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(72) Inventor: **HIRATA, Yoshihiro,**
c/o Phild Co., Ltd.
Nakagyoku,
Kyoto city,
Kyoto 6048152 (JP)

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(71) Applicant: **Phild Co., Ltd.**
Kyoto city, Kyoto 604-8152 (JP)

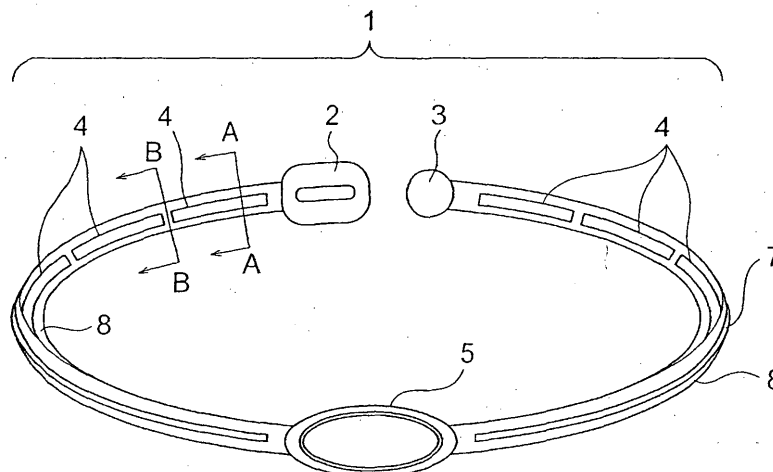
(74) Representative: **Vossius & Partner**
Siebertstrasse 4
81675 München (DE)

(54) **HEALTH JEWELRY UTILIZING SILICONE ELASTOMER AND PROCESS FOR PRODUCING THE SAME**

(57) The present invention provides a body accessory which can be formed into a ring shape, comprising a silicone elastomer body having a silicone elastomer layer mixed with fine titanium powder, which contains titanium powder obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure water, fusing metallic titanium using the resultant burning gas and precipitating the product in water at least as a major component, on the skin contacting side and the silicone elastomer decorative continuous protrusion on the exterior side. The present invention also provides a process for manufacturing the body accessory, which comprises a silicone

elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a silicone elastomer decorative continuous protrusion on the exterior side and can be made into a ring, said process comprising the first step of forming a continuous concavity on a silicone elastomer accessory body; the next step of embedding a silicone elastomer layer containing fine titanium powder; the further step of separately forming a silicone elastomer decorative continuous protrusion; and the final step of placing the accessory body thus obtained on said decorative continuous protrusion and curing with heat for integration.

FIG. 1



Description

Field of the Invention

[0001] The present invention relates to a body accessory containing fine titanium powder which is worn on various parts of the body to promote health and to a process for manufacturing the same.

The body accessory of the present invention can be formed into a ring shape and used as it is, or alternatively, a multiple number of the body accessories are connected to form a ring shape when a certain length is required.

Background Technology

[0002] Conventionally, in manufacturing accessories, metal materials have been used and formed into projected shapes by means of pressing process, scraping process, grinding process, and the like. However, the design of accessories has become diversified and so the shapes of accessories have become more complicated, which makes it difficult to obtain projected shapes by conventional means and causes many problems in mass production. A process for manufacturing a sintered body for accessories such as watchcases and earrings by a metal powder injection method has also been known (Japanese Patent Application Laid-open No. 1997-53159). Also, accessories having a blood circulation stimulating effect by magnet has been known, in which fine magnetic powder is blended into a raw material which is not limited to a metal and can be synthetic resin, rubber and the like (Registered Japanese Utility Model No. 3068758). Use of rubber and a synthetic resin as a material for forming ornamental accessories has been known; for example, accessories obtained by admixing shell powder or calcium carbonate into a thermo-plastic synthetic resin material such as an acrylic resin and subjecting to an injection molding process has been known (Japanese Patent Application Laid-open 1980-7456).

[0003] On the other hand, a molding method using a silicone rubber material has been known and is relatively new as compared to molding methods using other rubber materials, which include a process for manufacturing a silicone rubber patterned accessory in which a thin silicone rubber patterned sheet piece is arranged on a thick uncured silicone rubber sheet (Japanese Patent Application Laid-open No. 1988-57211); a process for manufacturing a cloth swimming cap in which liquid silicone rubber is previously injected into a mold and then a cloth sheet is placed on the top for integration into a product with an excellent three-dimensional design (Japanese Patent Application Laid-open 1990-279312); a method in which silicone rubber is filled into a first mold and a second mold and integrated with an interior accessory such as an electronic part in between (Japanese Patent Application Laid-open No. 1993-261744); a process for manufacturing a formed product comprising silicone rubber (milleable gum) and a material for dresses and their

ornaments (Japanese Patent Application Laid-open No. 1999-46810); and a process for manufacturing clothes and bags in which a silicone rubber sheet is cut in line with a mold (Japanese Patent Application Laid-open No. 2000-317966).

[0004] Further, methods for manufacturing personal ornaments using a silicone rubber material have also known, which include a process for manufacturing a multicolored pressed product such as a bracelet, an anklet, and a necklace in which multiple beads with various colors are placed into a silicone rubber ring in a mold (Japanese Patent Application Laid-open No. 2000-340855).

Since abovementioned conventional methods for manufacturing products with complicated shapes using metal materials are complicated and troublesome, technology for the production of body accessories with projected shapes in a simple manner has been desired. In the present invention, body accessories can easily be manufactured by using a silicone elastomer material.

[0005] Patent Reference No. 1: Japanese Patent Application Laid-open No. 1997-053159

Patent Reference No. 2: Registered Japanese Utility Model No. 3068758

Patent Reference No. 3: Japanese Patent Application Laid-open No. 1980-007456

Patent Reference No. 4: Japanese Patent Application Laid-open No. 1988-057211

Patent Reference No. 5: Japanese Patent Application Laid-open No. 1990-279312

Patent Reference No. 6: Japanese Patent Application Laid-open No. 1993-261744.

Patent Reference No. 7: Japanese Patent Application Laid-open No. 1999-046810

Patent Reference No. 8: Japanese Patent Application Laid-open No. 2000-317966

Patent Reference No. 9: Japanese Patent Application Laid-open No. 2000-340855

DISCLOSURE OF THE INVENTION

Problems that the Invention Attempts to Solve

[0006] An objective of the present invention is to provide body accessories which are ornamental, have soft and transparent feeling, which have not been obtainable with conventional body accessories formed using a mixture of plastic and metal, plastic and plastic, or synthetic leather and rubber as a raw material, and are more effective in promoting health than conventional accessories containing a magnet.

Means to Solve the Problems

[0007] The present invention is basically characterized by the following structures.

(1) A body accessory which can be formed into a

ring shape, comprising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a silicone elastomer decorative continuous protrusion on the exterior side.

(2) The body accessory described in (1) above, characterized in that the silicone elastomer layer mixed with fine titanium powder is formed by using a mold or by coating with a solvent solution containing silicone elastomer mixed with fine titanium powder.

(3) The body accessory described in (1) above, characterized in that it is selected from a necklace, a wristband, and a hair band.

(4) The body accessory described in (1), (2), or (3) above, characterized in that a fine titanium powder obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure water, fusing metallic titanium using the resultant burning gas and precipitating the product in water is used at least as a major component, as the fine titanium powder.

(5) A process for manufacturing a body accessory comprising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a silicone elastomer decorative continuous protrusion on the exterior side, characterized in that it comprises the first step of forming a continuous concavity on a silicone elastomer accessory body; the second step of embedding a silicone elastomer layer containing fine titanium powder obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure water, fusing metallic titanium using the resultant burning gas and precipitating the product in water at least as a major component, onto said continuous concavity; the third step of separately forming a silicone elastomer decorative continuous protrusion, and the fourth step of placing the accessory body obtained in the second step on said decorative continuous protrusion and curing with heat for integration.

(6) A process for manufacturing a body accessory comprising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a silicone elastomer decorative continuous protrusion on the exterior side, characterized in that the silicone elastomer decorative continuous protrusion is first formed, the accessory body is placed on said decorative continuous protrusion and cured with heat for integration, and then a solvent solution containing silicone elastomer mixed with the abovementioned fine titanium powder is coated onto the product.

Effectiveness of the Invention

[0008] The present invention has established an inexpensive process for manufacturing a stable product which can be bent and also be decorative, in which a health-promoting body accessory is made with silicone

elastomer mixed with fine titanium powder. When worn on the body, this body accessory stimulates an acupuncture point or an affected part thereby promoting blood circulation, which brings effects such as healing of shoulder ache or muscle ache.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

[Fig. 1] A perspective view of a silicone elastomer body accessory manufactured by a production method according to the present invention.

[Fig. 2] A cross-sectional view taken on line A-A of Fig. 1.

[Fig. 3] A cross-sectional view taken on line B-B of Fig. 1.

[Fig. 4] The first step (step of forming the accessory body).

[Fig. 5] A cross-sectional view of the accessory body.

[Fig. 6] The second step (step of forming a layer containing titanium powder).

[Fig. 7] A cross-sectional view of the accessory body containing the layer containing titanium powder.

[Fig. 8] The third step (step of forming a decorative continuous protrusion).

[Fig. 9] The fourth step (final step of forming the accessory).

[Fig. 10] An enlarged cross-sectional view of the accessory body.

Explanation of the Numbers

[0010]

1. Accessory (necklace)
2. Joint for hooking (small hole)
3. Joint for hooking (small ball)
4. Layer containing titanium powder
5. Indicating part
6. Concave part of first lower mold
7. Decorative continuous protrusion
8. Accessory body
9. Lower mold
10. Upper mold
11. Upper mold
12. Lower mold
13. Upper mold
14. Mold: first upper part
15. Mold: second upper part
16. Upper mold upper part
17. Upper mold upper part
- 17'. Upper mold upper part
18. Concave part of second lower mold

BEST MODE FOR CARRYING OUT THE INVENTION

[0011] In the present invention, a body accessory com-

prising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a silicone elastomer decorative continuous protrusion on the exterior side is manufactured. The silicone elastomer layer mixed with fine titanium powder, the silicone elastomer decorative continuous protrusion, and the silicone elastomer accessory body can be formed using extrusion molding, injection molding, or compression molding; however, it is suitable to use a compression molding method using a mold.

Namely, in the present invention, a silicone elastomer accessory is formed by compression molding, which comprises the first step of forming a continuous concavity on a silicone elastomer accessory body; the second step of embedding a silicone elastomer layer containing fine titanium powder into said continuous concavity; the third step of separately forming a silicone elastomer decorative continuous protrusion; and the fourth step of placing the accessory body obtained in the second step on said decorative continuous protrusion and curing with heat for integration.

Further, an alternative method of the present invention can comprise first the step of forming a silicone elastomer decorative continuous protrusion, which corresponds to the abovementioned third step, the step of placing the silicone elastomer body on the obtained decorative continuous protrusion for integration, which corresponds to the abovementioned fourth step, and then the step of coating a part of the silicone elastomer body with a silicone elastomer solvent solution mixed with fine titanium powder in a belt-like fashion. However, when the layer containing fine titanium powder is provided by this coating method, it is difficult to precisely control the coating area, and moreover, the coated layer may peel off resulting from abrasion, which results in poor durability as compared to the product by the abovementioned method. However, there is no difference in action and effectiveness of the resulting products between the abovementioned compression method and the coating method.

[0012] A silicone elastomer to be used in the present invention is not particularly limited and any organic silicon polymer having a siloxane bond can be used as long as it has rubber-like properties.

Further, fine powder titanium obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure water and heating metallic titanium using the resultant burning gas to reduce it to powder (Japanese Patent No. 3507063) is appropriately used as titanium powder to be mixed with a silicone elastomer, at least as a major component. This is because the fine titanium powder obtained by this method does not contain products such as byproducts and impurities and the metal powder thus obtained has excellent uniformity in its spheroidal shape and high homogeneity in the size of the powder particles and is economically produced.

[0013] Other titanium powders to be used mixed with the abovementioned fine titanium powder can be any powders of compounds containing titanium atoms. For

example, minerals such as rutile, brookite, and octahedrite can be used. Further, as titanium alloy powders, powders of alloys of titanium with metals such as copper, tin, iron, aluminium, chromium, cobalt, molybdenum, and tungsten can be used. Examples of the powders of titanium alloys include powders of Ti-Al, Ti-V, Ti-Mo, Ti-Cr, Ti-Mn, Ti-Fe, Ti-Al-Cr, and Ti-Cr-Fe-O; the composition ratio of each alloy powder can be appropriately selected.

[0014] Further, powders of titanium compounds can be used, which include powders of hydrides such as TiH_2 and TiH_4 ; oxides such as TiO , Ti_2O_3 , TiO_2 , $\text{Ti}(\text{OH})_2$, $\text{Ti}(\text{OH})_3$, and M_2TiO_3 (M is a metal atom); sulfides such as TiS , Ti_2S_3 , and TiS_2 ; oxyacid salts such as $\text{Ti}_2(\text{SO}_4)_3$, $\text{Ti}(\text{SO}_4)_2$, and TiP_2O_7 ; boron compounds such as Ti_2B , TiB , TiB_2 , and Ti_2B_5 ; titanium carbide composed of (TiC); silicone compounds such as TiSi_2 , TiSi , and Ti_5Si_3 ; nitrides such as TiN , Ti_3N_4 , Ti_3N_6 , and Ti_5N_6 ; phosphorus compounds such as TiPn ; titanium halides such as TiCl_2 , TiCl_3 , TiCl_4 , TiBr_2 , TiBr_3 , TiBr_4 , TiI_2 , TiI_3 , and TiI_4 ; complex salts such as M_2TiF_5 , M_3TiF_6 , M_2TiF_6 , $\text{M}_2[\text{TiCl}_5(\text{OH})_2]$, M_2TiCl_6 , $[\text{Ti}(\text{OH})_6]\text{Cl}_3$, and $\text{M}_2[\text{TiBr}_6]$; and titanates such as CaTiO_3 , SrTiO_3 , BaTiO_3 , CdTiO_3 , and PbTiO_3 . These powders can be used alone or in combination.

[0015] In the present invention, a body accessory which is suitable for the characteristics of silicone elastomer can be formed into various products which include ornamental accessories such as necklaces, wristbands, and hair bands. In particular, it is effectively used for wristbands, necklaces, and bracelets to relax nerves and muscle of athletes.

[0016] A body accessory of the present invention will be explained by referring to drawings.

Fig. 1 is a perspective view of an example of a body accessory 1 of the present invention. Fig. 2 is a sectional view taken on line A-A of Fig. 1, and Fig. 3 is a cross-sectional view taken on line B-B of Fig. 1.

The body accessory of the present invention comprises an accessory body 8, a joint for hooking (small hole) 2, a joint for hooking (small ball) 3, and an indicating part 5. On the accessory body 8, a decorative continuous protrusion 7 is formed on the surface side and a layer containing titanium powder is formed on the back side.

Use of silicone elastomer as a forming material provides decorativeness and soft feeling to the body and use of the abovementioned fine titanium powder as a major component provides physiological actions such as blood circulation promotion and an electromagnetic action by metallic titanium, which make it possible to obtain a body accessory providing improved health promoting functions more stably for a longer period of time as compared to conventional body accessories. The product of the present invention provides greater functions as compared to conventional body accessories making the best use of the characteristics of metallic titanium such as physiological actions, for example blood circulation promotion and an electromagnetic action. These actions of titanium are effective without direct contact of titanium

with the skin and generated relatively fast and the effectiveness lasts for a long period of time to provide marked health promoting effects.

[0017] The process of the production according to the present invention will be explained based on an example. However, the scope of the present invention is not limited to this example.

Example 1

[0018] As mentioned above, the body accessory of the present invention can be manufactured by extrusion molding, injection molding, and compression molding. As one example of the molding methods, a process of manufacturing using compression molding is explained in detail referring to Fig. 4 to Fig. 9.

First, in the first step as shown in Fig. 4, a silicone elastomer material to form the accessory body of the present invention is placed in the concave part of the lower mold 9 and the upper mold 10 having the first upper part 14 and the second upper part 15 is pressed down onto the first lower mold, cure molding is carried out by pressing with heat to form the accessory body 8 as shown in Fig. 5. In this way, the concave part 6 of the accessory body 8 is formed by the second upper part 15 of the upper mold. Next, in the second step as shown in Figure 6, a silicone elastomer material containing titanium powder is embedded into the concave part 6 of the accessory body 8 placed in the same first lower mold and pressed with heat. After pressing with heat, as shown in Fig. 7, the accessory body 8 in which a silicone elastomer material layer containing titanium powder is formed in the concave part 6 is obtained. The silicone elastomer material layer containing titanium powder can be either continuous or discontinuous lengthwise as shown in Fig. 1. Further, in the third step as shown in Fig. 8, the concave part 18 corresponding to the decorative continuous protrusion 7 of the accessory is provided in the second lower mold and the uncured silicone elastomer is embedded here, after which the second upper mold 13 with the upper convex part 17 formed is pressed down onto the second lower mold 12 to form the decorative continuous protrusion 7. In such a state, as shown in Fig. 9, the accessory body in which the silicone elastomer layer containing titanium powder is embedded into the concave part obtained by the second step is placed and the second upper mold 13 having the upper convex part 17 is pressed down onto the second lower mold 12 to form the projected accessory of the present invention. Favorably, the color of the decorative continuous protrusion 7 is different from that of the accessory body 8 for improved decorativeness. For example, if the accessory body 8 is black, the color of the decorative continuous protrusion 7 can be yellow or red to increase the distinguishability of the product.

[0019] As shown in Fig. 10, the accessory thus obtained has the layer containing titanium 4 on one side (the side in contact with the skin) and the decorative con-

tinuous protrusion 7 on the other side (the exterior side). The silicone elastomer layer containing titanium powder 4 can be either discontinuous as shown in Fig. 1 or continuous.

Further, as mentioned above, the alternative method can comprise the step of first forming a silicone elastomer decorative continuous protrusion, which corresponds to the abovementioned third step; the step of placing the silicone elastomer body on the obtained decorative continuous protrusion for integration, which corresponds to the abovementioned fourth step; and then the step of coating a part of the silicone elastomer body with a silicone elastomer solvent solution mixed with fine titanium powder in a belt-like fashion. However, the process of this method is complicated and the resulting product is not satisfactorily durable.

Claims

1. A body accessory which can be formed into a ring shape, comprising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a decorative protrusion strip made of silicone elastomer on the exterior side.
2. The body accessory according to claim 1, **characterized in that** the silicone elastomer layer mixed with fine titanium powder is formed by molding or by applying a solvent solution containing silicone elastomer mixed with fine titanium powder.
3. The body accessory according to claim 1, **characterized in that** the body accessory is selected from a necklace, a bracelet, a wristband, and a hair band.
4. The body accessory according to claim 1, 2, or 3, **characterized in that** the fine titanium powder obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure water, fusing metallic titanium using the resultant burning gas and precipitating the product in water is used at least as a major component.
5. A method for manufacturing a body accessory comprising a silicone elastomer accessory body having a silicone elastomer layer mixed with fine titanium powder on the skin contacting side and a decorative protrusion strip made of silicone elastomer on the exterior side, **characterized in that** the method comprises the steps of:

forming a continuous concavity on a silicone elastomer accessory body as a first step;
embedding a silicone elastomer layer containing fine titanium powder obtained by burning a gaseous oxygen-hydrogen mixture in high-pressure

water, fusing metallic titanium using the resultant burning gas and precipitating the product in water, at least as a major component, onto said continuous concavity as a second step;
forming the decorative protrusion strip made of silicone elastomer separately as a third step;
and
placing the accessory body obtained in the second step on said decorative protrusion strip and curing with heat for integration as a fourth step.

6. A method for manufacturing a body accessory comprising a silicone elastomer accessory body having a layer of silicone elastomer mixed with fine titanium powder on the skin contacting side and a decorative protrusion strip made of silicone elastomer on the exterior side, **characterized in that** the decorative protrusion strip made of silicone elastomer is first formed, the accessory body is placed on said decorative protrusion strip and cured with heat for integration, and then a solvent solution containing said silicone elastomer mixed with fine titanium powder is applied onto the product.

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FIG. 1

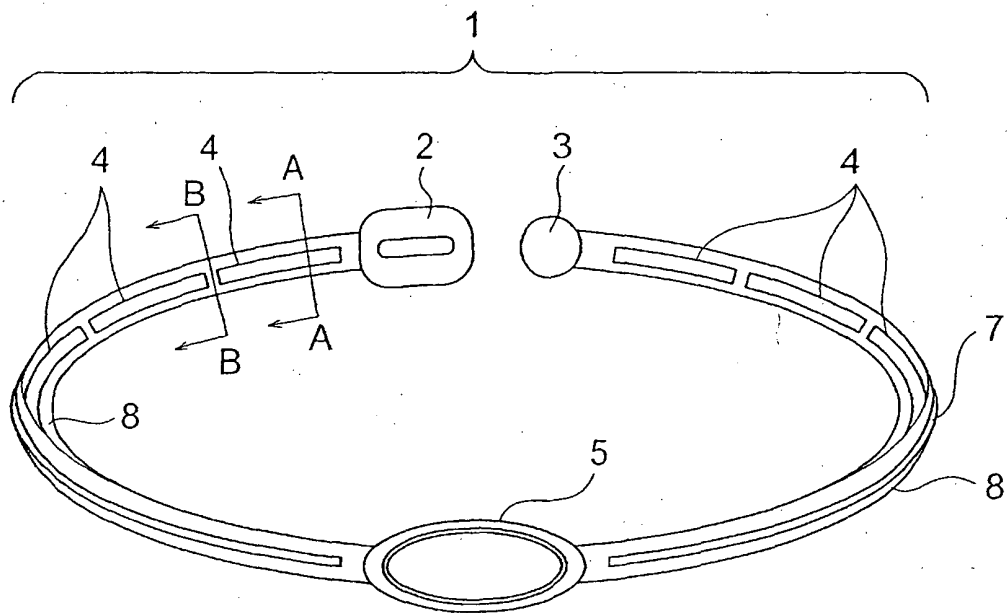


FIG. 2

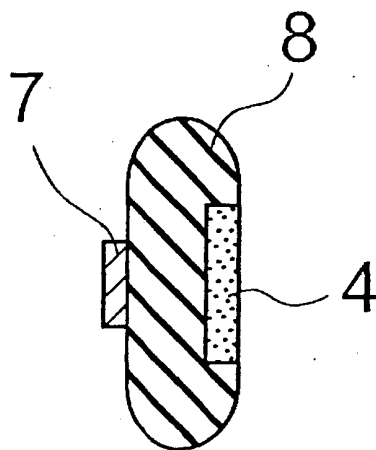


FIG. 3

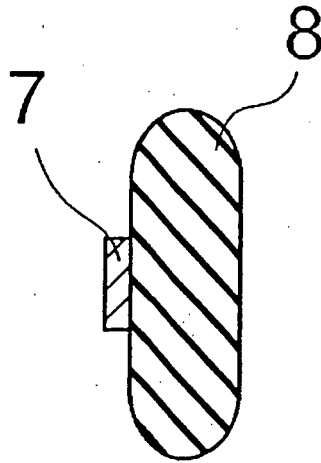


FIG. 4

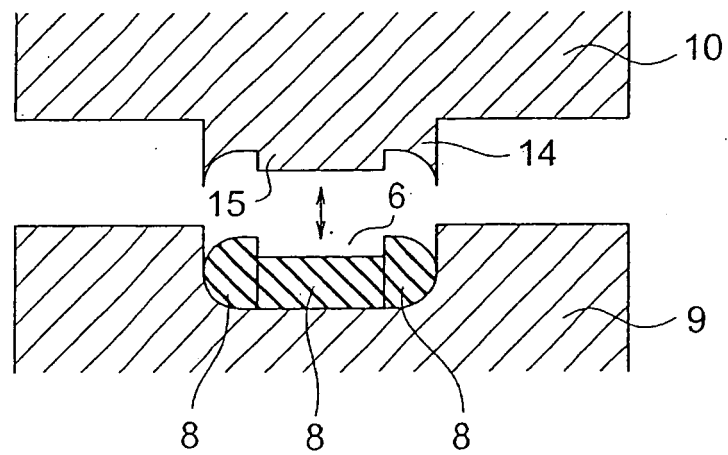


FIG. 5

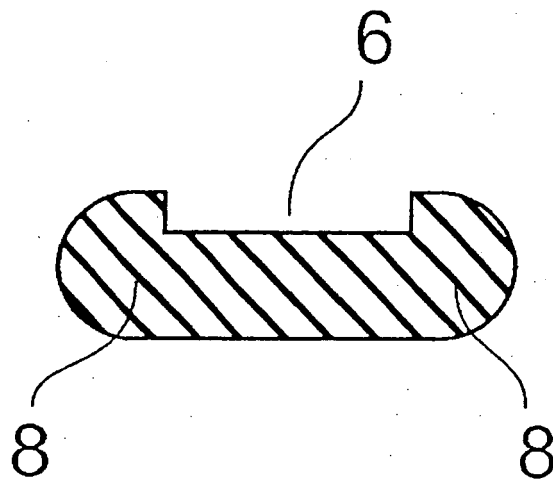


FIG. 6

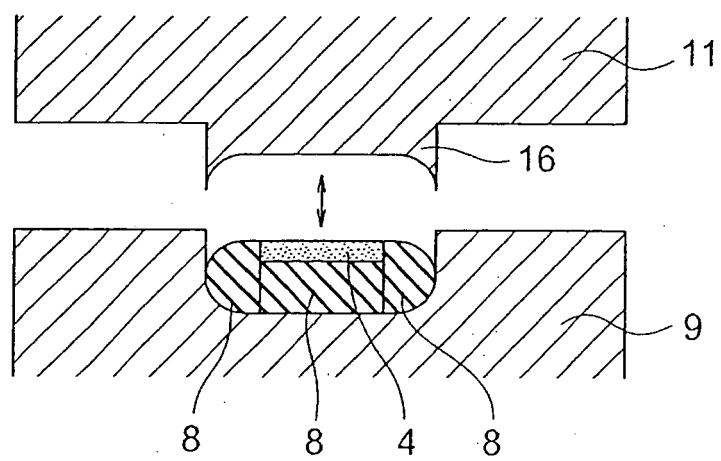


FIG. 7

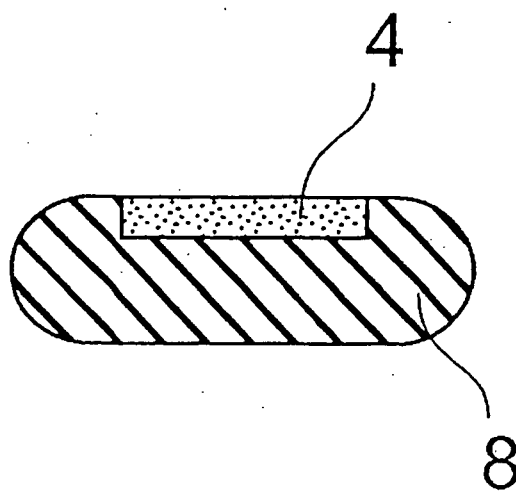


FIG. 8

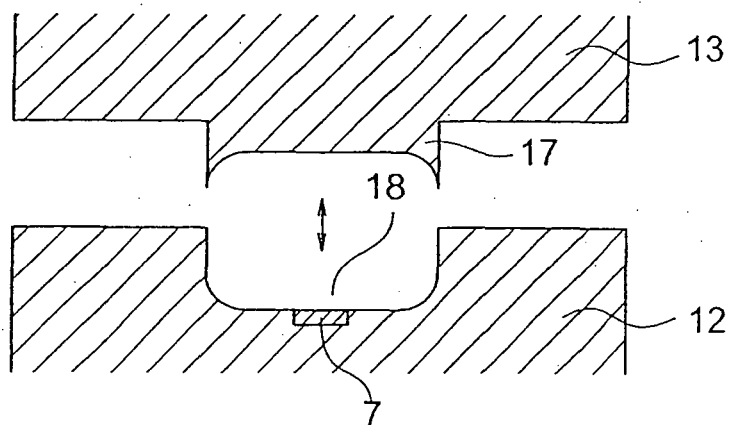


FIG. 9

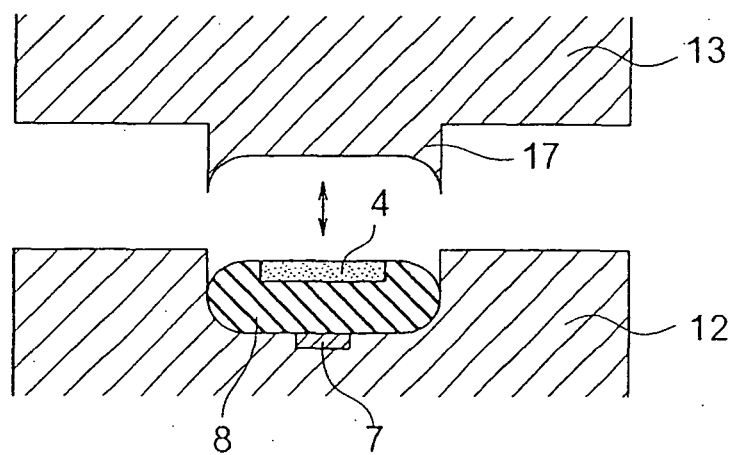
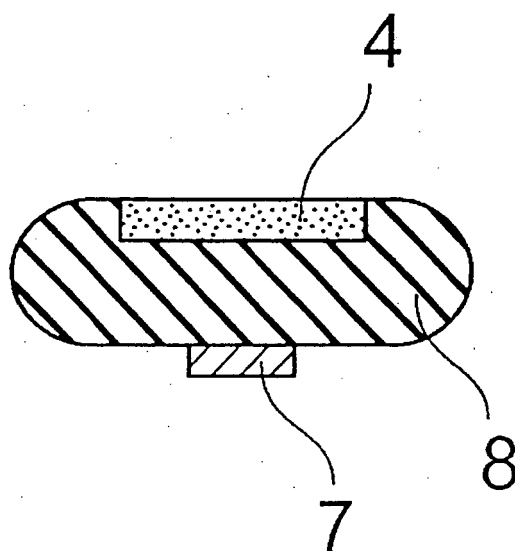


FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/010617

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ A44C25/00, 5/00, A45D8/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ A44C25/00, 5/00, A45D8/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2005
Kokai Jitsuyo Shinan Koho	1971-2005	Toroku Jitsuyo Shinan Koho	1994-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 3006811 U (Atsushi AMINO), 31 January, 1995 (31.01.95), Full text; all drawings (Family: none)	1-4 5, 6
Y A	JP 2003-164308 A (Kabushiki Kaisha Advance), 10 June, 2003 (10.06.03), Par. No. [0008]; Figs. 1, 2 (Family: none)	1-4 5, 6
Y A	WO 2002/078883 A (Fairudo Kabushiki Kaisha), 10 October, 2002 (10.10.02), Page 4, lines 34 to 45 & US 2004-118244 A & EP 1393841 A1	4 5, 6

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search
06 September, 2005 (06.09.05)Date of mailing of the international search report
04 October, 2005 (04.10.05)Name and mailing address of the ISA/
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REFERENCES CITED IN THE DESCRIPTION

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- JP 3507063 B [0012]