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(54) A BRISTLE TUFT ASSEMBLY AND A TOOTHBRUSH DEVICE

(57) This invention provides a bristle tuft assembly, comprising a bristle tuft, a compression plate, a base, and a base support plate, the base is configured with an accommodation chamber which has a wide top and a narrow bottom, forming a reversed splayed shape. The base support plate is placed horizontally and fit into the bottom of the accommodation chamber, the compression plate is placed vertically and fit into the accommodation chamber, the middle part of the bristle tuft is compressed and fixed between the vertically placed compression plate and the horizontally placed base support plate, both ends of the bristle tuft go through the space in the accommodation chamber and are set up and exposed outside the base. This invention further provides a toothbrush device, comprising the above mentioned bristle tuft assembly. The bristle tuft assembly occupies little room, and a toothbrush device can easily accommodate multiple bristle tuft assemblies, and the bristle tuft of the assembly is firmly fastened, not easy to fall off, and the multiple bristle tuft assemblies on the toothbrush device can flexibly and independently move in different directions.

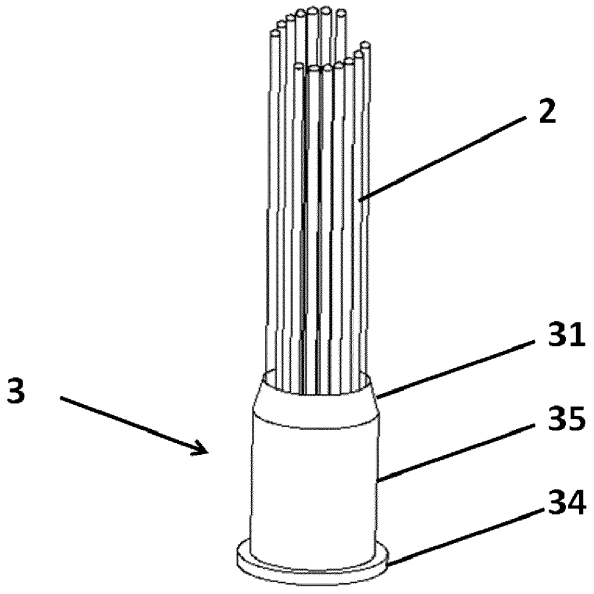

Figure 1

EP 3 440 956 A1

Description

THCHNICAL FIELD

[0001] The present application relates to the technical field of toothbrush products, and particularly relates to a bristle tuft assembly and a toothbrush device.

BACKGROUND OF THE INVENTION

[0002] Currently conventional brush products like toothbrushes and cleaning brushes are made by implanting bristle tufts into the implantation holes in the bristle implantation surface, however, bristle tufts in such conventional brush products are not securely fastened and thus easy to fall off, making the life span of the brush products short and requiring frequent replacement, which significantly affects user experience. Additionally, the bristle tufts of the brushes in the marketplace all move uniformly, and it is difficult to realize the independent movement of every bristle tuft in a brush product due to the little space within the brush product.

TECHNICAL PROBLEM

[0003] The present application aims to solve the technical problem and provide a bristle tuft assembly in which bristle tufts are securely fastened and not easy to fall off, and different bristle tufts of a toothbrush device installed with such bristle tuft assemblies are able to flexibly and independently move in different directions.

SOLUTION TO THE PROBLEM

Technical solution

[0004] The present application provides a bristle tuft assembly, comprising a bristle tuft, a compression plate, a base, and a base support plate, said base is configured with an accommodation chamber which has a wide top and a narrow bottom, forming a reversed splayed shape;

[0005] Said base support plate is placed horizontally and fit into the bottom of said accommodation chamber, said compression plate is placed vertically and fit into said accommodation chamber, the middle part of said bristle tuft is compressed and fixed between said vertically placed compression plate and said horizontally placed base support plate, both ends of said bristle tuft go through the space in said accommodation chamber and are set up and exposed outside said base.

[0006] Advantageously, said compression plate and the inner side wall of said accommodation chamber of said base are fixed and fit into each other through interference fit, and said base support plate and the inner side wall of said accommodation chamber of said base are fixed and fit into each other through interference fit.

[0007] Advantageously, said base also comprises a fixing flange, which is used for fixing said base on a toothbrush device.

[0008] Advantageously, an opening of said base is configured with a splayed shape and with a conical degree to compress said compression plate inside said accommodation chamber.

[0009] Advantageously, the bottom of said base is also configured with a spring-holding base cavity, said spring-holding base cavity accommodates the top portion of a coiled spring.

[0010] Advantageously, said bristle tuft is made of animal or human hair, plastic wool, or metal wire.

[0011] Advantageously, said base is made of iron, aluminum, or stainless steel.

[0012] Advantageously, said compression plate is made of iron, copper, aluminum, wood, or plastic.

[0013] The present application also provides a toothbrush device, wherein, comprises the bristle tuft assembly that is described above.

THE BENEFICIAL EFFECT OF THE INVENTION

Beneficial Effect

[0014] The beneficial effects of the present application are to provide a bristle tuft assembly that occupies little space, so that it is convenient to install multiple such bristle tuft assemblies in a toothbrush device, and the bristle tuft is securely fastened in the assembly, which is not easy to fall off, and different bristle tufts of a toothbrush device installed with such bristle tuft assemblies are able to flexibly and independently move in different directions.

BRIEF DESCRIPTION OF THE DRAWINGS

Description of drawings

[0015] In order to more clearly illustrate the embodiments of the present application or the technical solutions in the prior art, the following drawings, which are intended to be used in the description of the embodiments or the prior art, will be briefly described. It will be apparent that the drawings in the following description Is an embodiment of the present invention, it will be apparent to those skilled in the art that other drawings may be obtained in accordance with the provided drawings without paying creative work.

Figure 1 provides an overall structure diagram of a bristle tuft assembly, according to an embodiment of the present application.

Figure 2 provides an exploded structure diagram of a bristle tuft assembly, according to an embodiment of the present application.

Figure 3 provides a cross-sectional structure diagram of a bristle tuft assembly, according to an embodiment of the present application.

Figure 4 provides a flow diagram of assembling a bristle tuft assembly, according to an embodiment

of the present application.

Figure 5a provides a sectional structure view of a bristle tuft assembly, according to an embodiment of the present application.

Figure 5b provides an enlarged structure view of Part A of a sectional structure of a bristle tuft assembly, according to an embodiment of the present application.

Figure 5c provides an enlarged structure view of Part B of a sectional structure of a bristle tuft assembly, according to an embodiment of the present application.

Figure 6 provides a structure diagram of the opening configured with a splayed shape to compress and fix the compression plate inside the accommodation chamber.

EMBODIMENT OF THE INVENTION

[0016] In order to solve the above technical problems, the overall idea of the embodiment of the present application is as follows:

[0017] Figure 1 provides an overall structure diagram of a bristle tuft assembly, according to an embodiment of the present application, and figure 2 provides an exploded structure diagram of a bristle tuft assembly, according to an embodiment of the present application. The bristle tuft assembly comprises a bristle tuft 2, a compression plate 1, a base 3, and a base support plate 4, the base 3 is configured with an accommodation chamber 32 which has a wide top and a narrow bottom, forming a reversed splayed shape.

[0018] Based upon figures 5a, 5b, and 5c, the base support plate 4 is placed horizontally and fit into the bottom of the accommodation chamber 32, the compression plate 1 is placed vertically and fit into the accommodation chamber 32, the middle part of the bristle tuft 2 is compressed and fixed between the vertically placed compression plate 1 and the horizontally placed base support plate 4, both ends of the bristle tuft 2 go through the space in the accommodation chamber 32 and are set up and exposed outside the base 3.

[0019] Furthermore, the compression plate 1 and the inner side wall of the accommodation chamber 32 of the base 3 are fixed and fit into each other through interference fit, and the base support plate 4 and the inner side wall of the accommodation chamber 32 of the base 3 are fixed and fit into each other through interference fit.

[0020] A spring-holding base cavity 33 accommodates the top portion of a coiled spring, in order to realize that a bristle tuft assembly would press the coiled spring when the bristle tuft assembly is exerted by external force, and the bristle tuft assembly would resume upward movement when the external force is removed.

[0021] As seen from figure 6, an opening 31 of the base 3 is configured with a splayed shape and with a conical degree to compress the compression plate 1 inside the accommodation chamber 32. In addition, the bottom of the base 3 is also configured with a spring-holding base cavity 33, the spring-holding base cavity 33 accommodates the top portion of a coiled spring.

[0022] As seen from figure 1, the base 3 also comprises a fixing flange 34, which is used for fixing the base 3 on a toothbrush device. The fixing flange 34 can be circular enclosure. The size of the fixing flange 34 is bigger than the size of the opening of the spring-holding base cavity 33. The main body 35 of the base 3 above the fixing flange 34 can be accommodated in the lower part of the connecting hole of a toothbrush main body, and the size of the fixing flange 34 is bigger than the size of cross section of the lower part of the connecting hole of the toothbrush main body, thus preventing the bristle tuft unable to freely move upward and downward because of the base 3 being completely accommodated or got stuck inside the connecting hole.

[0023] Figure 5a provides a sectional structure view of a bristle tuft assembly, according to an embodiment of the present application; Figure 5b provides an enlarged structure view of Part A of a sectional structure of a bristle tuft assembly, according to an embodiment of the present application; Figure 5c provides an enlarged structure view of Part B of a sectional structure of a bristle tuft assembly, according to an embodiment of the present application. The spring-holding base cavity 33 accommodates the top portion of a coiled spring. The compression plate 1 and the inner side wall of the accommodation chamber 32 of the base 3 are fixed and fit into each other through interference fit, and the base support plate 4 and the inner side wall of the accommodation chamber 32 of the base 3 are fixed and fit into each other through interference fit.

[0024] Combining figures 4, 5a, 5b, 5c and 6, in the assembling process, firstly the base support plate 4 is placed into the accommodation chamber 32 of the base 3 and is fixed in the accommodation chamber 32. In the assembling process, before placing the compression plate 1 into the accommodation chamber 32 of the base 3, the head and tail of the bristle tuft 2 are in a straight line, the compression plate 1, under the external force by the fixture device, is moved to the middle portion of the bristle tuft 2 and is positioned perpendicular to the direction of the straight bristle tuft 2, and then the compression plate 1 is moved in the direction that is perpendicular to the straight bristle tuft 2 under the external force by the fixture device, thus bending and folding the bristle tuft 2, and finally the middle portion of the bristle tuft 2 that is folded drives the bristle tuft 2 into the accommodation chamber 32 together. And the middle portion of the bristle tuft 2 is pressed between the compression plate 1 and the base support plate 4. The opening 31 of the base 3 is deformed under manual or mechanical external force, developing into a splayed shape with a conical degree that is wide at the bottom and narrow at the top, such that the compression plate 1 is fixed in the accommodation chamber 32 and would not loosen and fall out. In addition, the opening 31 with such conical degree

can firmly and tightly encircles the bristle tuft 2, two sides of which extend outward. The spring-holding base cavity 33 can be used to accommodate the top part of the spring or other elastic functional member that is set up in the toothbrush main body, realizing the bristle tuft assembly pressing the spring/other elastic functional member downward when exerted external force, and the bristle tuft assembly being moved upward by the spring/other elastic functional member when external force is removed. Moreover, it is also feasible that the bottom of the base 3 is not configured with the spring-holding base cavity 33, depending on the configuration of other parts in the toothbrush main body.

[0025] Additionally, judging from figures 5b and 5c, the compression plate 1 and inner side wall of the main body 35 (that is the chamber wall of the accommodation chamber 32) are fixed and fit into each other through interference fit, and the base support plate 4 and the inner side wall of the main body 35 (that is the chamber wall of the accommodation chamber 32) are also fixed and fit into each other through interference fit.

[0026] The bristle tuft 2 is made of animal or human hair, plastic wool, or metal wire. The base 3 is made of iron, aluminum, or stainless steel. The compression plate 1 is made of iron, copper, aluminum, wood, or plastic.

[0027] The base 3 also comprises a fixing flange 34, which is used for fixing the base 3 on a toothbrush device. The fixing flange 34 can be circular enclosure, and a connecting part that is fit with the size of the fixing flange 34 is set up in the toothbrush device.

[0028] This invention also provides a toothbrush device, which comprises the bristle tuft assembly described above. The toothbrush device is set up with mounting slots, which the fixing flange 34 can fit into. The toothbrush device is able to configure multiple bristle tuft assemblies, and the bristle tuft in every assembly is able to independently move in different directions, satisfying the use requirement for a toothbrush device.

[0029] While the preferred embodiments of the present application have been described, it will be apparent to those skilled in the art that other changes and modifications may be made to these embodiments once the basic inventive concepts are known. Accordingly, the appended claims are intended to be construed as including preferred embodiments and all changes and modifications that fall within the scope of the invention.

[0030] It will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the application so that if such modifications and variations of the invention are within the scope of the appended claims and the equivalents thereof. The present application is also intended to embrace such variations.

Claims

1. A bristle tuft assembly, wherein, comprising: a bristle tuft (2), a compression plate (1), a base (3), and a base support plate (4), said base (3) is configured with an accommodation chamber (32) which has a wide top and a narrow bottom, forming a reversed splayed shape;
said base support plate (4) is placed horizontally and fit into the bottom of said accommodation chamber (32), said compression plate (1) is placed vertically and fit into said accommodation chamber (32), the middle part of said bristle tuft (2) is compressed and fixed between said vertically placed compression plate (1) and said horizontally placed base support plate (4), both ends of said bristle tuft (2) go through the space in said accommodation chamber (32) and are set up and exposed outside said base (3).

2. The bristle tuft assembly according to claim 1, wherein, said compression plate (1) and the inner side wall of said accommodation chamber (32) of said base (3) are fixed and fit into each other through interference fit, and said base support plate (4) and the inner side wall of said accommodation chamber (32) of said base (3) are fixed and fit into each other through interference fit.

3. The bristle tuft assembly according to claim 2, wherein, said base (3) also comprises a fixing flange (34), which is used for fixing said base (3) on a toothbrush device.

4. The bristle tuft assembly according to claim 3, wherein, an opening (31) of said base (3) is configured with a splayed shape and with a conical degree to compress said compression plate (1) inside said accommodation chamber (32).

5. The bristle tuft assembly according to claim 4, wherein, the bottom of said base (3) is also configured with a spring-holding base cavity (33), said spring-holding base cavity (33) accommodates the top portion of a coiled spring.

6. The bristle tuft assembly according to claim 5, wherein, said bristle tuft (2) is made of animal or human hair, plastic wool, or metal wire.

7. The bristle tuft assembly according to claim 6, wherein, said base (3) is made of iron, aluminum, or stainless steel.

8. The bristle tuft assembly according to claim 7, wherein, said compression plate (1) is made of iron, copper, aluminum, wood, or plastic.

9. A toothbrush device, wherein, comprises the bristle tuft assembly in claim 1.

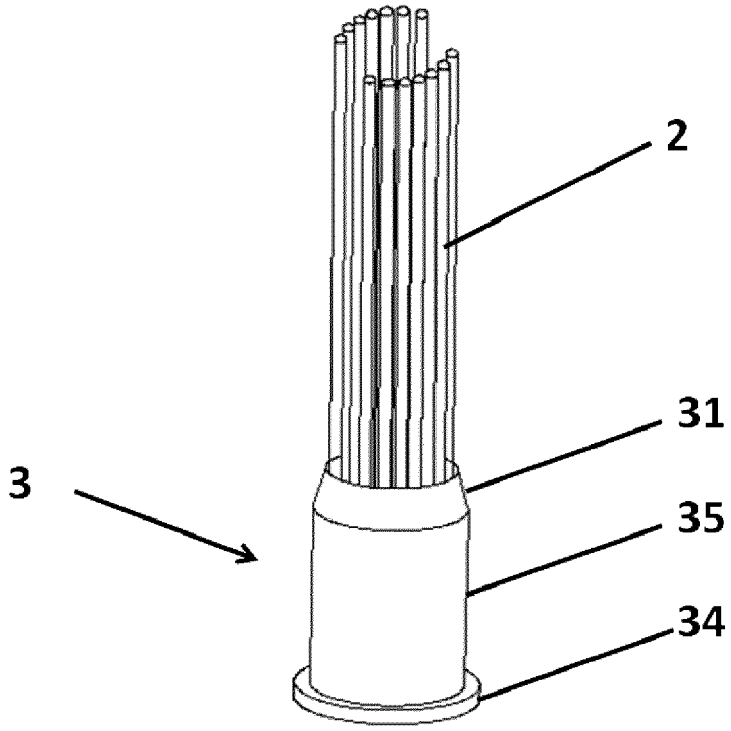

Figure 1

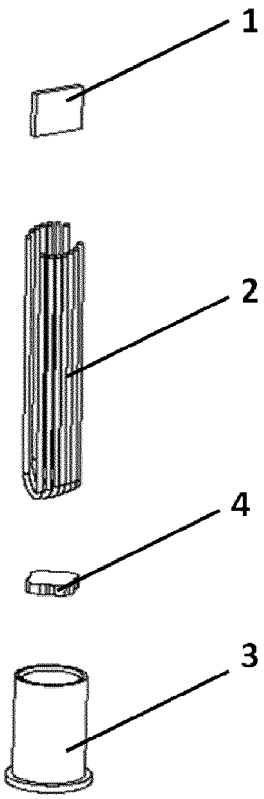

Figure 2

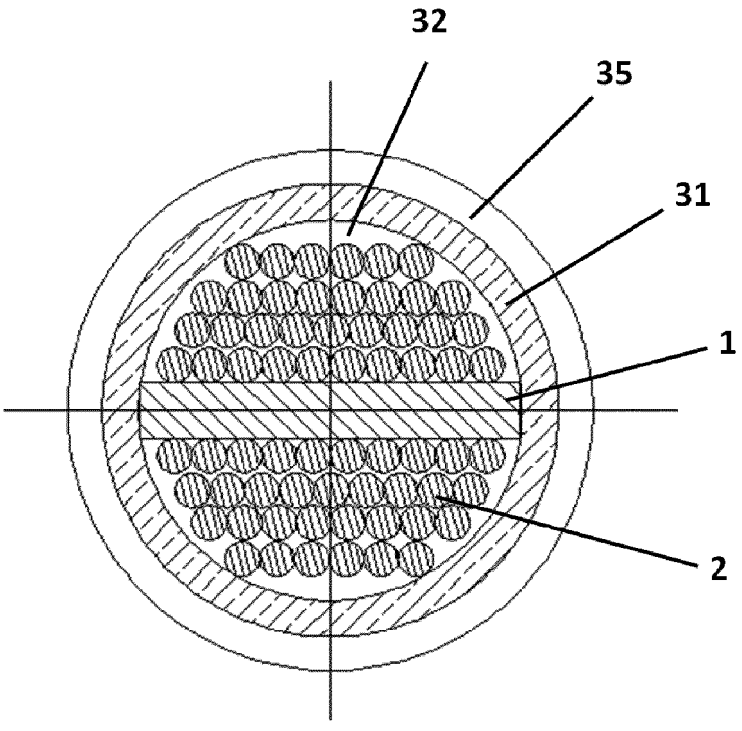

Figure 3

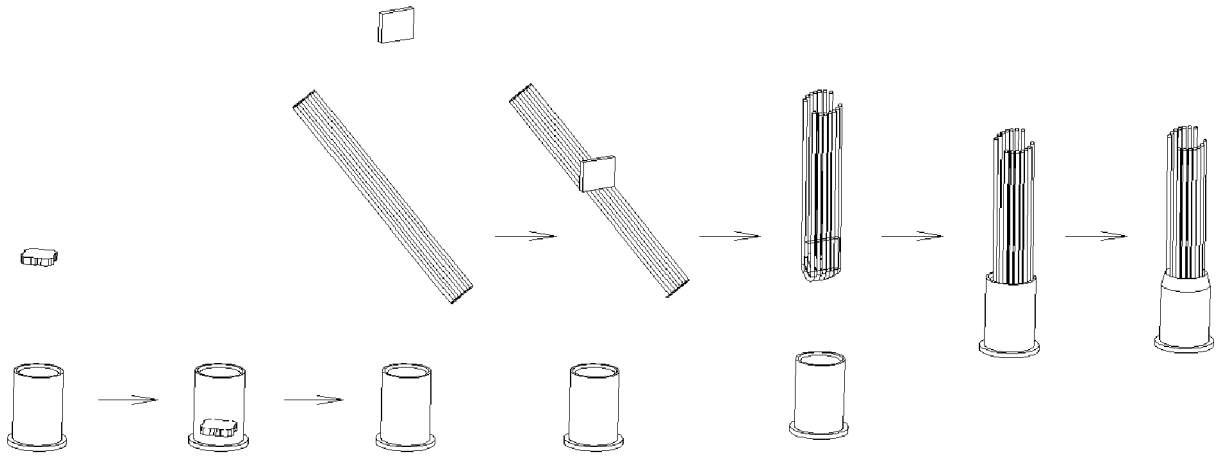

Figure 4

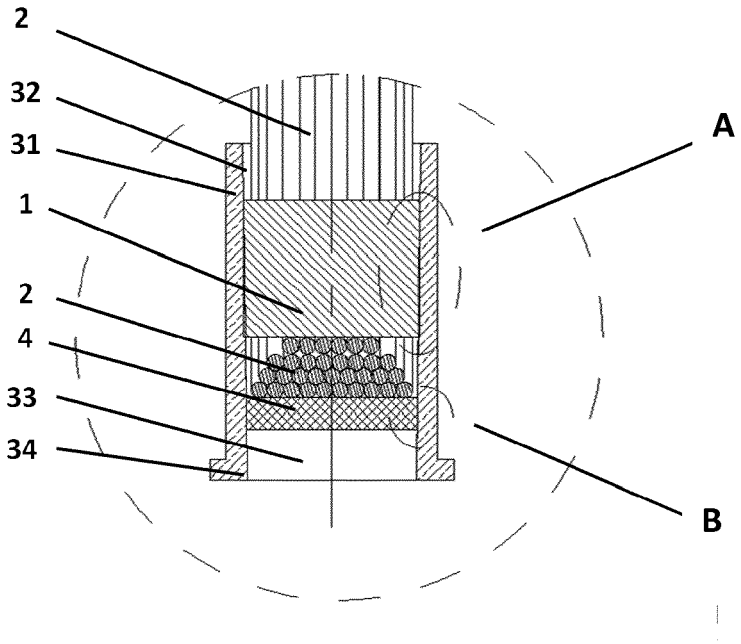

Figure 5a

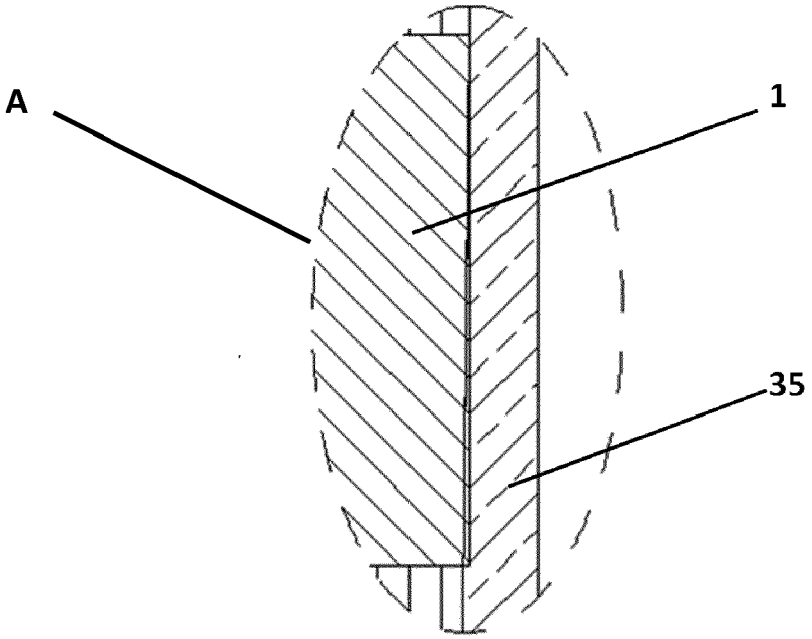

Figure 5b

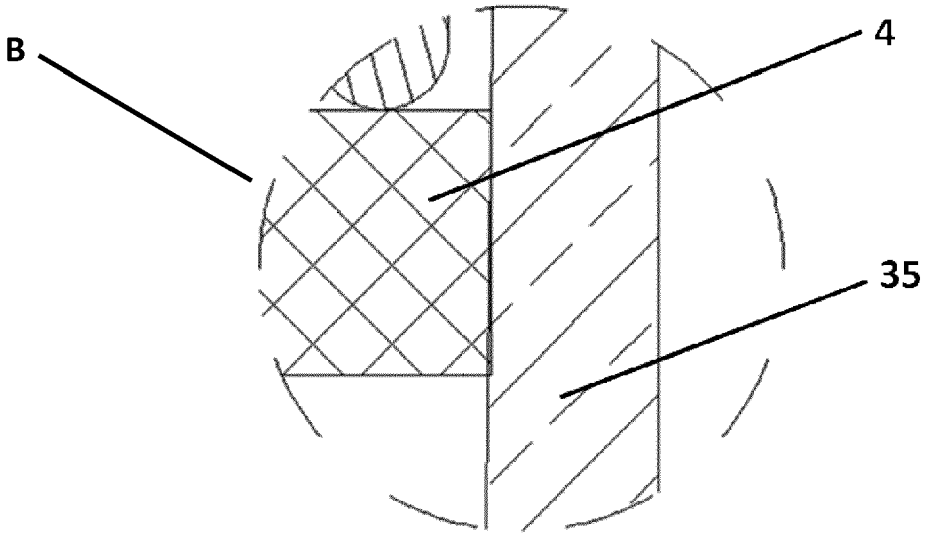

Figure 5c

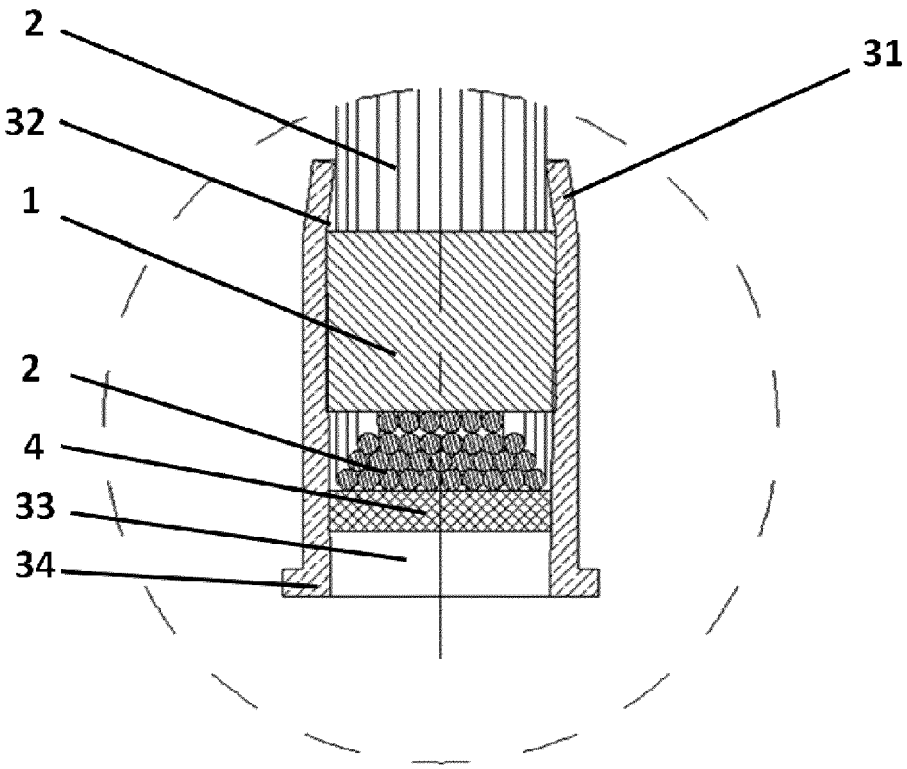

Figure 6

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EUROPEAN SEARCH REPORT

Application Number
EP 17 18 5651

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	EP 0 504 893 A1 (KIM JI WAN [KR]; YEUN UI WON [KR]) 23 September 1992 (1992-09-23) * column 3, line 58; figures 1, 2 *	5	

TECHNICAL FIELDS SEARCHED (IPC)

A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 February 2018	Dal Bó, Paolo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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