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(54) **LICE COMB**

(57) A lice comb (10) comprising a housing (12) having a planar lower wall portion (14), an upper wall portion (16) and a side wall portion (18). A comb unit (20) comprising a blade (22) having a plurality of teeth (24) is moveable from a retracted position, in which the blade (22) is parallel to the lower wall portion (14), and an extended position, in which the blade (22) extends at an angle away from the lower wall portion (14). A fan unit is provided within the housing (12) such that the fan unit operates to draw air inwardly through an opening (30) in the lower wall portion (14) adjacent the comb unit (20). When the blade (20) is in the extended position, the housing (12) may be moved to draw the teeth (24) through hair such that lice captured by the teeth (24) are drawn in through the opening (30).

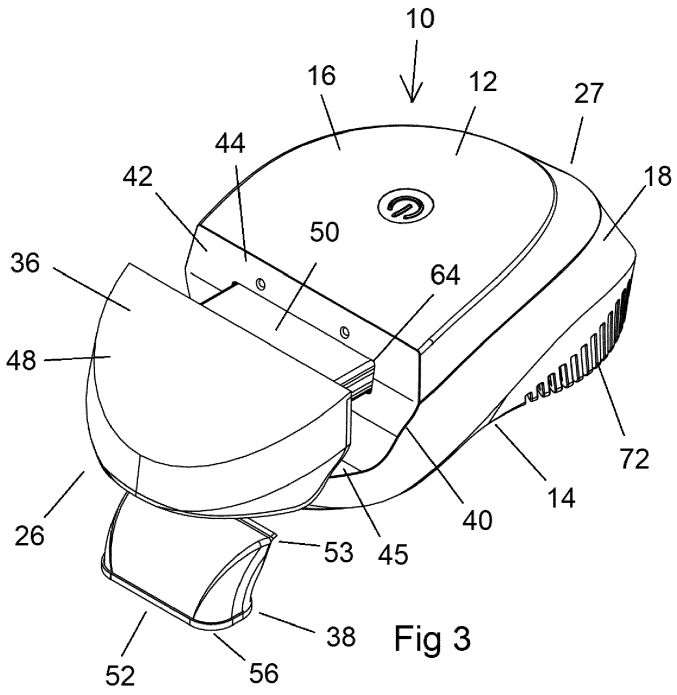

Fig 3

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Description

Field of the Invention

[0001] The present invention relates to a lice comb.

Background to the Invention

[0002] Various lice combs have been devised to capture lice by incorporating a vacuum which draws lice into the body of the comb. Such devices generally comprise a head having a comb unit, which is attached to either a housing having a vacuum, or the hose of a separate vacuum device.

[0003] The present invention relates to a lice comb incorporating a vacuum unit and configured to provide a compact and easy to manipulate device.

Summary of the Invention

[0004] According to one aspect of the present invention there is provided a lice comb comprising:

a housing having a planar lower wall portion, an upper wall portion and a side wall portion extending between the upper and lower wall portions;
a comb unit comprising a blade having a plurality of teeth, the blade being moveable from a retracted position, in which the blade is parallel to the lower wall portion, and an extended position, in which the blade extends at an angle away from the lower wall portion; and
a fan unit within the housing such that the fan unit operates to draw air inwardly through an opening in the lower wall portion adjacent the comb unit;
wherein when the blade is in the extended position, the housing may be moved to draw the teeth through hair such that lice captured by the teeth are drawn in through the opening.

[0005] Preferably the lower and upper wall portions are oval in shape and the side wall portion tapers inwardly from the periphery of the lower wall portion to the periphery of the upper wall portion such that the housing comprises a generally flat base and a domed upper side extending from the base.

[0006] Preferably the opening is provided between a midpoint of the lower wall portion and a first end of the housing and comprises an elongate opening extending transversely to a longitudinal axis of the housing.

[0007] Preferably the comb unit comprises a base from which the blade extends, the base comprising an elongate member pivotally mounted across the opening

[0008] In a preferred embodiment, the lower wall portion is provided with an elongate lip extending along a first side of the opening adjacent the first end, the elongate lip being arcuate in shape and extending over a portion of the opening such that the base of the comb unit is pivotally mounted adjacent an inner surface of the elongate lip.

[0009] Preferably when the comb unit is in the extended position, an arcuate lower surface of the base engages against the inner surface of the elongate lip and air may flow inwardly through the opening between an upper surface of the base and a second side of the opening and when the comb unit is in the retracted position, an upper surface of the base engages with the second side of the opening to close off the opening.

[0010] Preferably the lower wall portion of the housing is provided with a recess extending from the opening towards the second end to receive the blade of the comb unit when the comb unit is in the retracted position.

[0011] Preferably a filter holder is provided to receive a filter receptacle to capture lice drawn through the opening, the filter holder being moveable between a retracted position for use, and an extended position in which the filter receptacle can be engaged with or removed from the filter holder.

[0012] Preferably the filter holder is moved between the retracted and extended positions by sliding.

[0013] In a preferred embodiment, the filter holder is provided within a recessed portion adjacent the first end of the housing such that the filter holder can slide outwardly away from the first end to the extended position.

[0014] Preferably the recessed portion is provided within the upper wall portion and the side wall portion at the first end of the housing.

[0015] In a preferred embodiment, the recessed portion of the housing is defined by an inner wall including a first wall portion extending from the upper wall portion towards the lower wall portion, and a second wall portion extending parallel to the lower wall portion from the first end of the housing.

[0016] Preferably the filter holder includes a chamber defined by an outer wall portion and an inner wall portion, the inner wall portion being complementary in shape to the inner wall of the housing such that the inner wall portion rests against the inner wall of the housing and the outer wall portion of the filter holder following the shape of the upper wall portion and side wall portion of the housing.

[0017] Preferably the filter receptacle comprises a flexible bag having a ring around the open end thereof to be received into a complementary shaped recess provided around the periphery of an aperture in a lower side of the filter holder.

[0018] Preferably the filter receptacle includes a cover pivotable between a closed and an open position, the cover having an outer lug on an outer surface thereof such that when the filter receptacle is received within the filter holder and the filter holder is moved to the retracted position, the outer lug engages with the inner wall of the housing to move the cover to the open position.

[0019] In a preferred embodiment, the cover includes one or more internal lugs on an inner side thereof provided to engage with an inner surface of the bag to hold

the bag in an open position when in use.

[0020] Preferably the housing includes a first internal cavity in connection with the opening in the lower wall and a second internal cavity in which the fan unit is located, wherein air is drawn inwardly through the opening into the first internal cavity, through a hole in the inner wall of the housing into the filter receptacle and outwardly from the chamber in the filter holder into the second internal cavity.

[0021] Preferably the filter holder includes a projection extending inwardly through a slot in the first wall portion of the inner wall of the housing such that the filter holder can slide inwardly or outwardly relative to the first wall portion.

[0022] Preferably the projection is tubular and in communication with the chamber of the filter holder such that air drawn into the chamber exits outwardly through the tubular projection into the second internal cavity.

[0023] In a preferred embodiment, the fan unit comprises a motor and an impeller provided in the second internal cavity of the housing.

[0024] Preferably the second internal cavity of the housing includes also one or more outlets such that air drawn inwardly from the chamber may exit the second internal cavity via the outlets.

[0025] Preferably the outlets comprise a plurality of slots provided around the junction between the lower wall portion and the side wall portion at the second end of the housing.

Brief Description of the Drawings

[0026] The invention will now be described, by way of example, with reference to the following drawings, in which:

Figure 1 is an upper perspective view of a lice comb in accordance with the present invention;
Figure 2 is an upper perspective view of the lice comb of Figure 1 with the blade of the comb unit in the extended position;
Figure 3 is an upper perspective view of the lice comb of Figure 1 with the filter holder opened and the filter bag removed;
Figure 4 is a lower perspective view of the lice comb of Figure 1 with the blade in the retracted position;
Figure 5 is a lower perspective view of the lice comb of Figure 1 with the blade in the extended position;
Figure 6 is a lower perspective view of the lice comb of Figure 1 with the filter holder opened and the filter bag removed;
Figure 7 is a side view of the lice comb of Figure 1 with the blade in the retracted position;
Figure 8 is a side view of the lice comb of Figure 1 with the blade in the extended position;
Figure 9 is a side view of the lice comb of Figure 1 with the filter holder opened and the filter bag removed;
Figure 10 is a top view of the lice comb of Figure 1;
Figure 11 is a front view of the lice comb of Figure 1;
Figure 12 is a bottom view of the lice comb of Figure 1;
Figure 13 is a rear view of the lice comb of Figure 1;
Figure 14 is an exploded view of the lice comb of Figure 1;
Figure 15 is a side cross sectional view of the lice comb of Figure 1 with the blade in the retracted position;
Figure 16 is a side cross sectional view of the lice comb of Figure 1 with the blade in the extended position;
Figure 17a is a side cross sectional view of the lice comb of Figure 1 with the blade in the retracted position;
Figure 17b is close up view of Detail A of Figure 17a;
Figure 18a is a side cross sectional view of the lice comb of Figure 1 with the blade in the extended position;
Figure 18b is close up view of Detail A of Figure 18a;
Figure 19 is a side cross sectional view of the lice comb of Figure 1 with the filter holder opened and the filter bag removed;
Figure 20 is a perspective view of the filter bag of the lice comb of Figure 1;
Figure 21 is a perspective view of the filter bag with the cover opened;
Figure 22 is a perspective view of the filter bag showing internal features;
Figure 23 is a perspective view of the filter bag with the cover opened showing internal features;
Figure 24 is a side view of the filter bag; and
Figure 25 is a side view of the filter bag with the cover opened.

Detailed Description of Preferred Embodiments

[0027] Referring to the Figures, there is shown a lice comb 10 comprising a housing 12 having a comb unit 20. The housing 12 comprises generally a lower wall portion 14, an upper wall portion 16 and a side wall portion 18 connecting between the periphery of the lower wall portion 14 and the periphery of the upper wall portion 16.

[0028] The lower wall portion 14 is generally planar and the comb unit 20 is mounted to the lower wall portion 14. The lower wall portion 14 is generally oval in shape, as is the upper wall portion 16. The upper wall portion 16 is convex in shape and the side wall portion 18 tapers inwardly from the periphery of the lower wall portion 14 to the periphery of the upper wall portion 16 such that the housing 12 comprises a generally flat base and a domed upper side extending from the base. The housing 12 is therefore similar in shape to the shape of a computer mouse. The housing 12, in use, may be cupped within the hand of a user in a similar manner to a computer mouse such that the lower wall portion 14 is facing away from the hand.

[0029] The comb unit 20 comprises generally a base 28 and a blade 22. The base 28 comprises an elongate member from which the blade 22 extends. The blade 22 comprises a set of teeth 24. The lower wall portion 14 of the housing 12 includes an opening 30. The opening 30 is provided between a midpoint of the lower wall portion 14 and a first end 26 of the housing 12. The opening 30 comprises an elongate opening extending transversely to a longitudinal axis of the housing 12, the longitudinal axis extending from the first end 26 to an opposite second end 27.

[0030] The elongate base 28 of the comb unit 20 is pivotally mounted across the opening 30 such that the blade 22 is pivotable between an extended position (as can be seen in Figure 5) and a retracted position (as can be seen in Figure 4). In the retracted position, the blade 22 is oriented parallel to the lower wall portion 14 with the base located on a side adjacent the first end 26 of the housing 12 and the teeth 24 extending towards the second end 27. In the extended position, the blade 22 is oriented at an angle to the lower wall portion 14 such that distal ends of the teeth 24 are spaced apart from the lower wall portion 14. The blade 22 extends downwardly at an angle such that the teeth 24 are directly towards the second end 27 of the housing 12.

[0031] The lower wall portion 14 is provided with an elongate lip 32 extending along a first side of the opening 30 adjacent the first end 26. The elongate lip 32 is arcuate in shape and extends over a portion of the opening 30. The base 28 of the comb unit 20 is pivotally mounted adjacent an arcuate inner surface of the elongate lip 32. An arcuate lower surface of the base 28 engages against the inner surface of the lip 32. The comb unit 20 is pivotable between an extended and a retracted position. In the extended position, the lower surface of the base 28 engages against the inner surface of the elongate lip 32 but the opening is unobstructed such that air may be drawn into the opening across an upper surface of the base 28 of the comb unit 20. In the retracted position, the lower surface of the base 28 engages with the inner surface of the lip 32 and the upper surface of the base 28 engages with an opposite second side of the opening 30 such that the base 28 closes off the opening 30.

[0032] The lower wall portion 14 of the housing 12 is provided also with a recess 34 extending from the second side of the opening 30 towards the second end 27. The recess 34 is provided to receive the blade 22 of the comb unit 20 when the comb unit 20 is in the retracted position.

[0033] The lice comb 10 includes also a filter holder 36. The filter holder 36 is provided to receive a filter receptacle 38 which is provided to capture lice drawn through the opening 30. The filter holder 36 is provided within a recessed portion 40 of the housing 12. The recessed portion 40 is provided within the upper wall portion 16 and the side wall portion 18 at the first end 26 of the housing 12. The filter holder 36 is mounted relative to the housing 12 such that the filter holder 36 can move between a retracted position for use, and an extended position in which the filter receptacle 38 can be engaged with and removed from the filter holder 36.

[0034] The recessed portion 40 of the housing 12 is defined by an inner wall 42. The inner wall 42 includes a first wall portion 44 extending from the upper wall portion 16 generally towards the lower wall portion 14, and a second wall portion 45 extending generally parallel to the lower wall portion 14 from the first end 26 of the housing 12. The filter holder 36 includes a chamber 46 defined by an outer wall portion 48 and an inner wall portion 49. The inner wall portion 49 is complementary in shape to the inner wall 42 of the housing 12 such that the inner wall portion 49 rests against the inner wall 42 when the filter holder 36 is in the retracted position. The outer wall portion 48 of the filter holder 36 follows the shape of the upper wall portion 16 and side wall portion 18 of the housing 12 such that the outer wall portion 48 of the filter holder 36 forms portions of the upper wall portion 16 and side wall portion 18 adjacent the first end 26 of the housing 12.

[0035] In the embodiment shown, the filter holder 36 is slidable between the retracted and extended positions. The filter holder 36 includes a projection 50 extending inwardly through a slot 64 in the first wall portion 44 of the inner wall 42 such that the filter holder 36 can slide inwardly or outwardly relative to the first wall portion 44. The inner wall portion 49 of the filter holder 36 includes an aperture 54 into which is received the filter receptacle 38. The aperture 54 is provided on the inner wall portion 49 such that the aperture 54 is adjacent the second wall portion 45 of the inner wall 42 when the filter holder 36 is in the retracted position.

[0036] The filter receptacle 38 comprises a flexible bag 82 having an open first end 52 and a closed second end 53. The flexible bag 82 includes a ring 56 around the open first end 52 thereof. The ring 56 is received into a complementary shaped recess provided around the periphery of the aperture 54. The filter receptacle 38 can be received within the filter holder 36 by passing the closed second end 53 of the filter receptacle 38 in through the aperture 54 when the filter holder 36 is in the extended position. When the filter receptacle 38 is to be replaced, the filter holder 36 is moved to the extended position and the filter receptacle 38 may fall downwardly away from the filter holder 36.

[0037] The housing 12 includes a first internal cavity 58 defined adjacent the first end 26 of the housing 12. The first internal cavity 58 is defined in part by an interior wall 60 such that the opening 30 is in communication with the first internal cavity 58. A hole 62 is provided in the second wall portion 45 of the inner wall 42 such that air drawn inwardly through the opening 30 into the first internal cavity 58 may pass through the hole 62 into the filter receptacle 38 provided within the chamber 46 of the filter holder 36.

[0038] The projection 50 extending away from the inner wall portion 49 of the filter holder 36 is tubular and in communication with the chamber 46 of the filter holder

36 such that air drawn into the chamber 46 exits outwardly through the tubular projection 50. The air passing outwardly through the tubular projection 50 passes into a second internal cavity 59 within the housing 12. The second internal cavity 59 is defined in part by a duct 66. The duct 66 has a tubular first end which receives the tubular projection 50.

[0039] The duct 66 includes a second end which receives a fan unit. The fan unit includes an impeller 68 driven by a motor 70 mounted within a second internal cavity 59 such that rotation of the impeller 68 draws air inwardly through tubular projection 50 from within the chamber 46 of the filter holder 36. The second end of the duct 66 defines in part the second internal cavity 59 into which air is drawn through the tubular projection 50 by the impeller 68.

[0040] The second internal cavity 59 of the housing 12 includes also one or more outlets 72 such that air drawn inwardly from the chamber 46 may exit the second internal cavity 59 via the outlets 72. In the embodiment shown, the outlets 72 comprise a plurality of slots 73 provided around the junction between the lower wall portion 14 and the side wall portion 18 at the second end 27 of the housing 12.

[0041] The motor 70 is powered by a battery 74 contained within the housing 12. In the embodiment shown, the battery 74 is located within the first internal cavity 58 adjacent the interior wall 60.

[0042] The filter receptacle 38 includes a cover 76 as can be seen in Figure 20. The cover 76 comprises a planar member pivotally mounted to the ring 56. The cover 76 is pivotable between a closed position (as can be seen in Figure 20) in which the cover 76 seals across the ring 56 and an open position (as can be seen in Figure 21) in which the cover 76 pivots inwardly into the filter receptacle 38.

[0043] In the embodiment shown, the ring 56 is generally rectangular in shape, as is the cover 76. The cover 76 is pivotally connected along a longitudinal side thereof to a longitudinal side of the ring 56.

[0044] The cover 76 includes an outer lug 78 thereon. The outer lug 78 extends outwardly from the plane of the ring 56 when the cover 76 is in the closed position. In the embodiment shown, the outer lug 78 comprises a triangular shaped fin. The outer lug 78 is arranged such that when the filter receptacle 38 is received within the filter holder 36 and the filter holder 36 is moved to the retracted position, the outer lug 78 engages with the inner wall 42 around to the hole 62 to move the cover 76 to the open position. The cover 76 is biased to move towards the closed position, such that when the filter holder 36 is moved to the extended position, the cover 76 moves to the closed position to seal off the filter receptacle 38.

[0045] The cover 76 includes also one or more internal lugs 80 on an inner side thereof. The internal lugs 80 comprises also triangular shaped fins in the embodiment shown. The internal lugs 80 are provided to engage with an inner surface of the bag 82 to hold the bag 82 in an open position when in use.

[0046] When required for use, the comb unit 20 may be moved to the extended position. In the extended position, the base 28 engages against the inner surface of the elongate lip 32 such that air will be drawn between the base 28 and the second side of the opening 30. The housing 12 is held in the hand and is drawn towards the operator such that the teeth 24 pass through the hair. Lice and eggs captured between the teeth 24 will be caught on a side of the blade 22 adjacent the opening 30 and therefore will be drawn in through the opening 30 and through the hole 62 into the filter receptacle 38 where they will be captured.

[0047] When use has been completed, the comb unit 20 may be moved to the retracted position such that the base 28 seals across the opening 30, thereby preventing escape of any lice. The filter receptacle 38 may be replaced by moving the filter holder 36 to the extended position. The filter receptacle 38 may simply fall downwardly from the filter holder 36 into a bin. The cover 76 of the filter receptacle 38 moves to the closed position as the filter holder 36 is extended to capture lice within the filter receptacle 38 for disposal.

[0048] It will be readily apparent to persons skilled in the relevant arts that various modifications and improvements may be made to the foregoing embodiments, in addition to those already described, without departing from the basic inventive concepts of the present invention.

Claims

1. A lice comb comprising:

a housing having a planar lower wall portion, an upper wall portion and a side wall portion extending between the upper and lower wall portions;

a comb unit comprising a blade having a plurality of teeth, the blade being moveable from a retracted position, in which the blade is parallel to the lower wall portion, and an extended position, in which the blade extends at an angle away from the lower wall portion; and

a fan unit within the housing such that the fan unit operates to draw air inwardly through an opening in the lower wall portion adjacent the comb unit;

wherein when the blade is in the extended position, the housing may be moved to draw the teeth through hair such that lice captured by the teeth are drawn in through the opening.

2. A lice comb in accordance with claim 1, wherein the lower and upper wall portions are oval in shape and the side wall portion tapers inwardly from the periphery of the lower wall portion to the periphery of the

upper wall portion such that the housing comprises a generally flat base and a domed upper side extending from the base.

3. A lice comb in accordance with claim 2, wherein the opening is provided between a midpoint of the lower wall portion and a first end of the housing and comprises an elongate opening extending transversely to a longitudinal axis of the housing.

4. A lice comb in accordance with claim 3, wherein the comb unit comprises a base from which the blade extends, the base comprising an elongate member pivotally mounted across the opening

5. A lice comb in accordance with claim 4, wherein the lower wall portion is provided with an elongate lip extending along a first side of the opening adjacent the first end, the elongate lip being arcuate in shape and extending over a portion of the opening such that the base of the comb unit is pivotally mounted adjacent an inner surface of the elongate lip.

6. A lice comb in accordance with claim 5, wherein when the comb unit is in the extended position, an arcuate lower surface of the base engages against the inner surface of the elongate lip and air may flow inwardly through the opening between an upper surface of the base and a second side of the opening and when the comb unit is in the retracted position, an upper surface of the base engages with the second side of the opening to close off the opening.

7. A lice comb in accordance with claim 6, wherein the lower wall portion of the housing is provided with a recess extending from the opening towards the second end to receive the blade of the comb unit when the comb unit is in the retracted position.

8. A lice comb in accordance with any one of the preceding claims, wherein a filter holder is provided to receive a filter receptacle to capture lice drawn through the opening, the filter holder being moveable between a retracted position for use, and an extended position in which the filter receptacle can be engaged with or removed from the filter holder.

9. A lice comb in accordance with claim 8, wherein the filter holder is moved between the retracted and extended positions by sliding, and wherein the filter holder is provided within a recessed portion adjacent the first end of the housing such that the filter holder can slide outwardly away from the first end to the extended position.

10. A lice comb in accordance with claim 10, wherein the recessed portion is provided within the upper wall portion and the side wall portion at the first end of the housing, and wherein the recessed portion of the housing is defined by an inner wall including a first wall portion extending from the upper wall portion towards the lower wall portion, and a second wall portion extending parallel to the lower wall portion from the first end of the housing.

11. A lice comb in accordance with claim 10, wherein the filter holder includes a chamber defined by an outer wall portion and an inner wall portion, the inner wall portion being complementary in shape to the inner wall of the housing such that the inner wall portion rests against the inner wall of the housing and the outer wall portion of the filter holder following the shape of the upper wall portion and side wall portion of the housing.

12. A lice comb in accordance with claim 11, wherein the filter receptacle comprises a flexible bag having a ring around the open end thereof to be received into a complementary shaped recess provided around the periphery of an aperture in a lower side of the filter holder.

13. A lice comb in accordance with claim 12, wherein the filter receptacle includes a cover pivotable between a closed and an open position, the cover having an outer lug on an outer surface thereof such that when the filter receptacle is received within the filter holder and the filter holder is moved to the retracted position, the outer lug engages with the inner wall of the housing to move the cover to the open position, and optionally wherein the cover includes one or more internal lugs on an inner side thereof provided to engage with an inner surface of the bag to hold the bag in an open position when in use.

14. A lice comb in accordance with claim 13, wherein the housing includes a first internal cavity in connection with the opening in the lower wall and a second internal cavity in which the fan unit is located, wherein air is drawn inwardly through the opening into the first internal cavity, through a hole in the inner wall of the housing into the filter receptacle and outwardly from the chamber in the filter holder into the second internal cavity.

15. A lice comb in accordance with any one of claims 10 to 14, wherein the filter holder includes a projection extending inwardly through a slot in the first wall portion of the inner wall of the housing such that the filter holder can slide inwardly or outwardly relative to the first wall portion, and optionally wherein the projection is tubular and in communication with the chamber of the filter holder such that air drawn into the chamber exits outwardly through the tubular projection into the second internal cavity.

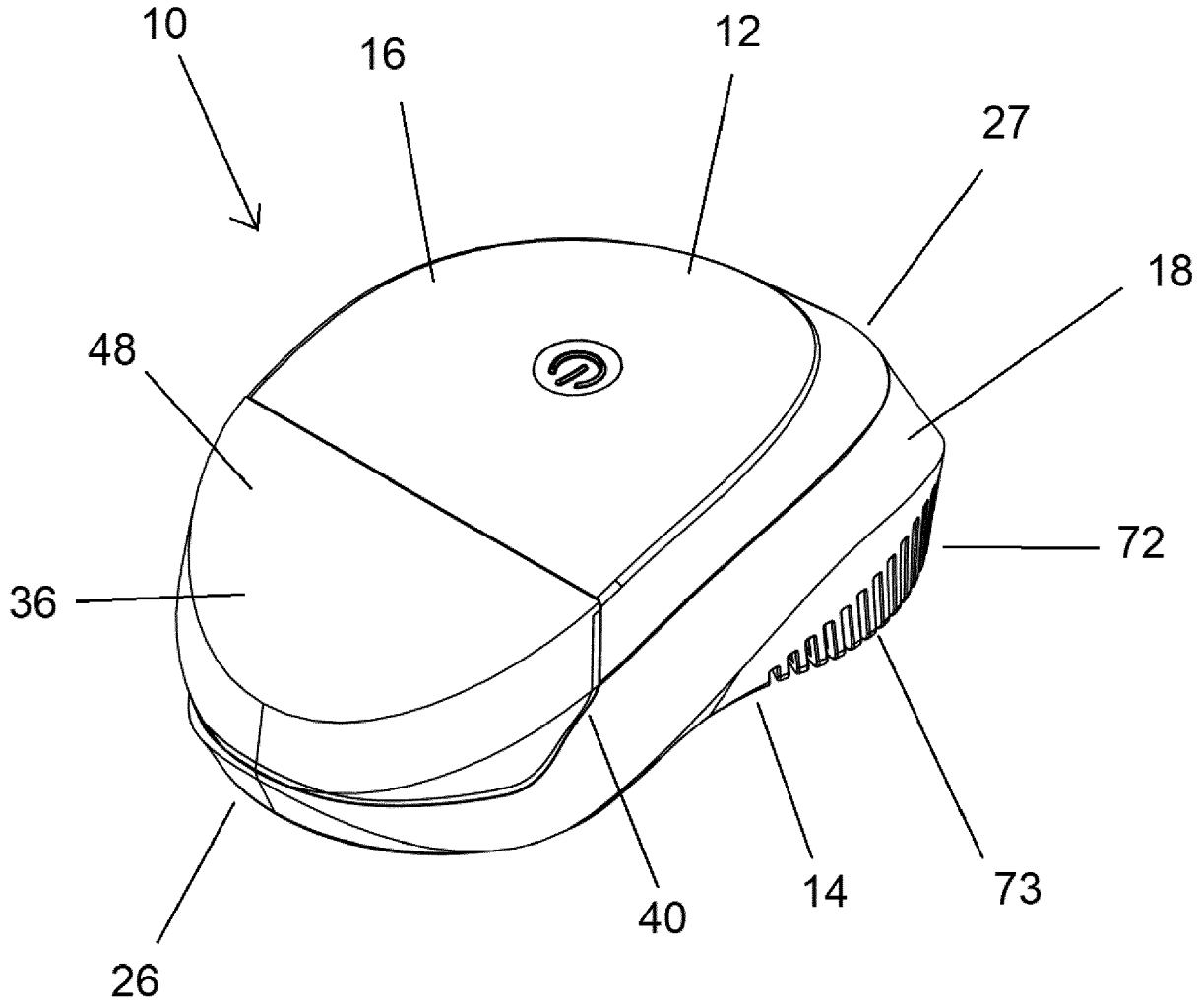

Fig 1

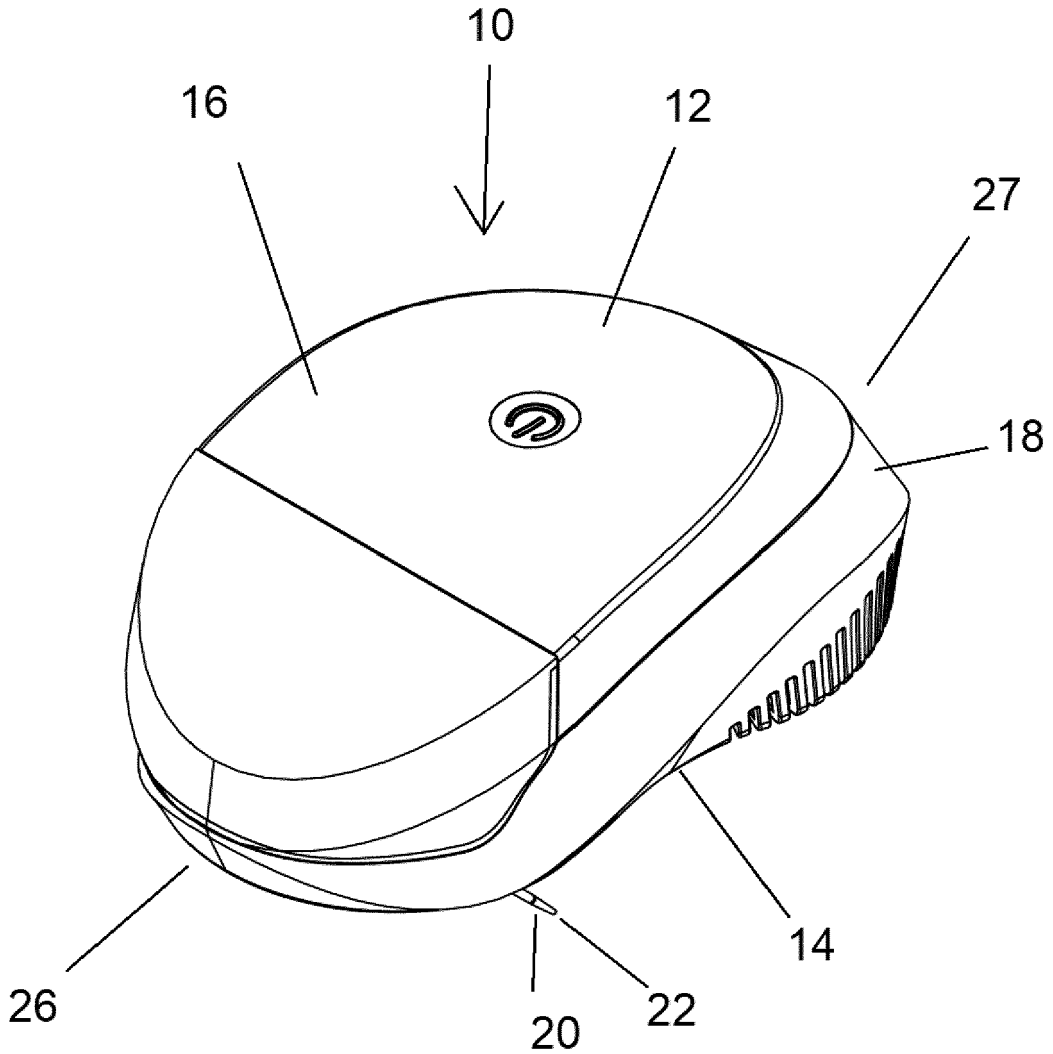

Fig 2

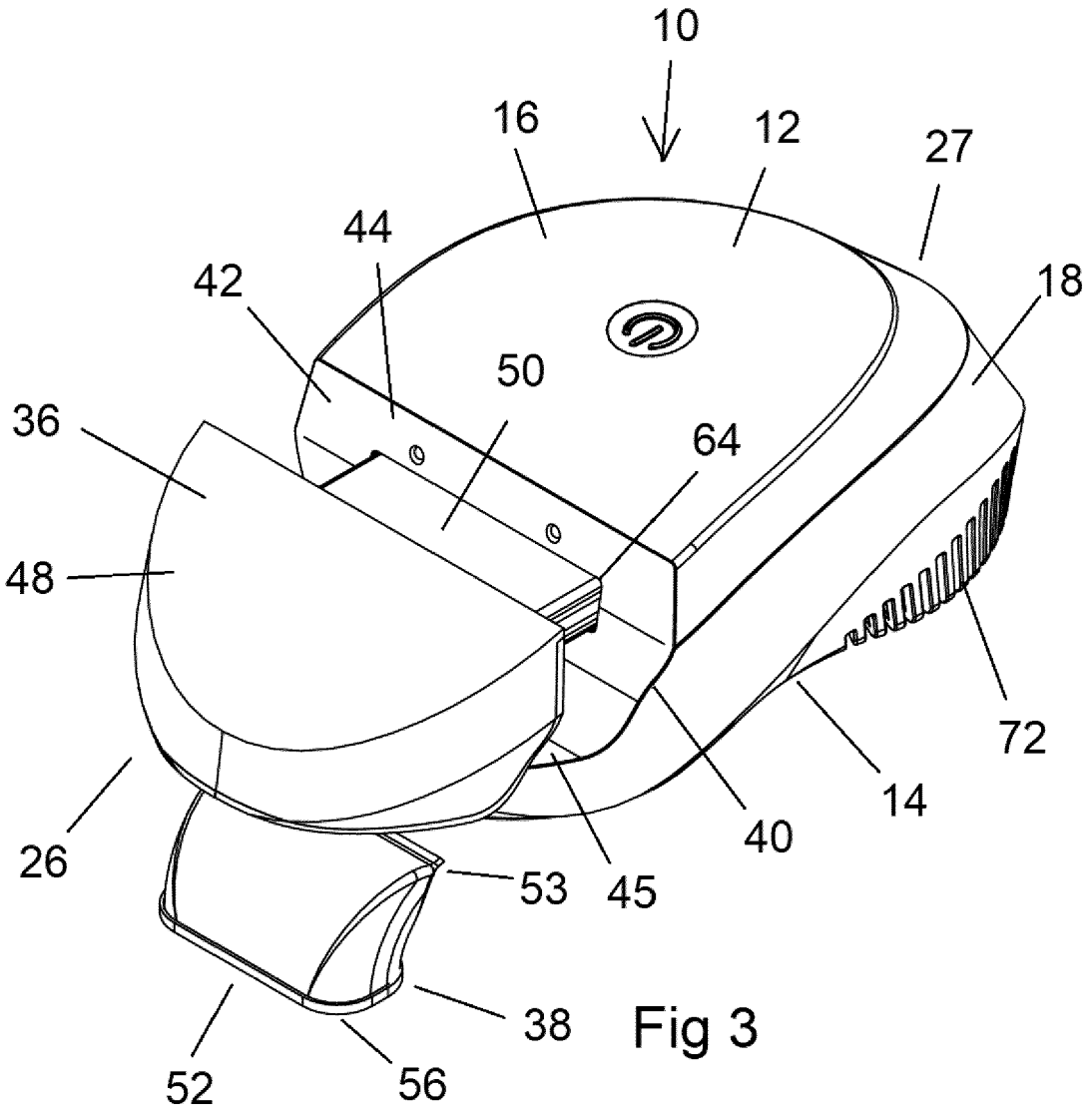

Fig 3

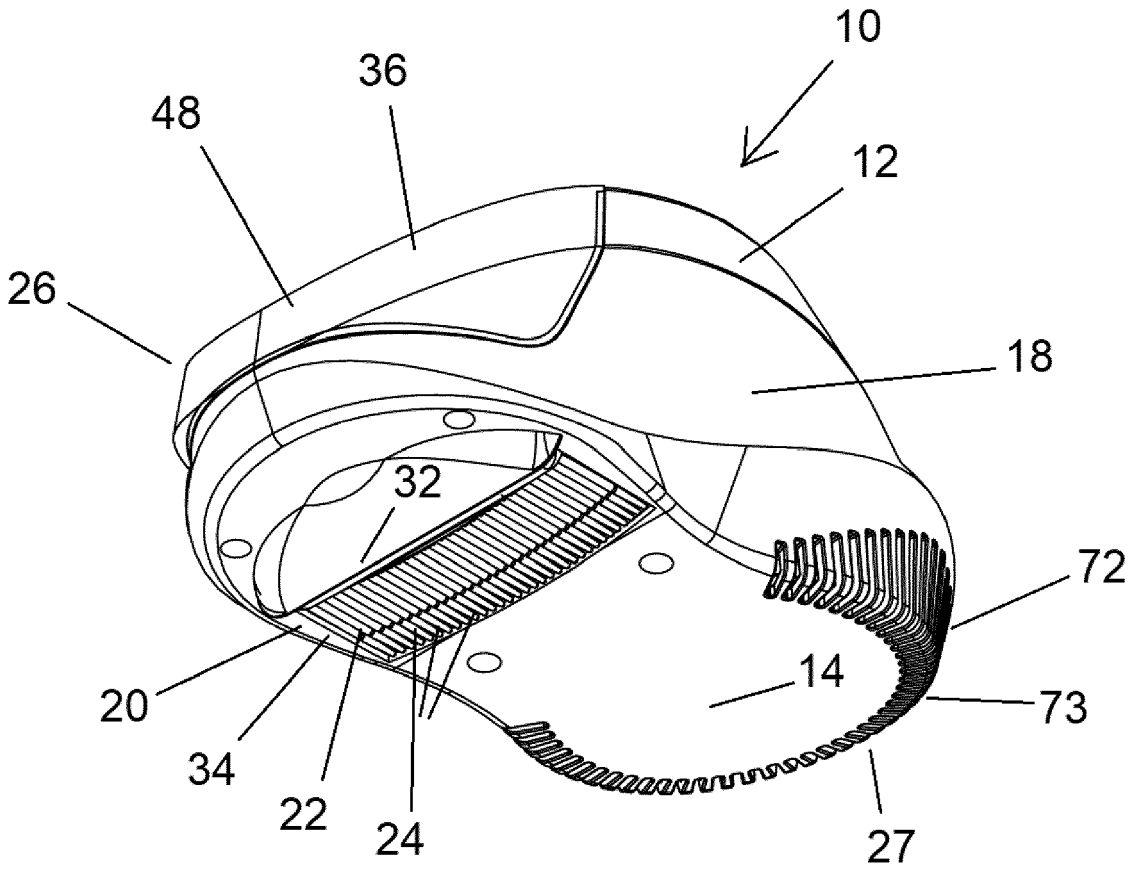

Fig 4

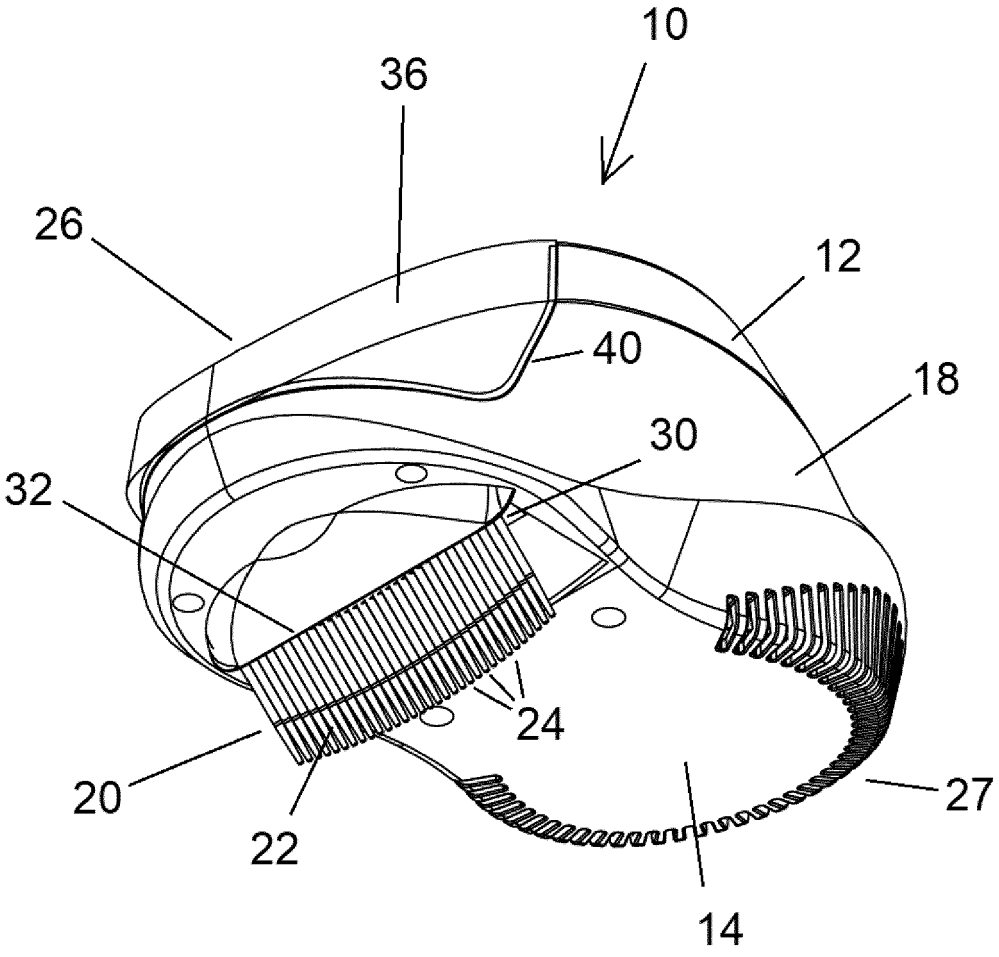

Fig 5

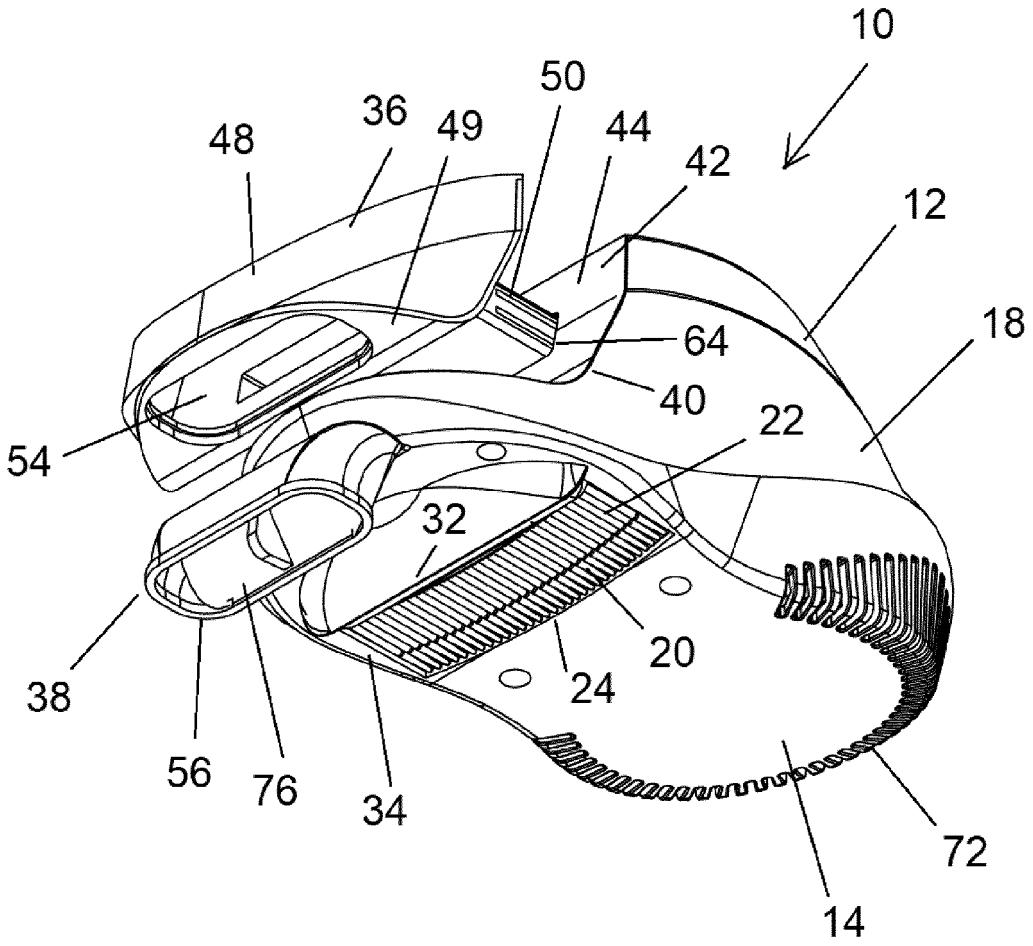

Fig 6

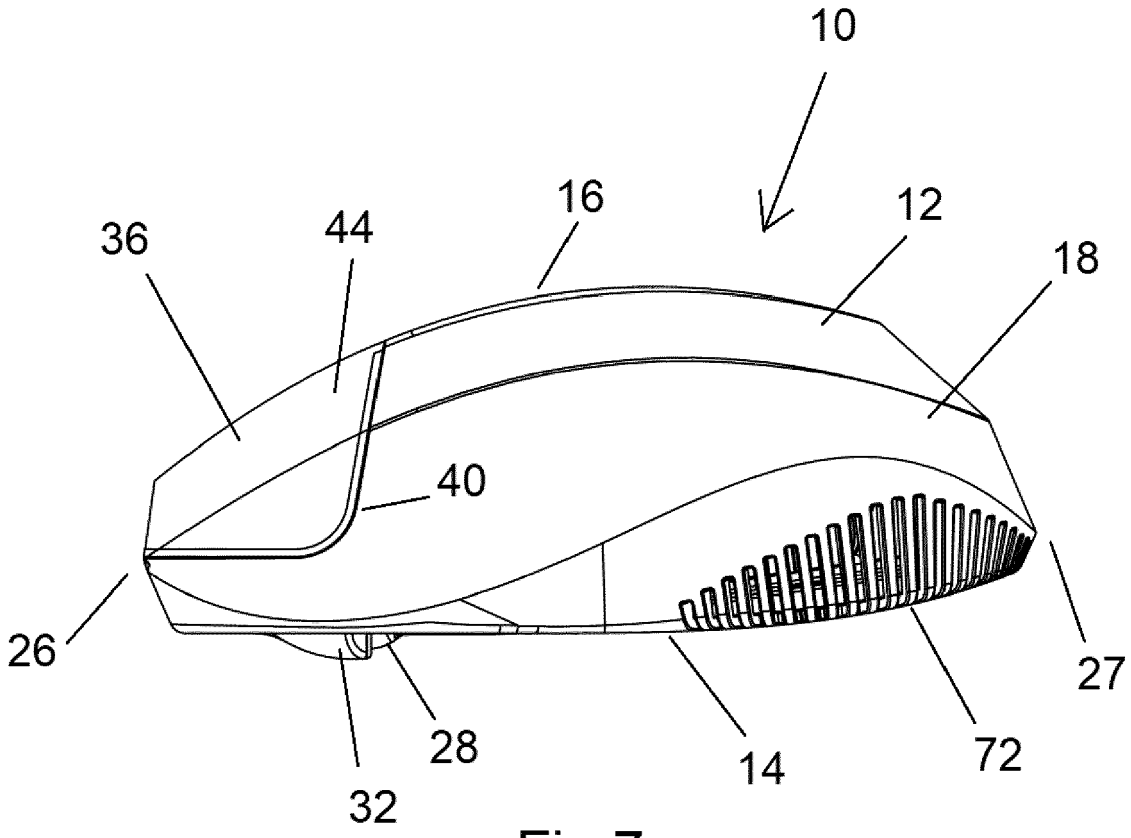

Fig 7

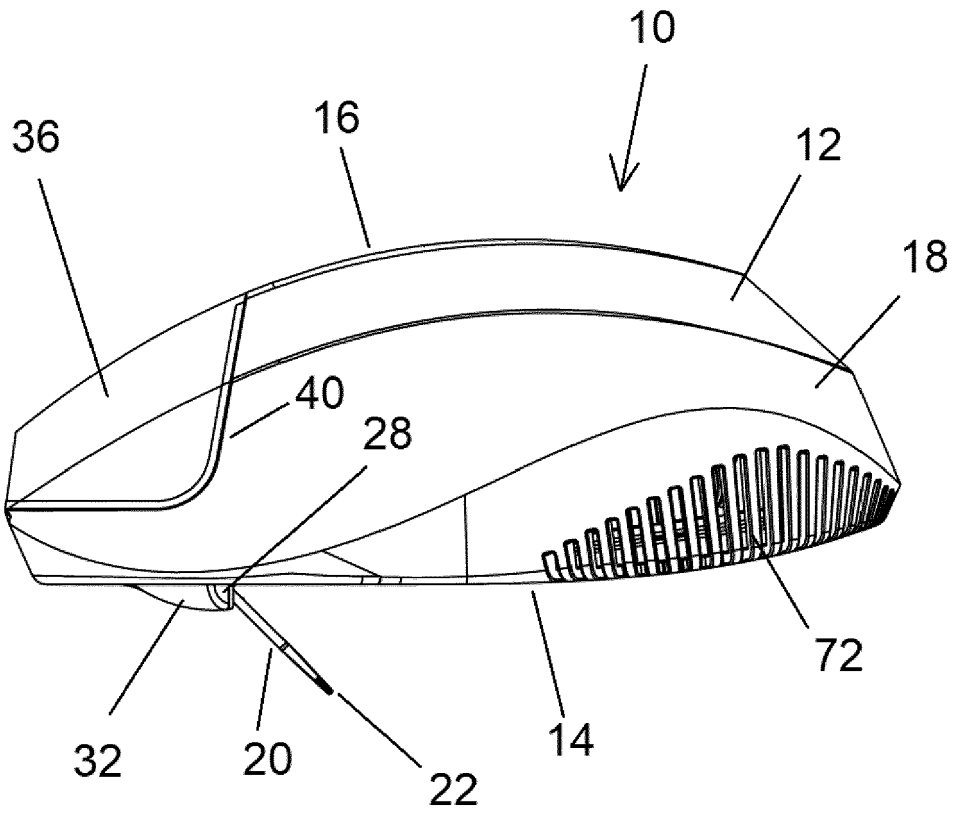

Fig 8

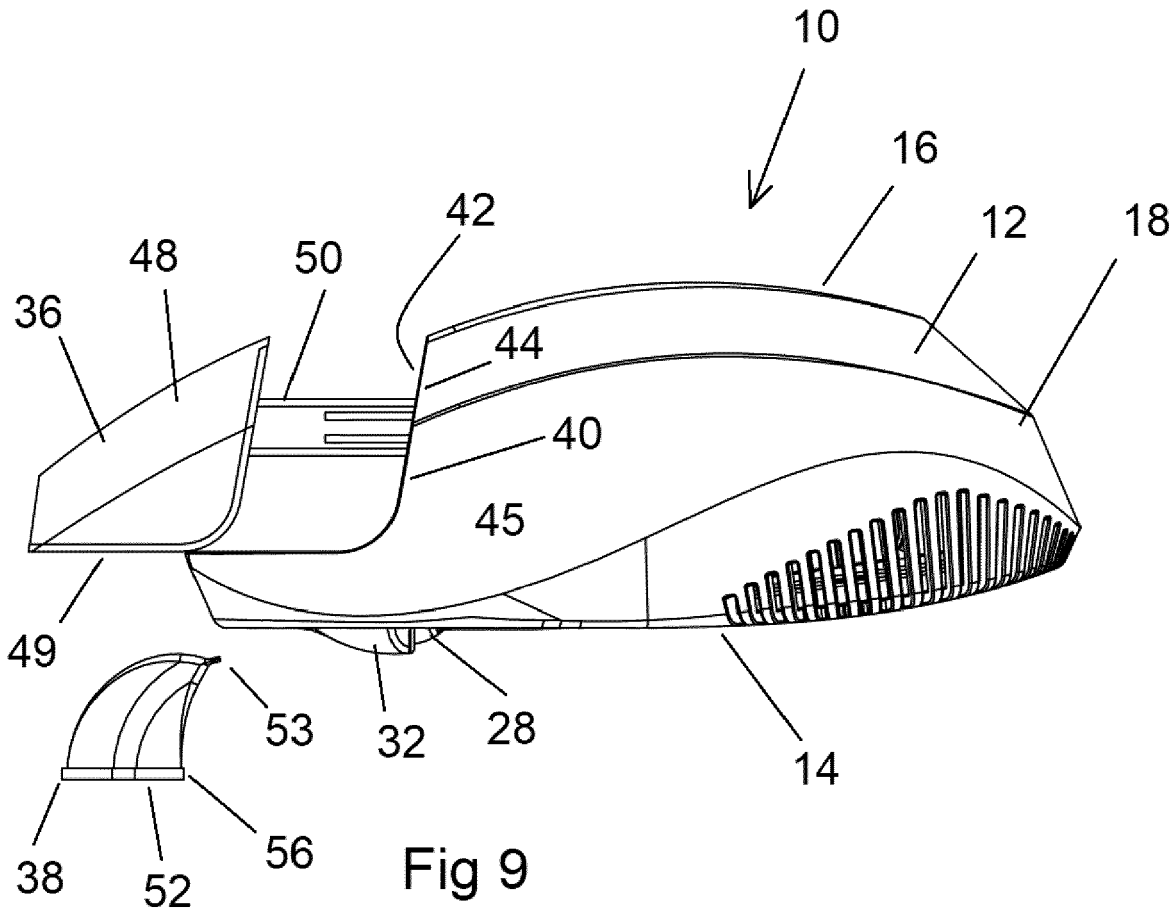

Fig 9

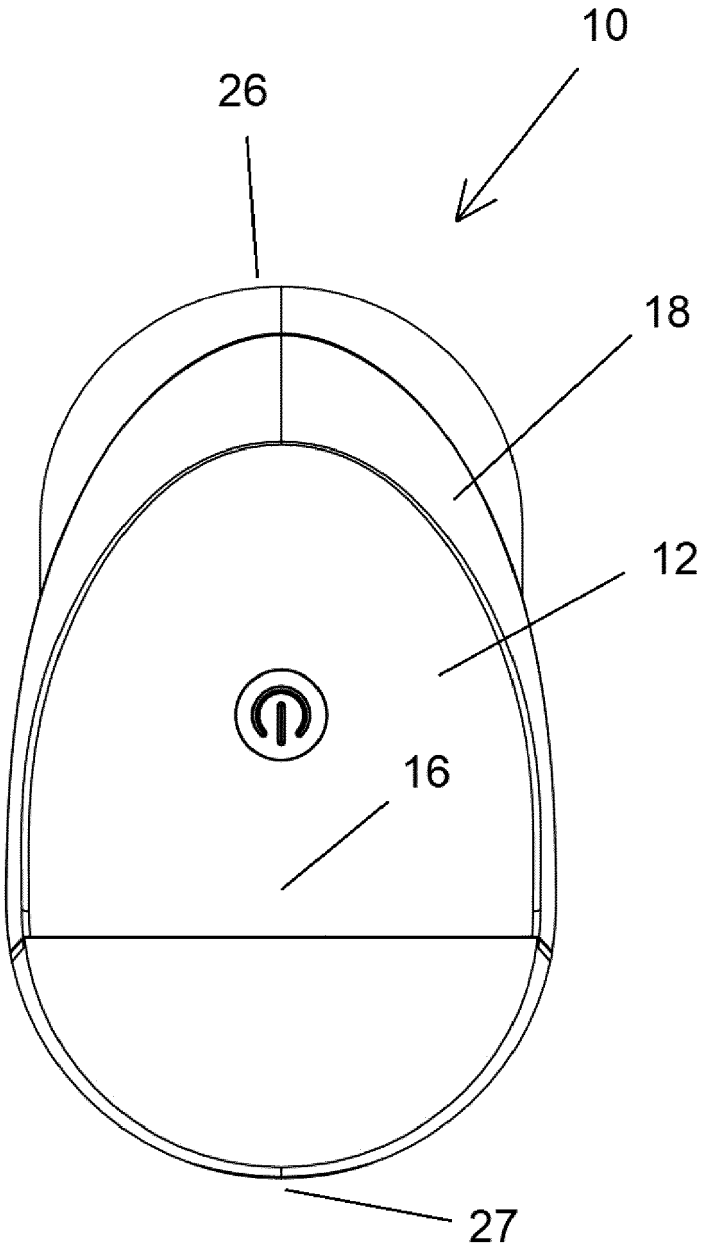

Fig 10

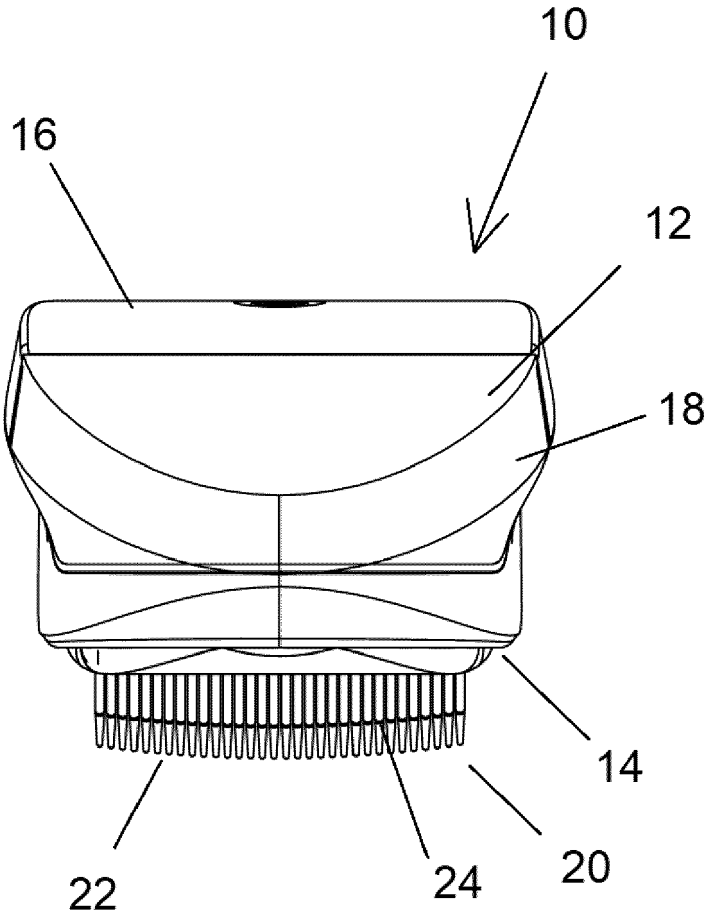

Fig 11

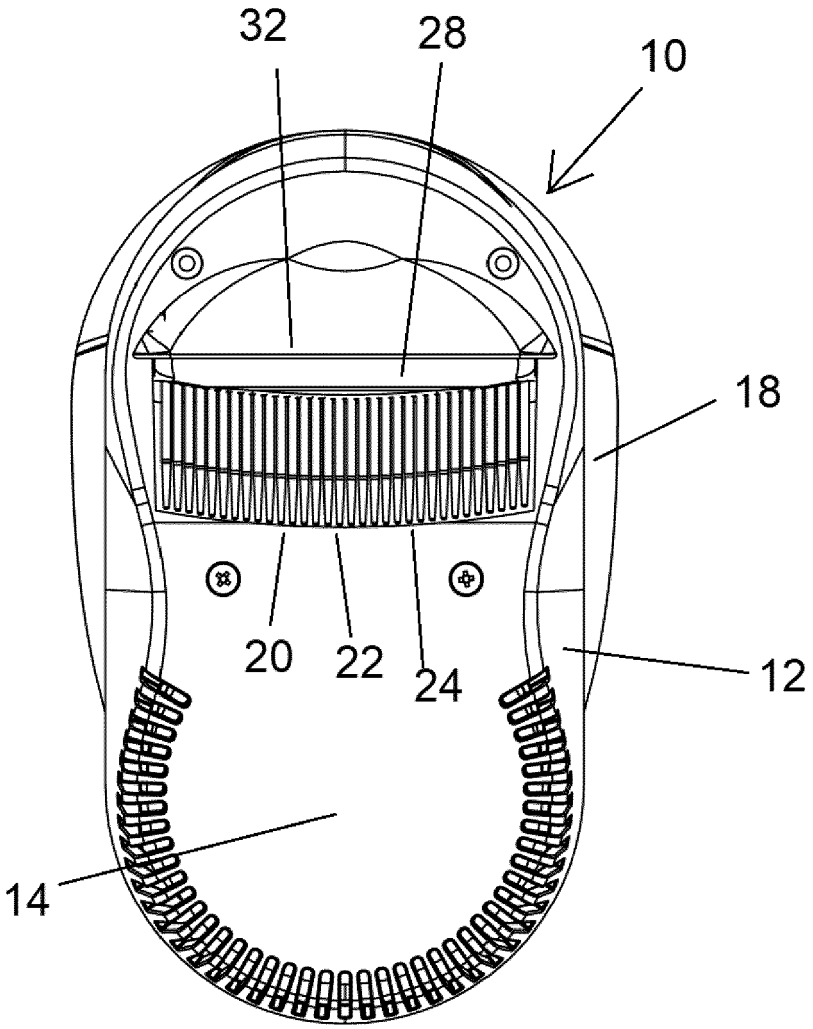

Fig 12

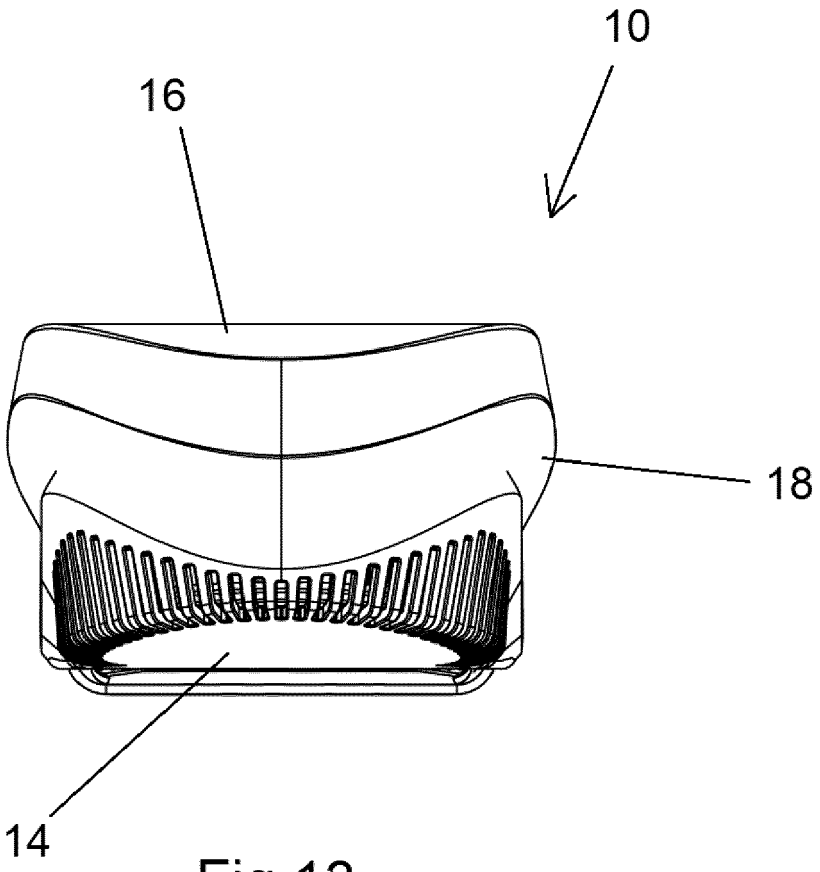

Fig 13

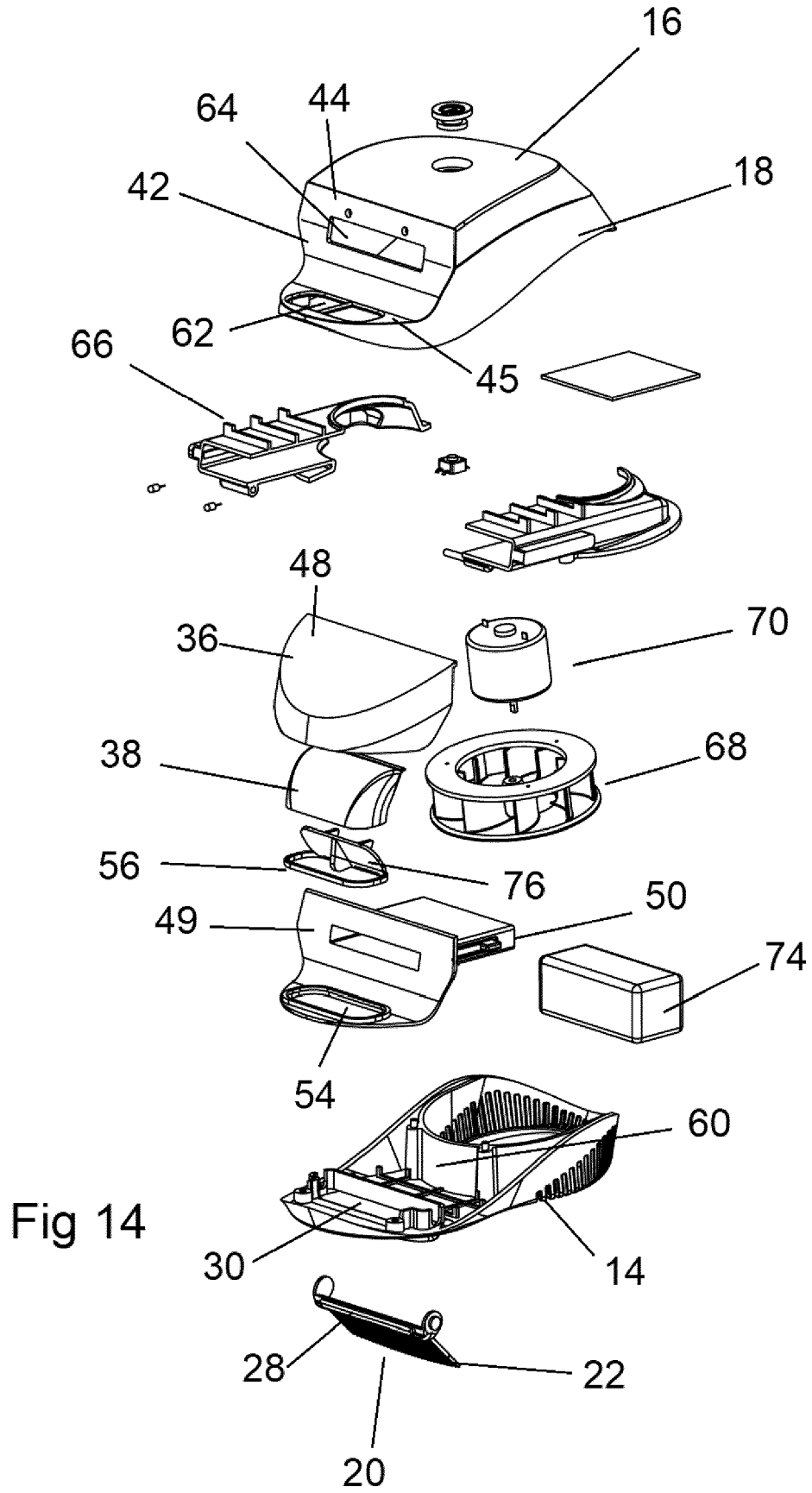
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Fig 14

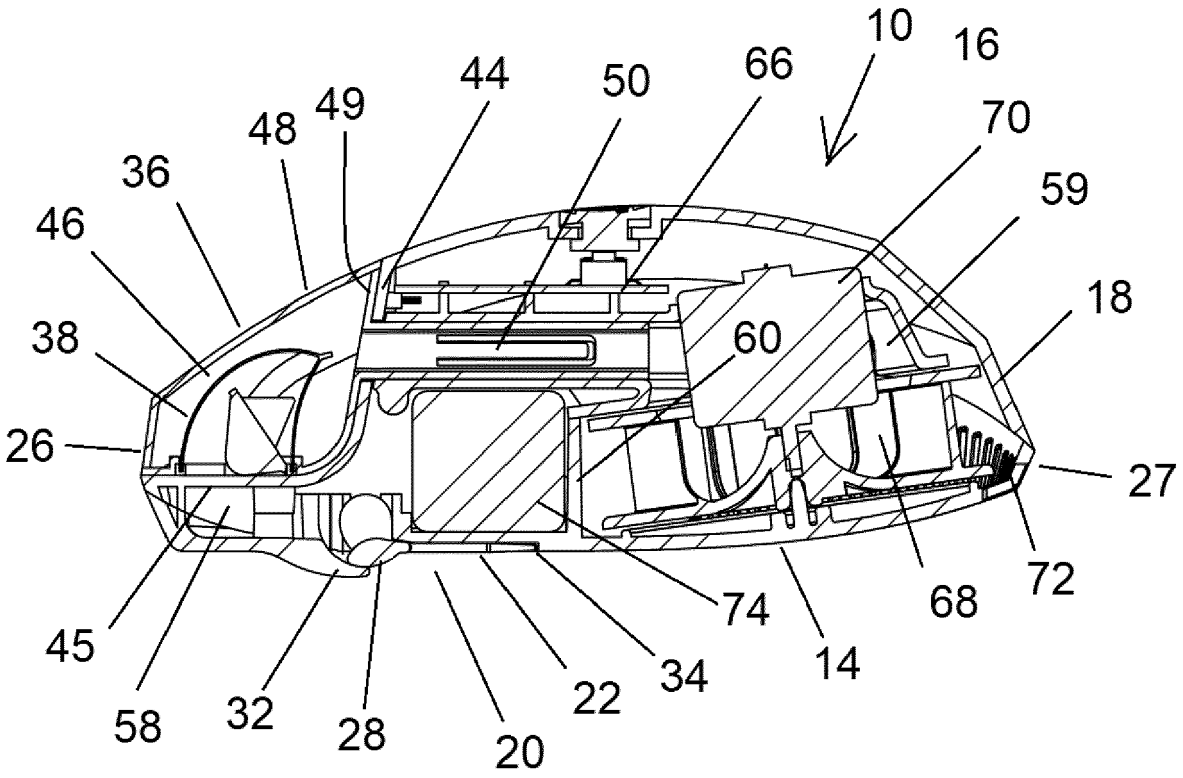
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Fig 15

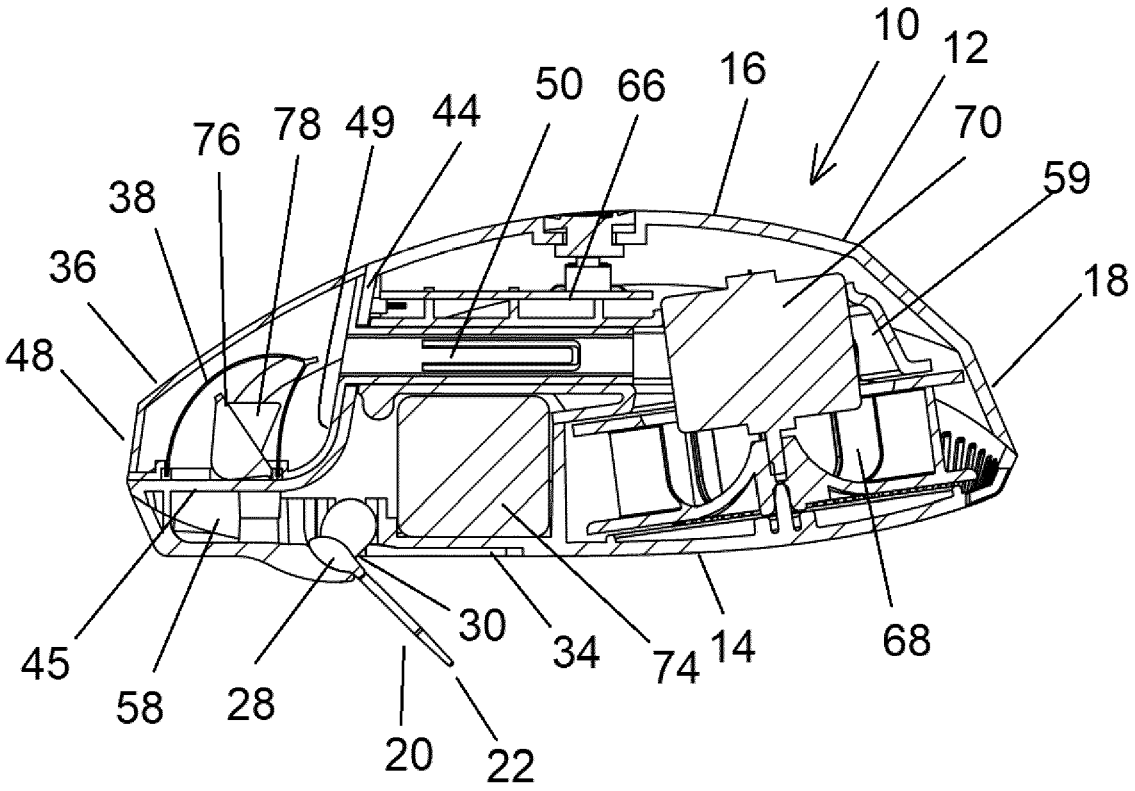
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Fig 16

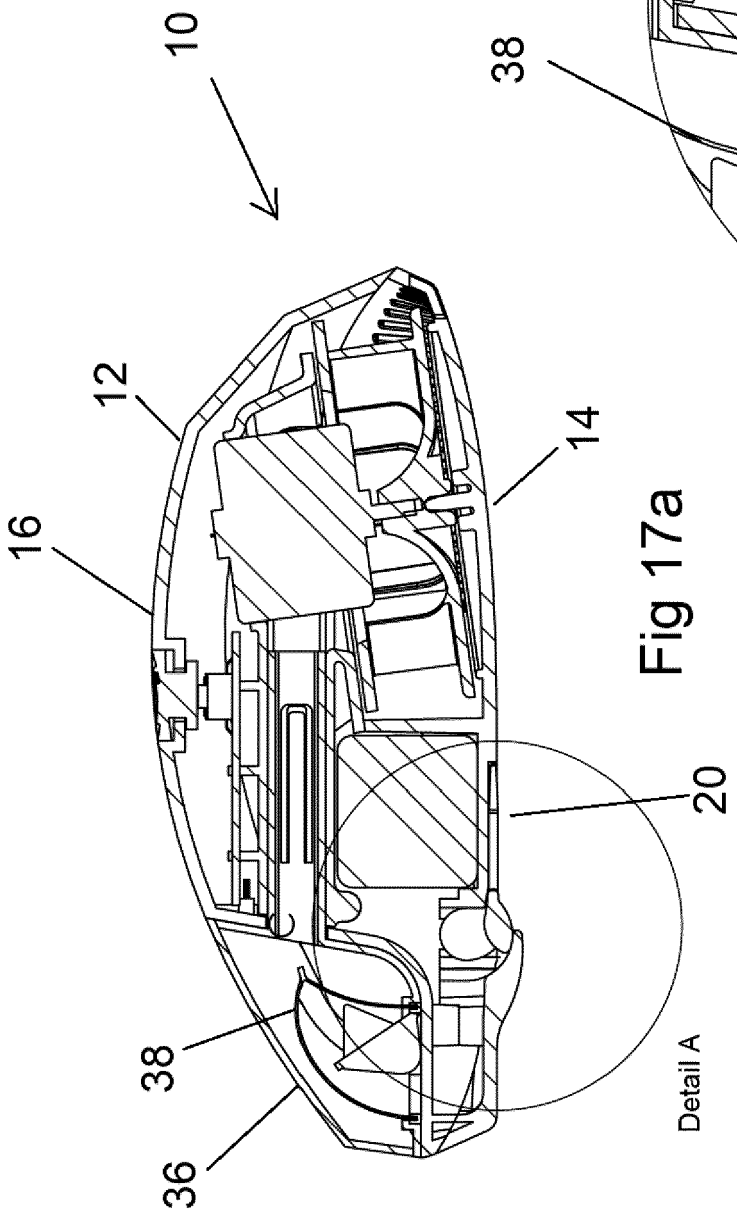

Fig 17a

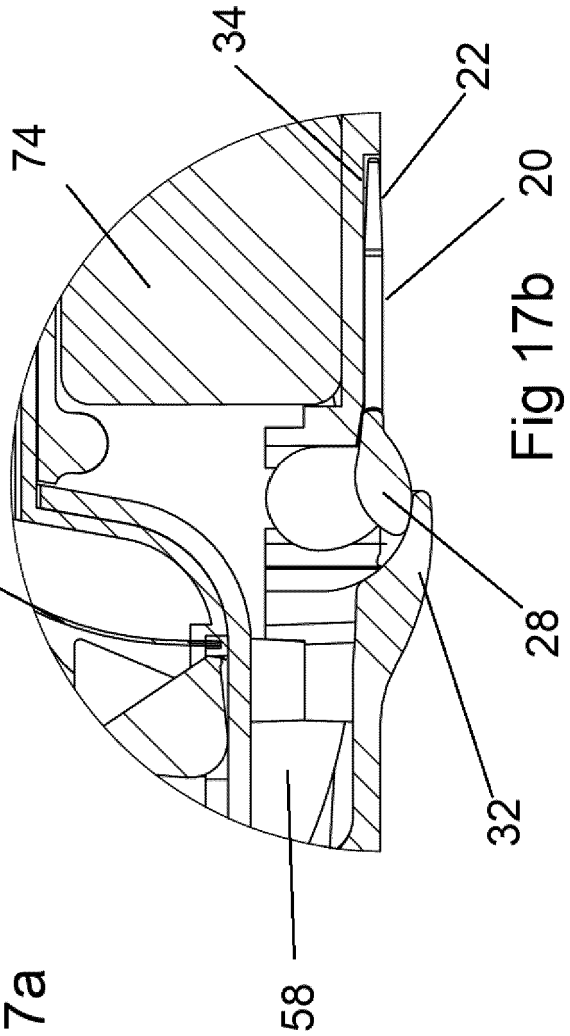

Fig 17b

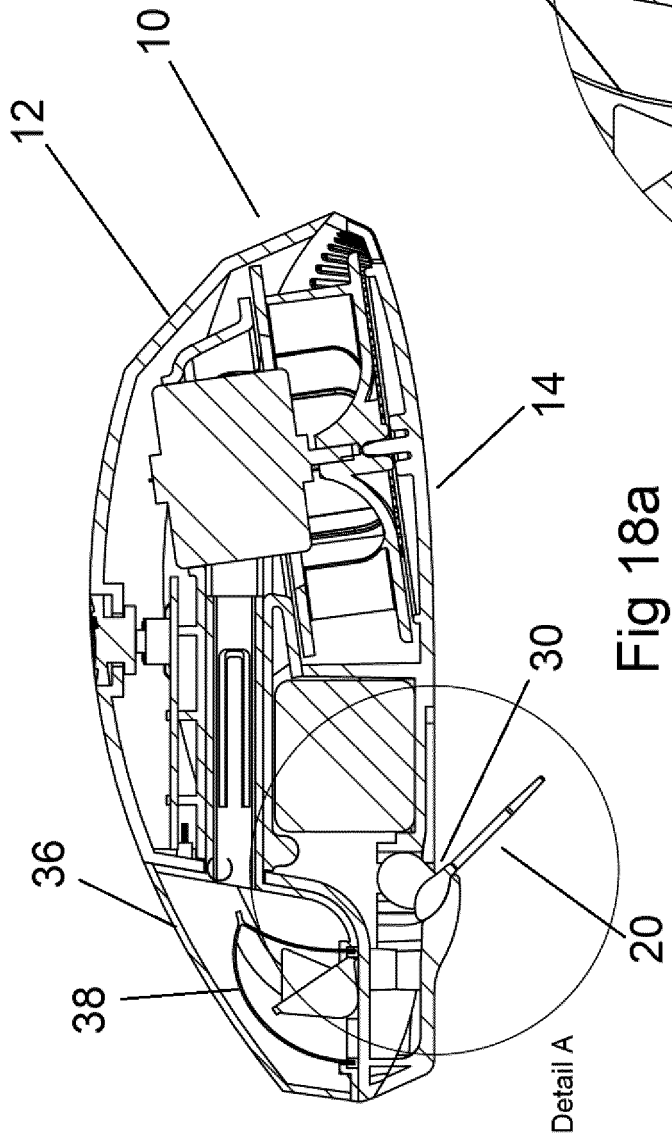

Fig 18a

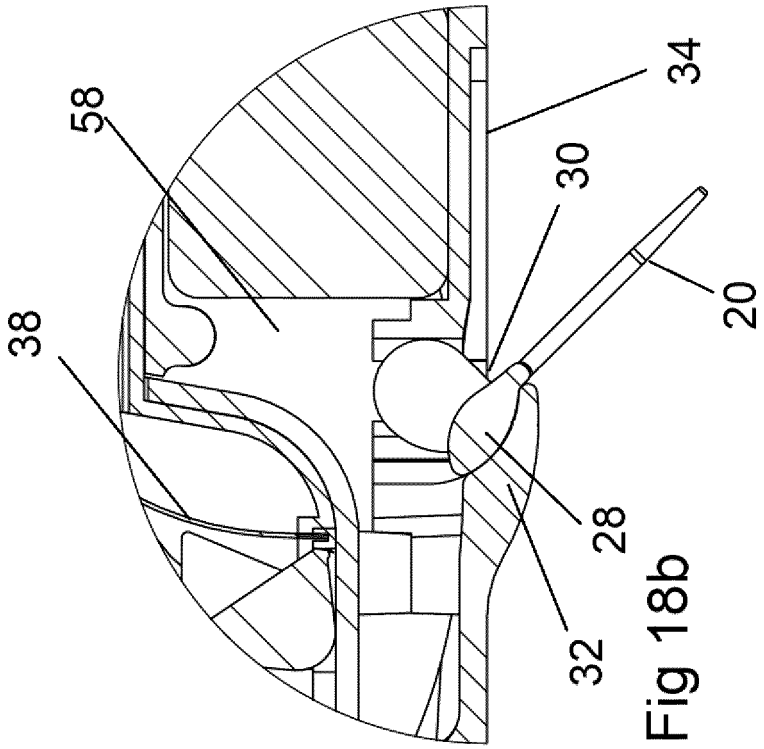

Fig 18b

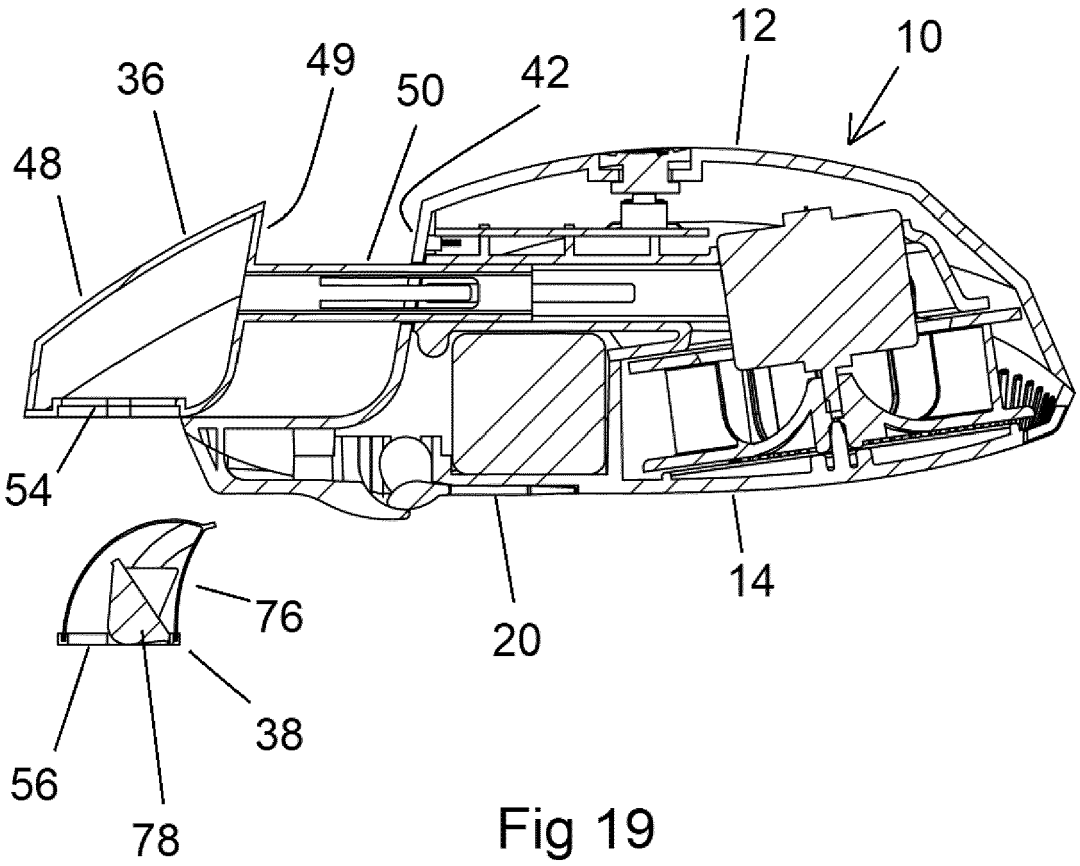

Fig 19

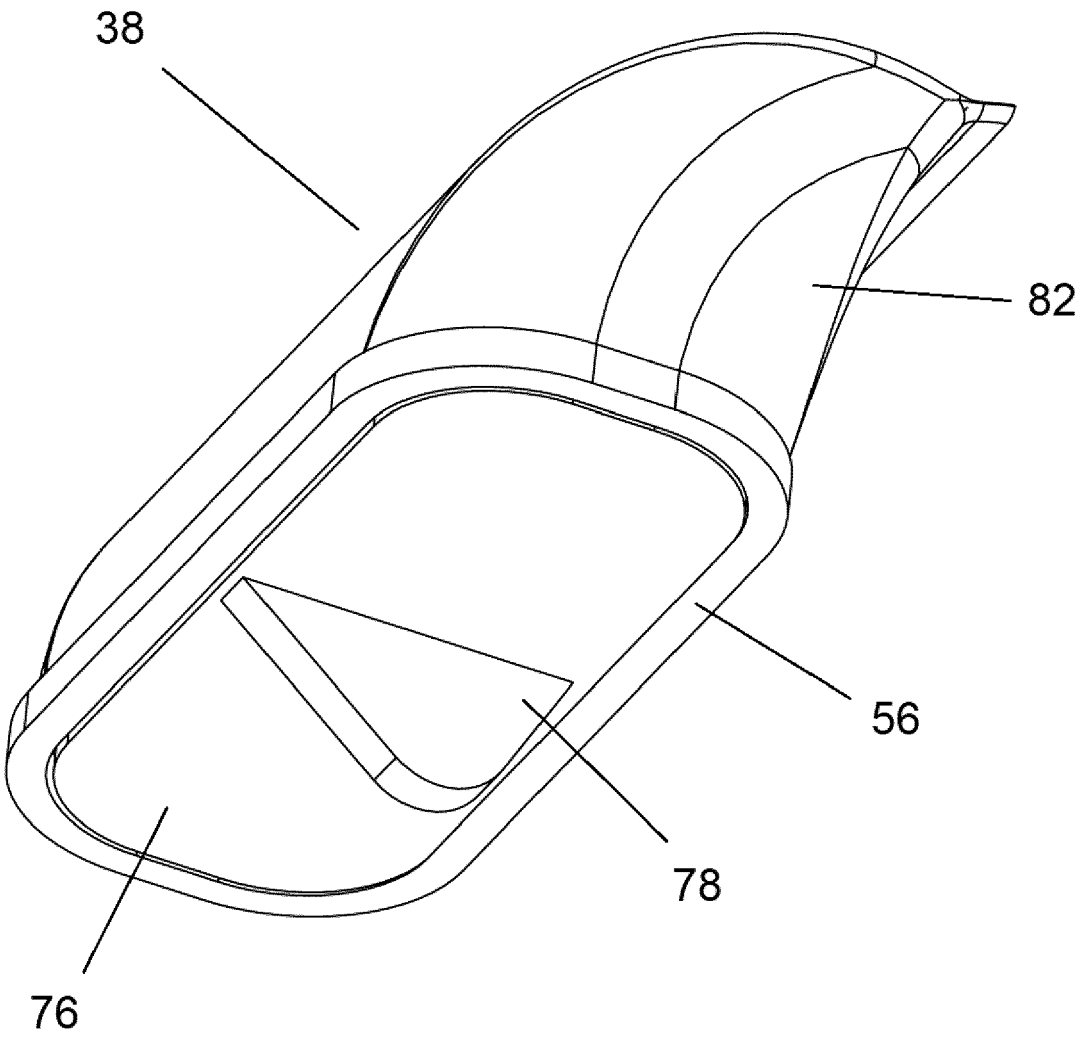

Fig 20

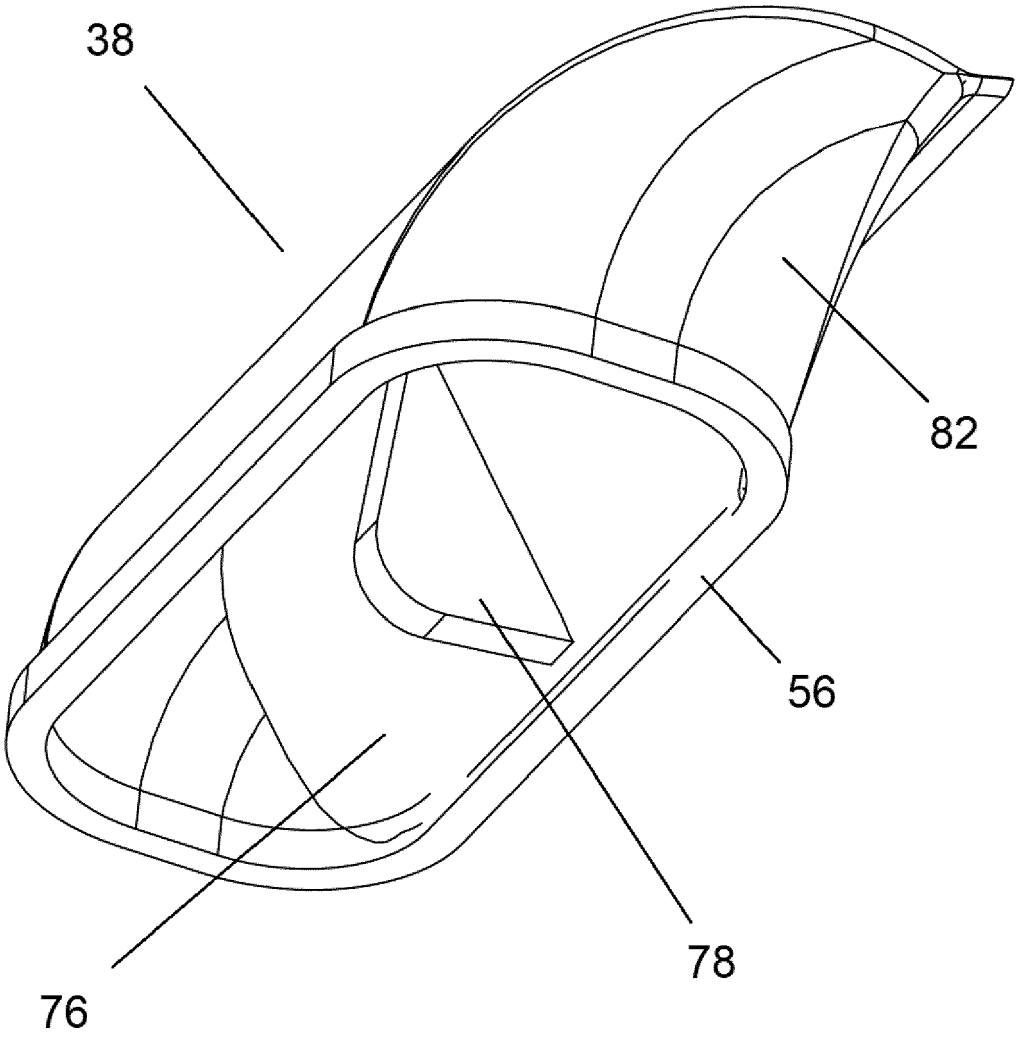

Fig 21

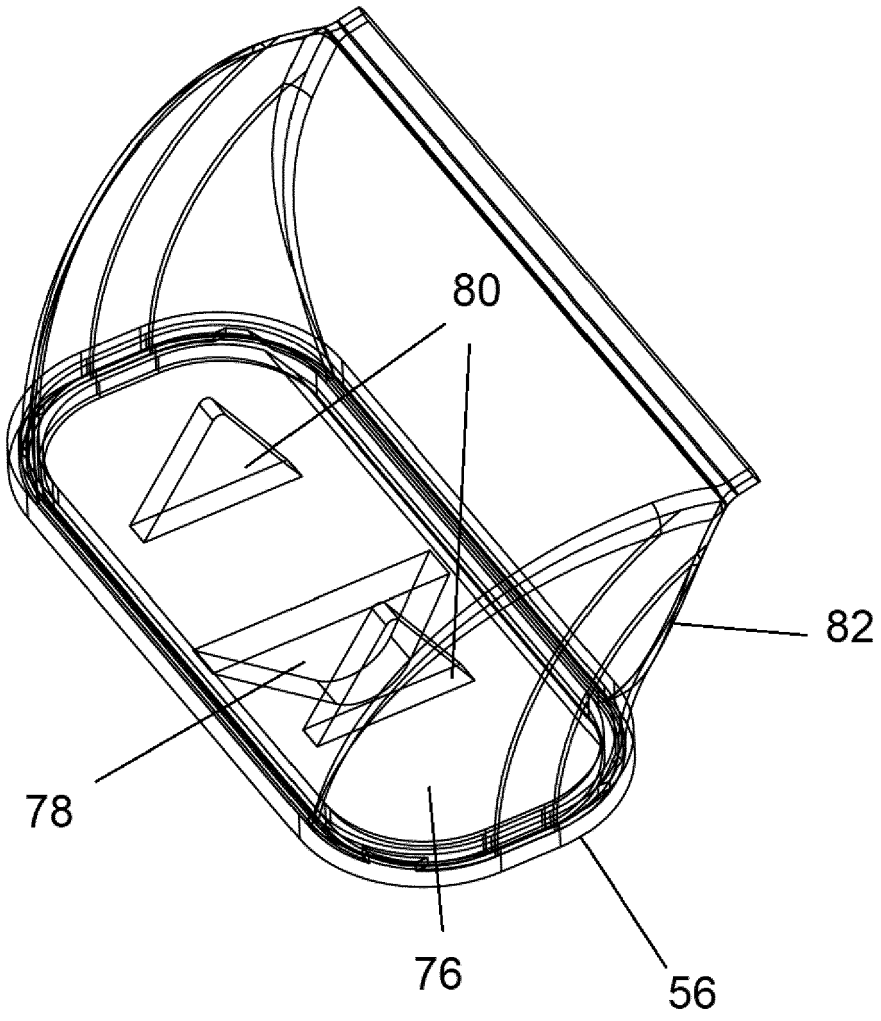

Fig 22

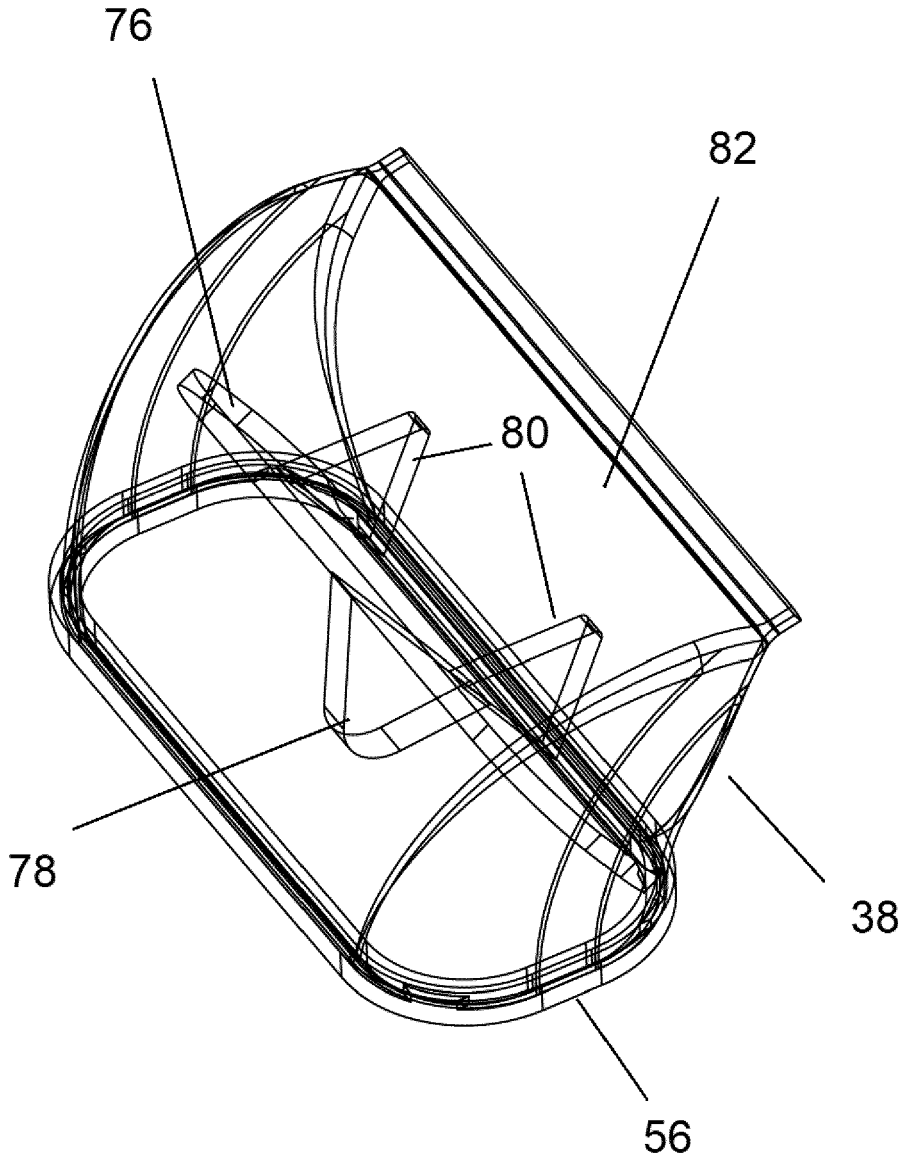

Fig 23

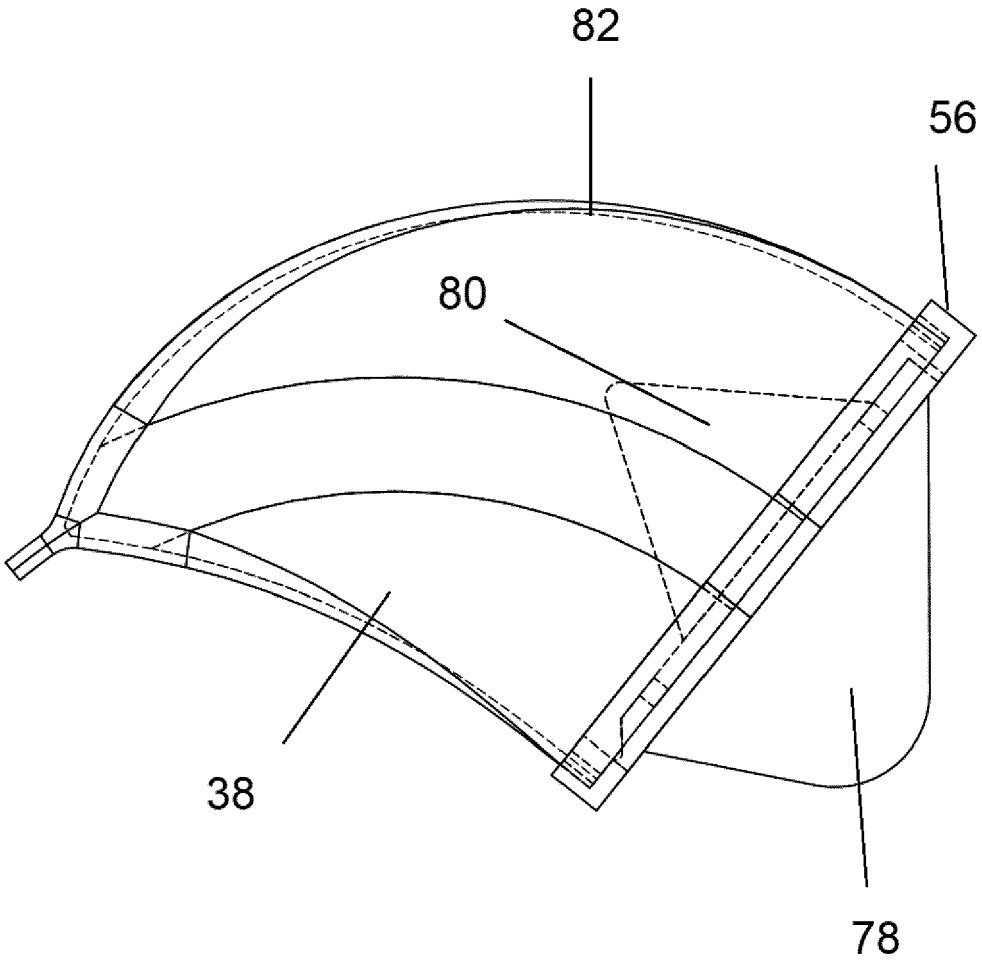

Fig 24

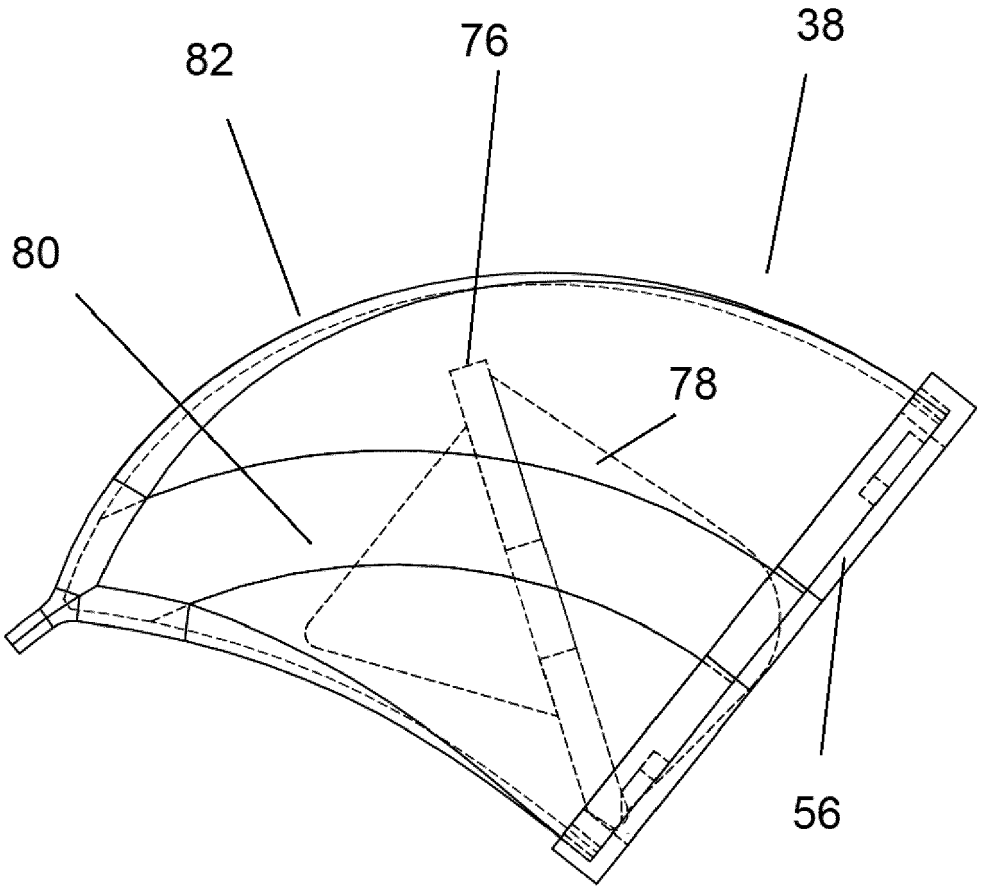

Fig 25

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 7478

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2017/219074 A1 (MAOR MOSHE [AU]) 28 December 2017 (2017-12-28) * abstract; figures 1,16,19 * -----	1-15	INV. A45D24/30 A45D24/10 A45D24/32
A	US 3 308 500 A (WOODRUFF OSCAR G) 14 March 1967 (1967-03-14) * the whole document * -----	1	A47L7/00
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TECHNICAL FIELDS SEARCHED (IPC)

A45D
A47L
A01K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 July 2019	Nicolás, Carlos

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02-07-2019

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