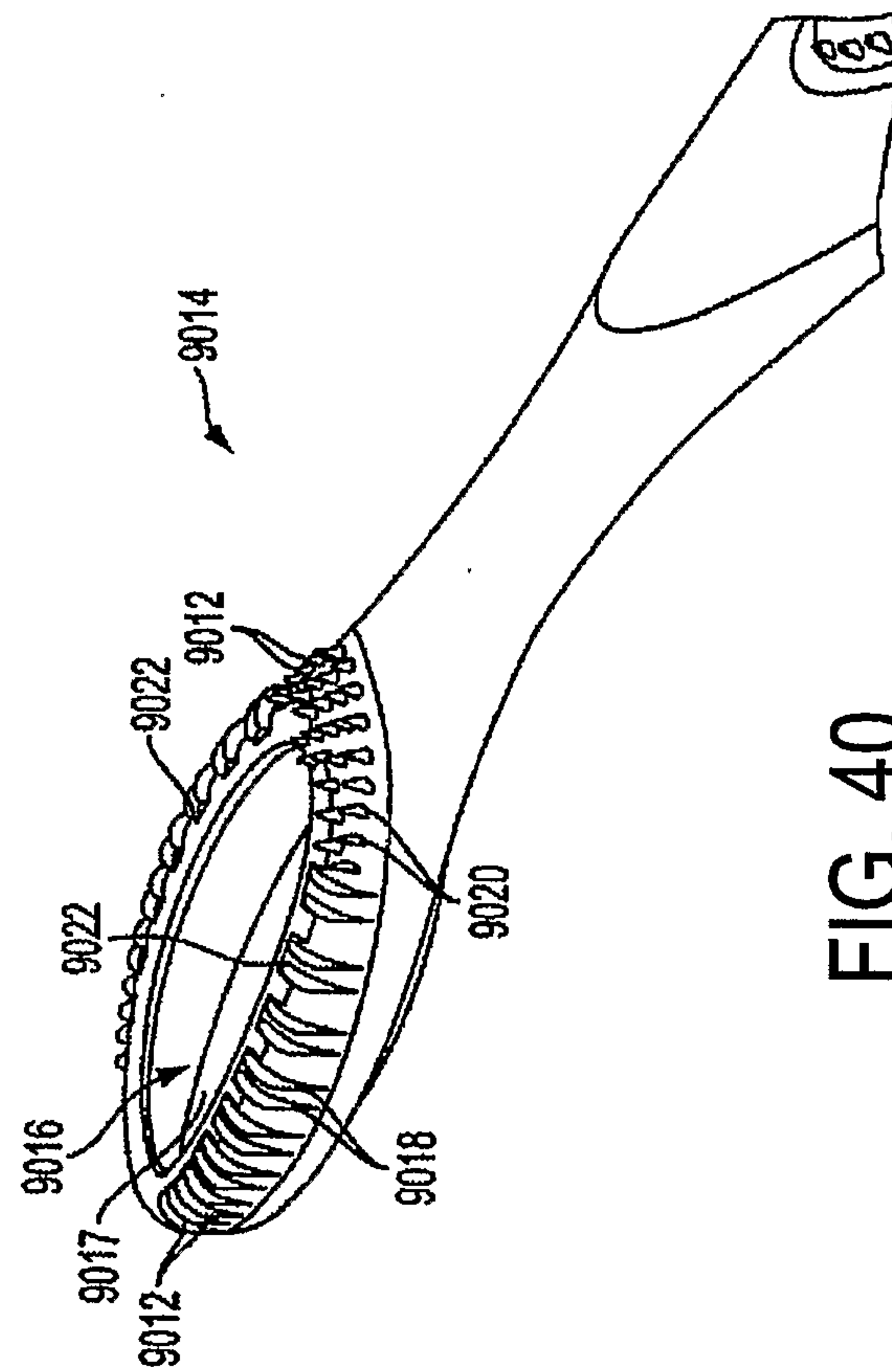


FIG. 40



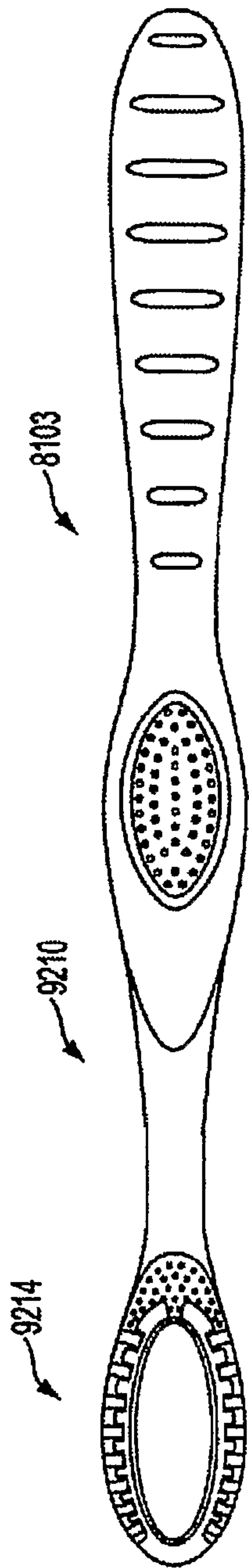


FIG. 41

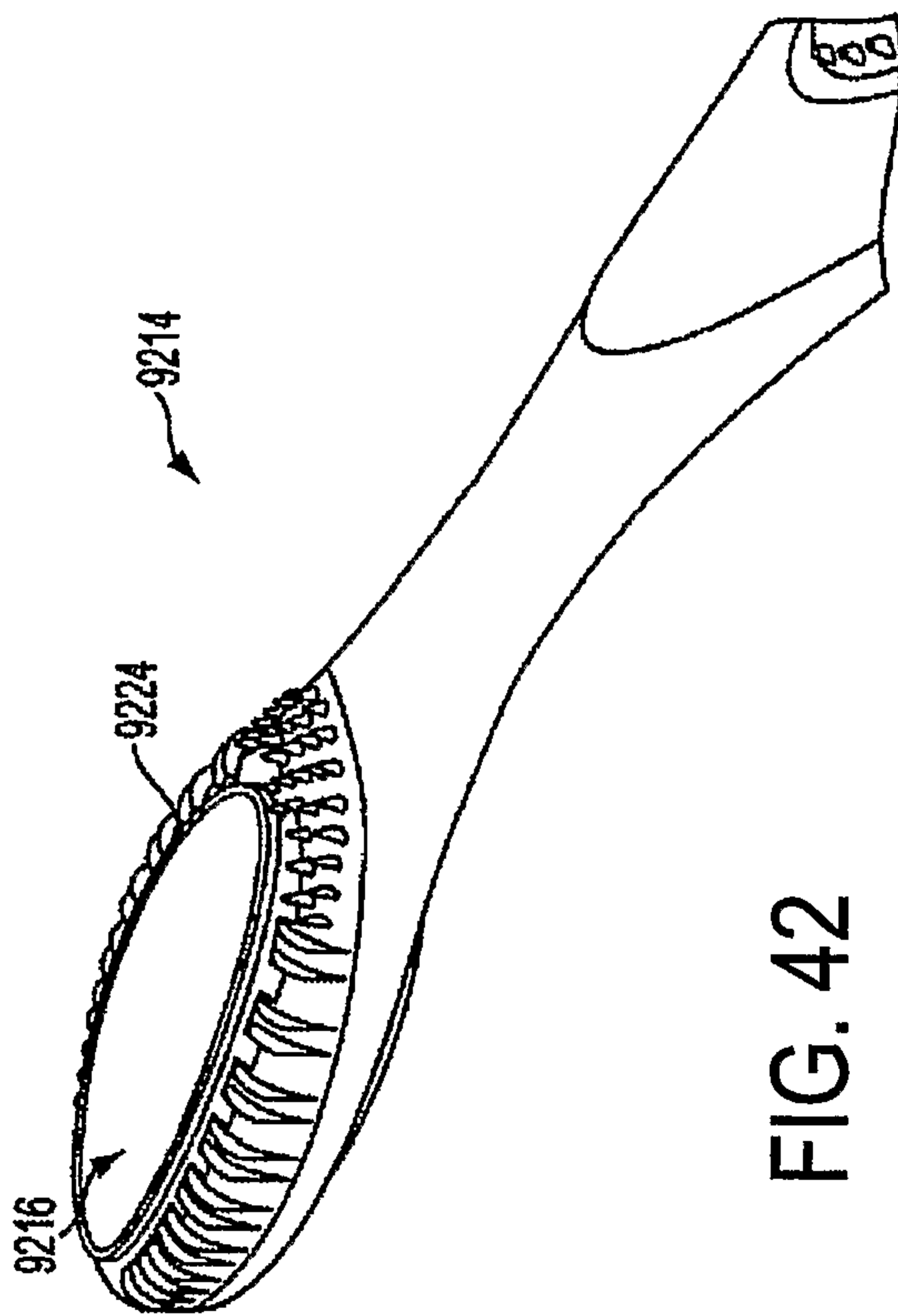


FIG. 42

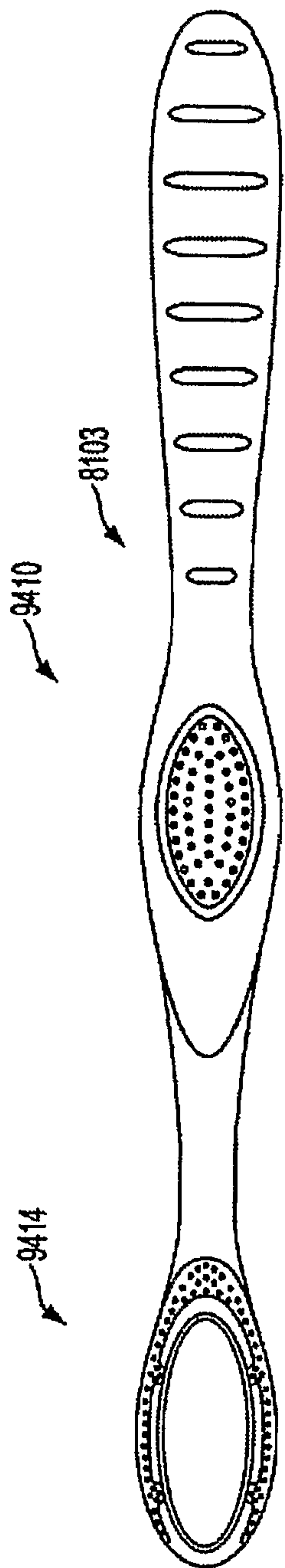


FIG. 43

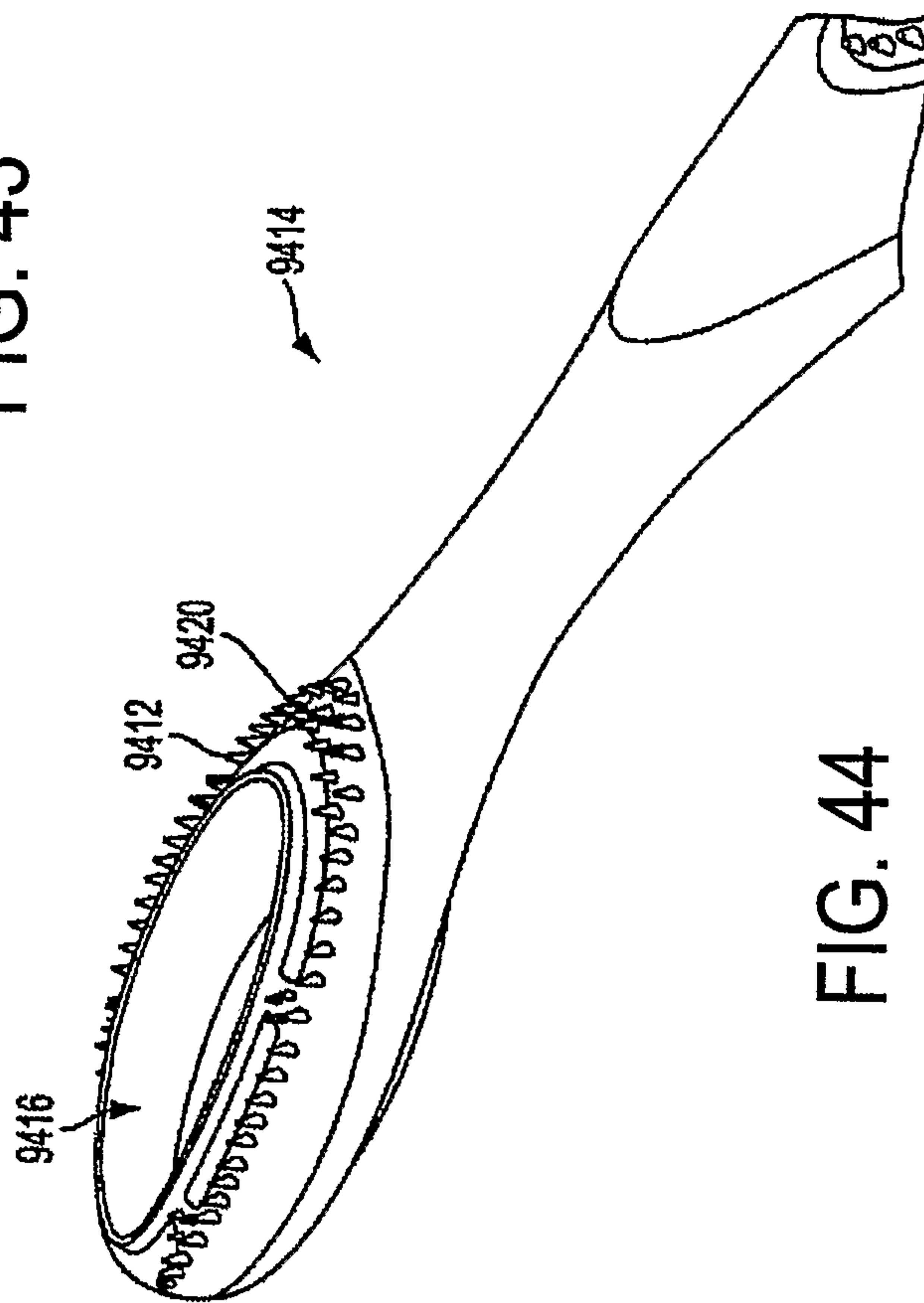


FIG. 44

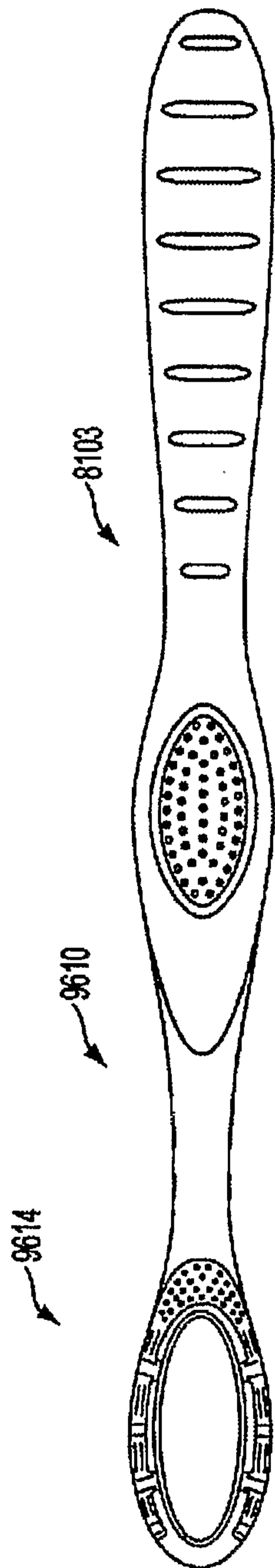


FIG. 45

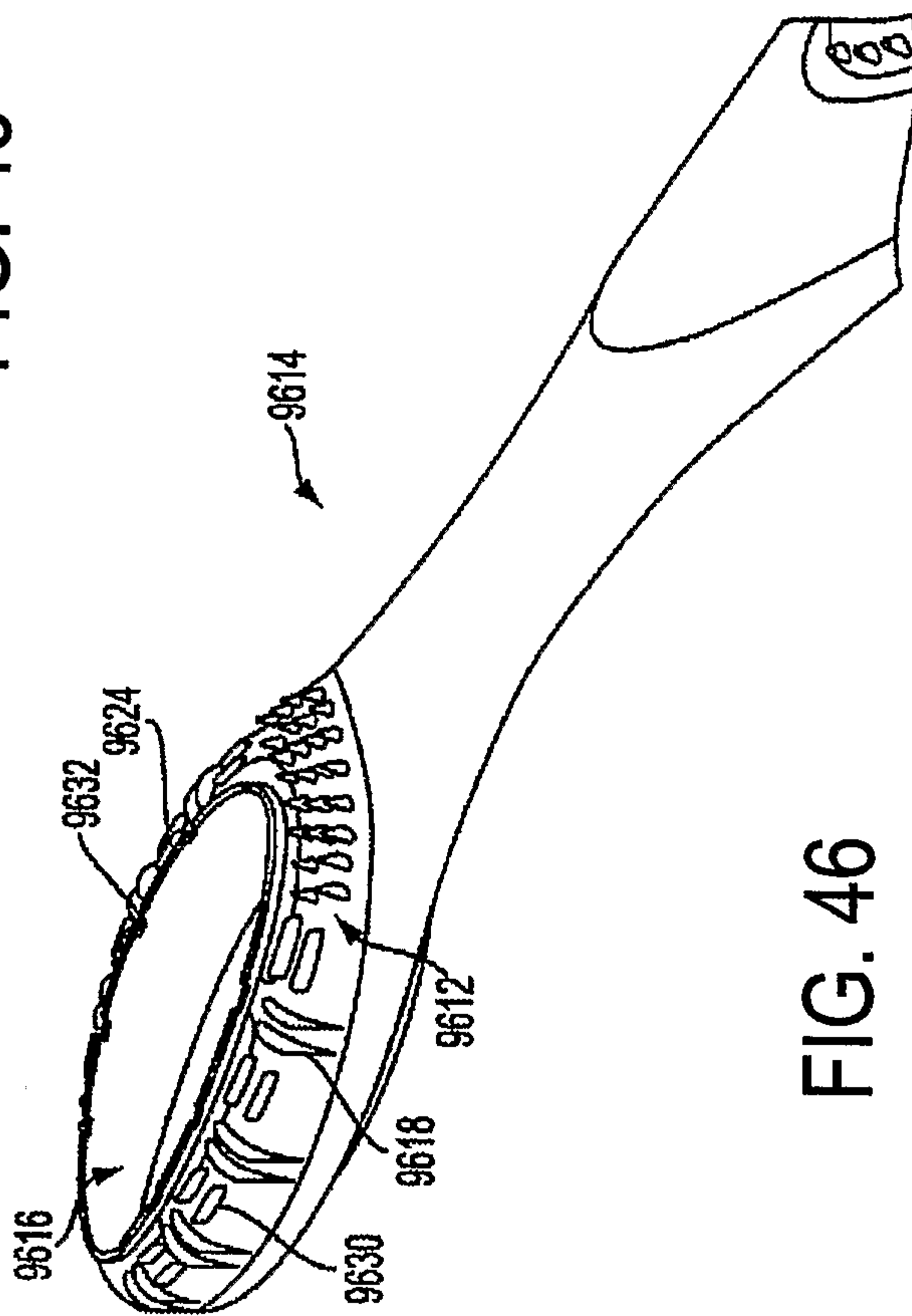


FIG. 46

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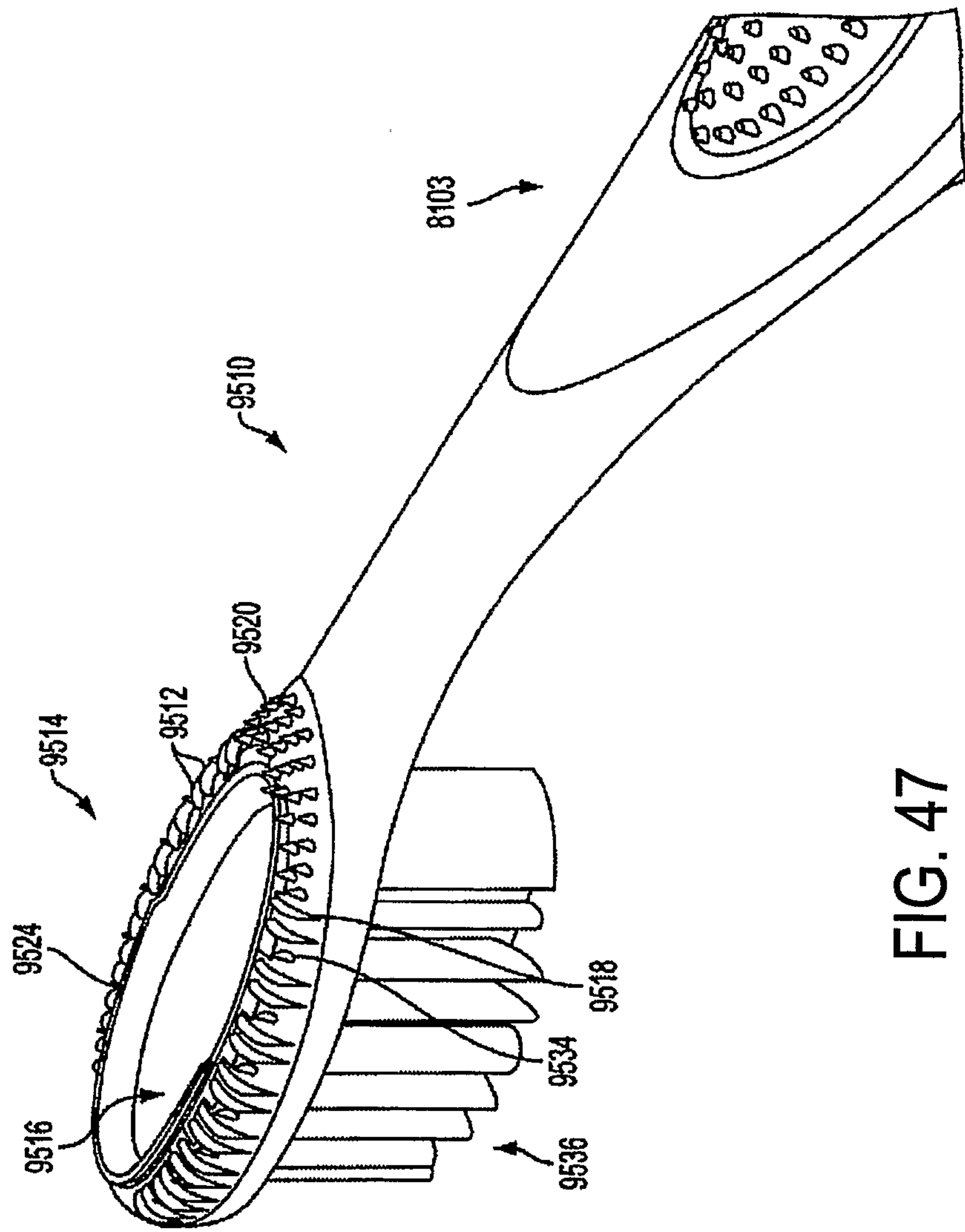


FIG. 47

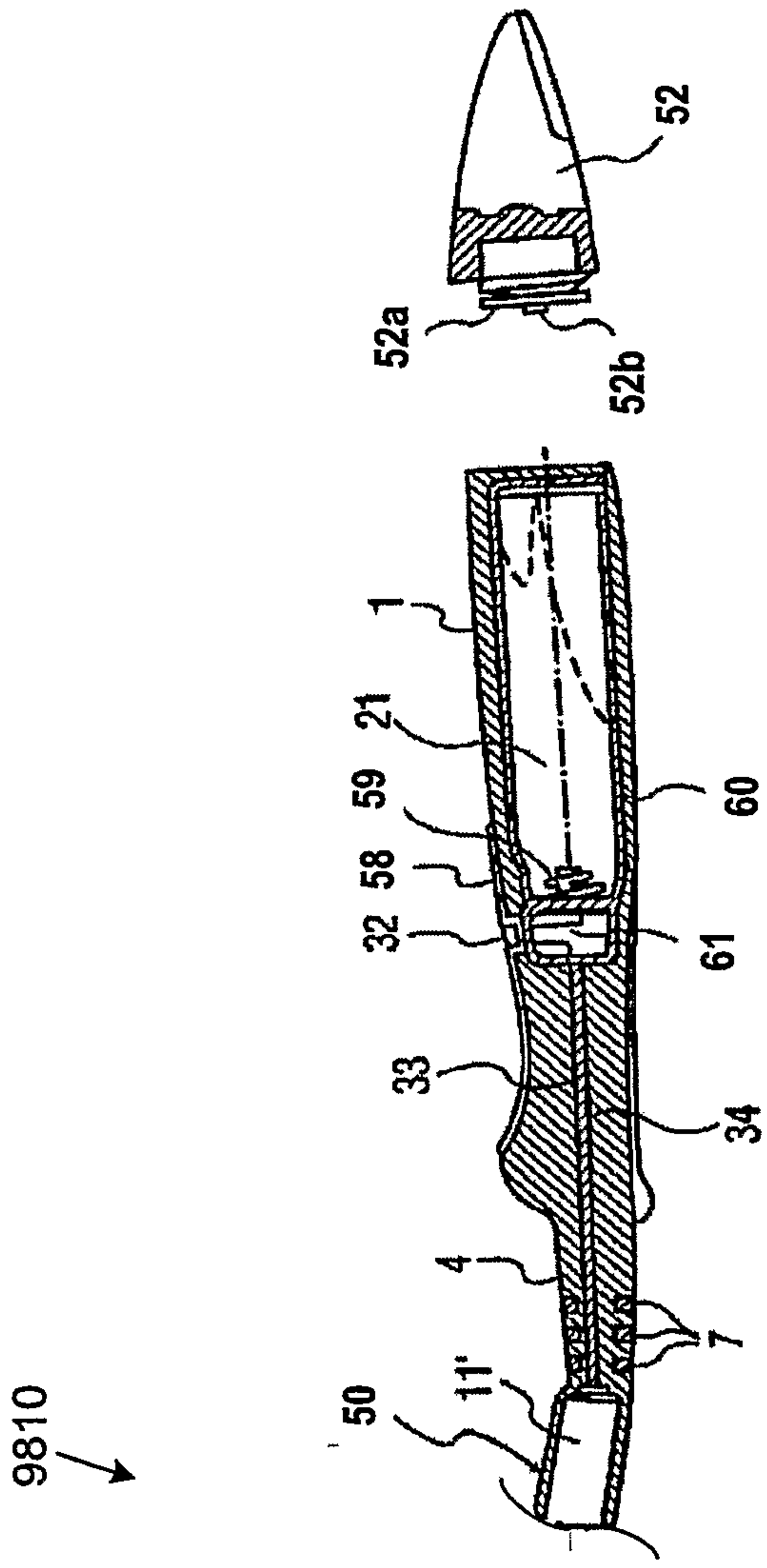


FIG. 48A

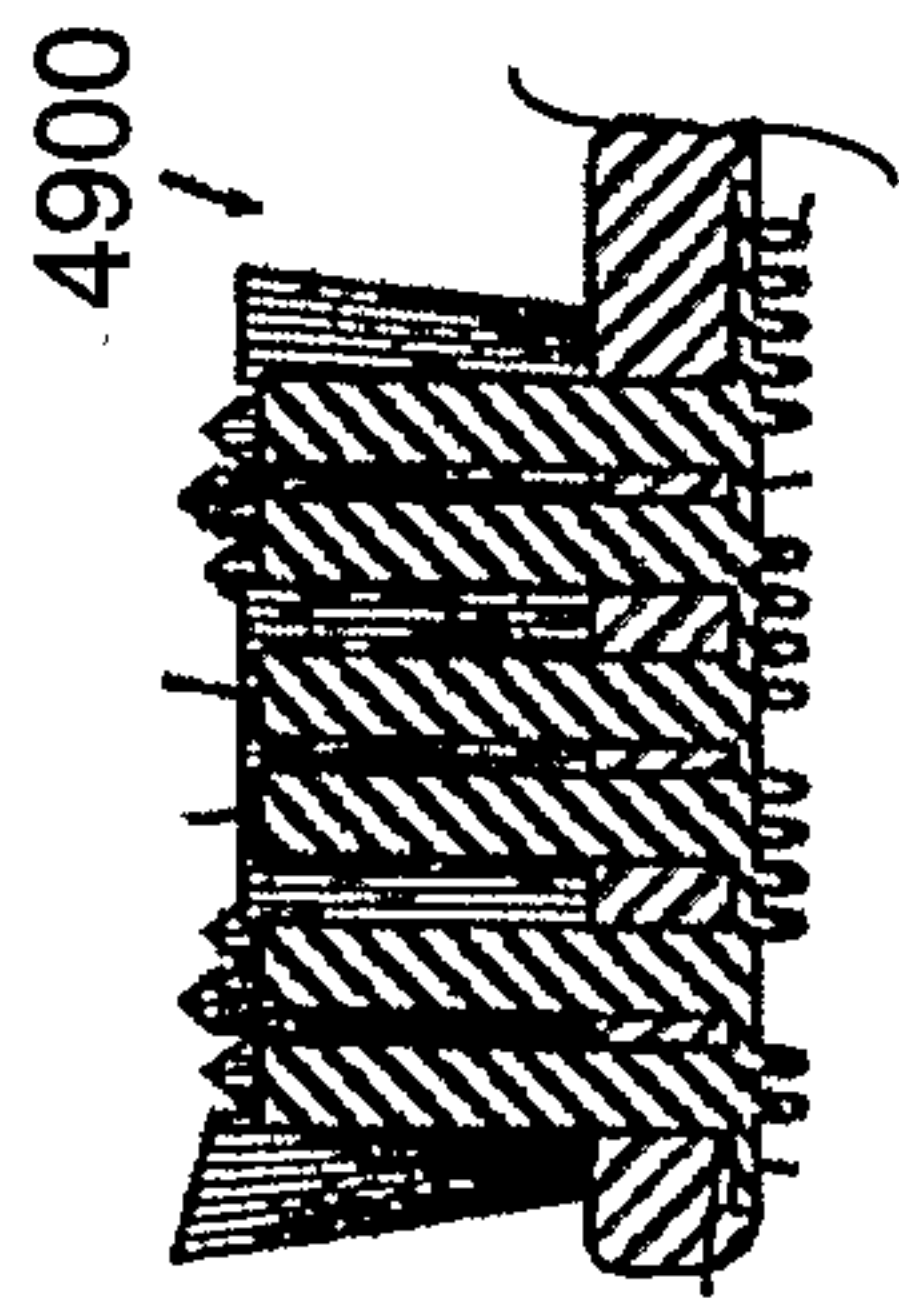


FIG. 48B

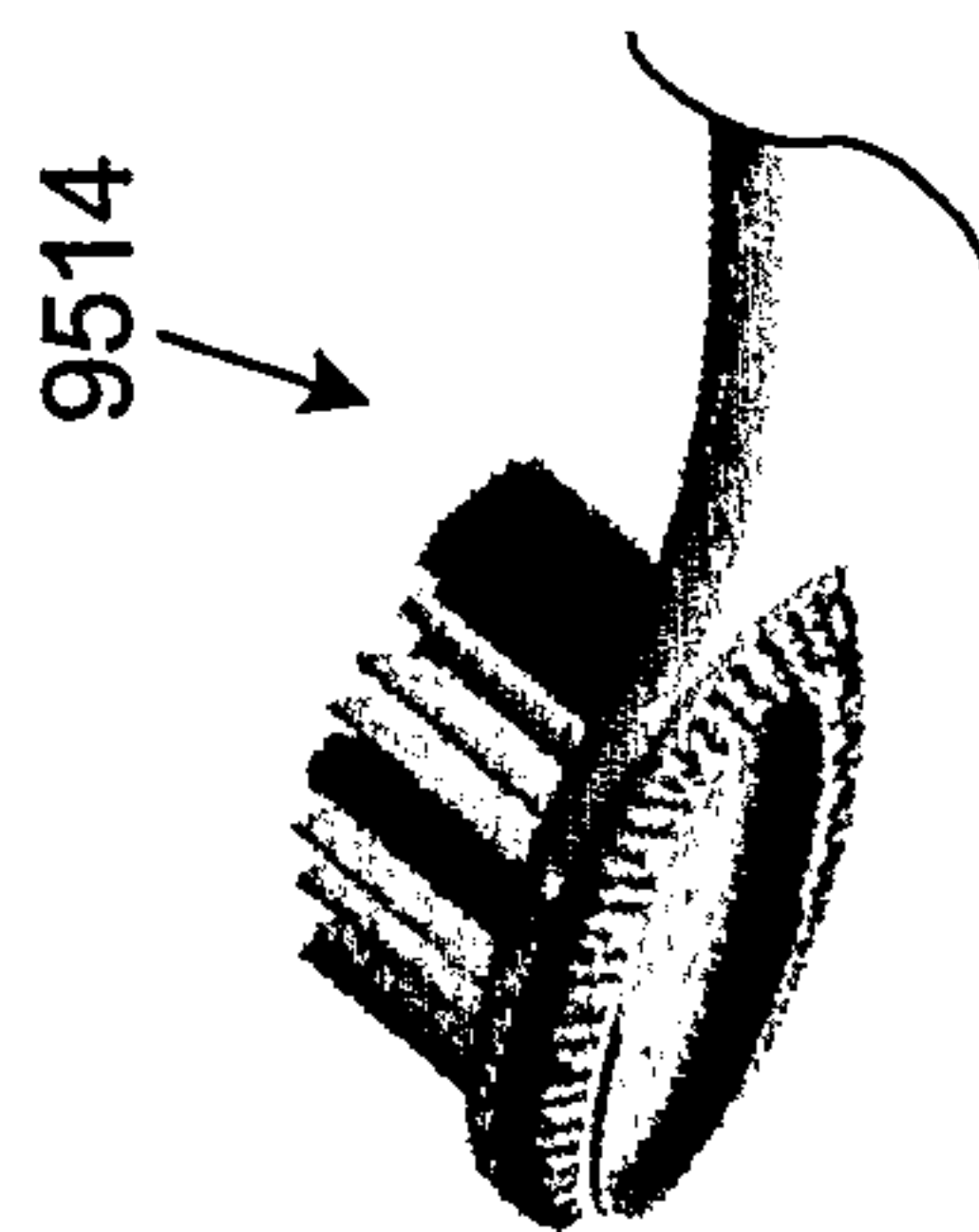


FIG. 48C

