(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 774 226 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
06.04.2022 Bulletin 2022/14

(21) Application number: **19715631.8**

(22) Date of filing: **20.03.2019**

(51) International Patent Classification (IPC):
B26B 21/40 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B26B 21/4012; B26B 21/4018

(86) International application number:
PCT/US2019/023065

(87) International publication number:
WO 2019/190837 (03.10.2019 Gazette 2019/40)

(54) SHAVING RAZOR CARTRIDGE AND METHOD OF MANUFACTURE

RASIERERKOPF UND VERFAHREN ZUR HERSTELLUNG

CARTOUCHE POUR RASOIR ET PROCÉDÉ DE FABRICATION

(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

(30) Priority: **30.03.2018 US 201862650382 P**

(43) Date of publication of application:
17.02.2021 Bulletin 2021/07

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to wet shaving safety razors and more particularly to shaving cartridges that have a polymeric housing for retaining one or more blades.

BACKGROUND OF THE INVENTION

[0002] In general, a cartridge or blade unit of a safety razor has at least one blade with a cutting edge which is moved across the surface of the skin being shaved by means of a handle to which the cartridge is attached. Some shaving razors are provided with a spring biased cartridge that pivots relative to the handle to follow the contours of the skin during shaving. The cartridge may be mounted detachably on the handle to enable the cartridge to be replaced by a fresh cartridge when the blade sharpness has diminished to an unsatisfactory level, or it may be attached permanently to the handle with the intention that the entire razor be discarded when the blade or blades have become dulled.

[0003] Razor blade assemblies have been disclosed wherein cutting edge portions of the blade members are held between skin engaging surfaces which are generally referred to as the guard and cap of the razor blade assembly. The guard contacts the skin in front of the blade member(s) and the cap contacts the skin behind the blade member(s) during a shaving stroke. The cap and guard may aid in establishing the so-called "shaving geometry", i.e., the parameters which determine the blade orientation and position relative to the skin during shaving, which in turn have a strong influence on the shaving performance and efficacy of the razor. The cap may comprise a water leachable shaving aid to reduce drag and improve comfort. The guard may be generally rigid, for example formed integrally with a frame or platform structure which provides a support for the blades. Guards may also comprise softer elastomeric materials (e.g., thermoplastic elastomers) to improve skin stretching. A shaving razor cartridge according to the state of the art is known for example from US 5,794,343.

[0004] Shaving razor handles are currently being designed with more features in an attempt to meet new consumer needs. For example, razor handles may contain various electronic components to deliver vibration or heat to the skin during shaving. However, these electric components require batteries, which make the handle much heavier. A heavier handle is more likely to cause the plastic housing holding the blades to break if the razor is dropped. A broken housing may expose or release the blades, thus causing a potentially hazardous condition. Accordingly, more robust housing designs and methods of manufacture are needed to account for the increase weight of today's shaving razor handles.

SUMMARY OF THE INVENTION

[0005] In one aspect, the invention features, in general a shaving razor cartridge with a housing molded from a first polymeric material and having a top surface and an opposing bottom surface. The housing has a wall partially defining an opening extending from the top surface to the bottom surface. The wall has a pair of arms each having a distal end that extend toward each other defining a gap. A guard is toward a front of the housing. A cap is toward a rear of the housing. At least one blade is mounted between the guard and the cap. A bridge interconnects the distal ends. The bridge is molded from a second polymeric material that is different than the first polymeric material.

[0006] In another aspect, the invention features, in general a shaving razor cartridge with a housing. A guard is toward a front of the housing. A cap toward a rear of the housing. At least one blade is mounted to the housing between the cap and the guard. A front wall of the housing is formed by a pair of arms each having a distal end that extend toward each other defining a gap therebetween.

[0007] In another aspect, the invention features, in general a method of assembling a shaving razor cartridge. A housing is molded with a wall partially defining an opening that extends from a top surface to a bottom surface of the housing. A bridge is molded enclosing the opening with a polymeric material that is different than a polymeric material of the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Other features and advantages of the present invention, as well as the invention itself, can be more fully understood from the following description of the various embodiments, when read together with the accompanying drawings, in which:

FIG. 1 is a perspective view of a shaving razor.
FIG. 2 is a top view of a shaving razor cartridge of FIG. 1.
FIG. 3A is a top view of plastic flowing during an injection molding process.
FIG. 3B is a top view of plastic flowing during an injection molding process.
FIG. 4A is a top view of a housing that may be incorporated into the shaving razor cartridge of FIG. 2.
FIG. 4B is a bottom view of the housing of FIG. 4A.
FIG.4C is an enlarged partial view of the housing of FIG. 4A.
FIG. 4D is a cross section view of the housing, taken generally along the line 4-4 of FIG. 4B.
FIG. 5A is a bottom view of the housing having a bridge.
FIG. 5B is a top view of the housing of FIG. 5A.
FIG. 6 is a cross section view of the shaving razor cartridge, taken generally along the line 6-6 of FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Referring to FIG. 1, a perspective view of a shaving razor 10 is shown. The shaving razor 10 may include a shaving razor cartridge 12 mounted to a handle 14. The shaving razor cartridge 10 may be removable or permanently mounted to the handle 14. For example, the shaving razor cartridge 12 may be detachably mounted to the handle 14 to enable the shaving razor cartridge 12 to be replaced by a fresh shaving razor cartridge 12 when blade sharpness has diminished to an unsatisfactory level. Alternatively, the shaving razor cartridge 12 may be attached permanently to the handle 14 with the intention that the entire shaving razor 10 be discarded when the blade or blades have become dulled. The shaving razor cartridge 12 may include a housing 16. The housing 16 may be injection molded from a first polymeric material. The housing 16 may be molded from polymers such as high impact polystyrene (HIPS), but other semi-rigid polymers such as polypropylene (PP), nylon, acrylonitrile butadiene styrene (ABS), polyphenylene ether, polystyrene, and combinations thereof may also be used.

[0010] Referring to FIG. 2, a top view of the shaving razor cartridge 12 of FIG. 1 is shown. A guard 18 may be positioned at a front portion 20 of the housing 16 and a cap 22 may be positioned at a rear portion 24 of the housing 12. The guard 18 may be a unitary elongated member that can be formed of a rigid plastic (e.g., the same material as the housing 16). For example, the guard 18 may be a solid or segmented bar that extends generally parallel to the cap 22 to help support the skin during a shaving stroke. In certain embodiments, the cap 22 may comprise one or more lubricants that are released during shaving.

[0011] An opening 26 may extend through the shaving razor cartridge 12. In certain embodiments, the opening 26 may be positioned in front of the guard 18. The opening 26 may be an oval or racetrack shape that extends a significant width of the housing 16. As will be described in greater detail below, the housing 16 may partially define the opening 26. The opening 26 may be configured to receive a portion of the handle 14 (shown in FIG. 1). For example, a portion of the handle 14 may extend into the opening 26 to provide one or more benefits to the user during shaving, such as delievering heat or moisture.

[0012] In certain embodiments, the housing 16 may comprise a skin-engaging member 28 (e.g., a thermoplastic elastomer pad or a plurality of fins or other protrusions 30 to aid in stretching the skin during a shaving stroke) on a top surface of the housing in front of the guard 18. In certain embodiments, the skin-engaging member 28 may be insert injection molded or co-injection molded to the housing 16. However, other known assembly methods may also be used such as adhesives, ultrasonic welding, or mechanical fasteners. As will be explained in greater detail below, the skin engaging member 28 may be molded from a different material than the housing 16. For example, material of the skin engaging member 28 may be molded from a thermo-plastic elastomer material having a lower durometer hardness or modulus compared to the material of the housing 16. In certain embodiments, the skin engaging member 28 may comprise an elastomeric material, such as a thermoplastic elastomer based on styrene block co-polymers. The skin engaging 28 member may comprise a lubricous material or a water leachable shaving aid.

[0013] The guard 18 and the cap 22 may define a shaving plane that is tangent to the guard 18 and the cap 22. One or more blade members 32 each having a respective cutting edge may be mounted to the housing 16 between the cap 22 and the guard 18 (i.e., in front of the cap 22 behind the guard 18). Although five blade members 32 are shown, the shaving razor cartridge 12 may have more or fewer blade members 32 depending on the desired performance and cost of the shaving razor cartridge 12. The blade members 32 may be secured to the housing 16 with one or more blade retention members 34 and 36, such as clips.

[0014] Injection molding is often used to created plastic parts having openings. These openings are created by cores inside the cavity of an injection mold. FIG. 3A is a top view of an injection mold cavity 38 with molten plastic 40 flowing around a core 42 during an injection molding process forming two polymer flow fronts 44 and 46 flowing towards each other in a non-parallel direction. The two polymer flow fronts 44 and 46 meld back together on the other side of the core 42 creating a weld line 48. Weld lines result from plastic flowing around large cores, as shown in FIG. 3A, or small cores, as shown in FIG. 3B. FIG. 3B is a top view of an injection mold cavity 50 with molten plastic 52 flowing around a core 54 during an injection molding process forming two polymer flow fronts 56 and 58 flowing towards each other in a non-parallel direction. The two polymer flow fronts 56 and 58 meld back together on the other side of the core 54 creating a weld line 60. Weld lines result in a localized weakened area of plastic components and can act as a crack propagation area because they are located immediately adjacent an opening formed by the core.

[0015] FIG. 4A is a top view of the housing 16 that may be incorporated into the shaving razor cartridge 16. FIG. 4B is a bottom view of the housing of FIG. 4A. The housing 16 may be similar to the component created by the mold cavity of FIG. 3A. The housing 16 may have a wall 62 that defines a partially enclosed opening 64 that extends from a top surface 66 (FIG. 4A) of the housing 16 to an opposing bottom surface 68 (FIG. 4B). It is understood the wall 62 may be an internal perimeter wall and need not extend around the periphery of the housing 16. The wall 62 may include a pair of arms 70 and 72 (e.g., spaced apart sections immediately adjacent an opening) each having a distal end 74 and 76 that extends toward the opposing distal end 74 and 76 define a gap 78 therebetween. The housing 16 may be similar to the part resulting from the mold cavity of FIG. 3A. For example,

the two polymer flow fronts 44 and 46 of FIG. 3A may represent the pair of arms 70 and 72 of the housing 16. However, instead of creating the weld line 48 of FIG. 3A, the two distal ends 74 and 76 are created, thus resulting in an improved design. Typically, an opening would be molded by having the wall completely defining the opening (i.e., a fully enclosed opening). However, such a design would result in a weld line (e.g., located along a front wall 80 and 82 of the housing 16), thus resulting in a weaker part. It is believed, without being held to theory, that the housing 16 with the gap 78 produces a part design that is more robust to manufacture, more impact resistant, and more consumer acceptable than a part having a structurally weak weld line.

[0016] The gap 78 may extend from the top surface 66 to the bottom surface 68 of the housing 16 and from the front walls 80 and 82 of the respective arms 70 and 72 to a rear wall 84 and 86 of the respective arms 70 and 72. In certain embodiments, the arms 70 and 72 may have a width "w1" of about 0.5 mm to about 15 mm (FIG. 4C) and more preferably about 3mm to about 11mm. The rear walls 84 and 86 may be part of the wall 62 that defines the partially enclosed opening 64. As shown in FIG. 4C, the distal ends 74 and 76 may be spaced apart at the front walls 80 and 82 by a distance d1 of about 0.1mm to about 38mm and more preferably about 0.75mm to about 3mm. The distal ends 74 and 76 may be spaced apart at the rear walls 84 and 86 by a distance d2 of about 0.1mm to about 38mm and more preferably about 0.75mm to about 3mm. It is understood that the gap 78 may not be uniform. For example, the size of the gap 78 may increase or decrease from the front walls 80 and 82 to the rear walls 84 and 86. In certain embodiments, the distal ends 74 and 76 may be spaced apart by a distance d3 of about 0.1mm to about 38mm and more preferably about 0.75mm to about 3mm, taken at a point between the front walls 80 and 82 and the rear walls 84 and 86 (e.g., taken at a position along a centerline of the arms 70 and 72). The distance d3 may be greater than the distance d1 and d2. FIG. 4D illustrates a cross section view of the housing 16, taken generally along the line 4-4 of FIG. 4B. Each arm 70 and 72 may have a thickness of "t1" extending from the top surface 66 to the bottom surface 68 of about 0.5mm to about 15mm, measured at the respective distal ends 74 and 76 of each arm 70 and 72.

[0017] In certain embodiments, the gap 78 may form a shape, such as an arrow (See FIG. 4B), to indicate the proper direction and positioning for attaching the handle 14 to the shaving razor cartridge 12. Accordingly, the gap 78 may act as a handle docking alignment member that indicates an intended docking direction for the handle 14 to be inserted into the opening 26 (FIG. 2). The handle docking alignment member (e.g., the gap 78) may be in communication with the opening 26 for receiving the handle 14. As will be explained in greater detail below, the gap 78 may be filled with a different material having a contrasting color to the housing 16 to provide a more noticeable and intuitive alignment for the user.

[0018] Referring to FIGS. 5A and 5B the housing 16 is shown with a bridge 88 filling the gap 78 (FIG. 4C) and interconnecting the pair of arms 70 and 72 (e.g., the distal ends 74 and 76), thus forming the enclosed opening 26 (FIG. 2). The bridge 88 and the arms 70 and 72 may form a front wall 90. The housing 16 may be injection molded with the first polymeric material and then a second polymeric material may be co-injection molded over the first polymeric material of the housing 16 to interconnect the pair of arms 70 and 72 (e.g., bonding the pair of arms 70 and 72 together). The second polymeric material may be a thermo-plastic elastomer material to provide support and flexibility to the pair of arms 70 and 72. In certain embodiments, the second polymeric material 88 that forms the bridge 88 may extend over a portion of the top surface 66 of the housing 16 to form the skin engaging member 28 and the protrusions 30 (see FIG. 5B). The bridge 88 may also cover a portion of the bottom surface 68 to provide extra impact resistance to help prevent the arms 70 and 72 from being damaged or breaking (e.g., when dropped onto a bathroom tile floor). The bridge member 88 may be injection molded from a thermo-plastic elastomer material which may further improve impact resistance.

[0019] Accordingly, the bridge 88 may not only make the housing 16 more manufacturable and impact resistant, but may also form the skin-engaging member 28 and protrusions 30 on the top surface 66 of the housing 16 to improve skin stretch during a shaving stroke. It may be beneficial for the bridge 88 to interconnect the distal ends 74 and 76, but not cover the bottom surface 68 because a polymeric material used to improve skin stretching, may not allow for smooth insertion of the handle 14 into the opening 26. In certain embodiments, the bridge 88 may comprise a lubricous material or a water leachable shaving aid that may also cover a portion of the top surface 66 of the housing 16 (e.g., the skin engaging member 28). A polymeric material having a lower coefficient of friction than the housing 16 may improve glide of the skin engaging member 28 and may also improve insertion of the handle 12 into the opening 26.

[0020] In certain embodiments, the bridge 88 may comprise a polymeric material that is a different color than the housing 16. The contrasting color of the bridge 88 and the housing 16 may act as an indicator for the consumer to properly insert the handle 14 into the opening 26. The proper insertion of the handle 14 may also be aided by the shape of the bridge 88. In certain embodiments, the bridge 88 may form a shape, such as an arrow, to indicate the proper positioning for attaching the handle 14 to the shaving razor cartridge 12. Accordingly, the bridge 88 may act as a handle docking alignment member that indicates an intended docking direction for the handle 14 to be inserted into the opening 26. The handle docking alignment member (e.g., the bridge 88) may be on the same surface (e.g., bottom surface 68) that defines the opening 26 for receiving the handle 14

to be more intuitive to the consumer. The handle docking alignment member (e.g., the bridge 88) may be positioned along a centerline "CL" of the housing 16. The bottom surface 68 of the housing 16 may include a handle locking member 92 (FIG. 5A) that secures a portion of the handle 14 (FIG. 1) within the opening 26. The handle locking member 92 may be positioned behind the handle docking alignment member (e.g., the bridge 88) to indicate the intended position of the handle 14 (FIG. 1) for proper attachment with the shaving razor cartridge 12 (FIG. 1). The handle locking member 92 may extend from interior wall 94 of the housing 16 extend over the opening 26.

[0021] Referring to FIG. 6, a cross section view of the shaving razor cartridge 12 is shown. The bridge 88 may have a thickness "t2" of about 0.5mm to about 15mm and more preferably about 2mm to about 7mm. The bridge 88 may extend from the bottom surface 68 to the top surface 66. The thickness "t2" may be increased to improve the integrity of the shaving razor cartride 12. Typically the most hazardous area of the housing 16 to fail is near the blades 32 (e.g., a first blade 32a). Accordingly, it may be beneficial to have the bridge 88 closer to the first blade 32a. A rear wall 98 of the bridge 88 may be a distance "d4" of about 2.5mm to about 7mm to a cutting edge 96 of the first blade 32a.

[0022] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

[0023] While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

Claims

1. A shaving razor cartridge (12) comprising:

a housing (16) molded from a first polymeric material, the housing having a wall (62) partially defining an opening (64) extending from a top surface (66) of the housing to a bottom surface (68) of the housing, the wall having a pair of arms (70,72) each having a distal end (74, 76) that extend toward each other defining a gap (78);
a guard (18) toward a front portion (20) of the housing;
a cap (22) toward a rear portion (24) of the housing;
at least one blade member (32) mounted between the guard and the cap; and
a bridge (88) interconnecting the distal ends, wherein the bridge is molded from a second polymeric material that is different than the first polymeric material.

2. The shaving razor cartridge (12) of claim 1 wherein the distal ends (74, 76) are spaced apart by 0.1 mm to 38 mm.

3. The shaving razor cartridge (12) of claim 1 wherein the distal ends (74, 76) are spaced apart by 0.75 mm to 3 mm.

4. The shaving razor cartridge (12) according to any one of the preceding claims wherein the gap (78) is positioned in front of the guard (18).

5. The shaving razor cartridge (12) according to any one of the preceding claims wherein the pair of arms (70, 72) and the bridge (88) form a front wall of the housing (16).

6. The shaving razor cartridge (12) according to any one of the preceding claims wherein a rear wall (98) of the bridge (88) is 2.5mm to 7mm to a cutting edge (96) of the at least one blade member (32).

7. The shaving razor cartridge (12) according to any one of the preceding claims wherein a secant modulus calculated at 1% engineering strain of the first polymeric material is more than 10% different than a secant modulus calculated at 1% engineering strain of the second polymeric material.

8. The shaving razor cartridge (12) according to any one of the preceding claims wherein a color of the first polymeric material is different than a color of the second polymeric material.

9. The shaving razor cartridge (12) according to any one of the preceding claims wherein the second polymeric material comprises a thermoplastic elastomer.

10. The shaving razor cartridge (12) according to any one of the preceding claims wherein the second polymeric material forms a skin contacting surface on the top surface of the housing.

11. The shaving razor cartridge (12) of claim 10 wherein the second polymeric material comprises a water leachable shaving aid.

12. A method of manufacturing a shaving razor cartridge (12) comprising:

molding a housing (16) from a first polymeric

material, the housing (16) having a wall (62) partially defining an opening (64) that extends from a top surface (66) to a bottom surface (68) of the housing; the wall having a pair of arms (70,72) each having a distal end (74, 76) that extend toward each other defining a gap (78);
molding a bridge (88) comprising a second polymeric material that is different than the first polymeric material that comprises the housing to enclose the opening, the bridge (88) interconnecting the distal ends.

13. The method of claim 12 wherein said molding of the housing (16) comprises forming two polymer flow fronts flowing towards each other in a non-parallel direction.

14. The method of claim 12 or 13 wherein said molding of the bridge (88) comprises molding a skin contacting surface over the top surface (66) of the housing (16).

15. The method of claim 12, 13 or 14 wherein said molding the bridge (88) comprises attaching the pair of spaced apart arms (70, 72) of the housing (16) to each other.

Patentansprüche

1. Rasiererkopf (12), umfassend:

ein Gehäuse (16), das aus einem ersten Polymermaterial gegossen ist, wobei das Gehäuse eine Wand (62) aufweist, die teilweise eine Öffnung (64) definiert, die sich von einer Oberseite (66) des Gehäuses zu einer Unterseite (68) des Gehäuses erstreckt, wobei die Wand ein Paar Arme (70, 72) aufweist, die jeweils ein distales Ende (74, 76) aufweisen, die sich zueinander erstrecken und einen Spalt (78) definieren;
einen Schutz (18) in Richtung eines vorderen Abschnitts (20) des Gehäuses;
eine Kappe (22) in Richtung eines hinteren Abschnitts (24) des Gehäuses;
mindestens ein Klingenelement (32), das zwischen dem Schutz und der Kappe angebracht ist; und
eine Brücke (88), die die distalen Enden miteinander verbindet, wobei die Brücke aus einem zweiten Polymermaterial gegossen ist, das sich von dem ersten Polymermaterial unterscheidet.

2. Rasiererkopf (12) nach Anspruch 1, wobei die distalen Enden (74, 76) um 0,1 mm bis 38 mm voneinander beabstandet sind.

3. Rasiererkopf (12) nach Anspruch 1, wobei die distalen Enden (74, 76) um 0,75 mm bis 3 mm voneinander beabstandet sind.

4. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei der Spalt (78) vor dem Schutz (18) positioniert ist.

5. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei das Paar Arme (70, 72) und die Brücke (88) eine Vorderwand des Gehäuses (16) bilden.

6. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei eine Rückwand (98) der Brücke (88) 2,5 mm bis 7 mm von einer Schneidkante (96) des mindestens einen Klingenelements (32) entfernt ist.

7. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei ein bei 1 % technischer Dehnung des ersten Polymermaterials berechneter Sekantenmodul sich um mehr als 10 % von einem bei 1 % technischer Dehnung des zweiten Polymermaterials berechneten Sekantenmodul unterscheidet.

8. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei eine Farbe des ersten Polymermaterials sich von einer Farbe des zweiten Polymermaterials unterscheidet.

9. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei das zweite Polymermaterial ein thermoplastisches Elastomer umfasst.

10. Rasiererkopf (12) nach einem der vorstehenden Ansprüche, wobei das zweite Polymermaterial eine hautberührende Oberfläche auf der Oberseite des Gehäuses bildet.

11. Rasiererkopf (12) nach Anspruch 10, wobei das zweite Polymermaterial ein mit Wasser auswaschbares Rasierhilfsmittel umfasst.

12. Verfahren zum Herstellen eines Rasiererkopfs (12), umfassend:

Gießen eines Gehäuses (16) aus einem ersten Polymermaterial, wobei das Gehäuse (16) eine Wand (62) aufweist, die teilweise eine Öffnung (64) definiert, die sich von einer Oberseite (66) zu einer Unterseite (68) des Gehäuses erstreckt; wobei die Wand ein Paar Arme (70, 72) aufweist, die jeweils ein distales Ende (74, 76) aufweisen, die sich aufeinander zu erstrecken und einen Spalt (78) definieren;
Gießen einer Brücke (88), umfassend ein zweites Polymermaterial, das sich von dem ersten Polymermaterial, welches das Gehäuse umfasst, unterscheidet, um die Öffnung zu umschließen, wobei die Brücke (88) die distalen

Enden miteinander verbindet.

13. Verfahren nach Anspruch 12, wobei das Gießen des Gehäuses (16) das Bilden zweier Polymerflussfronten umfasst, die in einer nicht parallelen Richtung aufeinander zu fließen.

14. Verfahren nach Anspruch 12 oder 13, wobei das Gießen der Brücke (88) das Gießen einer hautberührenden Oberfläche über die Oberseite (66) des Gehäuses (16) umfasst.

15. Verfahren nach Anspruch 12, 13 oder 14, wobei das Gießen der Brücke das Befestigen der beiden voneinander beabstandeten Arme (70, 72) des Gehäuses (16) aneinander umfasst.

Revendications

1. Cartouche de rasoir de rasage (12) comprenant :

un logement (16) moulé à partir d'un premier matériau polymère, le logement ayant une paroi (62) définissant partiellement une ouverture (64) s'étendant d'une surface supérieure (66) du logement à une surface inférieure (68) du logement, la paroi ayant une paire de bras (70, 72) ayant chacun une extrémité distale (74, 76) qui s'étendent l'un vers l'autre en définissant un espace (78) ;
une protection (18) vers une partie avant (20) du logement ;
une coiffe (22) vers une partie arrière (24) du logement ;
au moins un élément de lame (32) monté entre la protection et la coiffe ; et
un pont (88) interconnectant les extrémités distales, dans laquelle le pont est moulé à partir d'un second matériau polymère qui est différent du premier matériau polymère.

2. Cartouche de rasoir de rasage (12) selon la revendication 1, dans laquelle les extrémités distales (74, 76) sont espacées de 0,1 mm à 38 mm.

3. Cartouche de rasoir de rasage (12) selon la revendication 1, dans laquelle les extrémités distales (74, 76) sont espacées de 0,75 mm à 3 mm.

4. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle l'espace (78) est positionné devant la protection (18).

5. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle la paire de bras (70, 72) et le pont (88) forment une paroi avant du logement (16).

6. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle une paroi arrière (98) du pont (88) est située 2,5 mm à 7 mm d'un bord de coupe (96) de l'au moins un élément de lame (32).

7. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle un module sécant calculé à 1 % de déformation technique du premier matériau polymère est différent de plus de 10 % d'un module sécant calculé à 1 % de déformation technique du second matériau polymère.

8. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle une couleur du premier matériau polymère est différente d'une couleur du second matériau polymère.

9. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle le second matériau polymère comprend un élastomère thermoplastique.

10. Cartouche de rasoir de rasage (12) selon l'une quelconque des revendications précédentes, dans laquelle le second matériau polymère forme une surface de contact avec la peau sur la surface supérieure du logement.

11. Cartouche de rasoir de rasage (12) selon la revendication 10, dans laquelle le second matériau polymère comprend une aide au rasage lixiviable à l'eau.

12. Procédé de fabrication d'une cartouche de rasoir de rasage (12) comprenant :

le moulage d'un logement (16) à partir d'un premier matériau polymère, le logement (16) ayant une paroi (62) définissant partiellement une ouverture (64) qui s'étend d'une surface supérieure (66) à une surface inférieure (68) du logement ; la paroi ayant une paire de bras (70, 72) ayant chacun une extrémité distale (74, 76) qui s'étendent l'un vers l'autre en définissant un espace (78) ;
le moulage d'un pont (88) comprenant un second matériau polymère qui est différent du premier matériau polymère qui comprend le logement pour enfermer l'ouverture, le pont (88) interconnectant les extrémités distales.

13. Procédé selon la revendication 12, dans lequel ledit moulage du logement (16) comprend la formation de deux fronts d'écoulement de polymère s'écoulant

l'un vers l'autre dans une direction non parallèle.

14. Procédé selon la revendication 12 ou 13, dans lequel ledit moulage du pont (88) comprend le moulage d'une surface de contact avec la peau sur la surface supérieure (66) du logement (16).

15. Procédé selon la revendication 12, 13 ou 14, dans lequel ledit moulage du pont comprend la fixation de la paire de bras espacés (70, 72) du logement (16) l'un à l'autre.

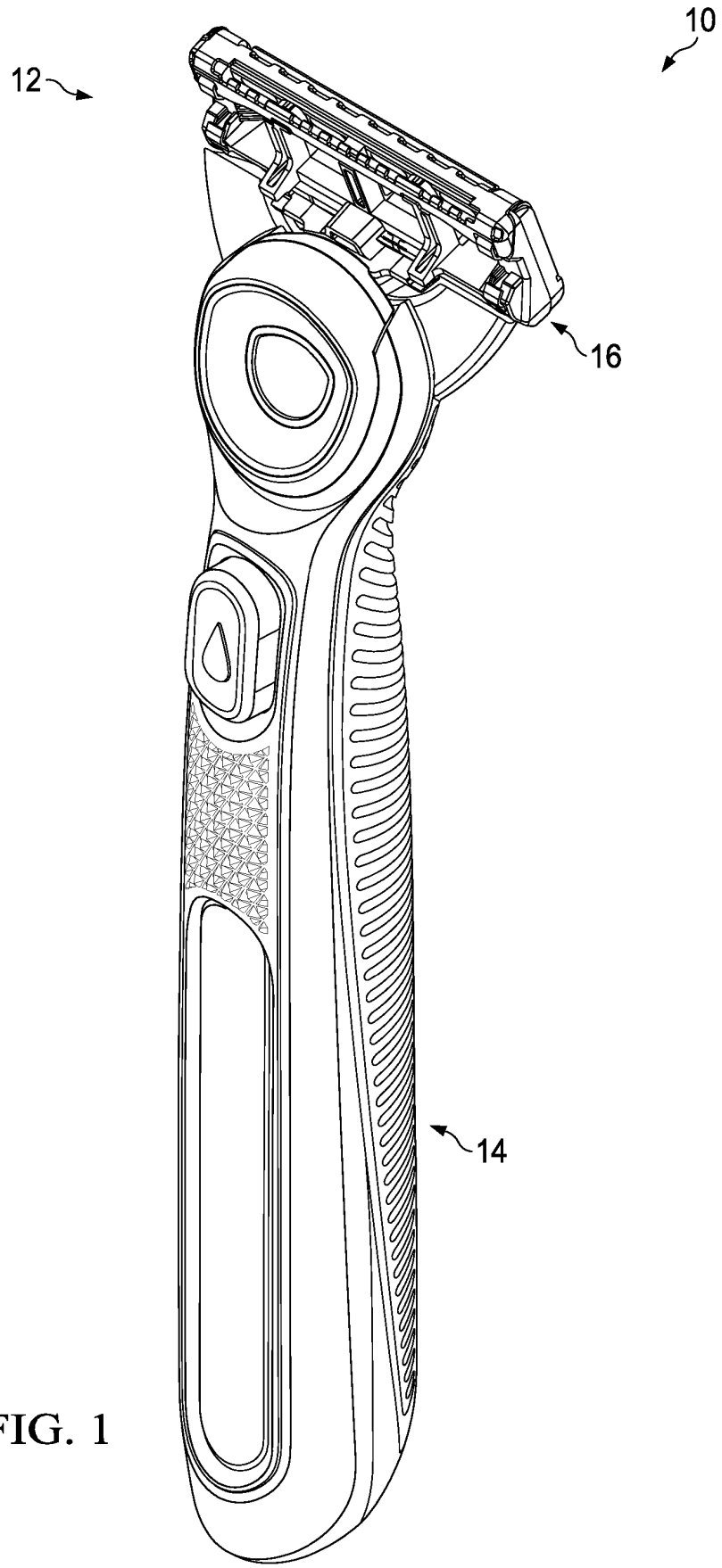

FIG. 1

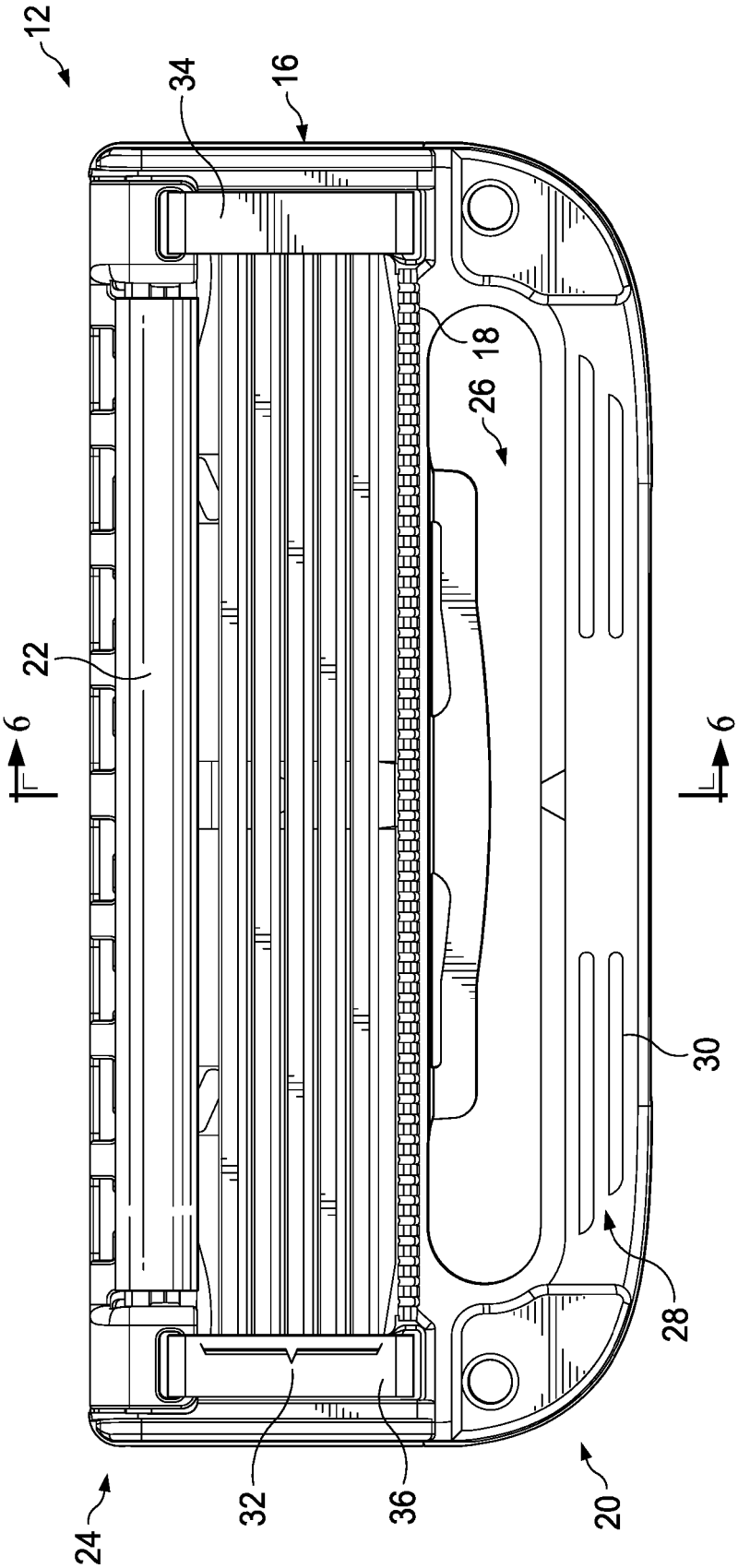

FIG. 2

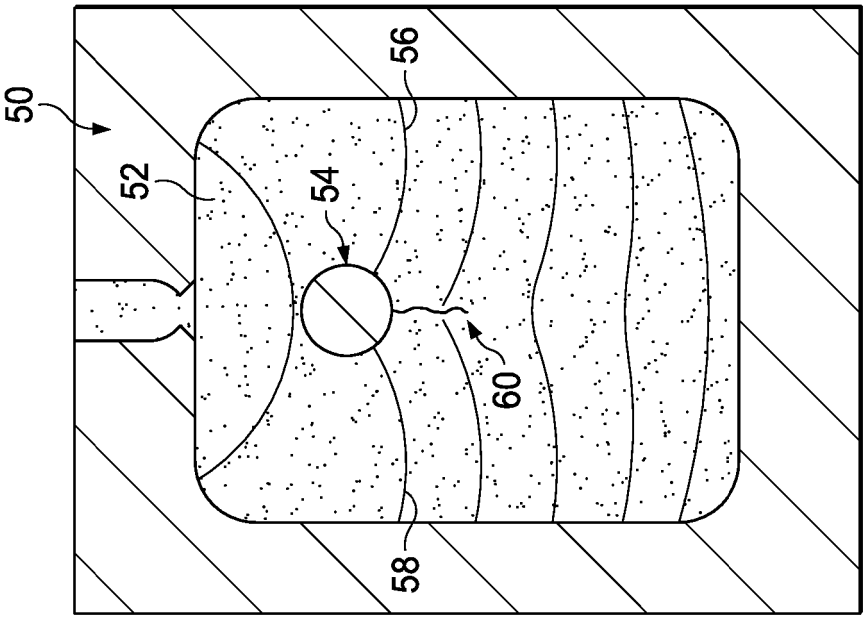

FIG. 3B

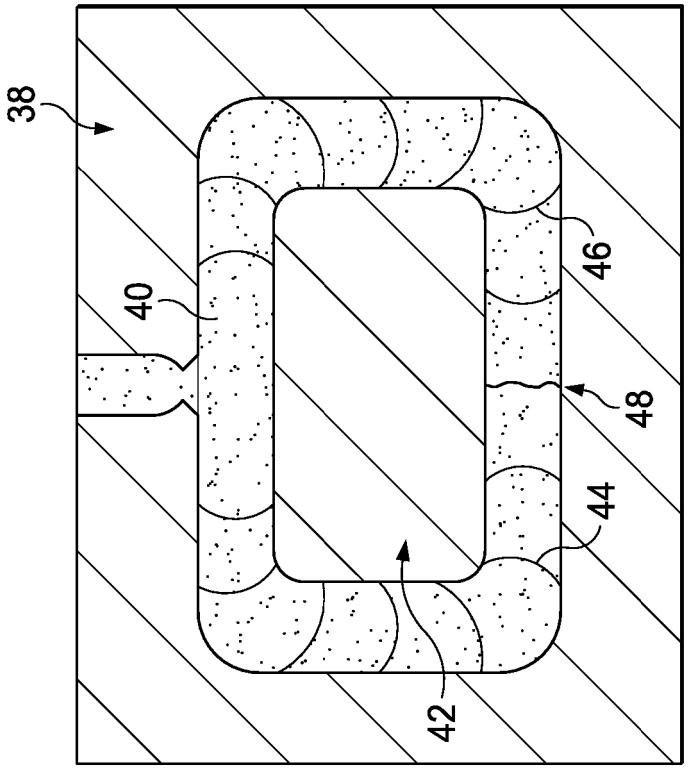

FIG. 3A

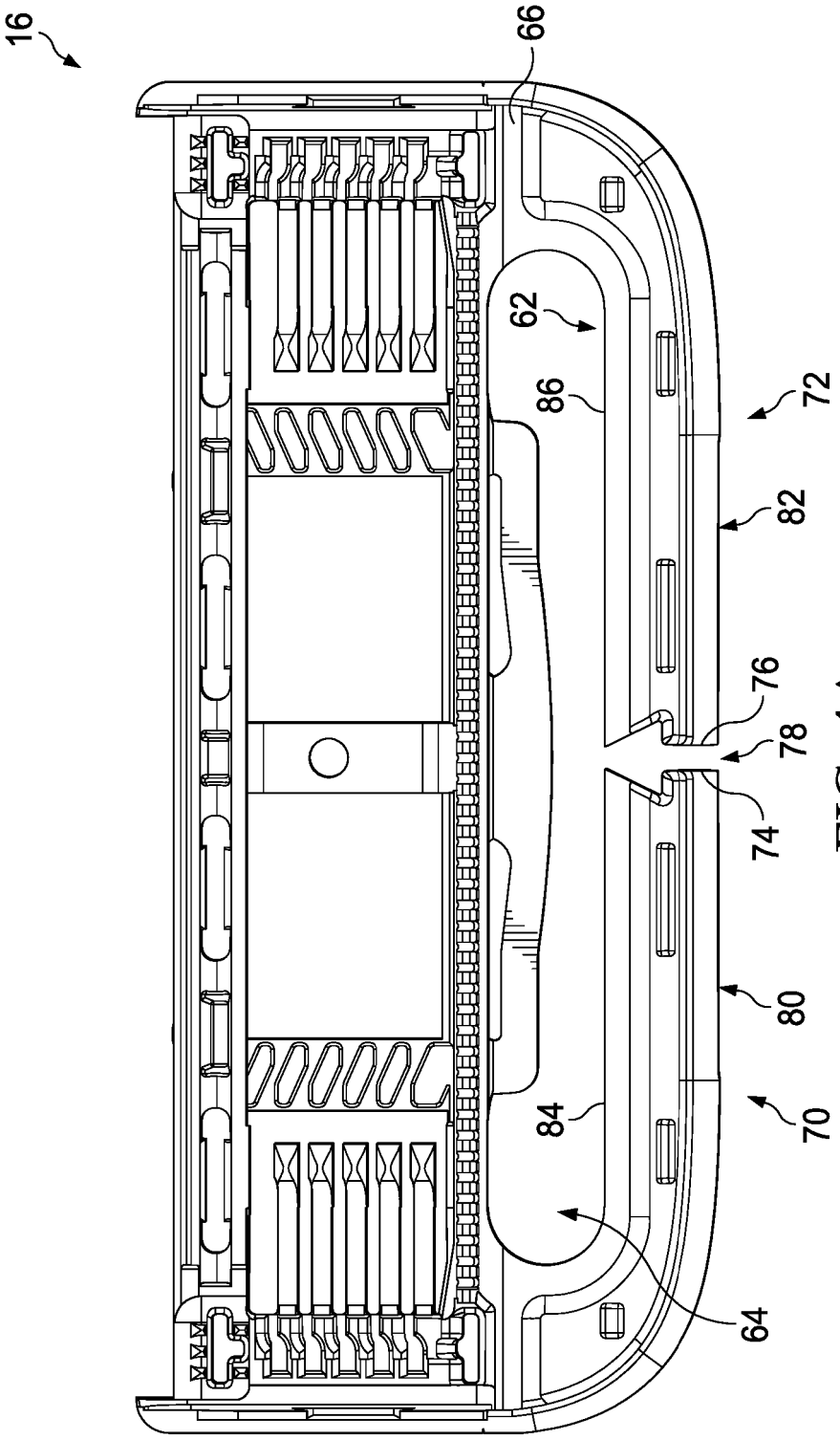

FIG. 4A

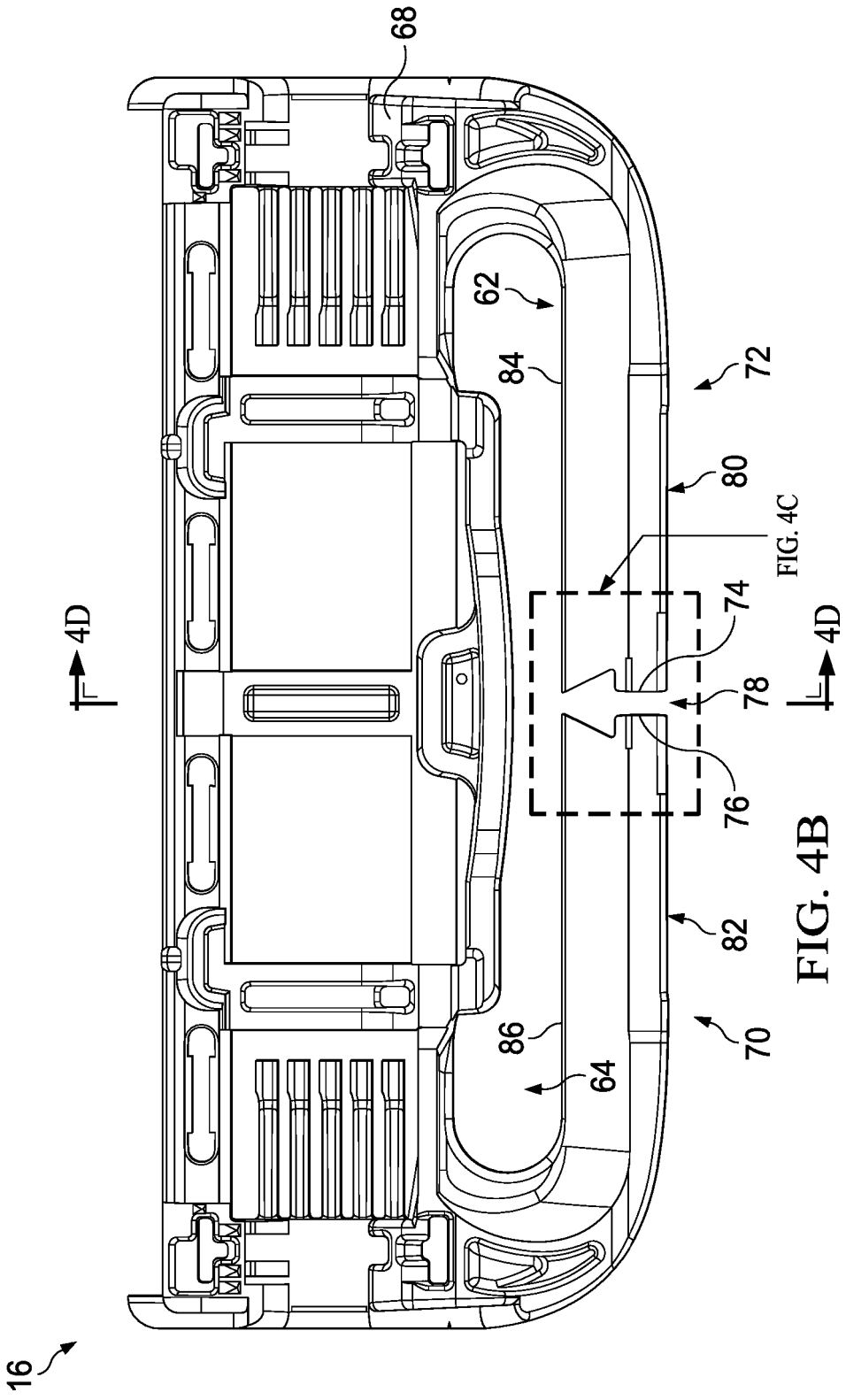

FIG. 4B

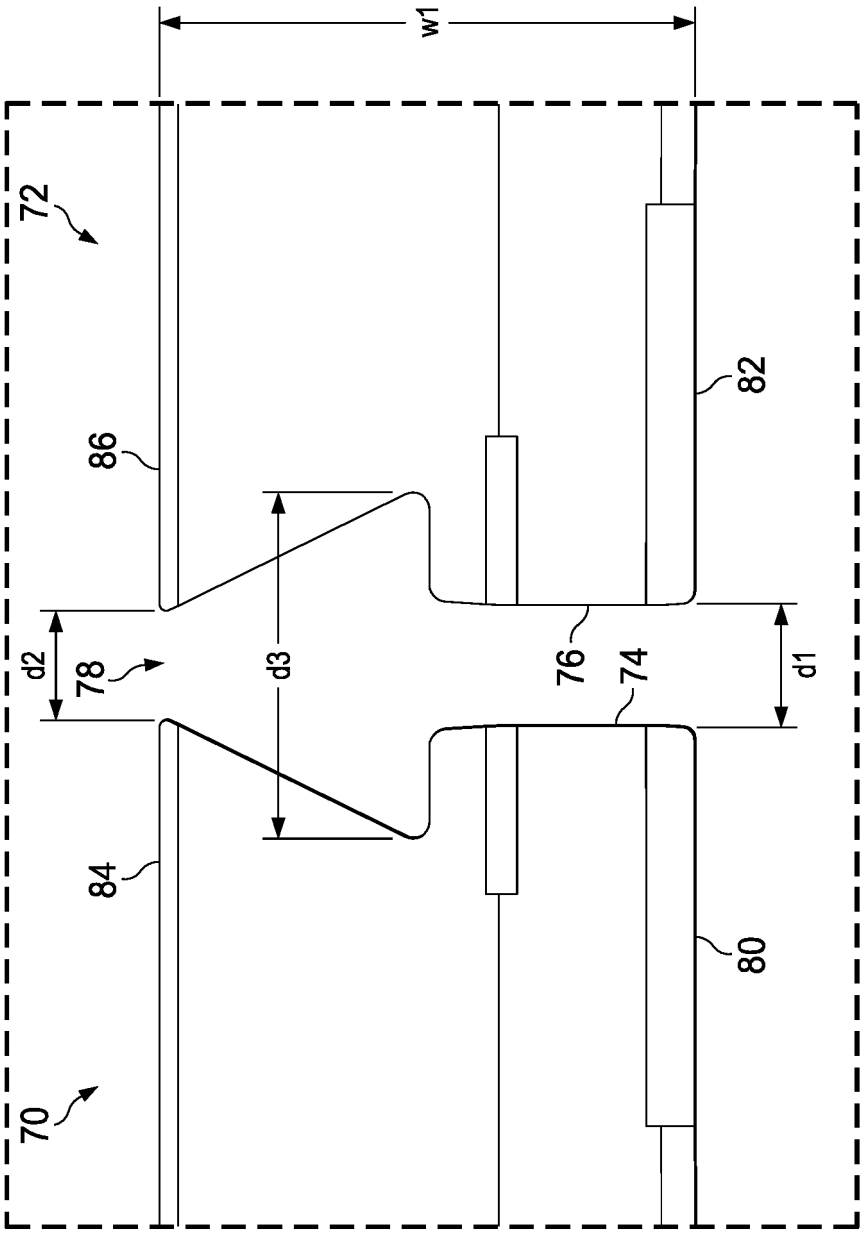

FIG. 4C

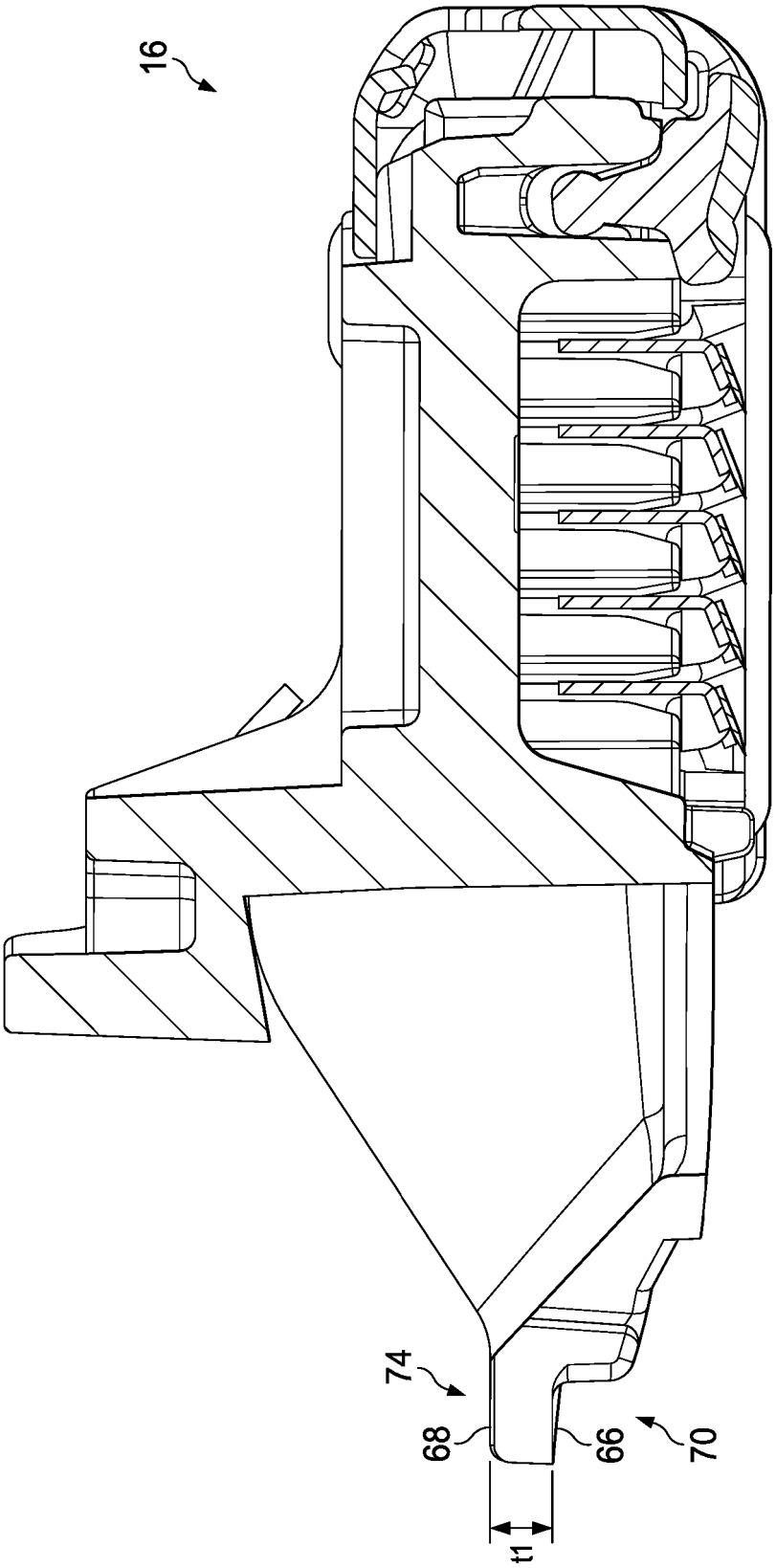

FIG. 4D

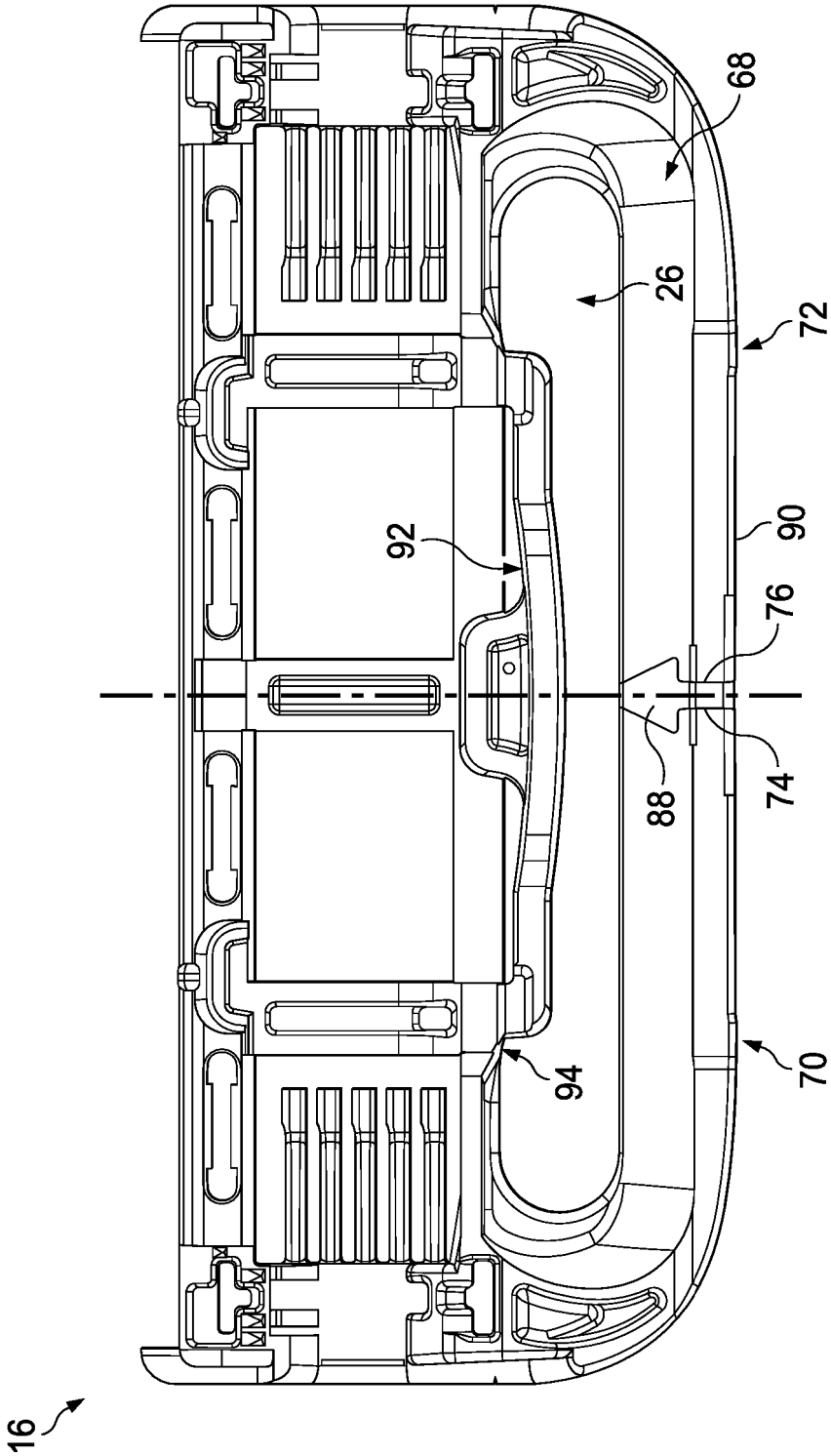

FIG. 5A

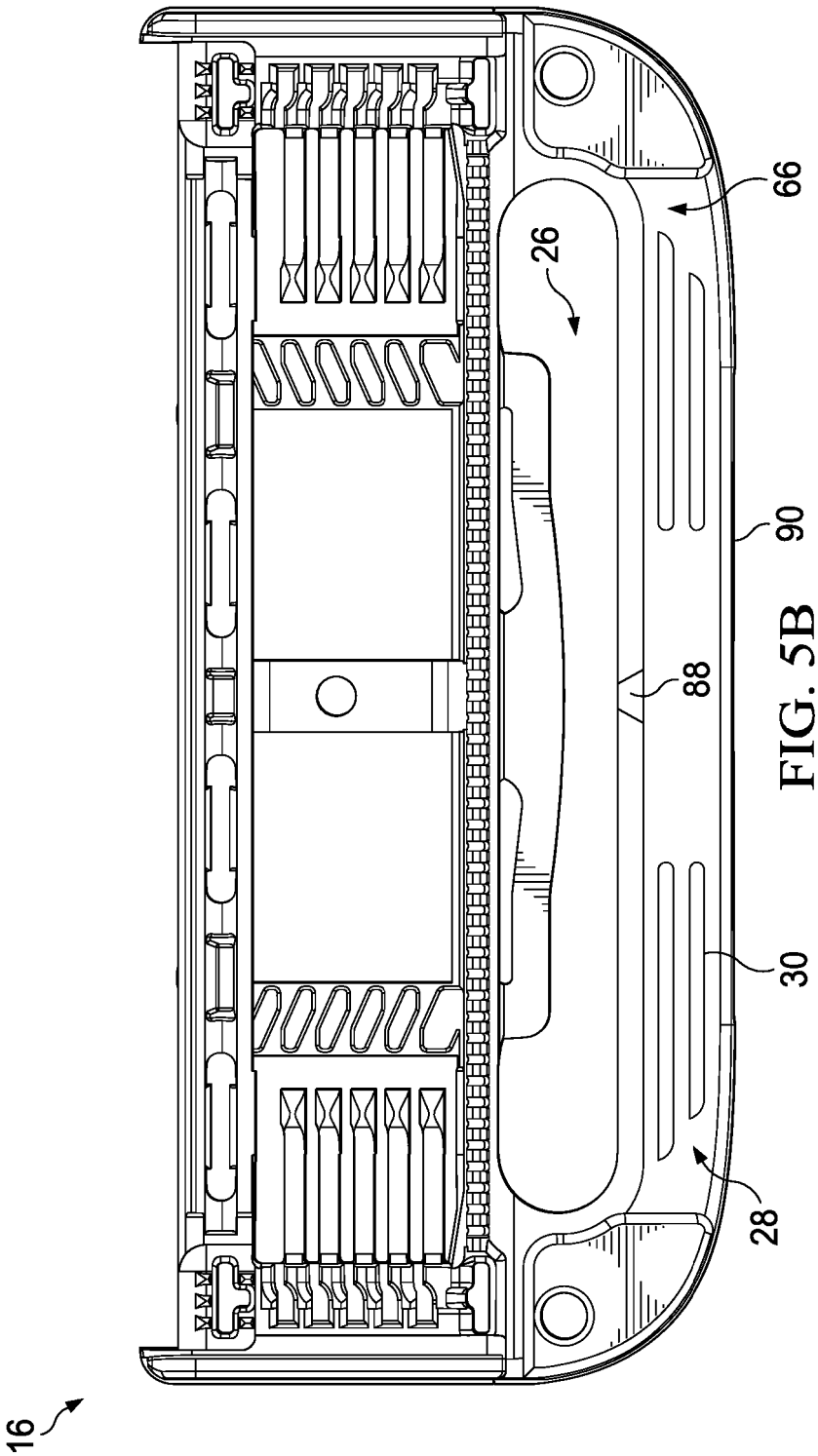

FIG. 5B

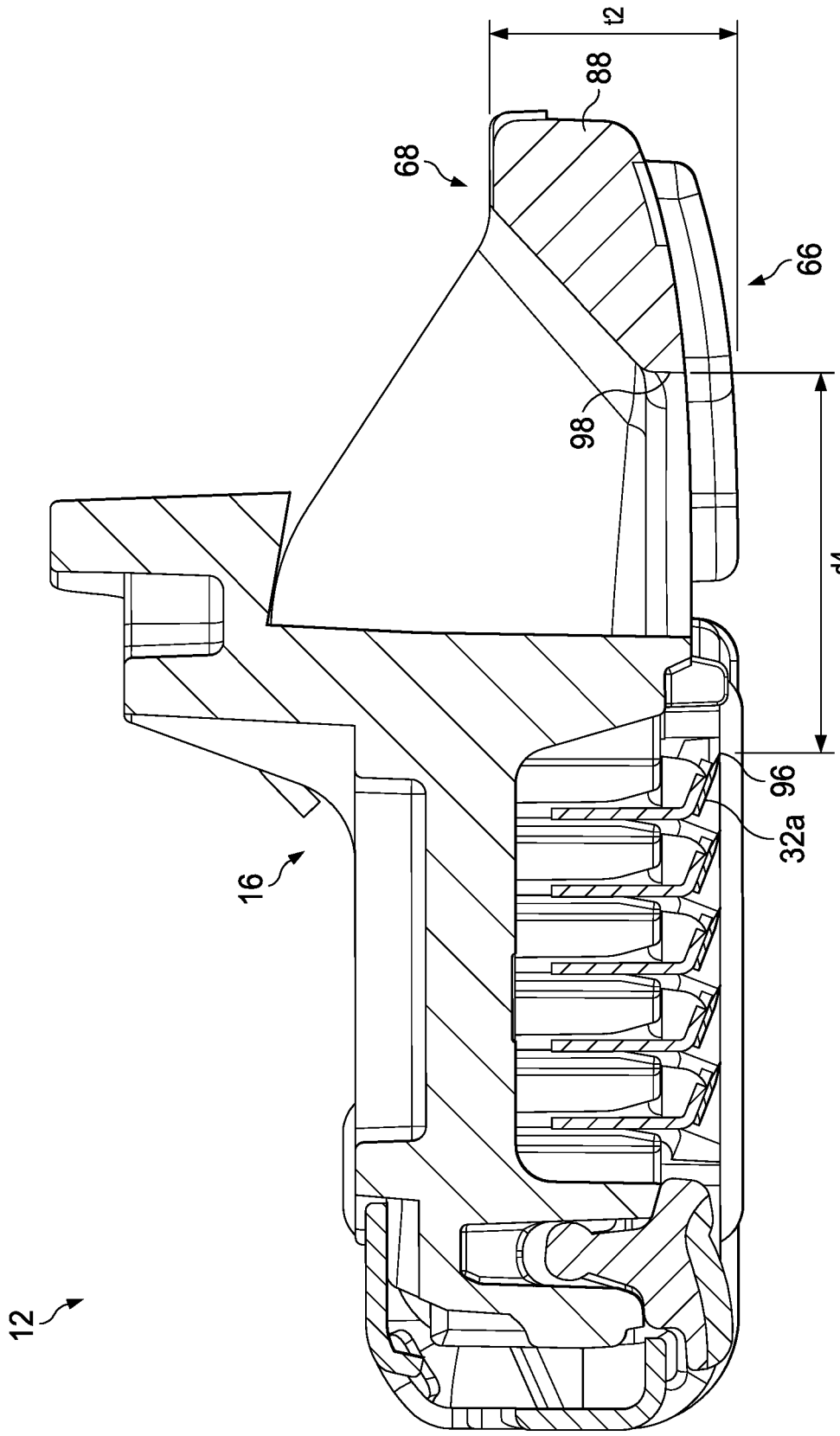

FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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