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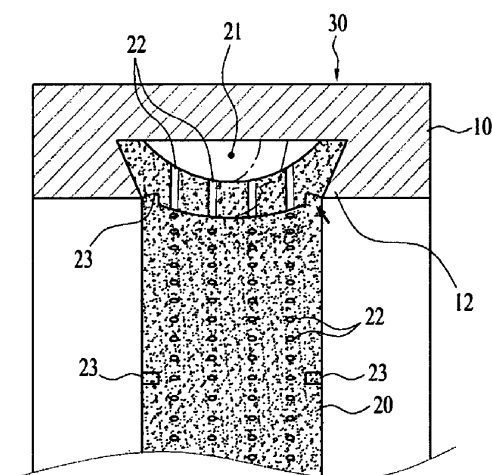
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(54) **INSIDE DIAMETER-ADJUSTABLE RING**

(57) The present invention pertains to an inside diameter-adjustable ring in which the inside diameter of the ring is adjustable, and more specifically, to an inside diameter-adjustable ring which comprises: an outside ring which has coupling grooves formed along the inner surface thereof; and an inside ring which is inserted into said coupling grooves and forms the inside diameter of the ring, wherein: separation prevention ridges are formed in the coupling grooves of said outside ring in order to prevent the inserted inside ring from being taken out; a curved portion which is bent to the inner side is formed along the outer surface of said inside ring, so that an air gap is formed on the inner side by the curved portion when said inside ring is inserted into the coupling grooves; a plurality of holes are formed on said inside ring; minerals which emit anions and far-infrared radiation are contained in said inside ring, and embossed parts are formed on the inner surface of said inside ring such that a consumer is able to extend or reduce the inside diameter of the ring by directly changing only the inside ring if the inside diameter of the ring has a huge difference in size; since said inside ring is made of an elastic rubber or silicon material, a certain change in the degree of size is available even with elasticity thereof without changing said inside ring; physical shock applied from the outside is absorbed into the inside ring by an air cushion generated by said inside ring, whereby a finger on which the ring is worn is protected; the plurality of holes are formed on said inside ring in such a manner that sweat or moisture which remains between the finger and the ring is evaporated through the holes; and since the minerals which emit the anions and the far-infrared radiation are

contained, the invention has a health enhancement function.

[FIG. 1b]



Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of Korean Patent Application No. 10-2010-0061020, filed on June 28, 2010 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to an inside diameter-adjustable ring where the inside diameter of the ring can be adjusted, more particularly, an inside diameter-adjustable ring that comprises an outside ring which has a coupling groove formed along the inner circumferential surface thereof, and an inside ring which is inserted in the coupling groove and defines an inside diameter of the inside diameter-adjustable ring, wherein separation prevention ridges are formed in the coupling groove of the outside ring in order to prevent the inserted inside ring from coming off the groove, and a curved portion bent inward is formed along an outer circumferential surface of the inside ring, so that an air gap is formed on an inner side by the curved portion when the inside ring is inserted in the coupling groove, and a plurality of through holes are formed in the inside ring, and minerals emitting anions or far-infrared radiation are contained in the inside ring, and embossed parts are formed on the inner circumferential surface of the inside ring and a plurality of pressing grooves are formed on inner circumferential edges of the inside ring.

DESCRIPTION OF RELATED ART

[0003] In general, a ring with desired design is selected in a store by a consumer in accordance with the consumer's taste, and the ring is produced and sold with standardized dimension depending on the thickness of the fingers of consumer.

[0004] However, such conventional ring has a problem that since it is standardized in dimension of its inside diameter for its characteristic, it cannot cope with the change of the thickness of the fingers according to the increased or decreased amount of the weight of user, therefore, if the finger becomes thicker the ring may not be worn and if the finger becomes slimmer the ring may idly rotate or easily come off the finger to be lost.

[0005] Furthermore, since conventional ring is produced with standardized dimension, for people having thick joints of fingers, the ring worn barely becomes loose on the finger, thus the wearability of the ring is not good, while for people having slim joints of the fingers, the ring is easily worn, thereby exhibiting a good wearability, but it is concerned that the ring may easily come off the finger to be lost.

[0006] For solving the above-mentioned problems, various solutions have been proposed as in Korean Pat-

ent Registration No. 0906826, Korean U.M. Registration No. 0396514 and Korean U.M. Registration No. 0294179. However, those solutions have problems that their structures for varying the inside diameter are complex and cannot be applied to various types of rings and devices for varying the inside diameter may be broken due to external physical impact, thereby causing an injury to the finger and a period of time for production is much consumed and production cost per unit is also high.

SUMMARY OF THE PRESENT INVENTION

[0007] Therefore, the present invention has been devised in order to solve the above-mentioned problems and it is an object of the present invention to prevent the ring from easily rotating on the finger and easily coming off the finger to be lost by a fact that a coupling groove is formed on an inner circumferential surface of outside ring with an inside diameter of constant dimension and the inside ring is inserted and coupled in the coupling groove, therefore, in the case where the change of dimension of the inside diameter of the ring is large, a consumer can enlarge or reduce the inside diameter of the ring only by replacing the inside ring in person, thus a ring snugly fitting the finger can be worn.

[0008] Furthermore, another object of the present invention is to enable the dimension of the inside diameter of the inside ring to be changed in some degree only due to the elasticity thereof without replacement of the inside ring by a fact that the inside ring is made of elastic rubber or silicone material and to protect the finger with the ring worn thereon by a fact that physical impact applied from the outside can be absorbed by the inside ring by means of an air cushion created by the inside ring.

[0009] Furthermore, yet another object of the present invention is to exhibit a health enhancement function by containing minerals emitting anions or far-infrared radiation in the inside ring.

[0010] In addition, yet another object of the present invention is to provide a ring that may expect an industrial effect by a fact that a structure of the ring is simple, thus very short period of time for production and remarkable reduction of production cost per unit can be achieved through efficient design.

[0011] For achieving the above-mentioned objects, the present invention is characterized in that the inside diameter-adjustable ring comprises an outside ring which has a coupling groove formed along an inner circumferential surface thereof, and an inside ring which is inserted in the coupling groove and defines an inside diameter of the inside diameter-adjustable ring, and separation prevention ridges are formed in the coupling groove of the outside ring in order to prevent the inserted inside ring from coming off the groove.

[0012] Furthermore, the present invention is characterized in that a curved portion bent inward is formed along an outer circumferential surface of the inside ring, so that an air gap is formed on an inner side by the curved

portion when the inside ring is inserted in the coupling groove, and a plurality of through holes are formed in the inside ring, and minerals emitting anions or far-infrared radiation are contained in the inside ring.

[0013] Furthermore, the present invention is characterized in that embossed parts are formed on the inner circumferential surface of the inside ring and a plurality of pressing grooves are formed on inner circumferential edges of the inside ring.

[0014] Furthermore, the present invention is characterized in that a plurality of viewing holes are formed along outer circumferential surface of the outside ring for seeing the inside ring from the outside.

[0015] Furthermore, the present invention is characterized in that the inside ring is constructed in the form of mesh (net).

Effects of the present invention

[0016] As described above, the present invention has an effect that the coupling groove is formed on the inner circumferential surface of outside ring with an inside diameter of constant dimension and the inside ring is inserted in the coupling groove, therefore, in the case where the change of dimension of the inside diameter of the ring is large, a consumer can enlarge or reduce the inside diameter of the ring only by replacing the inside ring in person.

[0017] Furthermore, the present invention has another effect that the inside ring is made of elastic rubber or silicone material, thus the dimension of the inside diameter of the inside ring can be changed in some degree only due to the elasticity thereof without replacement of the inside ring and physical impact applied from the outside can be absorbed by the inside ring by means of an air cushion created by the inside ring, whereby the finger with the ring worn thereon is protected.

[0018] Furthermore, the present invention has yet another effect that a plurality of through holes are formed in the inside ring, whereby sweat or moisture which may remain between the finger and the ring is evaporated through the through holes and the inside ring is made of material such as rubber, silicone etc. harmless to human body and blocks the contact of skin with the outside ring made from metal, thereby overcoming metal allergy to allow people having skin sensitive to the metal to wear a metallic ring, and a health enhancement function is exhibited by containing minerals emitting anions or far-infrared radiation in the inside ring.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

Fig. 1a is a sectional view showing a separated state of an outside ring and inside ring according to the present invention.

Fig. 1b is a sectional view showing a state of the

inside ring being inserted in and coupled to the outside ring according to the present invention.

Figs. 2a - 2g are illustrative views showing constructions of the inside diameter-adjustable ring according to the present invention.

Fig. 3 is a sectional view showing a state of embossed parts being formed on an inner circumferential surface of the inside ring according to the present invention.

Fig. 4 is an illustrative view showing embossed parts formed on the inner circumferential surface of the inside ring according to the present invention.

Fig. 5 is an illustrative view showing viewing holes formed in the outside ring according to the present invention.

Fig. 6 is an illustrative view showing the inside ring constructed in the form of mesh (net) according to the present invention.

MODE FOR CARRYING OUT THE INVENTION

[0020] For achieving the above-mentioned objects, the present invention will be described in detail with reference to the attached exemplary drawings as follows.

[0021] The inside diameter-adjustable ring comprises an outside ring (10) which has a coupling groove (11) formed along the inner circumferential surface thereof; and an inside ring (20) which is coupled in the coupling groove (11) and defines an inside diameter of the ring (30).

[0022] In this connection, separation prevention ridges (12) are formed in the coupling groove (11) of the outside ring (10) in order to prevent the inserted inside ring (20) from coming off the groove.

[0023] Furthermore, a curved portion bent inward is formed along an outer circumferential surface of the inside ring (20), so that an air gap (21) is formed on an inner side by the curved portion when the inside ring (20) is inserted in the coupling groove (11).

[0024] Furthermore, a plurality of through holes (22) may be formed in the inside ring (20), and minerals which emit anions or far-infrared radiation may be contained in the inside ring (20).

[0025] A plurality of pressing grooves (23) may be formed on inner circumferential edges of the inside ring (20).

[0026] Furthermore, embossed parts (24) may be formed on the inner circumferential surface of the inside ring (20).

[0027] In addition, a plurality of viewing holes (13) are formed along outer circumferential surface of the outside ring (10) for seeing the inside ring (20) from the outside.

[0028] Furthermore, the inside ring may be constructed in the form of mesh (net).

[0029] In the following, the detailed construction and example of the present invention will be described with reference to the drawings.

[0030] The outside ring (10) according to the present

invention is produced by casting and the inside ring (20) is injection-molded. First, a process of producing the outside ring (10) will be described as follows.

[0031] In a first step, a design of a ring to be produced is planned and drawn.

[0032] Then, in a second step, a mold is produced with particular resin.

[0033] Then, in a third step, the mold produced in the second step is divided into two equal parts, and inner surface of the halved mold is then shaped in intaglio according to the design of the ring drawn in the first step.

[0034] Furthermore, in a fourth step, the mold shaped in the third step is fixed in such a manner that the cut sections are joined, and thereafter, molten liquid paraffin is injected into the interior of the shaped mold.

[0035] Then, in a fifth step, drying is carried out so that the paraffin injected in the fourth step is cured, and if the paraffin is cured, the mold is divided again into the two equal parts to extract a paraffin model molded in the interior of the mold.

[0036] Furthermore, in a sixth step, gypsum is applied onto the paraffin model extracted in the fifth step to obtain a gypsum mold.

[0037] In a seventh step, the gypsum mold obtained in the sixth step is heated to melt the paraffin accommodated inside the gypsum mold and thereafter discharge the same outward.

[0038] Then, in an eighth step, molten liquid metal is injected into the interior of the gypsum mold that has been previously occupied by the paraffin discharged in the seventh step.

[0039] Furthermore, in a ninth step, the molten liquid metal which was injected into the interior of the gypsum mold in the eighth step is cooled.

[0040] In a tenth step, the gypsum mold with a metal casting cooled therein is separated to extract the ring formed in the gypsum mold.

[0041] Then, in an eleventh step, the ring which has been extracted from the gypsum mold in the tenth step is lustrously processed.

[0042] In the following, a process of producing the inside ring (20) will be described.

[0043] First, in a first step, the inside ring is designed based on the design of the outside ring, and an injection mold is designed accordingly.

[0044] Then, in a second step, the injection mold designed in the first step is produced.

[0045] In a third step, the injection mold is mounted on an injection molding machine to produce the inside ring.

[0046] The ring of the present invention produced by the above-described processes comprises the outside ring (10) with a fixed inside diameter and the inside ring (20) coupled with the outside ring (10) to define the inside diameter, as illustrated in Figs. 1a and 1b, wherein the coupling groove (11) of "□" shape is formed in the outside ring (10) along the inner circumferential surface thereof, and the separation prevention ridges (12) are formed in the coupling groove (11) in order to prevent the inserted

inside ring (20) from coming off the groove.

[0047] In other words, the coupling groove (11) is formed so as to be widened as going deeply into the groove, thus the separation prevention ridges (12) of acute angle are formed on lateral surfaces of the coupling groove (11), respectively. Therefore, if the inside ring is inserted and coupled in the coupling groove (11), the inside ring (20) is prevented from coming off the groove by the separation prevention ridges (12).

[0048] Thus, the inside ring (20) is inserted in the coupling groove (11) of the outside ring (10) to define the inside diameter of the ring (30), and the inside ring is made of material such as silicone, rubber etc. harmless to human body and blocks the contact of skin with the outside ring made from metal, thereby overcoming metal allergy to allow people having skin sensitive to the metal to wear a metallic ring.

[0049] Furthermore, the inside ring (20) defining the inside diameter of the ring (30) is made of rubber, silicone etc. harmless to human body and may have a plurality of through holes (22) enabling sweat or moisture which may remain on the finger with the ring (30) worn thereon to be easily discharged/evaporated by ventilating action.

[0050] Furthermore, as illustrated in Fig. 5, the viewing holes (13) penetrating the outside ring (10) from its outer circumferential surface to inner circumferential surface are formed along the outer circumferential surface, whereby the ventilation action is enhanced and the inside ring (20) can be seen from the outside as well.

[0051] In this connection, by coloring the inside ring (20) with a variety of colors to mount it on the inner circumferential surface of the outside ring (10), the colored inside ring (20) can be seen through the viewing holes (13) of the outside ring (10) and thus more pronounced esthetic feeling can be presented.

[0052] Furthermore, the inside ring (20) may have a function of enhancing the health of human body by containing minerals emitting anions or far-infrared radiation (silver, tourmaline, charcoal, ceramic, jade, magnet etc.). Before the inside ring (20) made of rubber or silicone is formed, the minerals are mixed in the form of powder with the rubber or silicone to form the inside ring (20), and thus this inside ring (20) can have a function of emitting anions or far-infrared radiation. Alternatively, the minerals emitting the anions or far-infrared radiation (silver, tourmaline, charcoal, ceramic, jade, magnet etc.) is processed in a pre-determined form and is then plurally joined on the inner circumferential surface or circumferential edges of the inside ring (20), whereby decoration effect and a function of emitting the anions or far-infrared radiation can be provided to the inside ring.

[0053] Therefore, with the above-described construction, any person having an allergy to metal whose skin is sensitive to metal can also wear the ring without any worry as allergy reaction to metal never occurs since the outside ring (10) made from the metal and the skin sensitive to the metal are spaced apart from each other by the non-metallic inside ring (20).

[0054] Moreover, the inside ring (20) may have pigment of various colors incorporated therein or be painted with various colors, thereby exhibiting a color conforming to consumer's taste, and marks, logs, initials, text etc. may be expressed in intaglio or relief on a surface of the inside ring (20).

[0055] Furthermore, a curved portion protruded outward is formed on the inner circumferential surface of the inside ring (20), thereby minimizing frictional resistance between the finger and the inside ring (20) when the ring is worn on or released from the finger. A protrusion degree of the curved portion may be differently set depending on the dimension of inside diameter.

[0056] In other words, for greatly reducing the inside diameter of the ring (30), the inside ring (20) with the curved portion greatly protruded is inserted in and coupled to the outside ring (10), while for relatively insignificantly reducing the inside diameter, the inside ring (20) with the curved portion relatively insignificantly protruded is inserted in and coupled to the outside ring (10).

[0057] Furthermore, a curved portion bent inward is formed along the outer circumferential surface of the inside ring (20), and thus an air gap (21) is formed on an inner side by the curved portion when the inside ring (20) is inserted in the coupling groove (11), thereby providing a buffering action and preventing external physical shock from being transferred to the finger.

[0058] Furthermore, pressing grooves (23) are formed on inner circumferential edges of the inside ring (20), which grooves are compressed when the inside ring (20) is released from the outside ring (10), and thus the inside ring (20) is bent toward one side to thereby easily depart from the coupling groove (11).

[0059] In this connection, the pressing grooves (23) may be plurally formed on the inner circumferential edges of the inside ring (20) at a constant interval or may be continuously formed along the inner circumferential edges.

[0060] Furthermore, as illustrated in Fig. 3, embossed parts (24) are formed on the inner circumferential surface of the inside ring (20) to reduce the frictional resistance when the ring is worn on or released from the finger and minimize contact area between the finger and ring, whereby ventilation can be easily achieved and thus sweat or moisture remaining on the finger can be easily evaporated.

[0061] Furthermore, according to another example of the present invention, the through holes (22) and embossed parts (24) may be formed alternately on the inner circumferential surface of the inside ring (20), whereby the ventilation may be achieved and a massaging effect on the finger by the embossed parts (24) may be provided as well.

[0062] In addition, as illustrated in Fig. 6, the inside ring may be constructed in the form of mesh(net) whereby the contact between the inside ring and the skin is minimized and thus the function of evaporating the sweat or moisture remaining on the finger can be enhanced.

[0063] Furthermore, in the case of the ring according to the present invention, the inside ring (20) can be easily separated from the outside ring (10), thus by separately washing only the inside ring (20) with water, hygienic wearing of the ring is possible.

[0064] As illustrated in Figs. 2a to 2h, the present invention is applicable to various types of rings such as plain ring, man's ring, wedding ring, stone ring etc..

[0065] Therefore, only by coupling the inside ring (20) to the outside ring (10) according to the present invention, the ring (30) snugly fitting the finger can be worn, and thus the ring is prevented from easily rotating about the finger and easily coming off the finger to be lost.

[0066] Furthermore, even if the finger and its joint have some difference from each other in thickness, the difference can be overcome, thereby providing a ring excellent in wearability.

[0067] As above, the present invention has been illustrated and described with respect to preferred examples of the present invention, but the present invention is not limited to the above-described examples and various modifications may be made without departing from the spirit of the invention as defined by the claims of the present invention, and such modifications also fall within the claims.

Industrial applicability

[0068] In the inside diameter-adjustable ring according to the present invention, the coupling groove is formed on the inner circumferential surface of the outside ring with an outer diameter of constant dimension and the inside ring is inserted in the coupling groove, therefore, an advantage is obtained that in the case where change of dimension of the inside diameter of the ring is large, a consumer can enlarge or reduce the inside diameter of the ring only by replacing the inside ring in person, thus industrial applicability is present.

Claims

1. An inside diameter-adjustable ring comprising:

an outside ring which has a coupling groove formed along an inner circumferential surface thereof; and

an inside ring which is coupled in the coupling groove and defines an inside diameter of the inside diameter-adjustable ring.

2. The inside diameter-adjustable ring according to claim 1, wherein separation prevention ridges are formed in the coupling groove of the outside ring in order to prevent the inserted inside ring from coming off the groove.

3. The inside diameter-adjustable ring according to

claim 1, wherein a curved portion bent inward is formed along an outer circumferential surface of the inside ring, so that an air gap is formed on an inner side between the inside ring and outside ring by the curved portion when the inside ring is inserted in the coupling groove. 5

4. The inside diameter-adjustable ring according to claim 1, wherein a plurality of through holes is formed in the inside ring. 10
5. The inside diameter-adjustable ring according to claim 1, wherein minerals emitting anions or far-infrared radiation are contained in the inside ring. 15
6. The inside diameter-adjustable ring according to claim 1, wherein pressing grooves are formed on inner circumferential edges of the inside ring.
7. The inside diameter-adjustable ring according to claim 1, wherein embossed parts are formed on the inner circumferential surface of the inside ring. 20
8. The inside diameter-adjustable ring according to claim 1, wherein a plurality of viewing holes are formed along outer circumferential surface of the outside ring for seeing the inside ring from the outside. 25
9. The inside diameter-adjustable ring according to claim 1, wherein the inside ring is constructed in the form of mesh (net). 30

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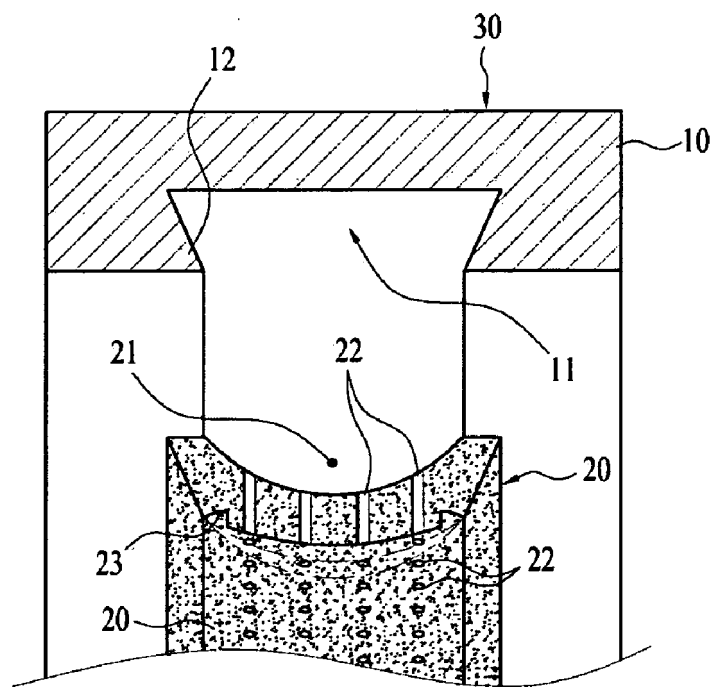
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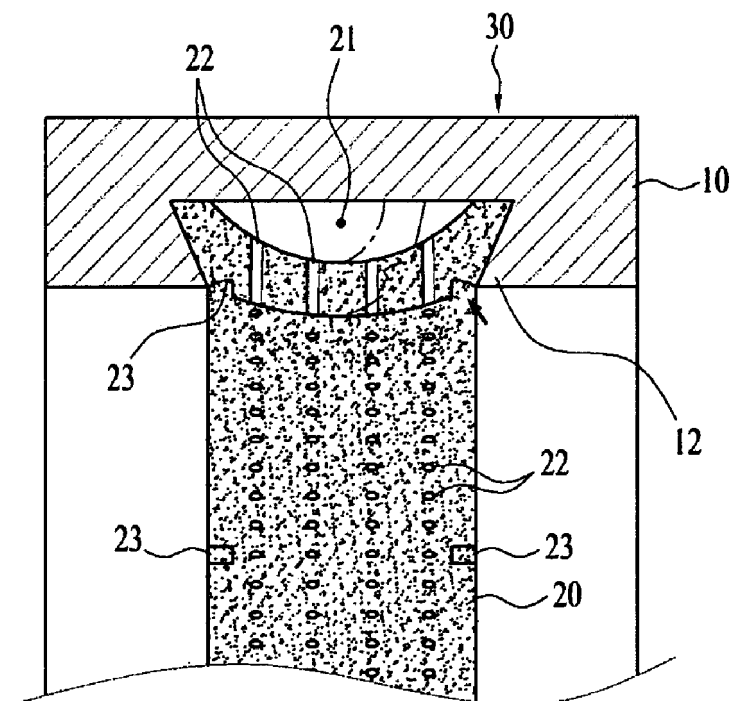
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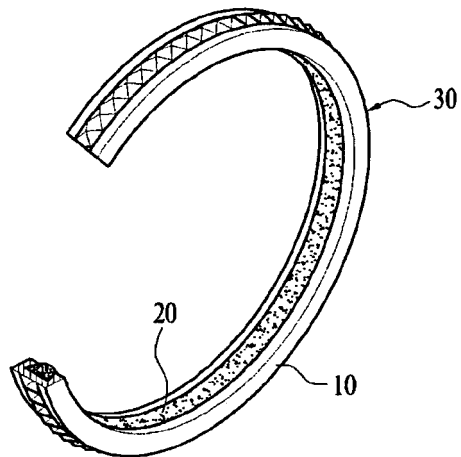
[FIG. 1a]



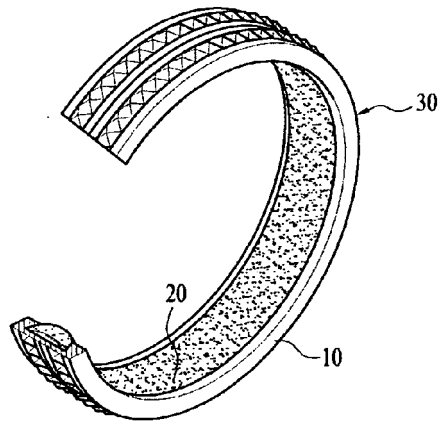
[FIG. 1b]



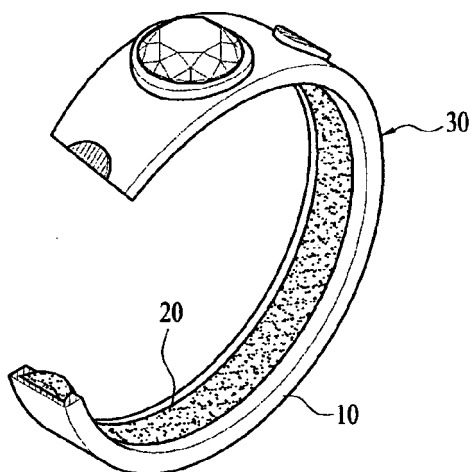
[FIG. 2a]



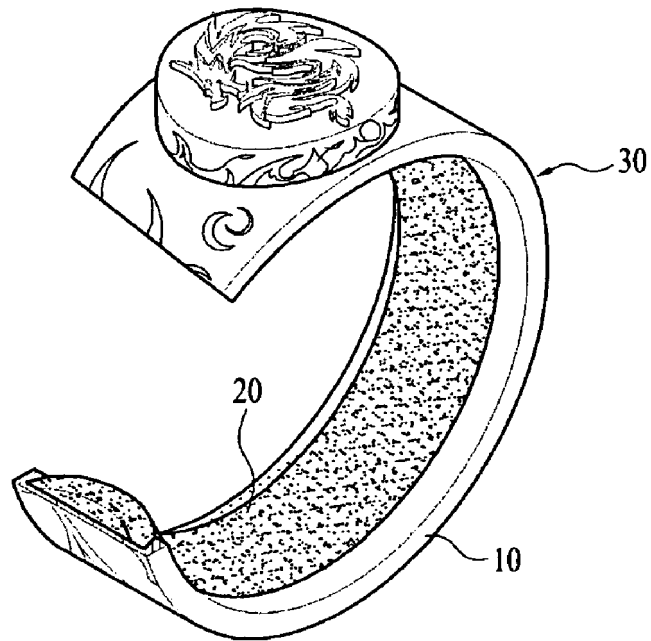
[FIG. 2b]



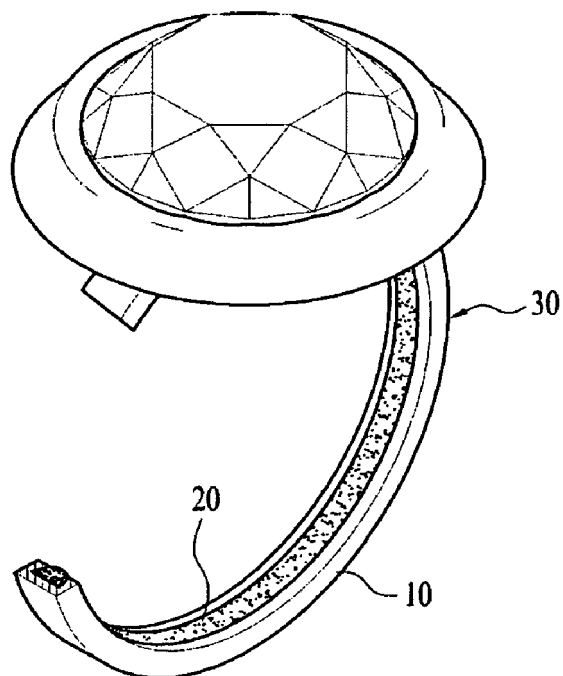
[FIG. 2c]



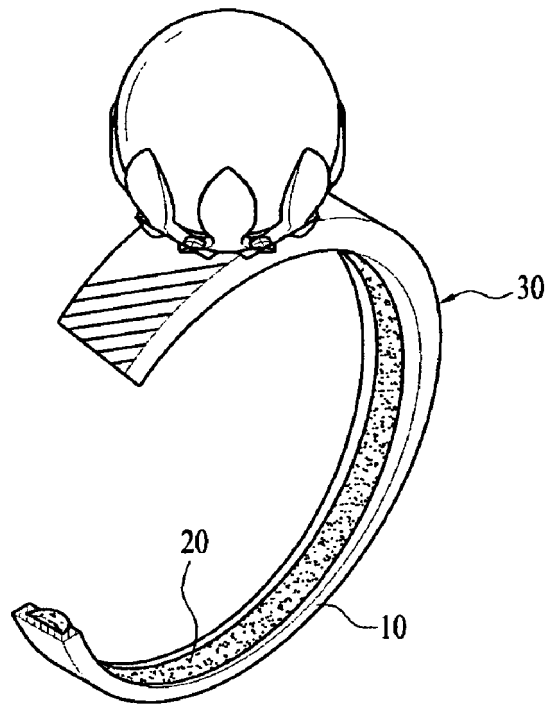
[FIG. 2d]



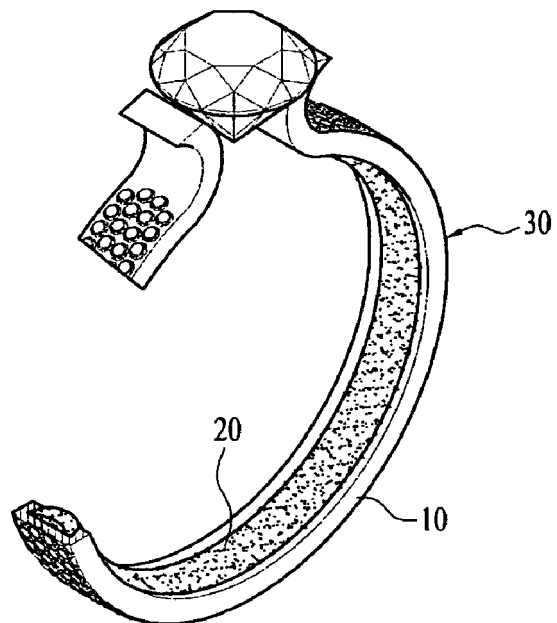
[FIG. 2e]



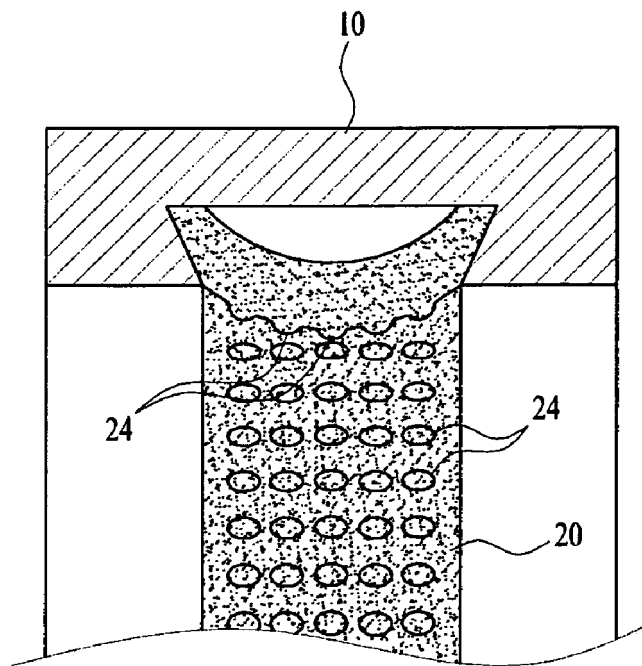
[FIG. 2f]



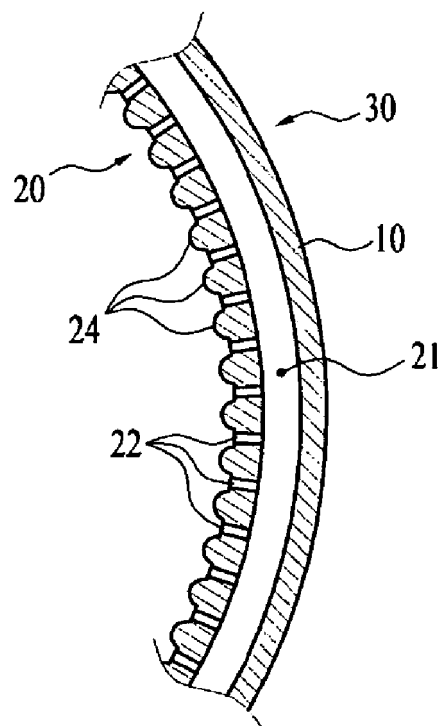
[FIG. 2g]



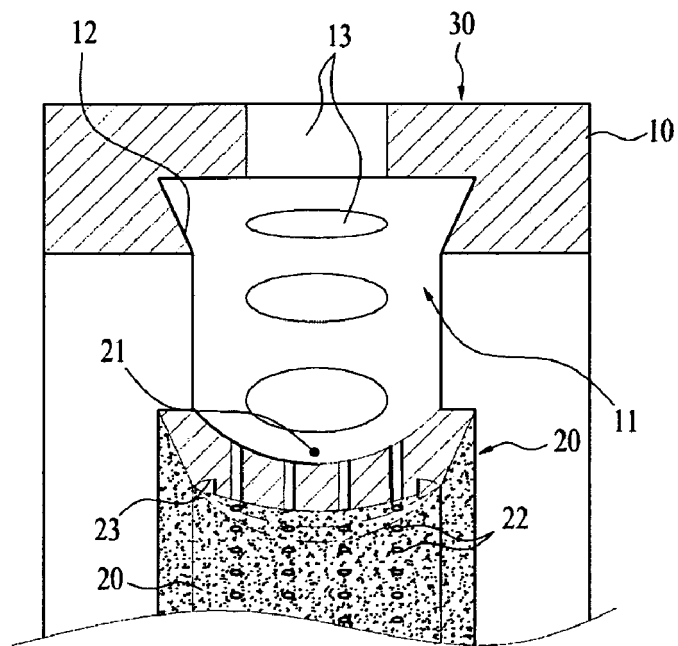
[FIG. 3]



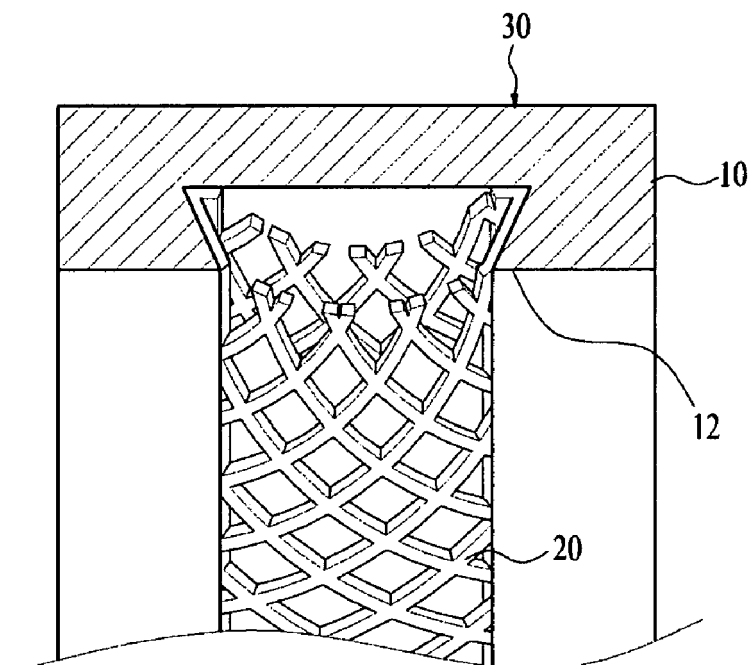
[FIG. 4]



[FIG. 5]



[FIG. 6]



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 1020100061020 [0001]
- KR 0906826 [0006]
- KR 0396514 [0006]
- KR 0294179 [0006]