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(54) SHAVING RAZOR HEAD

(57) A shaving razor head (100), comprising a razor head frame (10) and razor blades (20). The razor head frame (10) comprises a front side wall (10a), a rear side wall (10b), and a connecting side wall (10c) connected to the front side wall (10a) and the rear side wall (10b); the connecting side wall (10c), the front side wall (10a) and the rear side wall (10b) together define an accommodating space (10d); the razor blades (20) are located in the accommodating space (10d), and blade edges (21) of the razor blades (20) face the front side wall (10a); a first skin contact portion (11) in contact with the skin is provided on the rear side part of the front side wall (10a) adjacent to the blade edges (21), a second skin contact portion (30a) in contact with the skin is provided on the front side part of the front side wall (10a) away from the blade edges (21), the peak (A) of the second skin contact portion (30a) is higher than the peak (E) of the first skin contact portion (11), the peak (E) of the first skin contact portion (11) is higher than the blade edges (21), and the peak (E) of the first skin contact portion (11) is also located below a plane (P) defined by the peak (A) of the second skin contact portion (30a) and the blade edges (21). The shaving razor head can reduce irritation to the skin to improve comfort experience of shaving.

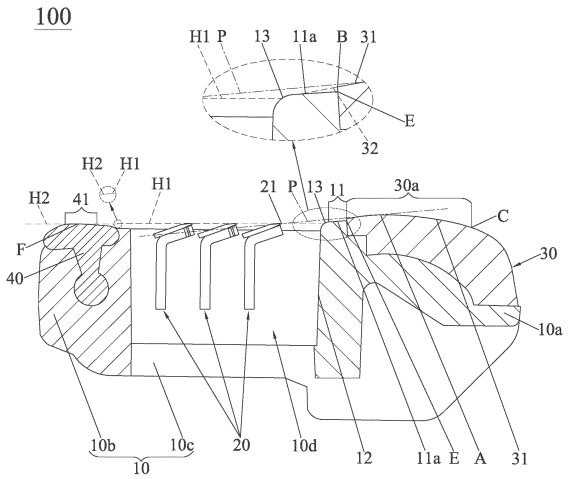

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the technical field of shaving, and more particularly to a razor head.

BACKGROUND OF THE INVENTION

[0002] With improvement of the economy and the society, abounding consumables are offered to people to satisfy people's demand, thereby improving people's standard or living. Razors are one of these consumables.

[0003] As shown in FIG. 5, for a manual razor, a razor head 300 includes a razor head frame 310 and blades 320. The razor head frame 310 includes a front side wall 310a, a rear side wall 310b, and a connecting side wall 310c connecting the front side wall 310a to the rear side wall 310b. In addition, the front side wall 310a, the rear side wall 310b and the connecting side wall 310c together define an accommodating space 310d, and the blades 320 are arranged in the accommodating space 310d. Specifically, cutting edges 321 of the blades 320 face the front side wall 310a, and a top surface of the front side wall 310a is provided with a skin contact portion 311 that contacts the skin during shaving. The height of the skin contact portion 311 decreases from the back to the front of the razor head frame 310 to ensure that the cutter head 300 can slide along user's skin more smoothly during shaving. Since the height of the skin contact portion 311 decreases from the back to the front of the razor head frame 310, the highest point N of the skin contact portion 311 is disposed backward to be close to the cutter edges 321. Thus, a distance D' between the highest point N and the cutter edges 321 is reduced, the skin 200 pressed by the highest point N of the skin contact portion 311 and the cutter edges 321 will be greatly arched during shaving. Because the skin 200 is arched greatly, the angle β between the cutter edges 321 and the arched skin 200 is smaller, so the skin is more easily scratched, and therefore, the shaving comfort is worse.

[0004] Therefore, there is a need for a razor head that improves shaving comfort and has good shaving effect to overcome the above-mentioned drawbacks.

SUMMARY OF THE INVENTION

[0005] One objective of the present invention is to provide a razor head that improves shaving comfort and has good shaving effect.

[0006] To achieve the above-mentioned objective, a razor head is provided, which includes a razor head frame and a razor blade. The razor head frame includes a front side wall, a rear side wall and a connecting side wall connected to the front side wall and the rear side wall. The connecting side wall, the front side wall and the rear side wall together enclose an accommodating space, the razor blade is located in the accommodating space, and a blade edge of the razor blade faces the front side wall. A rear part of the front side wall adjacent to the blade edge is provided with a first skin contact portion, and a front part of the front side wall away from the blade edge is provided with a second skin contact portion. A highest point of the second skin contact portion is higher than a highest point of the first skin contact portion. The highest point of the first skin contact portion is higher than the blade edge, and the highest point of the first skin contact portion is located below a plane jointly defined by the highest point of the second skin contact portion and the blade edge.

[0007] To achieve the above-mentioned objective, another razor head is further provided, which includes a razor head frame and a razor blade. The razor head frame includes a front side wall, a rear side wall and a connecting side wall connected to the front side wall and the rear side wall. The connecting side wall, the front side wall and the rear side wall together enclose an accommodating space, the razor blade is located in the accommodating space, and a blade edge of the razor blade faces the front side wall. The razor head further includes a protective structure which covers a front part of the front side wall away from the blade edge. A rear part of the front side wall adjacent to the blade edge forms an exposed first skin contact portion, and a second skin contact portion is formed around a highest point of the protective structure. A highest point of the second skin contact portion is higher than a highest point of the first skin contact portion, and the highest point of the first skin contact portion is higher than the blade edge. The highest point of the first skin contact portion is located below a plane jointly defined by the highest point of the second skin contact portion and the blade edge.

[0008] Preferably, the second skin contact portion has an arc-shaped structure with a convex middle portion along a front-rear direction of the razor head frame.

[0009] Preferably, an outer contour of a cross section of the second skin contact portion is an arc, and the height of the arc increases first and then decreasing gradually along the front-rear direction of the razor head frame.

[0010] Preferably, a rear end of the arc adjacent to the first skin contact portion is extended and then intersects the first skin contact portion.

[0011] Preferably, the razor head further includes a lubrication strip mounted on the rear side wall, and the lubrication strip has a third skin contact portion whose highest point is lower than the blade edge.

[0012] Preferably, the razor head has at least two razor blades, and the razor blades are spaced side by side along the front-rear direction of the razor head frame. The highest point of the second skin contact portion and the blade edge of the razor blade adjacent to the first skin contact portion together defines the plane.

[0013] Preferably, a cross section of the first skin contact portion is a straight line segment.

[0014] Preferably, an intersection of the part of the front side wall for defining the accommodating space and the

first skin contact portion is a round-chamfered structure.

[0015] Preferably, the straight line segment is tangent to an outer contour of a cross section of the round-chamfered structure.

[0016] In comparison with the prior art, the protective structure covers the front part of the front side wall away from the blade edge, and the rear part of the front side wall adjacent to the blade edge is the bare first skin contact portion that can contact with the skin. The second skin contact portion that can contact the skin is defined around the highest point of the protective structure. The highest point of the second skin contact portion is higher than the highest point of the first skin contact portion. The highest point of the first skin contact portion is higher than the blade edge, and the highest point of the first skin contact portion is also located below the plane jointly defined by the highest point of the second skin contact portion and the blade edge. Therefore, during shaving, the blade edge and the highest point of the second skin contact portion press against the skin, and the skin length between the blade edge and the highest point of the second skin contact portion is extended. Correspondingly, deformation amount of the skin between the blade edge and the highest point of the second skin contact portion is reduced. Furthermore, the highest point of the first skin contact portion is also located below the plane jointly defined by the highest point of the second skin contact portion and the blade edge, so the highest point of the first skin contact portion properly supports the skin between the blade edge and the highest point of the second skin contact portion, and the first skin contact portion makes sure the skin supported is higher than the blade edge. Therefore, the angle between the blade edge and the arched skin is increased thereby reducing skin scratch and improving shaving comfort.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The accompanying drawings facilitate an understanding of the various embodiments of this invention. In such drawings:

Fig. 1 is a cross-sectional view of the razor head according to an embodiment of the present invention for showing the internal structure of the razor head;
Fig. 2 is a schematic view to show use state of the razor head in which the razor head in Fig. 1 is in contact with the skin during shaving;
Fig. 3 is a schematic view to show the force point and the contact distance when the razor head in Fig. 2 is in contact with the skin during shaving;
Fig. 4 is a cross-sectional view of the razor head according to another embodiment of the present invention for showing the internal structure of the razor head; and
Fig. 5 is a schematic view to show use state of the existing razor head in which the existing razor head is in contact with the skin during shaving.

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENTS

[0018] A distinct and full description of the technical solution of the present invention will follow by combining with the accompanying drawings.

[0019] As shown in Fig. 1, a razor head 100 according to an embodiment of the present application includes a razor head frame 10, a razor blade 20 and a protective structure 30. The razor head frame 10 includes a front side wall 10a, a rear side wall 10b and a connecting side wall 10c connected to the front side wall 10a and the rear side wall 10b. The connecting side wall 10c, the front side wall 10a and the rear side wall 10b together enclose an accommodating space 10d. Preferably, the connecting side wall 10c, the front side wall 10a and the rear side wall 10b together to form an integrated structure, for example, but it is not limited to make them form the integrated structure by the injection molding process, so the connecting side wall 10c, the front side wall 10a and the rear side wall 10b are inseparable, which increases the strength of the razor head frame 10 on the one hand and facilitates the manufacture of the razor head frame 10 on the other hand. The razor blade 20 is located in the accommodating space 10d which provides a space for installation and work of the razor blade 20. A blade edge 21 of the razor blade 20 faces the front side wall 10a.

[0020] Specifically, the protective structure 30 covers a front part of the front side wall 10a away from the blade edge 21. Preferably, as shown in Fig. 1, an outer contour of a cross section of the front part has a horizontal line segment and a vertical line segment on the left, has an arc segment in the middle, and has a horizontal line segment on the right, but not limited to this. Specifically, the protective structure 30 covers the front part of the front side wall 10a in various ways. For example, the protective structure 30 can be integrally formed with the front side wall 10a by injection molding, or fixed with the front side wall 10a by gluing, or fixed with the front side wall 10a by ultrasonic welding, so that the protective structure 30 covers the front part of the front side wall 10a, but not limited thereto. A rear part of the front side wall 10a adjacent to the blade edge 21 forms an exposed first skin contact portion 11 that can be in contact with the skin, and a second skin contact portion 30a that will be in contact with the skin is formed around a highest point A of the protective structure 30. Understandably, the highest point of the protective structure 30 and a highest point of the second skin contact portion 30a are the same. The highest point A of the second skin contact portion 30a is higher than a highest point E of the first skin contact portion 11, and the highest point E of the first skin contact portion 11 is higher than the blade edge 21. The highest point E of the first skin contact portion 11 is also located below a plane P jointly defined by the highest point A of the second skin contact portion 30a and the blade edge 21, as shown in Fig. 1. Specifically, the razor head 100 further includes a lubrication strip 40 mounted on the rear

side wall 10b. Preferably, cross-section of the lubrication strip 40 is "T" shape, and the lubrication strip 40 has a third skin contact portion 41 whose highest point F is lower than the blade edge 21, which increases shaving comfort, as shown in Fig. 1. It should be noted that, in Fig. 1, HI represents the height where the blade edge 21 is located, and H2 represents the height where the highest point F of the third skin contact portion 41 is located.

[0021] Please refer to Fig. 1 again, the second skin contact portion 30a has an arc-shaped structure with a convex middle portion along a front-rear direction of the razor head frame 10. Preferably, an outer contour of a cross section of the second skin contact portion 30a is an arc 31, and the height of the arc 31 increases first and then decreases gradually along the front-rear direction of the razor head frame 10. In other words, the height of the arc 31 increases first and then decreases gradually from a rear end B adjacent to the first skin contact portion 11 to a front end C away from the first skin contact portion 11. Such an arrangement enables the skin to slide more smoothly along the second skin contact portion 30a to the blade edge 21 during shaving, with less resistance. More specifically, the arc 31 is adjacent to an extension line 32 of the first skin contact portion 11 (the extension line 32 is shown by a dotted line in a partial enlarged view of Fig. 1) and intersects the first skin contact portion 11, so that the first skin contact portion 11 can properly support the skin 200 pressed between the second skin contact portion 30a and the blade edge 21. The skin 200 between the second skin contact portion 30a and the blade edge 21 is less arched, so the skin 200 is less scratched, as shown in Figs. 2 and 3.

[0022] As shown in Figs. 1 to 3, at least two razor blades 20 are arranged side by side at a distance along the front-rear direction of the razor head frame 10. The highest point A of the second skin contact portion 30a and the blade edge 21 of the razor blade 20 adjacent to the first skin contact portion 11 together defines the plane P, so as to improve shaving efficiency by means of the plurality of razor blades 20.

[0023] As shown in Fig. 1, a cross section of the first skin contact portion 11 is a straight segment 11a. An intersection of the part 12 of the front side wall 10a used to define the accommodating space 10d and the first skin contact portion 11 is a round-chamfered structure 13. Preferably, the straight line segment 11a is tangent to an outer contour of a cross section of the round-chamfered structure 13 to ensure that the skin 200 slides toward the blade edge 21 more smoothly.

[0024] In comparison with the prior art, the protective structure 30 covers the front part of the front side wall 10a away from the blade edge 21, and the rear part of the front side wall 10a adjacent to the blade edge 21 is the bare first skin contact portion 11 that can contact with the skin. The second skin contact portion 30a that can contact the skin is formed around the highest point A of the protective structure 30. The highest point A of the second skin contact portion 30a is higher than the highest point E of the first skin contact portion 11. The highest point E of the first skin contact portion 11 is higher than the blade edge 21. Furthermore, the highest point E of the first skin contact portion 11 is also located below the plane P jointly defined by the highest point A of the second skin contact portion 30a and the blade edge 21. Therefore, during shaving, the skin 200 is pressed against the highest point A of the second skin contact part 30a and the blade edge 21, and the distance D of the skin 200 between the blade edge 21 and the highest point A of the second skin contact part 30a is extended (see Fig. 3). Namely the distance D is greater than D' shown in Fig. 5. Correspondingly, deformation amount of the skin 200 between the blade edge 21 and the highest point A of the second skin contact portion 30a is reduced. Furthermore, the highest point E of the first skin contact portion 11 is also located below the plane P jointly defined by the highest point A of the second skin contact portion 30a and the blade edge 21, so the highest point E of the first skin contact portion 11 properly supports the skin 200 between the blade edge 21 and the highest point A of the second skin contact portion 30a, and the first skin contact portion 11 makes sure the skin 200 supported is higher than the blade edge 21. Therefore, the angle α between the blade edge 21 and the arched skin 200 is increased, and the angle α is greater than the angle β shown in Fig. 5, thereby reducing skin scratch and improving shaving comfort.

[0025] As shown in Fig. 4, another embodiment of a razor head 100 is shown. The protective structure 30 in Fig. 1 is integrated with the front side wall 10a to form the front side wall 10a' of the razor head frame 10 in this new embodiment, and other structures are the same as the razor head 100 described above. Therefore, as shown in Fig. 4, in the new embodiment, the razor head 100' includes the razor head frame 10' and the razor blade 20. The razor head frame 10' includes a front side wall 10a', a rear side wall 10b, a connecting side wall 10c connected to the front side wall 10a' and the rear side wall 10b. The connecting side wall 10c, the front side wall 10a' and the rear side wall 10b jointly enclose the accommodating space 10d. The razor blade 20 is located in the accommodating space 10d, and the blade edge 21 of the razor blade 20 faces the front side wall 10a'. The rear part of the front side wall 10a' adjacent to the blade edge 21 has a first skin contact portion 11 that can contact with the skin, and the front part of the front side wall 10a' away from the blade edge 11 has a second skin contact portion 30a that can contact the skin. The highest point A of the second skin contact portion 30a is higher than the highest point E of the first skin contact portion 11, the highest point E of the first skin contact portion 11 is higher than the blade edge 21, and the highest point E of the first skin contact portion 11 is also located below the plane P jointly defined by the highest point A of the second skin contact portion 30a and the blade edge 21.

[0026] While the invention has been described in connection with what are presently considered to be the most

practical and preferred embodiments, it is to be understood that the invention is not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the invention.

Claims

1. A razor head comprising a razor head frame and a razor blade, the razor head frame comprising a front side wall, a rear side wall and a connecting side wall connected to the front side wall and the rear side wall, the connecting side wall, the front side wall and the rear side wall together enclosing an accommodating space, the razor blade being located in the accommodating space, and a blade edge of the razor blade facing the front side wall;
the razor head is **characterized in that** a rear part of the front side wall adjacent to the blade edge is provided with a first skin contact portion, a front part of the front side wall away from the blade edge is provided with a second skin contact portion, a highest point of the second skin contact portion is higher than a highest point of the first skin contact portion, the highest point of the first skin contact portion is higher than the blade edge, and the highest point of the first skin contact portion is located below a plane jointly defined by the highest point of the second skin contact portion and the blade edge.

2. A razor head comprising a razor head frame and a razor blade, the razor head frame comprising a front side wall, a rear side wall and a connecting side wall connected to the front side wall and the rear side wall, the connecting side wall, the front side wall and the rear side wall together enclosing an accommodating space, the razor blade being located in the accommodating space, and a blade edge of the razor blade facing the front side wall;
the razor head is **characterized in that** the razor head further comprises a protective structure, the protective structure is arranged for covering a front part of the front side wall away from the blade edge, a rear part of the front side wall adjacent to the blade edge forms an exposed first skin contact portion, a second skin contact portion is formed around a highest point of the protective structure, a highest point of the second skin contact portion is higher than a highest point of the first skin contact portion, the highest point of the first skin contact portion is higher than the blade edge, and the highest point of the first skin contact portion is located below a plane jointly defined by the highest point of the second skin contact portion and the blade edge.

3. The razor head according to claim 1 or claim 2, wherein the second skin contact portion has an arc-shaped structure with a convex middle portion along a front-rear direction of the razor head frame.

4. The razor head according to claim 3, wherein an outer contour of a cross section of the second skin contact portion is an arc, and the height of the arc increases first and then decreasing gradually along the front-rear direction of the razor head frame.

5. The razor head according to claim 4, wherein a rear end of the arc adjacent to the first skin contact portion is extended and then intersects the first skin contact portion.

6. The razor head according to claim 1 or claim 2, further comprising a lubrication strip mounted on the rear side wall, and the lubrication strip having a third skin contact portion whose highest point is lower than the blade edge.

7. The razor head according to claim 1 or claim 2, wherein the razor head comprises at least two razor blades, the razor blades are spaced side by side along a front-rear direction of the razor head frame, and the highest point of the second skin contact portion and the blade edge of the razor blade adjacent to the first skin contact portion together defines the plane.

8. The razor head according to claim 1 or claim 2, wherein a cross section of the first skin contact portion is a straight line segment.

9. The razor head according to claim 8, wherein an intersection of the part of the front side wall for defining the accommodating space and the first skin contact portion is a round-chamfered structure.

10. The razor head according to claim 9, wherein the straight line segment is tangent to an outer contour of a cross section of the round-chamfered structure.

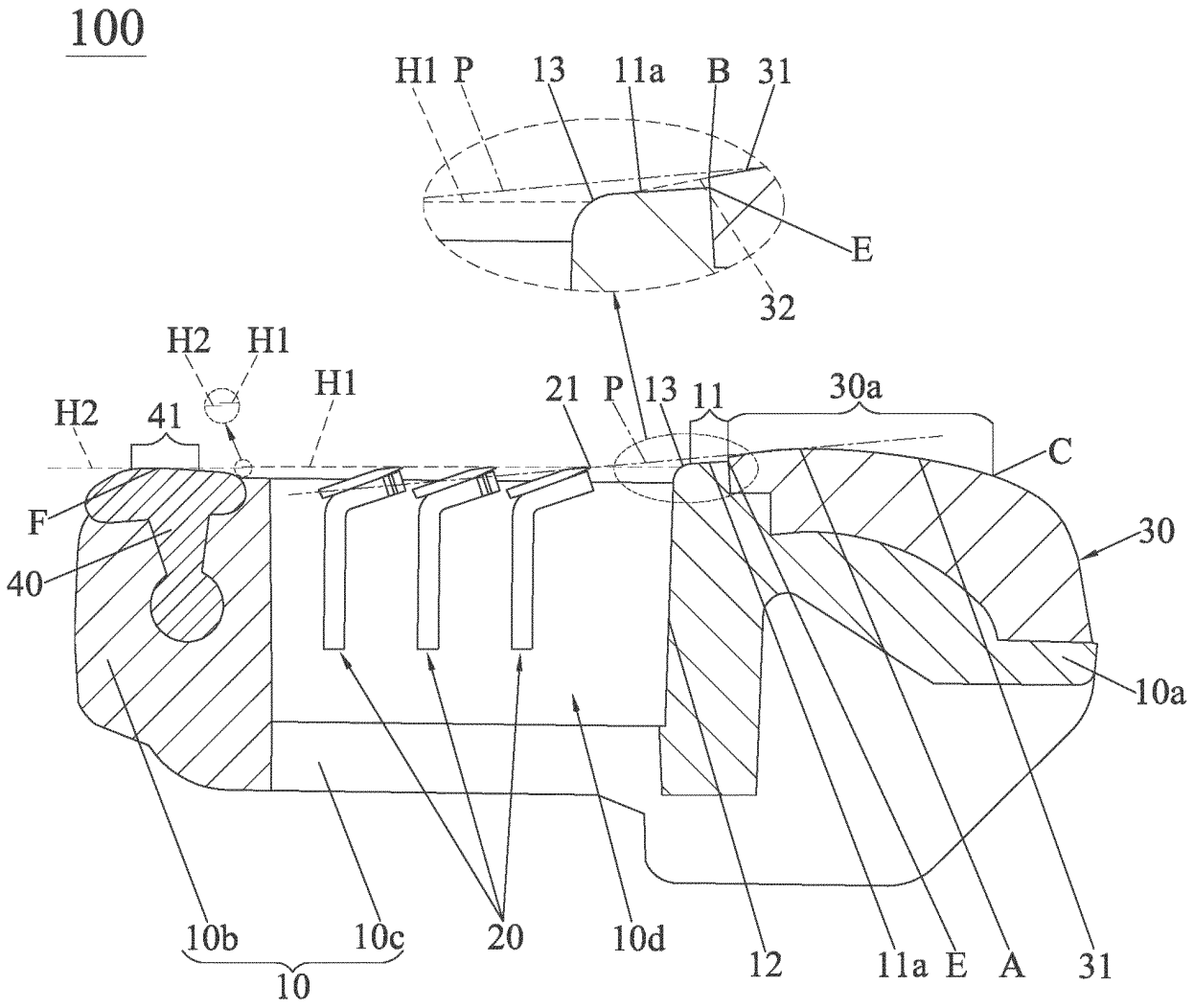
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Fig. 1

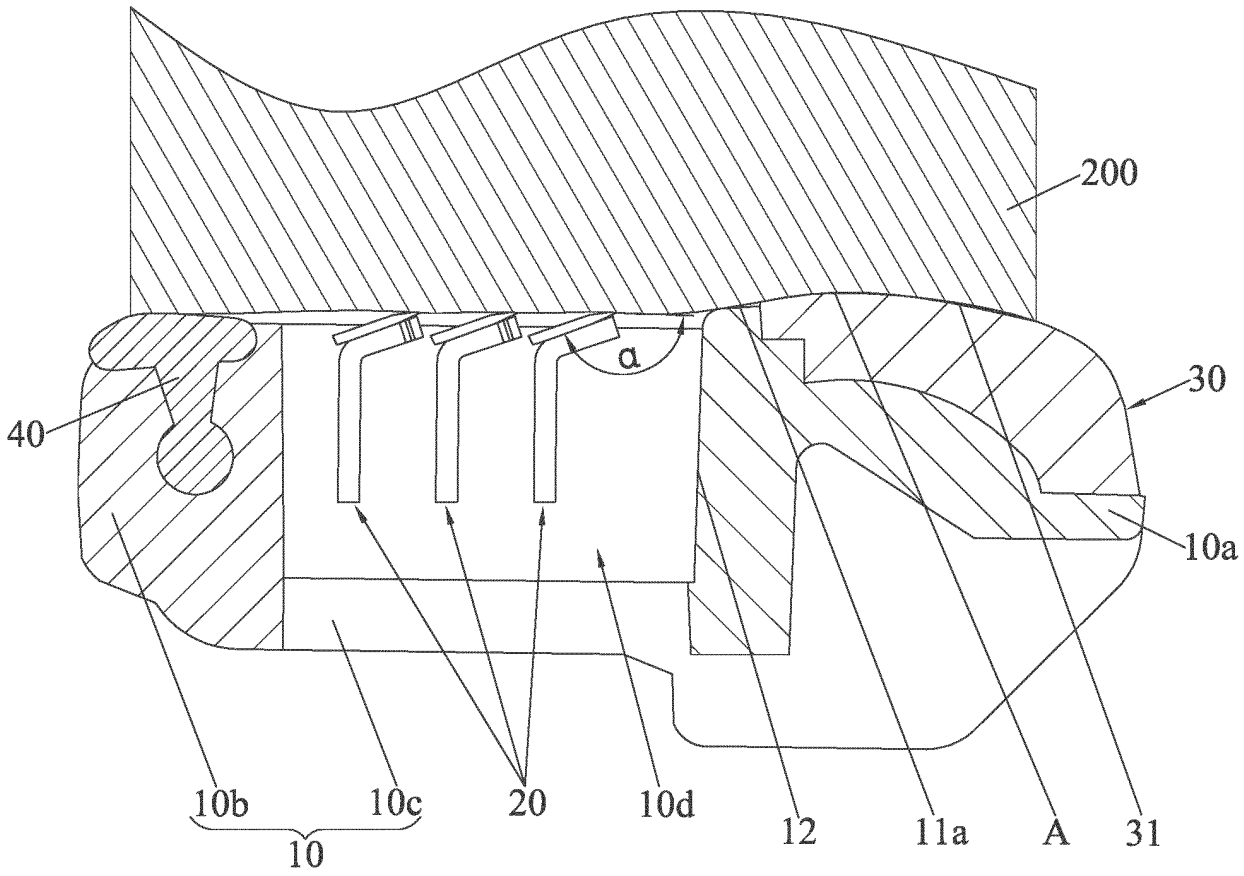

Fig. 2

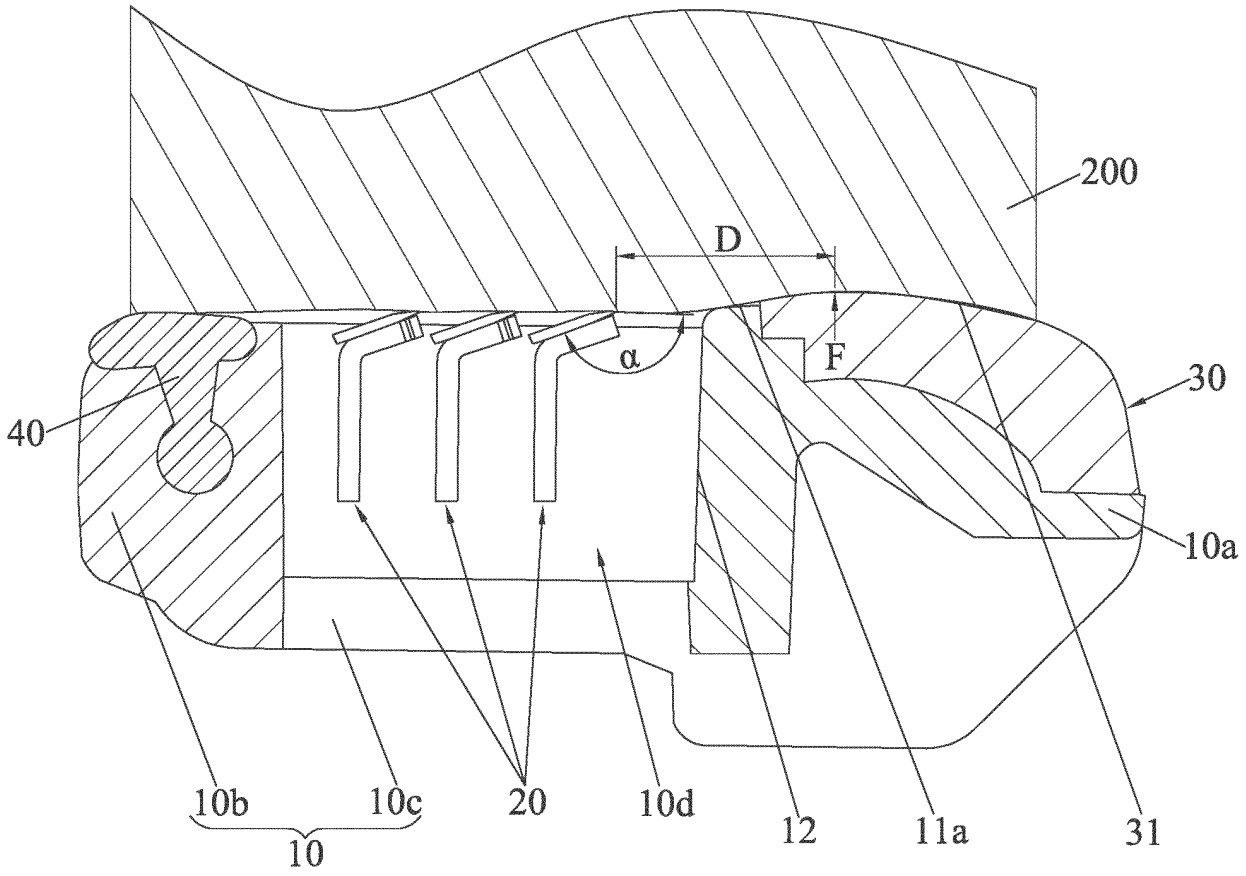

Fig. 3

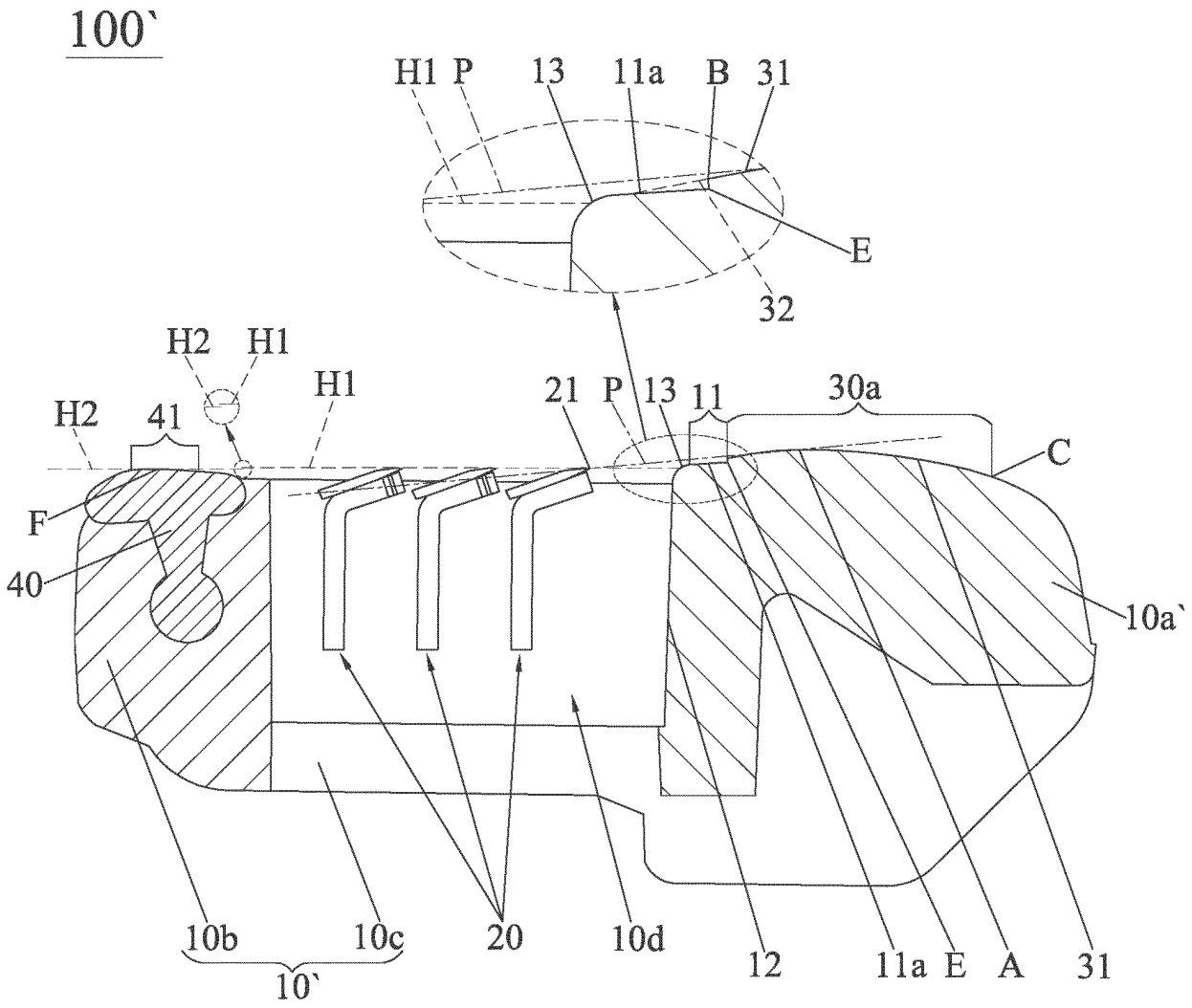
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Fig. 4

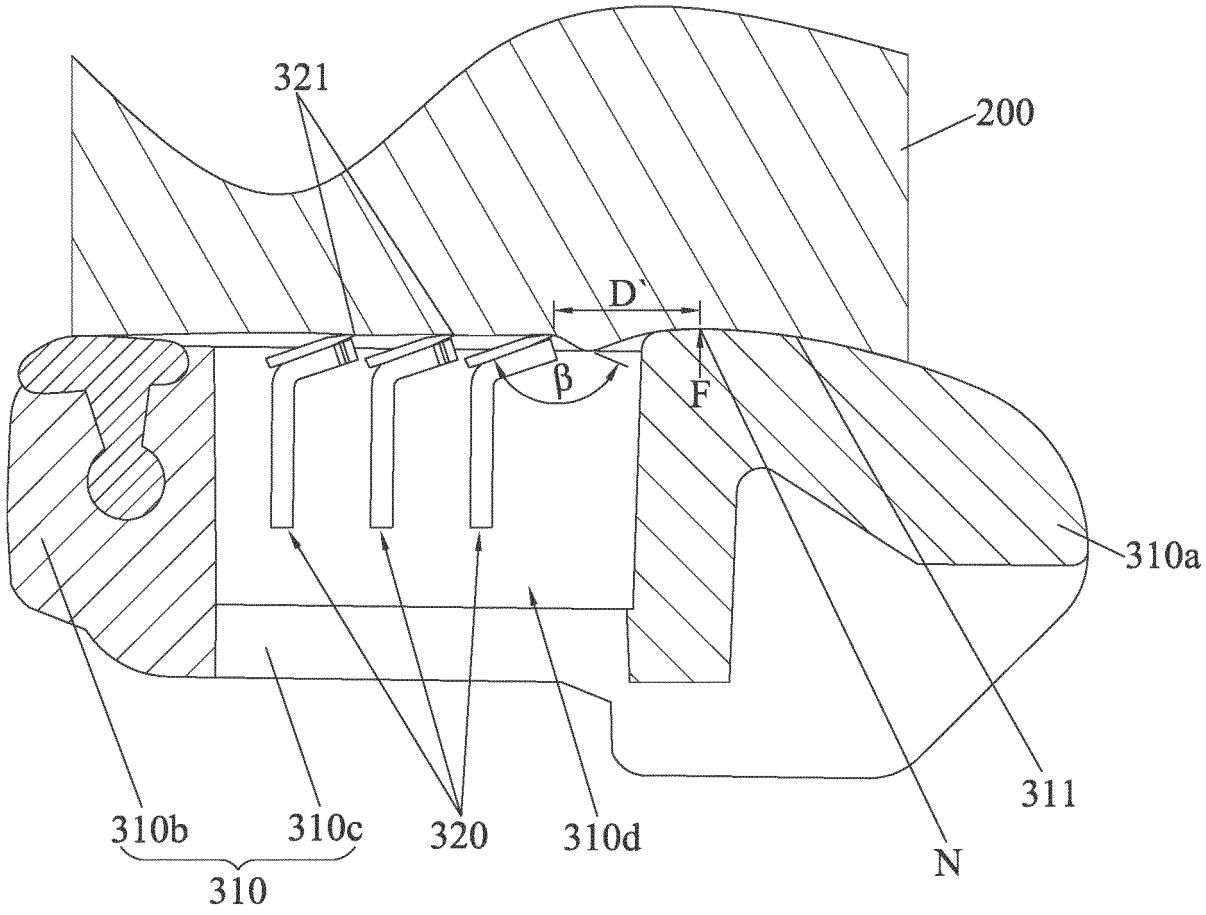

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/083250

A. CLASSIFICATION OF SUBJECT MATTER

B26B 21/22(2006.01)i; B26B 21/40(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B26B 21/22;B26B 21/+;B26B 19/+

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

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

CNABS, VEN, CNKI, 万方: 剃须刀, 刮刀, 剃刀, 接触, 皮肤, 刀片, 高度, 骨架, 弧线, 圆角, shaver, razor, contact+, skin, height, camber

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 110774320 A (DORCO CO., LTD.) 11 February 2020 (2020-02-11) description, paragraphs [0036]-[0104], and figures 1-14	1-10
A	CN 1915610 A (THE GILLETTE COMPANY) 21 February 2007 (2007-02-21) entire document	1-10
A	CN 1149851 A (GILLETTE CO.) 14 May 1997 (1997-05-14) entire document	1-10
A	CN 110785271 A (BIC VIOLEX SA) 11 February 2020 (2020-02-11) entire document	1-10
A	CN 209999245 U (ZHONGSHAN ZUOKE CARE PRODUCTS CO., LTD.) 31 January 2020 (2020-01-31) entire document	1-10
A	US 2004055156 A1 (THE GILLETTE COMPANY) 25 March 2004 (2004-03-25) entire document	1-10
A	US 2019329434 A1 (GILLETTE CO LLC) 31 October 2019 (2019-10-31) entire document	1-10

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 November 2020	**30 November 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/083250

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 110774320 A	11 February 2020	US 2020031005 A1	30 January 2020
		JP 2020014836 A	30 January 2020
		EP 3599066 A1	29 January 2020
		KR 102063770 B1	08 January 2020
CN 1915610 A	21 February 2007	NZ 517606 A	28 March 2003
		US 8117753 B2	21 February 2012
		US 2002144404 A1	10 October 2002
		ES 2322160 T3	17 June 2009
		MX PA02003195 A	20 August 2003
		DE 60041722 D1	16 April 2009
		US 2004060176 A1	01 April 2004
		EP 2055450 A1	06 May 2009
		AU 774134 B2	17 June 2004
		IL 148473 D0	12 September 2002
		AU 7437400 A	30 April 2001
		BR 0014324 A	28 May 2002
		CA 2383994 C	08 July 2008
		DE 60020579 D1	07 July 2005
		AT 424284 T	15 March 2009
		GB 2354474 A	28 March 2001
		EP 2055450 B8	26 December 2012
		CN 1915610 B	27 June 2012
		GB 2354474 B	01 August 2001
		GB 9922832 D0	24 November 1999
		GB 2354474 B8	29 January 2008
		BR 0014324 B1	04 May 2010
		CN 1376105 A	23 October 2002
		IL 148473 A	20 September 2007
		EP 1586425 B1	04 March 2009
		EP 1216121 A1	26 June 2002
		GB 2354474 C	
		KR 20020035613 A	11 May 2002
		US 2009126196 A1	21 May 2009
		TW M252529 U	11 December 2004
		TR 200200798 T2	21 August 2002
		JP 2003510142 A	18 March 2003
		CO 5280125 A1	30 May 2003
		US 2006101647 A1	18 May 2006
		ES 2239615 T3	01 October 2005
		DK 1586425 T3	08 June 2009
		PT 1586425 E	14 May 2009
		AR 025732 A1	11 December 2002
		EP 2055450 B1	06 June 2012
		US 2010269351 A1	28 October 2010
		AT 296718 T	15 June 2005
		EP 1586425 A1	19 October 2005
		CA 2383994 A1	05 April 2001
		WO 0123150 A1	05 April 2001
		EP 1216121 B1	01 June 2005
		DE 60020579 T2	27 October 2005

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/083250

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
				US	2005108882	A1	26 May 2005
				KR	100736996	B1	09 July 2007
CN	1149851	A	14 May 1997	CN	1121302	C	17 September 2003
				CZ	290222	B6	12 June 2002
				HU	218468	B	28 September 2000
				EP	0760734	A1	12 March 1997
				HU	9603239	A2	28 May 1997
				JP	3961020	B2	15 August 2007
				NZ	305619	A	26 August 1998
				HU	9603239	A3	28 March 2000
				HK	1009413	A1	24 August 2001
				PL	317327	A1	01 April 1997
				SK	144896	A3	06 August 1997
				BR	9605889	A	19 August 1997
				DE	69611406	T2	21 June 2001
				CA	2190269	A1	26 September 1996
				DE	69611406	T3	15 February 2007
				AT	198438	T	15 January 2001
				CZ	341596	A3	15 April 1998
				TR	9600887	T1	21 March 1997
				GR	3035693	T3	31 July 2001
				ES	2153100	T3	16 February 2001
				RO	121633	B1	30 January 2008
				PT	760734	E	31 May 2001
				TR	199600887	T1	21 March 1997
				EP	0760734	B1	03 January 2001
				JP	2007083084	A	05 April 2007
				JP	H10500888	A	27 January 1998
				ES	2153100	T5	01 February 2007
				GB	9505917	D0	10 May 1995
				EP	0760734	B2	09 August 2006
				WO	9629183	A1	26 September 1996
				DE	69611406	D1	08 February 2001
				AU	5366396	A	08 October 1996
				PT	760734	T	31 May 2001
				MY	118327	A	30 October 2004
				CO	4520116	A1	15 October 1997
				RU	2160181	C2	10 December 2000
				SK	283788	B6	08 January 2004
				TW	307708	B	11 June 1997
				CA	2190269	C	28 May 2002
				CZ	9603415	A3	15 April 1998
				PL	180793	B1	30 April 2001
				AU	708312	B2	29 July 1999
CN	110785271	A	11 February 2020	EP	3651949	A1	20 May 2020
				KR	20200032047	A	25 March 2020
				WO	2019011523	A1	17 January 2019
CN	209999245	U	31 January 2020	None			
US	2004055156	A1	25 March 2004	None			

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/083250

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US 2019329434 A1	31 October 2019	CN 109153140 A	04 January 2019
		US 2018001492 A1	04 January 2018
		EP 3478463 A1	08 May 2019
		WO 2018005570 A1	04 January 2018
		US 10384360 B2	20 August 2019

Form PCT/ISA/210 (patent family annex) (January 2015)