

(19)



(11)

EP 3 827 939 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

08.05.2024 Bulletin 2024/19

(21) Application number: **18927498.8**

(22) Date of filing: **25.07.2018**

(51) International Patent Classification (IPC):

B26B 19/14 ^(2006.01)

(52) Cooperative Patent Classification (CPC):

B26B 19/145; B26B 19/14

(86) International application number:

PCT/CN2018/097052

(87) International publication number:

WO 2020/019200 (30.01.2020 Gazette 2020/05)

(54) **SHAVER AND BLADE FLOATING STRUCTURE**

RASIERAPPARAT UND KLINGENSCHWIMMSTRUKTUR

RASOIR ET STRUCTURE FLOTTANTE DE LAME

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:

02.06.2021 Bulletin 2021/22

(73) Proprietor: **Shenzen Soocas Technology Co., Ltd.
Shenzhen, Guangdong 518000 (CN)**

(72) Inventors:

- **MENG, Fandi**
Shenzhen, Guangdong 518000 (CN)
- **QIU, Yunfeng**
Shenzhen, Guangdong 518000 (CN)

(74) Representative: **Berggren Oy**

**P.O. Box 16
Eteläinen Rautatiekatu 10A
00101 Helsinki (FI)**

(56) References cited:

EP-A1- 0 757 613	EP-B1- 0 757 613
AU-A4- 2015 101 748	CN-A- 101 564 845
CN-A- 102 873 696	CN-A- 106 514 732
CN-U- 204 160 507	CN-U- 204 160 507
JP-B2- 2 667 267	US-A- 3 890 705
US-A1- 2005 172 491	

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 3 827 939 B1

Description**TECHNICAL FIELD**

[0001] The present application relates to the technical field of personal care products, more specifically, relates to a shaver and its blade head floating structure.

BACKGROUND

[0002] In the field of personal care products, such as electric shaver, most of the shaving unit and the supporting structure are fixedly connected, that is, the shaving unit cannot move relative to the supporting structure, and the blade head assembly located on the shaving unit is driven by the internal transmission structure to rotate for shaving operation. EP0757613A1 discloses an electric shaver including a housing that forms a handgrip and supports, at an end portion, at least one shaving head in which the face coming into contact with the contour to be shaved has passages for the hairs to be shaved. The shaving head accommodates a cutting blade, and the housing accommodates a drive for rotatably actuating the cutting blade about an axis that lies substantially at right angles to the resting face of the shaving head. The shaving head is supported by a flexible membrane connected to the housing. Although this structure achieves the need for shaving, when the shaving unit moves on the surface of the skin, there is a blunt resistance between the shaving unit and the skin. It is completely dependent on the human hand grip to adjust the shaving strength. When the skin is in tight contact with shaving unit, press the shaver loosely with your hands, otherwise, press it tightly. During the whole shaving process, the hands are in a tense state. After the shaving is completed, you may feel sore and the experience is extremely poor.

[0003] In order to solve this problem, some shaving units use cross-type universal joints to realize the rotation with the supporting structure, but such structure assembly is cumbersome, the defect rate increases, and the flexibility of the rotating structure is not high. And it has not fundamentally solved the adaptive ability between the shaving unit and the skin and cannot provide a good user experience.

TECHNICAL PROBLEM

[0004] The purpose of the embodiments of the present application is: in the first aspect, a blade head floating structure is provided to solve the problem that the rotating structure of the shaving unit relative to the supporting structure in the shaver in the prior art is complicated, the flexibility is low, and the user experience is poor.

[0005] In the second aspect, a shaver is provided to solve the technical problems in the prior art that the rotating structure of the shaving unit relative to the supporting structure in the shaver is complicated, the flexibility is low, and the user experience is poor.

SUMMARY

[0006] To solve the above technical problems, the technical solution adopted in the embodiments of the present application is:

In the first aspect, a blade head floating structure is provided, characterized in that the blade head floating structure comprises:

10 a supporting member;

a shaving unit arranged above the supporting member;

15 a first hinge provided inside the shaving unit, wherein the first hinge has a first matching groove, and wherein the bottom of the first matching groove penetrates the first hinge;

20 a second hinge, wherein the top of the second hinge has a matching portion placed in the first matching groove, and wherein a limiting structure is provided between the first matching groove and the matching portion structure, the limiting structure preventing relative rotation and being separated along the central axis of the first matching groove, the matching portion being provided with a first central hole penetrating to the bottom of the second hinge, and wherein the bottom of the second hinge penetrates the first hinge to be installed in the supporting member;

25 30 35 an elastic member passing through the first matching groove and the first central hole of the second hinge, wherein the top end of the elastic member abuts against the shaving unit, and wherein the bottom end of the elastic member abuts against the supporting member.

40 **[0007]** Further, the shaving unit comprises a housing and a hinge cover, the housing having a mounting hole, the first hinge being fixed to the mounting hole by the hinge cover, and wherein the second hinge protrudes from the mounting hole and is fixedly connected to the supporting member, and wherein the top end of the elastic member abuts against the hinge cover.

[0008] Further, the first matching groove has a first spherical arc surface, and wherein the matching portion surface has a second spherical arc surface matching with the first spherical arc surface; or alternatively wherein the first matching groove has a first plane, the surface of the matching portion having a second plane matching with the first plane.

45 **[0009]** Further, the limiting structure comprises a first limiting plane arranged on the outer surface of the matching portion and a second limiting plane arranged in the first matching groove and attached to the first limiting plane.

[0010] Further, a positioning block is provided in the first matching groove, and the second limiting plane is provided inside the positioning block and faces the center of the first matching groove.

[0011] Further, there are a plurality of the first limiting planes, and a plurality of the first limiting planes are uniformly distributed on the outer wall surface of the matching portion; and there are a plurality of the second limiting planes, and a plurality of the second limiting planes are uniformly arranged on the inside the first matching groove.

[0012] Further, the second hinge is fixedly connected to the supporting member through a connector.

[0013] Further, a second matching groove is provided on the matching portion, at least one penetrating first connecting hole is provided on the wall of the second matching groove, and at least one second connecting hole corresponding to the first connecting hole is provided on the wall of the first matching groove, a mounting post is provided in the supporting member, and the connector is a screw that penetrates the first connecting hole and the second connecting hole into the mounting post.

[0014] Further, the bottom of the second hinge has a connecting portion, and a positioning structure for limiting the connector is provided on the connecting portion corresponding to the first connecting hole.

[0015] Further, the positioning structure comprises a positioning boss provided on the outer wall of the connecting portion for the connector to pass through, and further comprises a concavity located below the positioning boss, arranged along the height direction of the connecting portion and used for accommodating the connector.

[0016] Further, the top of the supporting member has a step surface with inward concavity, the step surface is provided with a second central hole penetrating the supporting member, the mounting post is provided on the step surface, and an annular protrusion is arranged on the step surface and located at the edge of the two central holes, and the bottom of the elastic member is sleeved on the annular protrusion.

[0017] Further, there are multiple first limiting planes, wherein there is an equal number of first connecting holes and first limiting planes, and wherein at least one of the first connecting holes is arranged between the two first limiting planes.

[0018] Further, the edge of the mounting hole is provided with at least one stopper, the edge of the first matching groove extends outward to form an annular flange, the annular flange is arranged on the edge of the mounting hole, and wherein a first avoiding groove is provided on the annular flange corresponding to the stopper, the hinge cover covers in the first matching groove, and at least one block that can be stopped at the stopper is provided on the edge of the hinge cover.

[0019] Further, a groove that can be locked when the block rotates horizontally is arranged between the stopper and the edge of the mounting hole, and one side of

the groove is provided with a limiting block that resists the block, and the hinge cover edge is provided with a second avoiding groove that can avoid the stopper, and the block is provided at the second avoiding groove.

[0020] Further, there are a plurality of stoppers, and wherein a plurality of stoppers are evenly distributed on the edge of the mounting hole; there are a plurality of the block, and a plurality of blocks are evenly distributed on the edge of the hinge cover.

[0021] Further, the edge of the mounting hole is further provided with at least one positioning post, and the annular flange is provided with a semi-circular positioning hole for at least one positioning post to be inserted when the annular flange rotates.

[0022] Further, there are a plurality of positioning posts, a plurality of stoppers, and wherein a plurality of positioning posts and a plurality of stoppers are alternately spaced and evenly distributed on the edge of the mounting hole.

[0023] Further, the shaving unit further comprises a cover plate provided on the housing, a bracket provided on the cover plate, at least one blade head assembly provided on the bracket, and a transmission structure arranged in the enclosed space of the cover plate and housing for driving the blade head assembly.

[0024] Further, it also comprises a flexible bracket wrapped outside the second hinge, wherein the top of the flexible bracket is arranged on the mounting hole, the first hinge is pressed on the top edge of the flexible bracket, and the bottom of the flexible bracket is sleeved on the outer wall of the supporting member.

[0025] Further, the top of the outer wall of the supporting member is provided with an annular groove, and the bottom of the flexible bracket is sleeved on the annular groove.

[0026] In a second aspect, a shaver is provided, which comprises a body and the above-mentioned blade head floating structure arranged on the body.

BENEFICIAL EFFECT

[0027] Compared with the prior art, the beneficial effects of the shaver and blade head floating structure provided by the embodiment of the present application are: the first hinge is fixed in the shaving unit, the first hinge and the shaving unit form into one a whole; and the second hinge and the supporting member are fixedly connected, the first hinge and the second hinge are in a matching state through the first matching groove and the matching portion. A limiting structure and an elastic member are arranged between the first hinge and the second hinge. When the shaver is working, the shaving unit is in contact with the face and is squeezed by the face force, the shaving unit moves downward to squeeze the elastic member, and at the same time, the first hinge also moves downward. When the downward force is greater than the elastic force of the elastic member, the elastic member is compressed. In this process, the first hinge and the

anti-rotation limiting structure between the second hinge is separated so that the shaving unit can rotate with the first hinge around the center of the first matching groove, so as to realize the rotation of the shaving unit by 360°. During the rotation, the elastic member acts as a flexible connection between the shaving unit and the supporting member. The flexible connection makes the shaving unit rotate 360° more smoothly; and when the shaving unit acts on different parts of the face, the external force that the face reacts to the shaver changes. When the external force applied to the shaving unit decreases, the external force is less than the elastic force of the elastic member, the elastic member elastically returns to push the shaving unit upwards, the first hinge and the shaving unit move upwards, and the limiting structure between the first hinge and the second hinge re-matches to prevent the relative rotation of the first hinge and the second hinge. During this process, the shaving unit floats up and down along the central axis L to better adapt to changes in the facial curve and avoid hard contact with the face, thus bringing users a more comfortable experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] In order to more clearly describe the technical solution in the embodiments of the present application, the following will briefly introduce the drawings that need to be used in the embodiment or the prior art description. Obviously, the drawings in the following description are only for some embodiments of the application, for those of ordinary skill in the art, other drawings can be obtained from these drawings without creative work.

Fig. 1 is a schematic diagram of a shaver provided in the first embodiment of the present application;

Fig. 2 is a side view of the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig. 3 is a longitudinal sectional view of the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig.4 is a schematic diagram of of the first hinge in the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig. 5 is a schematic diagram of the second hinge in the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig.6 is an exploded schematic diagram of the first hinge and the second hinge in the blade head floating structure of the shaver provided by the first embodiment of the present application before assembly;

Fig.7 is a top view of the assembly of the first hinge and the second hinge in the blade head floating structure of the shaver provided by the first embodiment of the present application;

Fig.8 is a longitudinal sectional view of the first hinge and the second hinge in the blade head floating structure of the shaver provided by the first embodiment of the present application after assembly;

Fig.9 is a schematic diagram of the supporting member in the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig. 10 is a schematic diagram of the hinge cover in the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig. 1 1 is an exploded schematic diagram of the hinge cover and the housing in the blade head floating structure in the shaver provided by the first embodiment of the present application before assembly;

Fig.12 is a top view of the assembly of the hinge cover and housing in the blade head floating structure of the shaver provided by the first embodiment of the present application;

Fig. 13 is an exploded schematic diagram of the blade head floating structure in the shaver provided by the first embodiment of the present application;

Fig.14 is an enlarged view of A in Fig. 11;

Fig.15 is an exploded schematic diagram of the blade head floating structure provided by the second embodiment of the present application;

Fig.16 is a longitudinal sectional view of the blade head floating structure provided by the second embodiment of the present application;

[0029] Wherein, the references in the drawings are as follows:

100-body; 200-blade head floating structure; 210-flexible bracket; 211-ring flange; 220-limiting structure; 300-supporting member; 310-mounting post; 320-step surface; 330-second central hole; 340-second Annular protrusion; 350-annular groove; 400-shaving unit; 410-housing; 411-mounting hole; 412-stopper; 413-positioning post; 414-groove; 415-limiting block; 420-cover plate; 430-bracket; 440 -blade head assembly; 500-first hinge; 510-first matching groove; 511-second limiting plane; 512-positioning block; 513-second connecting hole; 514-annular flange; 515-first avoiding groove; 516-semi-cir-

cular positioning hole; 517-first spherical arc surface; 518-first plane; 600-second hinge; 610-matching portion; 611-first limiting plane; 612-second plane; 620-second matching groove; 621-first central hole; 622-first connecting hole; 630-connecting portion; 640-positioning boss; 641-semi-circular hole; 650-concavity; 700-hinge cover; 710-first annular protrusion; 720-block; 730-second avoiding groove; 800-elastic member; 900-connector.

DETAILED DESCRIPTION

[0030] In order to make the purpose, technical solutions, and advantages of the present application clearer, the present application will be described in detail below with reference to the accompanying drawings and embodiments. It should be understood that the specific embodiments described here are only used to explain the present application, and are not used to limit the present application.

[0031] It should be noted that when a component is referred to as being "fixed to" or "installed on" another component, it can be directly on the other component or indirectly on the other component. When a component is said to be "connected" to another component, it can be directly connected to the other component or indirectly connected to the other component.

[0032] It should also be noted that the same or similar references in the drawings of the embodiments of the present application correspond to the same or similar components; in the description of the present application, it should be understood that if there are the terms of "upper" and "lower", "left", "right", etc. indicating the orientation or positional relationship based on the orientation or positional relationship shown in the drawings, are only for the convenience of describing the present application and simplifying the description, but not indicating or implying the device or element must have a specific orientation, structure and operation in a specific orientation. Therefore, the terms describing the positional relationship in the drawings are only for illustrative purposes and cannot be understood as a limitation of the patent. For those of ordinary skill in the art, the specific meaning of the above terms according to the specific situation could be understood.

[0033] In addition, the terms of "first" and "second" are only used for descriptive purposes, and cannot be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Therefore, the features defined with "first" and "second" may explicitly or implicitly include one or more of these features. In the description of the present application, "a plurality of" means two or more, unless otherwise specifically defined.

[0034] The blade head floating structure 200 provided by the embodiments of the present applications is mainly applied to shaver. The following takes shaver as an example for detailed description. It should be noted that the

blade head floating structure 200 can also be applied to other personal care products, such as barber scissors, shaving scissors and so on.

[0035] The blade head floating structure provided by the embodiments of the present application includes a supporting member 300, a shaving unit, a first hinge, a second hinge, and an elastic member. Wherein, the shaving unit is provided above the supporting member 300, the first hinge is provided in the shaving unit, the first hinge has a first matching groove, and the bottom of the first matching groove penetrates the first hinge; and the top of the second hinge has a matching portion arranged in the first matching groove. A limiting structure 220 that prevents relative rotation and can be separated along the central axis of the first matching groove is provided between the first matching groove and the matching portion, and the matching portion is provided with a first central hole that penetrates to the bottom of the second hinge, and the bottom of the second hinge passing through the first hinge is extended and fixed in the supporting member 300; while the elastic member is inserted into the first matching groove and the first central hole of the second hinge. The top end of the elastic member abuts against the shaving unit, and the bottom end of the elastic member abuts against the supporting member 300.

[0036] Based on the above-mentioned blade head floating structure 200, since the first hinge is arranged in the shaving unit, the first hinge and the shaving unit form into one a whole; while the second hinge and the supporting member 300 are fixedly connected into one as a whole, and the first hinge and the second hinge are in a matching state by the matching groove and the matching portion, the matching state can also be regarded as the above-mentioned two wholes being in a matching state. When the limiting structure 220 is not arranged, the two wholes can be rotated relative to each other. In this way, for the entire shaver, when the shaver is turned on and not shaving, the entire shaving unit is in a rotating state which makes the shaving unit unstable and inconvenient for the shaving operation; therefore, it is necessary to arrange a limiting structure 220 between the matching portions of the two wholes, namely the first hinge and the second hinge, but after the limiting structure 220 for anti-rotation of the first hinge and the second hinge is arranged, the first hinge and the second hinge cannot be rotated, so that the shaving unit has poor flexibility when shaving, and the contact with the skin is dull, and the use experience is poor. In the embodiments of the present application, an elastic member is arranged between the first hinge and the second hinge, the limiting structure 220 is separated in the axial direction of the first matching groove by pressing the first hinge, and the separated limiting structure 220 is re-opened by the elastic restoring force of the elastic member. In this way, when shaving, according to the different shaving strength, the limiting structure 220 is continuously separated and matched alternately, so that the first hinge and the second hinge

can rotate or be relatively static, and the elastic member is used during the separation and matching process. The extension and contraction of the shaving unit realize the floating of the shaving unit in the extension and contraction direction of the elastic member, so that the user can get a good shaving experience.

[0037] In actual applications, the above structure can be implemented by different embodiments. The implementation of a blade head floating structure 200 provided by the present application will be described in detail below with specific embodiments in combination with specific drawings.

Embodiment one

[0038] Referring to Figs. 1-3, the shaver provided by the first embodiment of the present application includes a body 100 and a blade head floating structure 200 on the body 100. Wherein, the blade head floating structure 200 includes a supporting member 300, a shaving unit 400 arranged above the supporting member 300, a first hinge 500 arranged in the shaving unit 400, a second hinge 600 matched with the first hinge 500, and an elastic member 800. The top end of the second hinge 600 is matched with the first hinge 500 and an anti-rotation limiting structure 220 is provided between the second hinge 600 and the first hinge 500, and the bottom end of the second hinge 600 is fixedly connected to the supporting member 300. Specifically, the first hinge 500 has a first matching groove 510, the first matching groove 510 has a first spherical arc surface 517, the center of the first spherical arc surface 517 is O, the first matching groove 510 has a central axis L, and the bottom of the first matching groove 510 penetrates the first hinge 500, that is, the first hinge 500 is hollow.

[0039] The top of the second hinge 600 has a matching portion 610 arranged in the first matching groove 510, the matching portion 610 is spherical, and the outer wall of the matching portion 610 matches the arc of the first spherical arc surface 517. Thus, when the matching portion 610 is arranged in the first matching groove 510, the outer wall surface of the matching portion 610 can better fit the first spherical arc surface 517. A limiting structure 220 is provided between the matching portion 610 and the first matching groove 510 to prevent relative rotation. A second matching groove 620 is provided in the matching portion 610, and the bottom of the second matching groove 620 is provided with a first central hole 621 that penetrates to the bottom of the second hinge 600. The bottom of the second hinge 600 penetrates the first hinge 500 and is fixed in the supporting member 300, so that the second hinge 600 is fixedly connected to the supporting member 300 to form into one as a whole.

[0040] Further, in this embodiment, the shaving unit 400 includes a housing 410 and a hinge cover 700. The housing 410 has a three-lobed shape as a whole with a mounting hole 411 in the center. The first hinge 500 is fixed at the mounting hole 411 through the hinge cover

700, and the second hinge 600 matched with the first hinge 500 protrudes from the mounting hole 411 and is connected to the supporting member 300. The top end of the elastic member 800 abuts against the hinge cover 700. In this embodiment, the first hinge 500 is fixed at the mounting hole 411 through the hinge cover 700. In other embodiments, the hinge cover 700 may also be omitted, and the first hinge 500 may be fixed at the mounting hole 411 by the structural design of the first hinge 500 or other parts.

[0041] The elastic member 800 passes through the first central hole 621, the second matching groove 620 and the first matching groove 510 of the second hinge 600, and the top end of the elastic member 800 abuts against the bottom of the hinge cover 700, and the bottom end of the elastic member 800 abuts against the top of the supporting member 300.

[0042] In the non-working state, the elastic force of the elastic member 800 pushes the hinge cover 700 and the supporting member 300 to both ends along the central axis L respectively, so that the first hinge 500 fixedly connected to the hinge cover 700 and the second hinge 600 fixedly connected to the supporting member 300 are more closely attached on the spherical arc surface.

[0043] When the shaver is working, the shaving unit 400 is in contact with the face and is squeezed by the force of the face, the shaving unit 400 drives the hinge cover 700 to move downward and squeeze the elastic member 800, and at the same time the first hinge 500 also moves downward. When the elastic force of member 800 is applied, elastic member 800 is compressed. During this process, the anti-rotation limiting structure 220 between the first hinge 500 and the second hinge 600 separates so that the hinge cover 700 and the shaving unit 400 can rotate with the first hinge 500 around the center O of the first spherical arc surface 517. In this way, the shaving unit 400 can be rotated within a range of 360°. During the rotation, the elastic member 800 is a flexible connection between the shaving unit 400 and the supporting member 300, making the 360° rotation of the shaving unit 400 smoother; and when the shaving unit 400 acts on different position of the face, the external force of the face reacting to the shaver changes. When the external force applied to the shaving unit 400 decreases, that is, when the external force is less than the elastic force of the elastic member 800, the elastic member 800 elastically returns to push the hinge cover 700 upward, and the first hinge 500 and the shaving unit 400 move upward. The limiting structure 220 between the hinge 500 and the second hinge 600 is re-matched to prevent the first hinge 500 and the second hinge 600 from rotating relative to each other. During this process, the shaving unit 400 floats up and down along the central axis L, which can better adapt to changes in the face curve and avoid hard contact with the face, thus bringing users a more comfortable shaving experience.

[0044] Furthermore, in order to facilitate the restriction between the first hinge 500 and the second hinge 600

not to rotate with each other, and also to facilitate the separation of the first hinge 500 and the second hinge 600, the limiting structure 220 does not block the rotation of the first hinge 500. In this embodiment, the limiting structure 220 is designed simply and ingeniously, which prevents rotation in the circumferential direction without affecting the separation in the axial direction.

[0045] Specifically, referring to FIGS. 4-8, the limiting structure 220 includes a first limiting plane 611 arranged on the outer wall of the matching portion 610 and a second limiting plane 511 arranged in the first matching groove 510 and attached to the first limiting plane 611. Since the outer wall surfaces of the first spherical arc surface 517 and the matching portion 610 are spherical arc surfaces, they can rotate without friction or resistance when they are directly matched. The first limiting plane 611 and the second limiting plane 511 are arranged to match each other, the first hinge 500 and the matching portions 610 rotate with each other, the first limiting plane 611 and the second limiting plane 511 cannot rotate due to the frictional force between the two planes, thereby realizing the limitation in the circumferential direction. At the same time, the two planes are attached in the axial direction without hindering the upward or downward movement of the first hinge 500.

[0046] Specifically, the first limiting plane 611 can be regarded as a plane formed by longitudinal cutting along the outer wall surface of the matching portion 610. Since the first spherical arc surface 517 is a curved surface, in order to facilitate the arrangement of the second limiting plane 511, a positioning block 512 is provided in the first matching groove 510, and the second limiting plane 511 is arranged inside the positioning block 512 toward the center of the first matching groove 510. In this embodiment, the positioning block 512 has a cubic block structure, and the second limiting plane 511 is the inner surface of the cubic block structure.

[0047] In this embodiment, there are three first limiting planes 611, and the three first limiting planes 611 are evenly distributed on the outer wall of the matching portion 610; there are three second limiting planes 511, and the three second limiting planes 511 are evenly arranged in the first matching groove 510. Through the attachment of the three groups of planes, the first hinge 500 and second hinge 600 can be well limited. Moreover, since the top surface of the cubic positioning block 512 is also flat, a triangular arrangement is formed between the three positioning blocks 512, and the top surfaces of the three positioning blocks 512 form a stable supporting surface for supporting the hinge cover 700 more reliably. Of course, the number of the first limiting plane 611 and the second limiting plane 511 can also be one, two, or four, or more.

[0048] In this embodiment, when the second hinge 600 and the supporting member 300 are fixedly connected as a whole, the second hinge 600 and the supporting member 300 are assembled and fixed by the connector 900. Through the assembly of the connector 900, the

fixed connection between the second hinge 600 and the supporting member 300 is detachable, which is convenient for disassembly, maintenance, and assembly during product production. Of course, under the premise of ensuring a reliable connection between the second hinge 600 and the supporting member 300, in other embodiments, other detachable fixed connection methods, such as a snap connection, can also be used.

[0049] Specifically, the second matching groove 620 of the matching portion 610 of the second hinge 600 is provided with a first connecting hole 622, and the first matching groove 510 attached to the matching portion 610 is provided with a second connecting hole 513 corresponding to the first connecting hole 622. The connector 900 is specifically a screw. A mounting post 310 is provided in the supporting member 300, and a screw hole is provided in the mounting post 310 (not labeled in the figure). The screws pass through the first connecting hole 622 and the second connecting hole 513 and are screwed into the screw holes of the mounting post 310. The second hinge 600 is fixed by screwing, which is simple in structure, easy to process and assemble.

[0050] As shown in Fig.9, the supporting member 300 is a general cylindrical structure, which has a step surface 320 with an inward concavity on the top. The step surface 320 is provided with a second central hole 330 that penetrates the supporting member 300. The mounting post 310 is provided on the step surface 320. In this way, the depth of the step surface 320 recessed downward fills the height of the mounting post 310 to prevent the mounting post 310 from protruding from the top surface of the supporting member 300 and occupy more space or form a connection gap.

[0051] Furthermore, there are three first connecting holes 622, three second connecting holes 513, three mounting posts 310, and three connectors 900. The three connectors 900 are arranged in a triangle shape to make the second hinge 600 and the supporting member 300 more stable. Moreover, for the second hinge 600, the number of the first limiting plane 611 and the first connecting hole 622 are both three. The first connecting hole 622 and the first limiting plane 611 are alternately arranged at intervals, that is, a first connecting hole 622 is arranged between the two first limiting planes 611, and a first limiting plane 611 is arranged between the two first connecting holes 622.

[0052] In this embodiment, the top of the second hinge 600 is a matching portion 610, and the bottom has a connecting portion 630, and the connecting portion 630 is specifically a cylindrical structure. The diameter of the cylinder is slightly larger than the bottom diameter of the matching portion 610. Since the inner wall surface of the second spherical arc surface in the ball head gradually increases from bottom to top, the diameter of the cylinder is designed to be slightly larger than the bottom diameter of the matching portion 610. In this way, on the one hand, the compactness of the second hinge 600 is maintained, on the other hand, it also enables the connector 900 to

pass through the connecting portion 630 when passing through the matching portion 610 through the first connecting hole 622, thus the matching portion 610 and the connecting portion 630 of the second hinge 600 are connected as a whole through the connector 900, so that the instability caused by separation from the connecting portion 630 when only the matching portion 610 is connected to the supporting member 300 could be avoided. And cause. Specifically, a positioning structure for limiting the connector 900 is provided on the connecting portion 630 corresponding to the first connecting hole 622.

[0053] Specifically, as shown in Fig. 5, the positioning structure includes a positioning boss 640 provided on the outer wall of the connecting portion 630 for the connector 900 to pass through, and a concavity 650 provided under the positioning boss 640 along the height direction of the connecting portion 630 for accommodating the connector 900. In this embodiment, a semi-circular hole 641 is provided on the positioning boss 640 for the connector 900 to pass through, or a circular hole may be provided, or the positioning boss 640 is directly designed as a positioning ring for the connector 900 to pass through.

[0054] In this embodiment, the elastic member 800 is preferably a spring. The spring is pre-compressed between the hinge cover 700 and the supporting member 300. The installation structure of the spring is shown in Fig. 3 and Fig. 9. The bottom center of the hinge cover 700 extends around the central hole to form a first annular protrusion 710. At the same time, a second annular protrusion 340 is provided on the step surface 320 of the supporting member 300 and at the edge of the central hole. The top of the spring is sleeved on the first annular protrusion 710, and the bottom of the spring is sleeved on the second annular protrusion 340. In other embodiments, the bottom of the hinge cover 700 and the step surface 320 of the supporting member 300 may also be provided with concave holes, and the two ends of the spring are respectively arranged in the concave holes.

[0055] In other embodiments, the spring can also be replaced by other retractable and resettable elastic components, such as, shrapnel.

[0056] Referring to Figs 11-13, the shaving unit 400 further includes a cover plate 420 arranged on the housing 410, a bracket 430 arranged on the cover plate 420, and at least one blade head assembly 440 arranged on the bracket 430 (in this embodiment, there are three blade head assemblies 440), and a transmission structure (not shown in the Figure) provided in the enclosed space of housing 410 and cover plate 420 for driving the blade head assembly 440.

[0057] Referring to Fig. 4 again, the edge of the first matching groove 510 of the first hinge 500 extends outward to form an annular flange 514. During installation, the annular flange 514 is stacked on the edge of the mounting hole 411. The edge of the mounting hole 411 is provided with at least one stopper 412. The annular flange 514 is provided at the corresponding stopper 412. There is a first avoiding groove 515, the hinge cover 700

covers on the first matching groove 510, and the edge of the hinge cover 700 protrudes outward at least one block 720 that can be stopped at the stopper 412. In this way, the hinge cover 700 is fixed on the housing 410 through the block 720 and the stopper 412. At the same time, because the hinge cover 700 covers on the first hinge 500, the first hinge 500 is limited between the housing 410 and the hinge cover 700, so that the first hinge 500, housing 410 and the hinge cover 700 is connected in to one as a whole.

[0058] When the first hinge 500 is installed, for quick positioning, the edge of the mounting hole 411 is further provided with at least one positioning post 413, and the circular flange 514 is provided with a semi-circular positioning hole 516 for at least one positioning post 413 to be inserted when the circular flange 514 rotates. The positioning post 413 and the semi-circular positioning hole 516 not only play a role in positioning, but also play a role in supporting and positioning the internal transmission structure of the housing 410.

[0059] Furthermore, referring to Fig. 14, the position of stopper 412 is higher than the edge of mounting hole 411. In this way, the gap between stopper 412 and the edge of mounting hole 411 forms a groove 414 that can be locked when block 720 rotates horizontally. A limiting block 415 is provided on one side of groove 414. When the block 720 rotates at a certain angle in groove 414, it stops at limiting block 415 and does not continue to rotate. At this time, the hinge cover 700 is installed in place. At the same time, in order to facilitate the rotation of hinge cover 700, the second avoiding groove 730 is arranged on the edge of hinge cover 700 to avoid stopper 412, the block 720 is arranged in the second avoiding groove 730. In this way, when installing, firstly the hinge cover 700 covers on the first hinge 500, specifically, the hinge cover 700 is arranged on the top surface of the three positioning blocks 512, and the second avoiding groove 730 is arranged corresponding to the block 720, and then the hinge cover 700 is rotated to make the block 720 rotate into the groove 414 until it stops at the limiting block 415 to complete the installation of the hinge cover 700. At this time, the groove 414 limits the block 720 in the direction of the central axis L, and the limiting block 415 and the second avoiding groove 730 limit the rotation angle of the block 720 in the circumferential direction.

[0060] Preferably, in this embodiment, there are three stoppers 412, the three stoppers 412 are evenly distributed on the edge of the mounting hole 411, there are three positioning posts 413, and the three positioning posts 413 and three stopper 412 are alternately spaced and evenly distributed on the edge of the mounting hole 411. That is, a stopper 412 is arranged between two positioning posts 413, and a positioning post 413 is arranged between two stoppers 412. Such an alternately arranged structure makes the fixing of the first hinge 500 more stable and reliable.

[0061] In this embodiment, the hinge cover 700 is fixed

in a detachable manner of screwing and snapping in as described above. In other embodiments, the hinge cover 700 may also be fixed by screw fixing, glue bonding, or ultrasonic welding.

[0062] Referring to FIG. 3, FIG. 9 and FIG. 13 again. In this embodiment, the blade head floating structure 200 further includes a flexible bracket 210. The flexible bracket 210 is wrapped around the outside of the second hinge 600. That is, the flexible bracket 210 has a hollow cylindrical structure, and the second hinge 600 is located in the hollow structure of the flexible bracket 210. Specifically, the top of the flexible bracket 210 also extends outward to form a ring flange 211, the ring flange 211 is arranged on the edge of the mounting hole 411, the annular flange 514 of the first hinge 500 is pressed on the ring flange 211, and the top outer wall of the supporting member 300 is provided with a ring groove 350, and the bottom of the flexible bracket 210 is sleeved on the supporting member annular groove 350 to realize the fixation of the top and bottom of the flexible bracket 210. The flexible bracket 210 is arranged here to shield the exposed part between the housing 410 and the supporting member 300, which improves the appearance of the shaver, protects the internal components, and also supports the shaving unit 400 to a certain extent.

Embodiment two

[0063] Referring to FIGS 15 and 16, the blade head floating structure 200 provided in the second embodiment of the present application is substantially the same as the blade head floating structure 200 in the first embodiment, except that the shape of the first matching groove 510 and the matching portion 610 are different. Specifically, in this embodiment, the first matching groove 510 has a first plane 518 inside, the first plane extends horizontally inward along the bottom edge of the first matching groove 510, and the surface of the matching portion 610 has a second plane 612 matching with the first plane 518. The second plane 612 is the bottom plane of the matching portion 610. When the matching portion 610 of the second hinge 600 extends into the first matching groove 510 of the first hinge 500, the second plane 612 of the matching portion 610 overlaps with the first plane 518 in the first matching groove 510. When the limiting structure 220 is separated, the second plane 612 and the first plane 518 can rotate with each other, thereby the relative rotation between the first hinge 500 and the second hinge 600 can also be realized, and the requirement of the shaving unit 400 to rotate within a range of 360° in the first embodiment can also be realized.

[0064] Other structures not listed in this embodiment are basically the same as those in Embodiment one, and will not be repeated here.

[0065] The above are only preferred embodiments of the present application, and are not used to limit the present application. For those skilled in the art, the

present application can have various changes and amendments.

5 Claims

1. A blade head floating structure (200), **characterized in that** the blade head floating structure (200) comprises:

a supporting member (300);
 a shaving unit (400) arranged above the supporting member (300);
 a first hinge (500) provided inside the shaving unit (400), wherein the first hinge (500) has a first matching groove (510), and wherein the bottom of the first matching groove (510) penetrates the first hinge (500);
 a second hinge (600), wherein the top of the second hinge (600) has a matching portion (610) placed in the first matching groove (510), and wherein a limiting structure (220) is provided between the first matching groove (510) and the matching portion (610) structure, the limiting structure (220) preventing relative rotation and being separated along the central axis of the first matching groove (510), the matching portion (610) being provided with a first central hole (621) penetrating to the bottom of the second hinge (600), and wherein the bottom of the second hinge (600) penetrates the first hinge (500) to be installed in the supporting member (300);
 an elastic member (800) passing through the first matching groove (510) and the first central hole (621) of the second hinge (600), wherein the top end of the elastic member (800) abuts against the shaving unit (400), and wherein the bottom end of the elastic member (800) abuts against the supporting member (300).

2. The blade head floating structure (200) according to claim 1, wherein the shaving unit (400) comprises a housing (410) and a hinge cover (700), the housing (410) having a mounting hole (411), the first hinge (500) being fixed to the mounting hole (411) by the hinge cover (700), and wherein the second hinge (600) protrudes from the mounting hole (411) and is fixedly connected to the supporting member (300), and wherein the top end of the elastic member (800) abuts against the hinge cover (700).

3. The blade head floating structure (200) according to claim 1, wherein the first matching groove (510) has a first spherical arc surface (517), and wherein the matching portion (610) surface has a second spherical arc surface matching with the first spherical arc surface (517); or alternatively wherein the first matching groove (510) has a first plane (518), the

surface of the matching portion (610) having a second plane (612) matching with the first plane (518).

4. The blade head floating structure (200) according to any one of claims 1 to 3, wherein the limiting structure (220) comprises a first limiting plane (611) arranged on the outer surface of the matching portion (610) and a second limiting plane (511) arranged in the first matching groove (510) and attached to the first limiting plane (611). 5
5. The blade head floating structure (200) according to claim 4, wherein a positioning block (512) is provided in the first matching groove (510), and wherein the second limiting plane (511) is provided inside the positioning block (512) and faces the center of the first matching groove (510). 10
6. The blade head floating structure (200) according to claim 4, wherein there are a plurality of the first limiting planes (611), and wherein a plurality of the first limiting planes (611) are uniformly distributed on the outer wall surface of the matching portion (610); and wherein there are a plurality of the second limiting planes (511), and a plurality of the second limiting planes (511) are uniformly arranged on the inside the first matching groove (510). 15
7. The blade head floating structure (200) according to claim 1, wherein the second hinge (600) is fixedly connected to the supporting member (300) through a connector (900). 20
8. The blade head floating structure (200) according to claim 7, wherein a second matching groove (620) is provided on the matching portion (610), at least one penetrating first connecting hole (622) is provided on the wall of the second matching groove (620), and at least one second connecting hole (513) corresponding to the first connecting hole (622) is provided on the wall of the first matching groove (510), a mounting post (310) is provided in the supporting member (300), and the connector (900) is a screw that penetrates the first connecting hole (622) and the second connecting hole (513) into the mounting post (310). 25
9. The blade head floating structure (200) according to claim 8, wherein the bottom of the second hinge (600) has a connecting portion (630), and wherein a positioning structure for limiting the connector (900) is provided on the connecting portion (630) corresponding to the first connecting hole (622). 30
10. The blade head floating structure (200) according to claim 9, wherein the positioning structure comprises a positioning boss (640) provided on the outer wall of the connecting portion (630) for the connector (900) to pass through, and further comprises a concavity (650) located below the positioning boss (640), arranged along the height direction of the connecting portion (630) and used for accommodating the connector (900). 35
11. The blade head floating structure (200) according to claim 8, wherein the top of the supporting member (300) has a step surface (320) with inward concavity (650), the step surface (320) is provided with a second central hole (330) penetrating the supporting member (300), the mounting post (310) is provided on the step surface (320), and an annular protrusion is arranged on the step surface (320) and located at the edge of the two central holes, and the bottom of the elastic member (800) is sleeved on the annular protrusion. 40
12. The blade head floating structure (200) according to any one of claims 8 to 11, further comprising multiple first limiting planes (611), wherein there is an equal number of first connecting holes (622) and first limiting planes (611), and wherein at least one of the first connecting hole (622) is arranged between the two first limiting planes (611). 45
13. The blade head floating structure (200) according to claim 2, wherein the edge of the mounting hole (411) is provided with at least one stopper (412), the edge of the first matching groove (510) extends outward to form an annular flange (514), the annular flange (514) is arranged on the edge of the mounting hole (411), and wherein a first avoiding groove (515) is provided on the annular flange (514) corresponding to the stopper (412), the hinge cover (700) covers in the first matching groove (510), and at least one block that can be stopped at the stopper (412) is provided on the edge of the hinge cover (700). 50
14. The blade head floating structure (200) according to claim 13, wherein a groove that can be locked when the block rotates horizontally is arranged between the stopper (412) and the edge of the mounting hole (411), and one side of the groove is provided with a limiting block (415) that resists the block, and the hinge cover (700) edge is provided with a second avoiding groove (730) that can avoid the stopper (412), and the block is provided at the second avoiding groove (730). 55
15. The blade head floating structure (200) according to claim 13 or 14, wherein there are a plurality of stoppers (412), and wherein a plurality of stoppers (412) are evenly distributed on the edge of the mounting hole (411); there are a plurality of the block, and a plurality of blocks are evenly distributed on the edge of the hinge cover (700).

16. The blade head floating structure (200) according to claim 13, wherein the edge of the mounting hole (411) is further provided with at least one positioning post (413), and the annular flange (514) is provided with a semi-circular positioning hole (516) for at least one positioning post (413) to be inserted when the annular flange (514) rotates. 5
17. The blade head floating structure (200) according to claim 16, wherein there are a plurality of positioning posts (413), a plurality of stoppers (412), and wherein a plurality of positioning posts (413) and a plurality of stoppers (412) are alternately spaced and evenly distributed on the edge of the mounting hole (411). 10
18. The blade head floating structure (200) according to claim 2, wherein the shaving unit (400) further comprises a cover plate (420) provided on the housing (410), a bracket provided on the cover plate (420), at least one blade head assembly (440) provided on the bracket, and a transmission structure arranged in the enclosed space of the cover plate (420) and housing (410) for driving the blade head assembly (440). 15 20 25
19. The blade head floating structure (200) according to claim 18, wherein further comprising a flexible bracket (210) wrapped outside the second hinge (600), wherein the top of the flexible bracket (210) is arranged on the mounting hole (411), the first hinge (500) is pressed on the top edge of the flexible bracket (210), and the bottom of the flexible bracket (210) is sleeved on the outer wall of the supporting member (300). 30 35
20. The blade head floating structure (200) according to claim 19, wherein the top of the outer wall of the supporting member (300) is provided with an annular groove (350), and the bottom of the flexible bracket (210) is sleeved on the annular groove (350). 40
21. A shaver, comprising a body (100), the body (100) comprising the blade head floating structure (200) according to any one of claims 1 to 20 arranged on the body (100). 45

Patentansprüche

1. Schwimmende Scherkopfstruktur (200), **dadurch gekennzeichnet, dass** die schwimmende Scherkopfstruktur (200) Folgendes umfasst: 50
- ein Trägerelement (300);
 - eine Rasiereinheit (400), die oberhalb des Trägerelements (300) angeordnet ist;
 - ein erstes Drehgelenk (500), das innerhalb der Rasiereinheit (400) bereitgestellt ist, wobei das 55

erste Drehgelenk (500) eine erste Anpassungsaussparung (510) aufweist, und wobei die Unterseite der ersten Anpassungsaussparung (510) das erste Drehgelenk (500) durchdringt; ein zweites Drehgelenk (600), wobei die Oberseite des zweiten Drehgelenks (600) einen Anpassungsabschnitt (610) aufweist, der in der ersten Anpassungsaussparung (510) angeordnet ist, und wobei eine Begrenzungsstruktur (220) zwischen der ersten Anpassungsaussparung (510) und der Struktur des Anpassungsabschnitts (610) bereitgestellt ist, wobei die Begrenzungsstruktur (220) eine relative Drehung verhindert und entlang der Mittelachse der ersten Anpassungsaussparung (510) getrennt ist, wobei der Anpassungsabschnitt (610) mit einem ersten Mittelloch (621) bereitgestellt ist, das in die Unterseite des zweiten Drehgelenks (600) eindringt, und wobei die Unterseite des zweiten Drehgelenks (600) das erste Drehgelenk (500) durchdringt, um in dem Trägerelement (300) installiert zu werden; ein elastisches Element (800), das durch die erste Anpassungsaussparung (510) und das erste Mittelloch (621) des zweiten Drehgelenks (600) hindurchgeht, wobei das obere Ende des elastischen Elements (800) an der Rasiereinheit (400) anliegt und wobei das untere Ende des elastischen Elements (800) am Trägerelement (300) anliegt.

2. Schwimmende Scherkopfstruktur (200) nach Anspruch 1, wobei die Rasiereinheit (400) ein Gehäuse (410) und eine Drehgelenkabdeckung (700) umfasst, wobei das Gehäuse (410) ein Montageloch (411) aufweist, wobei das erste Drehgelenk (500) durch die Drehgelenkabdeckung (700) am Montageloch (411) befestigt ist, und wobei das zweite Drehgelenk (600) aus dem Montageloch (411) hervorsteht und fest mit dem Trägerelement (300) verbunden ist, und wobei das obere Ende des elastischen Elements (800) an der Drehgelenkabdeckung (700) anliegt. 35 40

3. Schwimmende Scherkopfstruktur (200) nach Anspruch 1, wobei die erste Anpassungsaussparung (510) eine erste sphärische Bogenoberfläche (517) aufweist, und wobei die Oberfläche des Anpassungsabschnitts (610) eine zweite sphärische Bogenoberfläche aufweist, die passend zu der ersten sphärischen Bogenoberfläche (517) ist; oder wobei alternativ die erste Anpassungsaussparung (510) eine erste Ebene (518) aufweist, wobei die Oberfläche des Anpassungsabschnitts (610) eine zweite Ebene (612) aufweist, die passend zu der ersten Ebene (518) ist. 45 50

4. Schwimmende Scherkopfstruktur (200) nach einem

- der Ansprüche 1 bis 3, wobei die Begrenzungsstruktur (220) eine erste Begrenzungsebene (611), die an der Außenoberfläche des Anpassungsabschnitts (610) angeordnet ist, und eine zweite Begrenzungsebene (511), die in der ersten Anpassungsaussparung (510) angeordnet und an der ersten Begrenzungsebene (611) befestigt ist, umfasst.
5. Schwimmende Scherkopfstruktur (200) nach Anspruch 4, wobei ein Positionierungsblock (512) in der ersten Anpassungsaussparung (510) bereitgestellt ist, und wobei die zweite Begrenzungsebene (511) innerhalb des Positionierungsblocks (512) bereitgestellt ist und der Mitte der ersten Anpassungsaussparung (510) gegenüberliegt.
 6. Schwimmende Scherkopfstruktur (200) nach Anspruch 4, wobei eine Vielzahl der ersten Begrenzungsebenen (611) vorhanden ist und wobei eine Vielzahl der ersten Begrenzungsebenen (611) gleichmäßig auf der Außenwandoberfläche des Anpassungsabschnitts (610) verteilt ist; und wobei eine Vielzahl der zweiten Begrenzungsebenen (511) vorhanden ist und eine Vielzahl der zweiten Begrenzungsebenen (511) gleichmäßig auf der Innenseite der ersten Anpassungsaussparung (510) angeordnet ist.
 7. Schwimmende Scherkopfstruktur (200) nach Anspruch 1, wobei das zweite Drehgelenk (600) über ein Verbindungsstück (900) fest mit dem Trägerelement (300) verbunden ist.
 8. Schwimmende Scherkopfstruktur (200) nach Anspruch 7, wobei eine zweite Anpassungsaussparung (620) am Anpassungsabschnitt (610) bereitgestellt ist, mindestens ein durchgehendes erstes Verbindungsloch (622) an der Wand der zweiten Anpassungsaussparung (620) bereitgestellt ist, und mindestens ein zweites Verbindungsloch (513), das dem ersten Verbindungsloch (622) entspricht, an der Wand der ersten Anpassungsaussparung (510) bereitgestellt ist, ein Montagezapfen (310) in dem Trägerelement (300) bereitgestellt ist, und das Verbindungsstück (900) eine Schraube ist, die das erste Verbindungsloch (622) und das zweite Verbindungsloch (513) in den Montagezapfen (310) durchdringt.
 9. Schwimmende Scherkopfstruktur (200) nach Anspruch 8, wobei die Unterseite des zweiten Drehgelenks (600) einen Verbindungsabschnitt (630) aufweist und wobei eine Positionierungsstruktur zum Begrenzen des Verbindungsstücks (900) am Verbindungsabschnitt (630) bereitgestellt ist, das dem ersten Verbindungsloch (622) entspricht.
 10. Schwimmende Scherkopfstruktur (200) nach Anspruch 9, wobei die Positionierungsstruktur einen Positionierungsvorsprung (640) umfasst, der an der Außenwand des Verbindungsabschnitts (630) bereitgestellt ist, damit das Verbindungsstück (900) hindurchgehen kann, und ferner eine Konkavität (650) umfasst, die sich unterhalb des Positionierungsvorsprungs (640) befindet, entlang der Höhenrichtung des Verbindungsabschnitts (630) angeordnet ist und zum Aufnehmen des Verbindungsstücks (900) verwendet wird.
 11. Schwimmende Scherkopfstruktur (200) nach Anspruch 8, wobei die Oberseite des Trägerelements (300) eine Stufenoberfläche (320) mit einer nach innen gerichteten Konkavität (650) aufweist, die Stufenoberfläche (320) mit einem zweiten Mittelloch (330) bereitgestellt ist, das das Trägerelement (300) durchdringt, der Montagezapfen (310) auf der Stufenoberfläche (320) bereitgestellt ist, und ein ringförmiger Vorsprung auf der Stufenoberfläche (320) angeordnet ist und sich am Rand der zwei Mittellöcher befindet, und die Unterseite des elastischen Elements (800) auf den ringförmigen Vorsprung gestülpt ist.
 12. Schwimmende Scherkopfstruktur (200) nach einem der Ansprüche 8 bis 11, die ferner mehrere erste Begrenzungsebenen (611) umfasst, wobei eine gleiche Anzahl von ersten Verbindungslöchern (622) und ersten Begrenzungsebenen (611) vorhanden ist, und wobei mindestens eines der ersten Verbindungslöcher (622) zwischen den beiden ersten Begrenzungsebenen (611) angeordnet ist.
 13. Schwimmende Scherkopfstruktur (200) nach Anspruch 2, wobei der Rand des Montagelochs (411) mit mindestens einem Anschlag (412) bereitgestellt ist, der Rand der ersten Anpassungsaussparung (510) sich nach außen erstreckt, um einen ringförmigen Flansch (514) zu bilden, der ringförmige Flansch (514) am Rand des Montagelochs (411) angeordnet ist, und wobei eine erste Ausweichaussparung (515) am ringförmigen Flansch (514), die dem Anschlag (412) entspricht, bereitgestellt ist, die Drehgelenkabdeckung (700) in der ersten Anpassungsaussparung (510) abdeckt und mindestens ein Block, der an dem Anschlag (412) gestoppt werden kann, am Rand der Drehgelenkabdeckung (700) bereitgestellt ist.
 14. Schwimmende Scherkopfstruktur (200) nach Anspruch 13, wobei eine Aussparung, die verriegelt werden kann, wenn sich der Block horizontal dreht, zwischen dem Anschlag (412) und dem Rand des Montagelochs (411) angeordnet ist, und eine Seite der Aussparung mit einem Begrenzungsblock (415) bereitgestellt ist, der dem Block Widerstand entgegensetzt, und der Rand der Drehgelenkabdeckung (700) mit einer zweiten Ausweichaussparung (730)

bereitgestellt ist, die dem Anschlag (412) ausweichen kann, und der Block an der zweiten Ausweich-
aussparung (730) bereitgestellt ist.

15. Schwimmende Scherkopfstruktur (200) nach An-
spruch 13 oder 14, wobei eine Vielzahl von Anschlä-
gen (412) vorhanden ist und wobei eine Vielzahl von
Anschlägen (412) gleichmäßig am Rand des Mon-
tagelochs (411) verteilt ist; eine Vielzahl des Blocks
vorhanden ist und eine Vielzahl von Blöcken gleich-
mäßig am Rand der Drehgelenkabdeckung (700)
verteilt ist. 5
16. Schwimmende Scherkopfstruktur (200) nach An-
spruch 13, wobei der Rand des Montagelochs (411)
ferner mit mindestens einem Positionierungszapfen
(413) bereitgestellt ist und der ringförmige Flansch
(514) mit einem halbkreisförmigen Positionierungs-
loch (516) für mindestens einen Positionierungszap-
fen (413) bereitgestellt ist, der einzuführen ist, wenn
sich der ringförmige Flansch (514) dreht. 10
17. Schwimmende Scherkopfstruktur (200) nach An-
spruch 16, wobei eine Vielzahl von Positionierungs-
zapfen (413) und eine Vielzahl von Anschlägen (412)
vorhanden sind, und wobei eine Vielzahl von Posi-
tionierungszapfen (413) und eine Vielzahl von An-
schlägen (412) abwechselnd beabstandet und
gleichmäßig auf dem Rand des Montagelochs (411)
verteilt sind. 15
18. Schwimmende Scherkopfstruktur (200) nach An-
spruch 2, wobei die Rasiereinheit (400) ferner eine
Abdeckplatte (420), die an dem Gehäuse (410) be-
reitgestellt ist, eine Halterung, die an der Abdeck-
platte (420) bereitgestellt ist, mindestens eine Scher-
kopfanordnung (440), die an der Halterung bereit-
gestellt ist, und eine Übertragungsstruktur, die in
dem eingeschlossenen Raum der Abdeckplatte
(420) und des Gehäuses (410) zum Antreiben der
Scherkopfanordnung (440) angeordnet ist, umfasst. 20
19. Schwimmende Scherkopfstruktur (200) nach An-
spruch 18, wobei sie ferner eine flexible Halterung
(210) umfasst, der außerhalb des zweiten Drehge-
lenks (600) gewickelt ist, wobei die Oberseite der
flexiblen Halterung (210) auf dem Montageloch
(411) angeordnet ist, das erste Drehgelenk (500) auf
den oberen Rand der flexiblen Halterung (210) ge-
presst ist und die Unterseite der flexiblen Halterung
(210) auf die Außenwand des Trägerelements (300)
gestülpt ist. 25
20. Schwimmende Scherkopfstruktur (200) nach An-
spruch 19, wobei die Oberseite der Außenwand des
Trägerelements (300) mit einer ringförmigen Aus-
sparung (350) bereitgestellt ist und die Unterseite
der flexiblen Halterung (210) auf die ringförmige Aus-
sparung (350) gestülpt ist. 30

sparung (350) gestülpt ist.

21. Rasierer, der einen Körper (100) umfasst, wobei der
Körper (100) die schwimmende Scherkopfstruktur
(200) nach einem der Ansprüche 1 bis 20 umfasst,
die am Körper (100) angeordnet ist. 35

Revendications

1. Structure flottante de tête de lame (200), **caracté-
risée en ce que** la structure flottante de tête de lame
(200) comprend :

un élément de support (300) ;
une unité de rasage (400) agencée au-dessus
de l'élément de support (300) ;
une première charnière (500) prévue à l'intérieur
de l'unité de rasage (400), dans laquelle la pre-
mière charnière (500) a une première rainure
correspondante (510), et dans laquelle le bas
de la première rainure correspondante (510) pé-
nètre dans la première charnière (500) ;
une seconde charnière (600), dans laquelle le
dessus de la seconde charnière (600) a une par-
tie correspondante (610) placée dans la premiè-
re rainure correspondante (510), et dans laquel-
le une structure de limitation (220) est prévue
entre la première rainure correspondante (510)
et la structure de la partie correspondante (610),
la structure de limitation (220) empêchant la ro-
tation relative et étant séparée le long de l'axe
central de la première rainure correspondante
(510), la partie correspondante (610) étant do-
tée d'un premier trou central (621) pénétrant jus-
qu'au bas de la seconde charnière (600), et dans
laquelle le bas de la seconde charnière (600)
pénètre dans la première charnière (500) pour
être installé dans l'élément de support (300) ;
un élément élastique (800) passant à travers la
première rainure correspondante (510) et le pre-
mier trou central (621) de la seconde charnière
(600), dans laquelle l'extrémité supérieure de
l'élément élastique (800) vient en butée contre
l'unité de rasage (400), et dans laquelle l'extré-
mité inférieure de l'élément élastique (800) vient
en butée contre l'élément de support (300). 40

2. Structure flottante de tête de lame (200) selon la re-
vendication 1, dans laquelle l'unité de rasage (400)
comprend un boîtier (410) et un couvercle de char-
nière (700), le boîtier (410) ayant un trou de montage
(411), la première charnière (500) étant fixée au trou
de montage (411) par le couvercle de charnière
(700), et dans laquelle la seconde charnière (600)
dépasse du trou de montage (411) et est reliée de
manière fixe à l'élément de support (300), et dans
laquelle l'extrémité supérieure de l'élément élastique 45

(800) vient en butée contre le couvercle de charnière (700).

3. Structure flottante de tête de lame (200) selon la revendication 1, dans laquelle la première rainure correspondante (510) a une première surface en arc sphérique (517), et dans laquelle la surface de la partie correspondante (610) a une seconde surface en arc sphérique correspondant à la première surface en arc sphérique (517); ou en variante dans laquelle la première rainure correspondante (510) a un premier plan (518), la surface de la partie correspondante (610) ayant un second plan (612) correspondant au premier plan (518). 5
4. Structure flottante de tête de lame (200) selon l'une quelconque des revendications 1 à 3, dans laquelle la structure de limitation (220) comprend un premier plan de limitation (611) agencé sur la surface externe de la partie correspondante (610) et un second plan de limitation (511) agencé dans la première rainure correspondante (510) et fixé au premier plan de limitation (611). 10
5. Structure flottante de tête de lame (200) selon la revendication 4, dans laquelle un bloc de positionnement (512) est prévu dans la première rainure correspondante (510), et dans laquelle le second plan de limitation (511) est prévu à l'intérieur du bloc de positionnement (512) et fait face au centre de la première rainure correspondante (510). 20
6. Structure flottante de tête de lame (200) selon la revendication 4, dans laquelle il y a une pluralité de premiers plans de limitation (611), et dans laquelle une pluralité de premiers plans de limitation (611) sont uniformément répartis sur la surface de paroi externe de la partie correspondante (610); et dans laquelle il existe une pluralité de seconds plans de limitation (511), et une pluralité de seconds plans de limitation (511) sont agencés uniformément à l'intérieur de la première rainure correspondante (510). 25
7. Structure flottante de tête de lame (200) selon la revendication 1, dans laquelle la seconde charnière (600) est reliée de manière fixe à l'élément de support (300) par l'intermédiaire d'un connecteur (900). 30
8. Structure flottante de tête de lame (200) selon la revendication 7, dans laquelle une seconde rainure correspondante (620) est prévue sur la partie correspondante (610), au moins un premier trou de connexion pénétrant (622) est prévu sur la paroi de la seconde rainure correspondante (620), et au moins un second trou de connexion (513) correspondant au premier trou de connexion (622) est prévu sur la paroi de la première rainure correspondante (510), une colonne de montage (310) est prévue dans l'élé-

ment de support (300), et le connecteur (900) est une vis qui pénètre dans le premier trou de connexion (622) et le second trou de connexion (513) dans la colonne de montage (310).

9. Structure flottante de tête de lame (200) selon la revendication 8, dans laquelle le bas de la seconde charnière (600) a une partie de connexion (630), et dans laquelle une structure de positionnement pour limiter le connecteur (900) est prévue sur la partie de connexion (630) correspondant au premier trou de connexion (622). 35
10. Structure flottante à tête de lame (200) selon la revendication 9, dans laquelle la structure de positionnement comprend un bossage de positionnement (640) prévu sur la paroi externe de la partie de connexion (630) pour que le connecteur (900) puisse passer à travers, et comprend en outre une concavité (650) située au-dessous du bossage de positionnement (640), agencée le long de la direction de la hauteur de la partie de connexion (630) et utilisée pour recevoir le connecteur (900). 40
11. Structure flottante de tête de lame (200) selon la revendication 8, dans laquelle le dessus de l'élément de support (300) a une surface étagée (320) avec une concavité vers l'intérieur (650), la surface étagée (320) est munie d'un second trou central (330) pénétrant dans l'élément de support (300), la colonne de montage (310) est prévue sur la surface étagée (320), et une saillie annulaire est agencée sur la surface étagée (320) et située au bord des deux trous centraux, et le bas de l'élément élastique (800) est emmanché sur la saillie annulaire. 45
12. Structure flottante de tête de lame (200) selon l'une quelconque des revendications 8 à 11, comprenant en outre plusieurs premiers plans de limitation (611), dans laquelle il y a un nombre égal de premiers trous de connexion (622) et de premiers plans de limitation (611), et dans laquelle au moins l'un des premiers trous de connexion (622) est agencé entre les deux premiers plans de limitation (611). 50
13. Structure flottante de tête de lame (200) selon la revendication 2, dans laquelle le bord du trou de montage (411) est pourvu d'au moins une butée (412), le bord de la première rainure correspondante (510) s'étend vers l'extérieur pour former une bride annulaire (514), la bride annulaire (514) est agencée sur le bord du trou de montage (411), et dans laquelle une première rainure d'évitement (515) est prévue sur la bride annulaire (514) correspondant à la butée (412), le couvercle de charnière (700) recouvre la première rainure correspondante (510), et au moins un bloc qui peut être arrêté au niveau de la butée (412) est agencé sur le bord du couvercle de char-

nière (700).

14. Structure flottante de tête de lame (200) selon la revendication 13, dans laquelle une rainure qui peut être verrouillée lorsque le bloc tourne horizontalement est agencée entre la butée (412) et le bord du trou de montage (411), et un côté de la rainure est pourvu d'un bloc de limitation (415) qui résiste au bloc, et le bord du couvercle de charnière (700) est pourvu d'une seconde rainure d'évitement (730) qui peut éviter la butée (412), et le bloc est pourvu au niveau de la seconde rainure d'évitement (730). 5
15. Structure flottante de tête de lame (200) selon la revendication 13 ou 14, dans laquelle il y a une pluralité de butées (412), et dans laquelle une pluralité de butées (412) sont réparties uniformément sur le bord du trou de montage (411) ; il y a une pluralité de blocs, et une pluralité de blocs sont répartis uniformément sur le bord du couvercle de charnière (700). 15 20
16. Structure flottante de tête de lame (200) selon la revendication 13, dans laquelle le bord du trou de montage (411) est en outre pourvu d'au moins une colonne de positionnement (413), et la bride annulaire (514) est dotée d'un trou de positionnement semi-circulaire (516) pour au moins une colonne de positionnement (413) à insérer lorsque la bride annulaire (514) tourne. 25 30
17. Structure flottante de tête de lame (200) selon la revendication 16, dans laquelle il y a une pluralité de colonnes de positionnement (413), une pluralité de butées (412), et dans laquelle une pluralité de colonnes de positionnement (413) et une pluralité de butées (412) sont alternativement espacées et réparties uniformément sur le bord du trou de montage (411). 35
18. Structure flottante de tête de lame (200) selon la revendication 2, dans laquelle l'unité de rasage (400) comprend en outre une plaque de recouvrement (420) prévue sur le boîtier (410), un support prévu sur la plaque de recouvrement (420), au moins un ensemble tête de lame (440) prévu sur le support, et une structure de transmission agencée dans l'espace clos de la plaque de recouvrement (420) et du boîtier (410) pour l'entraînement de l'ensemble de tête de lame (440). 40 45 50
19. Structure flottante de tête de lame (200) selon la revendication 18, dans laquelle comprenant en outre un support flexible (210) enveloppé à l'extérieur de la seconde charnière (600), dans laquelle le dessus du support flexible (210) est agencé sur le trou de montage (411), la première charnière (500) est pressée sur le bord supérieur du support flexible (210), et le bas du support flexible (210) est emmanché sur 55

la paroi externe de l'élément de support (300).

20. Structure flottante de tête de lame (200) selon la revendication 19, dans laquelle le dessus de la paroi externe de l'élément de support (300) est pourvu d'une rainure annulaire (350), et le bas du support flexible (210) est emmanché sur la rainure annulaire (350).
21. Rasoir, comprenant un corps (100), le corps (100) comprenant la structure flottante de tête de lame (200) selon l'une quelconque des revendications 1 à 20 agencée sur le corps (100).

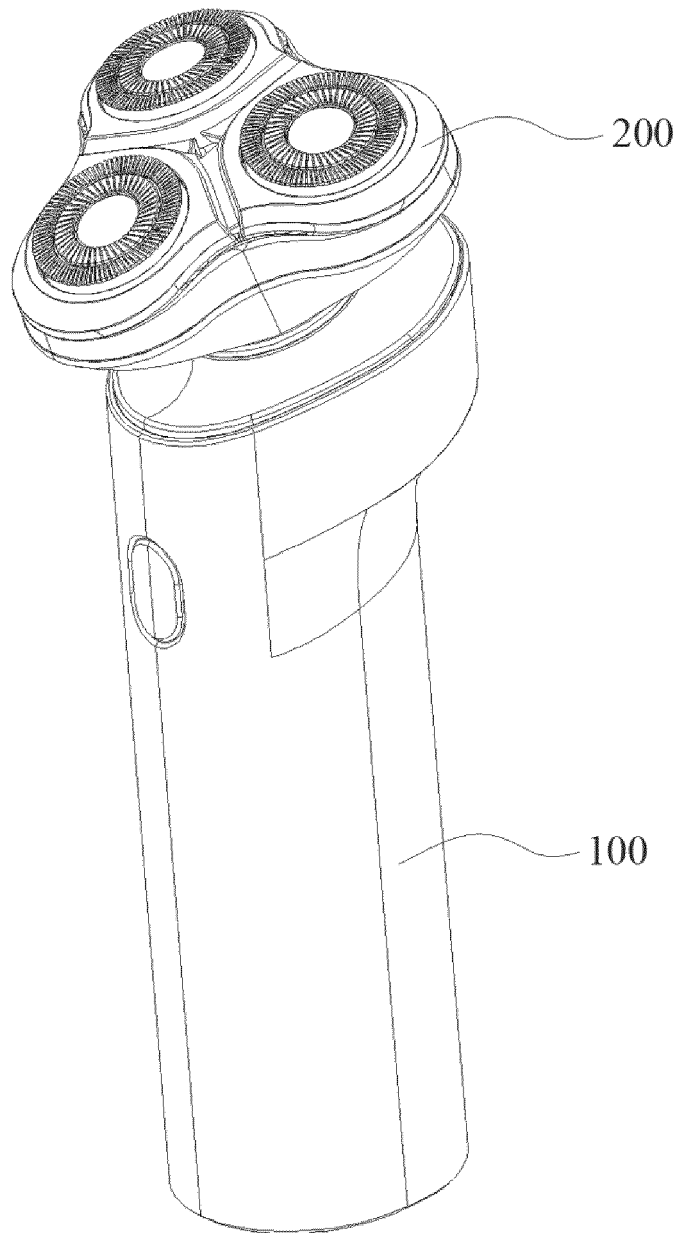


Fig. 1

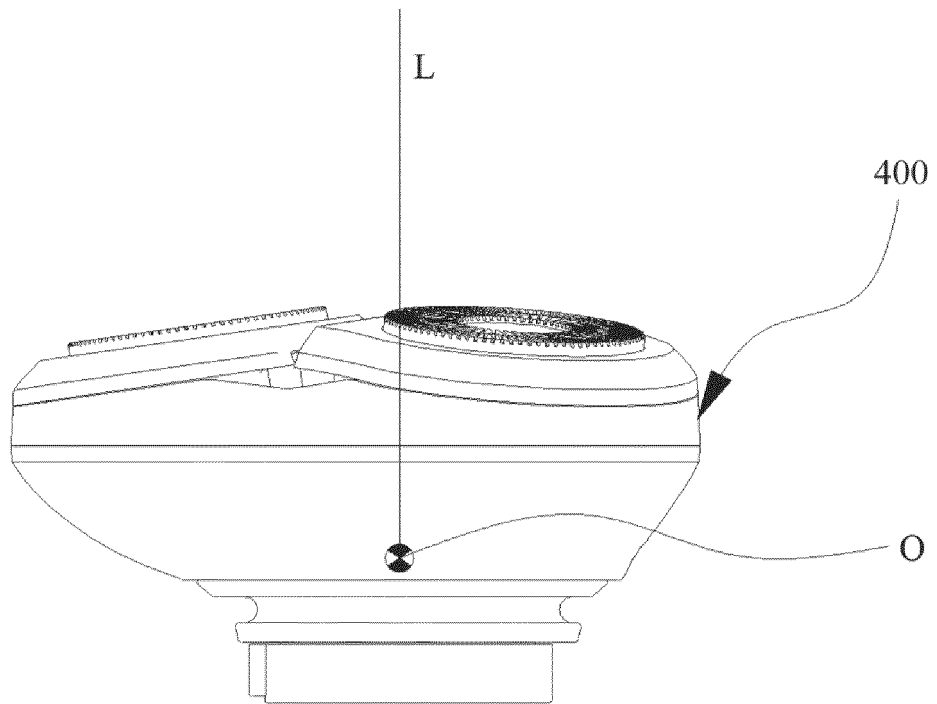


Fig. 2

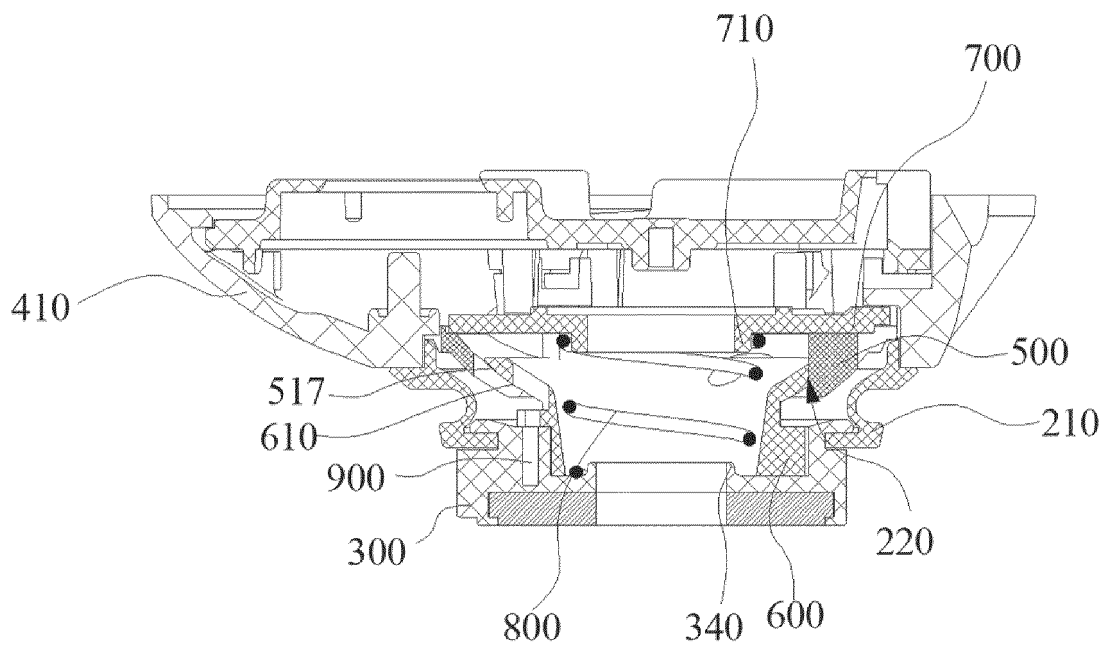


Fig. 3

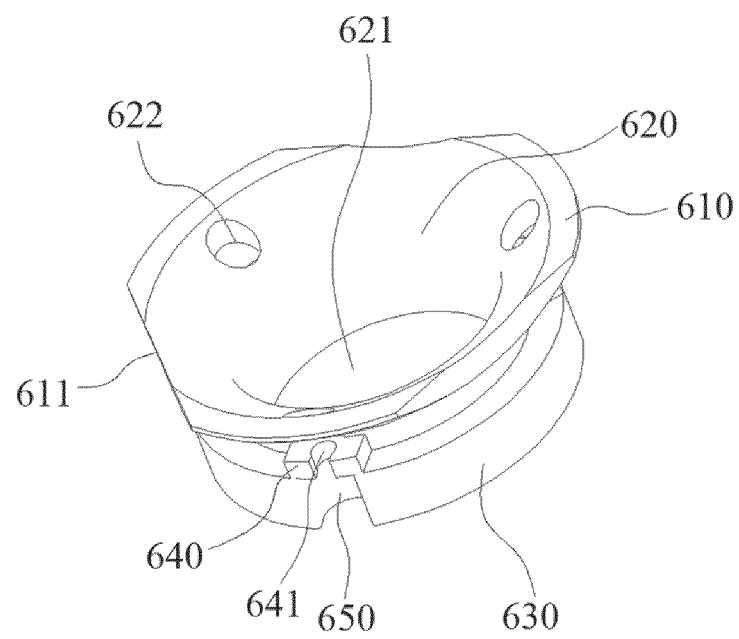
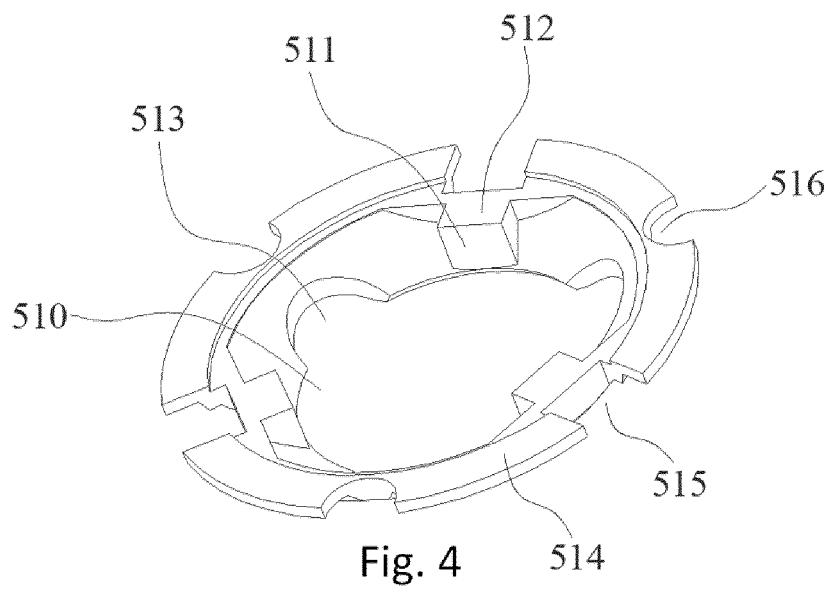


Fig. 5

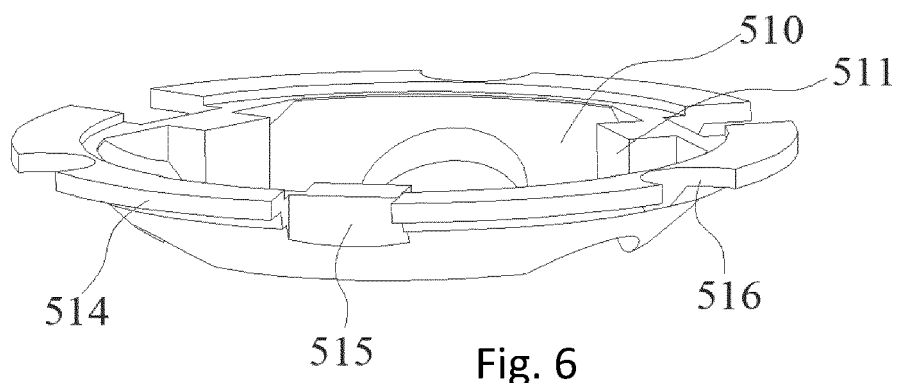
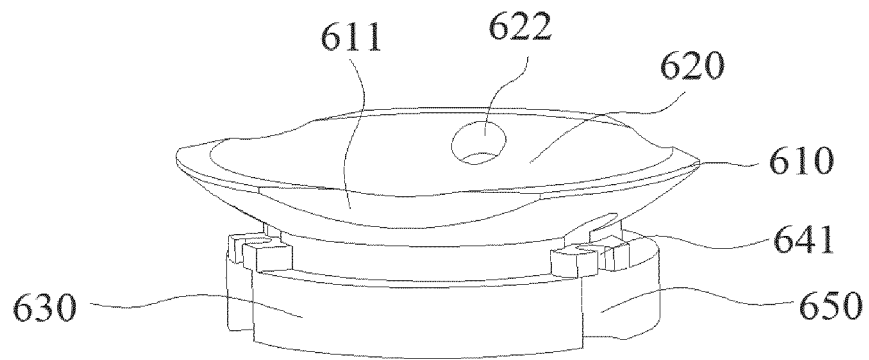


Fig. 6

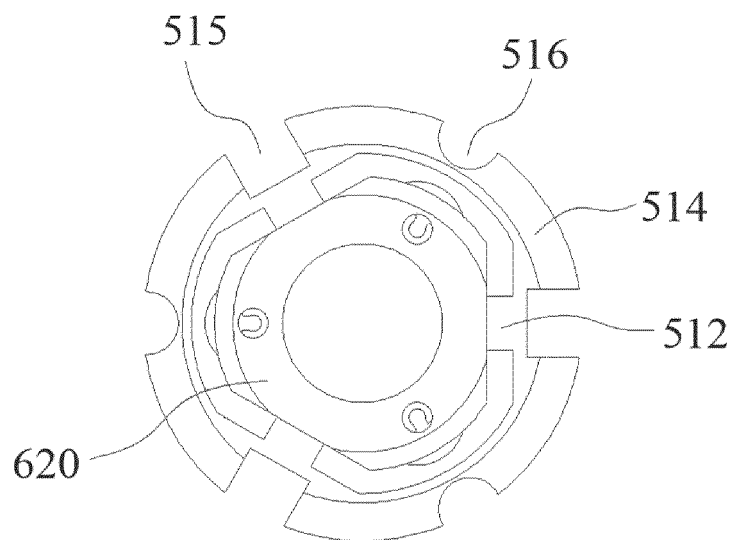
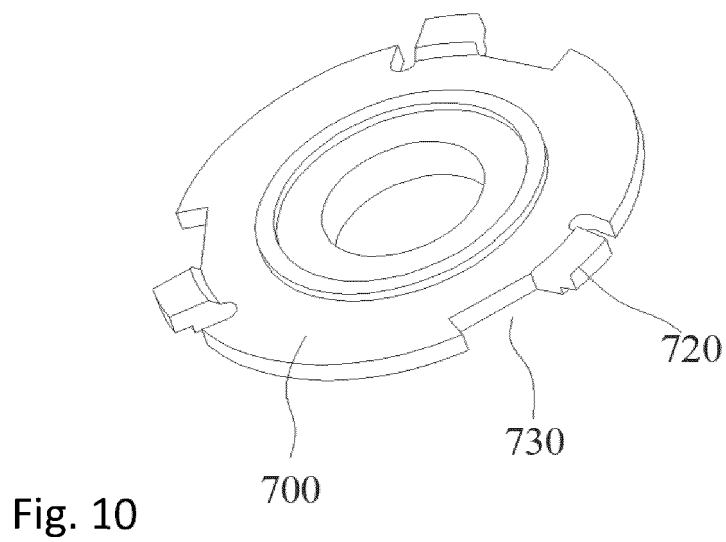
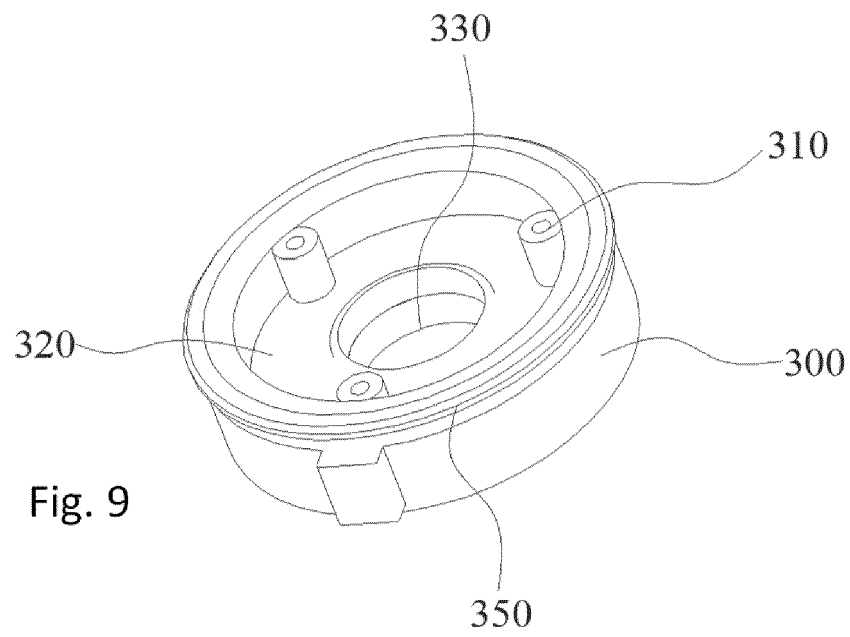
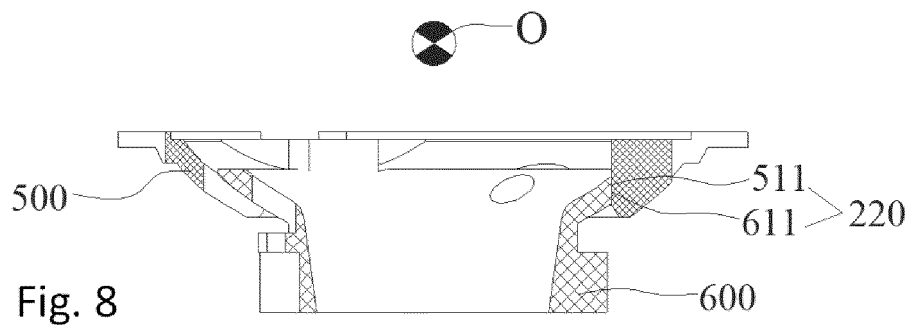


Fig. 7



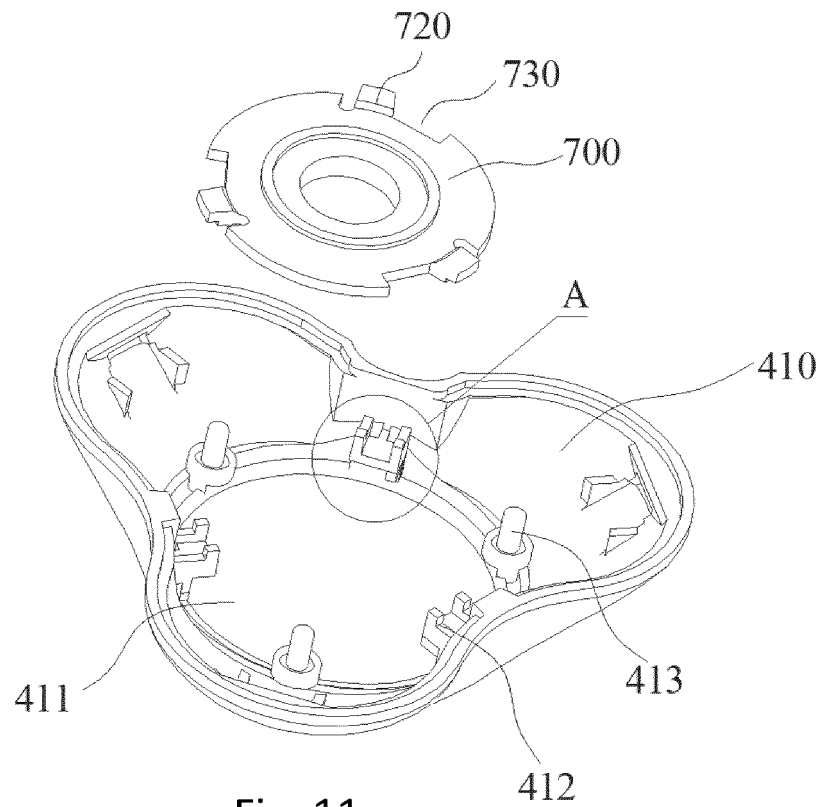


Fig. 11

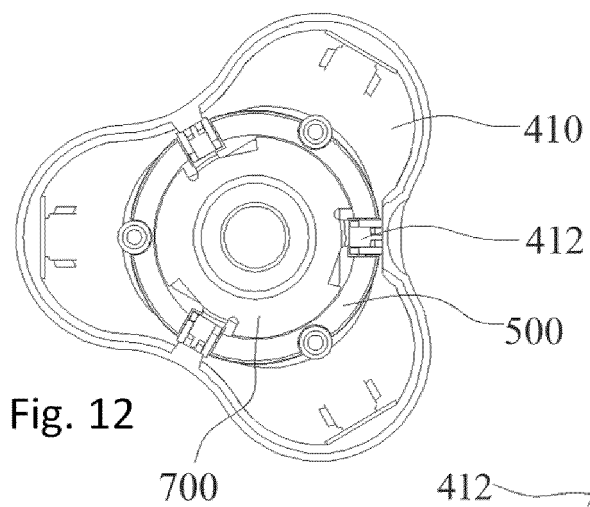


Fig. 12

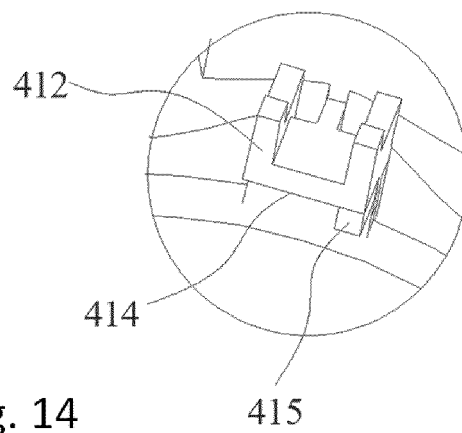


Fig. 14

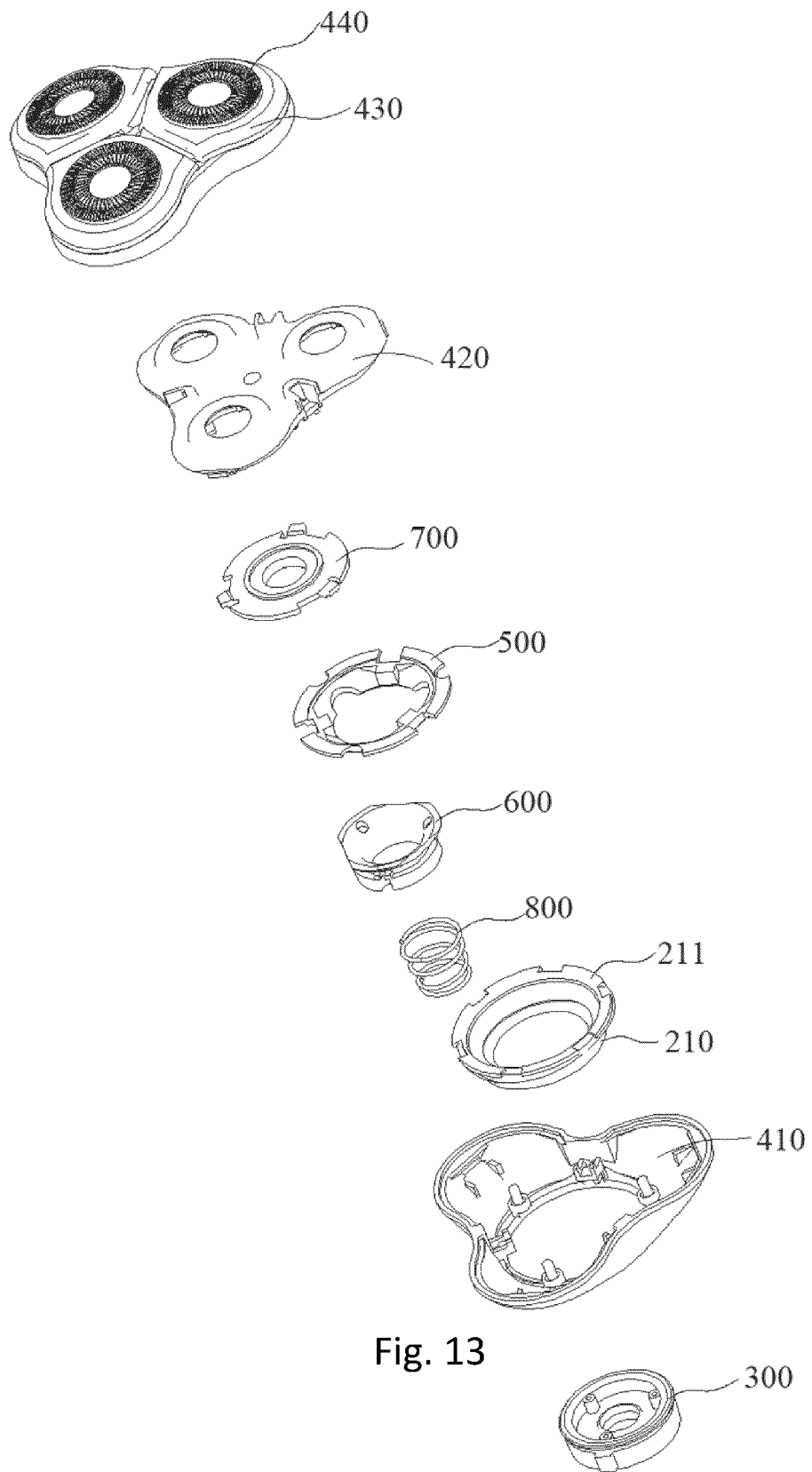


Fig. 13

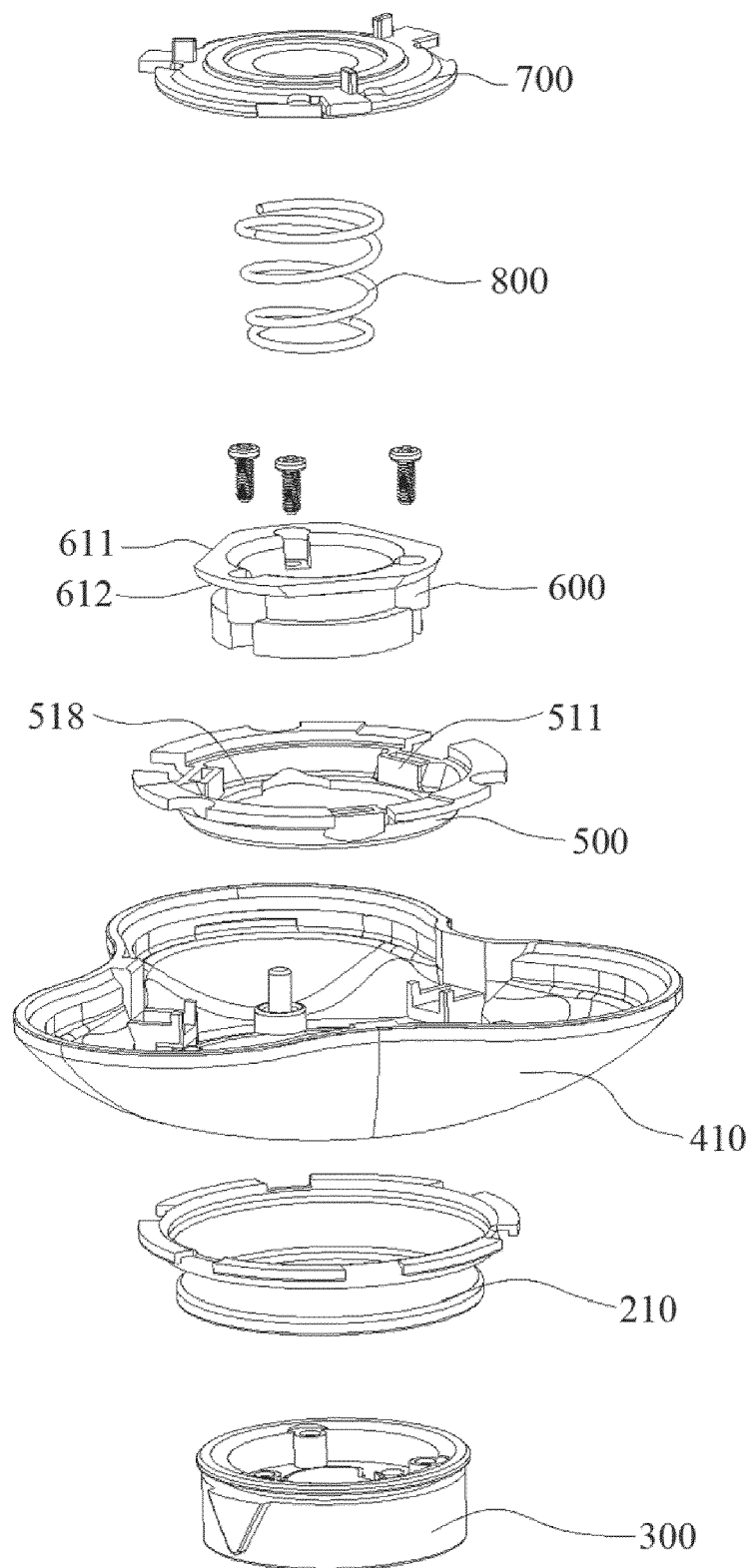


Fig. 15

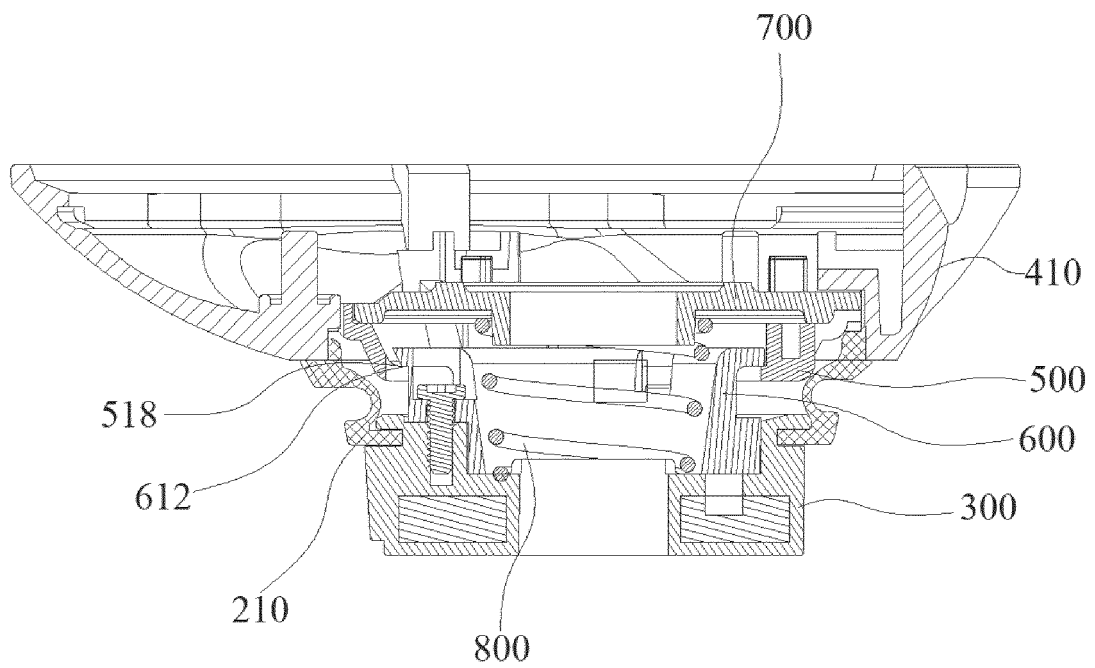


Fig. 16

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 0757613 A1 [0002]