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(54) IMPROVEMENTS IN AND RELATING TO A HAND HELD DEVICE COMPRISING A BRUSH

(57) A hand held device comprising an elongate body, the elongate body comprising, at one end thereof, a brush comprising a plurality of bristles in a pre-defined arrangement; the elongate body comprising an internal cavity defining a storage compartment adapted to hold a drying agent, such as a natural drying agent or drying agent that is artificially engineered, (optionally comprising a granular material, powder, talc, or other particulate material) means for releasing the drying agent from the storage compartment and for delivery to the bristles of the brush such that the drying agent can be delivered from the storage compartment to the bristles for dispensing from the bristles for use in removing sand, dirt and other foreign substances from humans, pets and apparatus.

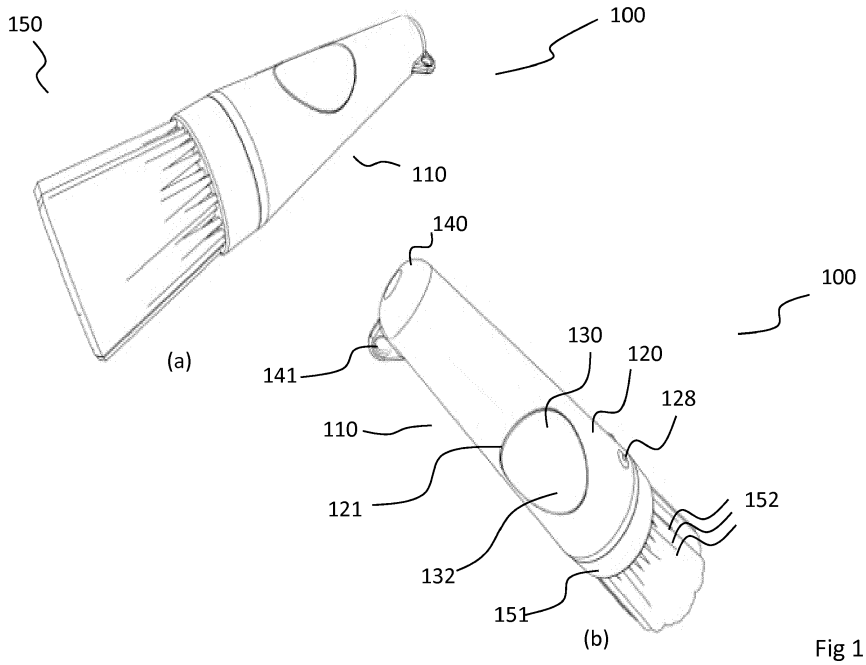

Fig 1

EP 3 415 036 A2

Description

Field

[0001] The present invention concerns improvements in and relating to a hand held device comprising a brush and in particular, relates to hand held device comprising a brush comprising an internal cavity defining a storage compartment adapted to hold a drying agent, which is preferably a natural drying agent but may also comprise an artificially engineered drying agent. The drying agent preferably comprises a granular material such as powder, talc, or other particulate material capable of being released from the storage compartment and for delivery to a brush head in fluid communication with the storage compartment, such that the granular material can be delivered from the brush head for use in removing sand, dirt and other foreign substances from humans, pets and apparatus.

Background Of The Invention

[0002] While there are a number of known brushes, primarily cosmetic brushes for dipping the brush into a powder such as a compressed powder or loose cosmetic powder for use in applying to the face for cosmetic purposes, there is no brush that the applicant is aware of that delivers and is specifically adapted to dispense powder for use in removing sand, dirt and other foreign substances or that have this particular construction coupled with interchangeable heads for different applications.

[0003] One of the most irritating and frustrating dilemmas has been how to remove both dry and wet sand from a human body including adults and children, and from an immediate space such as in a car after the beach, in an easy, painless and hassle-free way.

[0004] Sand particles stick to the body; and this is especially the case when sand is coupled with sun cream, oils and insect repellent which causes rashes and skin irritation for children in particular. Traditional methods used to move sand from the body include the use of towels, socks or water, each imposing different constraints.

[0005] A further nuisance for parents and beachgoers is they neither have the time nor the patience to endure the extensive painstaking removal of sand from themselves or their children. Wet sand takes considerably more time and effort to remove than dry sand, particularly in cold and moist climates. The device of the present invention helps resolve this problem and is safe for children to use by themselves and is therefore extremely beneficial.

Summary

[0006] Accordingly, a first embodiment of the present invention, there is provided a hand held device comprising an elongate body, the elongate body comprising, at one end thereof, a brush comprising a plurality of bristles in a pre-defined arrangement; the elongate body comprising an internal cavity defining a storage compartment adapted to hold a drying agent, means for releasing the drying agent from the storage compartment and for delivery to the bristles of the brush such that the drying agent can be controllably delivered from the storage compartment to the bristles for dispensing from the bristles for use in removing sand, dirt and other foreign substances from humans, pets and apparatus; and wherein, preferably, the drying agent comprises a natural drying agent or an artificial drying agent, most preferably, selected from one or more of the following: granular material, powder, talc, or other particulate material.

Preferably, the hand held device of the present invention comprises a brush head for securing the bristles of the brush to said brush head, the brush head being configured for fluid communication with the storage compartment, such that the drying agent can be delivered from the storage compartment to the bristles for dispensing from the bristles for use in removing sand, dirt and other foreign substances from humans, pets and apparatus.

[0007] Other features of the present invention are provided in the appended claims. Advantageous embodiments are provided in the dependent claims.

[0008] The hand held device a body dimensioned to fit in the hand of a user and a brush head at one end of the body. The brush head comprises a plurality of bristles. The opposite end is closed and comprises of an eyelet for attaching string, cord, ribbon or material for hanging purposes

[0009] The body of one embodiment comprises an outer shell formed from a relatively rigid material such as PBT, ASA, ABS or bamboo and an inner deformable receptacle inside the outer shell formed at least partially from an elastomeric material such as silicone, rubber, PVC, TPE, TPE-S or TPU. The outer shell has at least one aperture through which a user can squeeze the inner deformable receptacle.

[0010] The inner deformable receptacle contains the drying agent in its internal cavity.

[0011] The brush head has at least one small channel at the base to allow fluid communication between the internal cavity of the deformable receptacle and the bristles of the brush, such that squeezing the inner deformable receptacle through the aperture provided in the outer shell allows the expulsion of the drying agent from the internal cavity, through the small channel or channels, into the bristles of the brush head. A removable closure tab, such as a sticker, may cover

the channels prior to first use or between uses in order to prevent humidity damaging the drying agent in the internal cavity. The deformable receptacle may be open at one end or may be provided with a nozzle which may extend through a small channel in the base of the brush head. A nozzle controls the volume of drying agent dispensed and also allows the brush head to be changed without risk of spillage of drying agent.

[0012] The brush head my also comprise slots which extend partially into the base into which the bristles or bundles of bristles are fixed, however other arrangements are envisaged.

[0013] The device may be provided with a plurality of interchangeable brush heads, each suited to different jobs with varying bristle lengths, varying bristle numbers, varying bristle textures, densities and materials. For example, while harder bristles may remove sand more effectively from soles of shoes and apparatus, softer bristles may be preferable for normal /sensitive skin.

[0014] The interchangeable brush heads preferably comprise screw threads for connection to the body, which also preferably comprises screw threads. This allows the brush heads to be changed or renewed easily between uses. Other connection types such as push fit are also envisaged.

[0015] The inner deformable receptacle and outer shell can be made using injection mouldings. They may be formed from synthetic or natural materials such as wood or bamboo.

[0016] The bristles can be made from synthetic or semi-synthetic materials such as Nylon, Tafre, or natural fibres such as bamboo, flax, or hair, for example from goat, boar or squirrel.

[0017] The bristles can comprise a mixture of synthetic and or natural fiber filaments that have been crimped or tapered at an irregular pitch, and angle and straight natural/ synthetic fiber filaments

[0018] The formation, density shape and length of the bristles ensures that they touch the skin at an appropriate angle for effective but gentle operation; and reach the difficult to access areas such as between the toes, fingers and under the folds of the skin of small children and babies. It is preferable that the device comprises at least two different lengths of bristles as the different lengths of bristles, arranged in pre-determined pattern, maximises the effectiveness of the bristles and the device for removal of unwanted material including both dry and wet sand. Given its ergonomic design, the device of the present invention is particularly suitable for both adults and children.

[0019] Advantageously, a sealing arrangement is provided between the deformable receptacle and the base of the brush head. The sealing arrangement prevents the loss of drying agent from the internal cavity while changing brush heads.

[0020] Optionally, the sealing arrangement is provided by a seal which is substantially solid but has openings which allow the expulsion of drying agent when the deformable receptacle is compressed. A removable closure tab, such as a sticker, may cover the openings prior to first use or between uses in order to prevent humidity damaging the drying agent in the internal cavity.

[0021] In an alternative embodiment of the invention, the device comprises a body formed from elastomeric material so that the entire body may be compressed to dispense the drying agent into the bristles of the brush. In a preferred embodiment, such a body preferably comprises an accordion-like shape and can be compressed longitudinally to dispense the drying agent. This body differs from that previously described embodiment in that the device in the second embodiment does not comprise a rigid outer shell the function of the outer shell is performed by the by the elastomeric elongate body, preferably, of an accordion shape but of course, it will be understood that any shape or profile of elastomeric elongate body is possible.

[0022] The handheld device is preferably filled with a powder which acts as a drying agent. The device is squeezable in the middle to release the flow of the drying agent to absorb the moisture out of the wet sand, and the movement of the bristles freely disperses the sand. This configuration is designed not to dispense powder unless the inner cavity is squeezed. The user applies appropriate pressure as desired.

[0023] The device of the present invention provides a light, re-useable, hygienic, and durable hand held device comprising a brush which is filled with a natural powder to remove both dry and wet sand from your person and immediate space.

[0024] The drying agent is preferably natural, and preferably made from plant extracts and minerals. The drying agent is most preferably in the form of a powder. Preferably, the drying agent comprises ingredients selected from antibacterial agents, antifungal agents, anti-inflammatory compounds, antioxidants and vitamin E, and may also comprise an insect repellent. In some cases, the drying agent may comprise sun blocking components such as zinc oxide or titanium dioxide.

[0025] A liquid flows differently from a particulate material such as a drying agent/ powder because a liquid cannot resist any shear stress and therefore it cannot reside at a tilted angle without flowing -that is, it has zero angle of repose. A powder on the other hand comprises solids particles, and its flow properties are completely different. A drying agent particles can support shear stresses and therefore can display an angle of repose. Powders also display clumping behaviour, unlike liquids or gases. Clumping behaviour arises when Van der Walls forces cause individual grains/particles of the drying agent to cling to one another. This clumping behaviour becomes more pronounced with smaller particle sizes. Thus, while a liquid may drip freely through an aperture under force of gravity alone, a powder can clog or jam the aperture through its own clumping behaviour and will not dislodge without some sort of pressure or air flow to disperse

the clumps.

[0026] For the above reasons, the internal cavity can be in fluid communication with the bristles of the brush head without risk of substantial amounts of powder leaking.

[0027] By having a substantially rigid outer shell around the body, with the only portion of the device being compressible being the deformable regions accessible through finger and thumb sized apertures in the outer shell, the chance of the powder being expelled through accidental compression, for example in a bag, is minimised.

[0028] In another embodiment, accidental expulsion of powder is minimised by the shape and configuration of the body which must be compressed substantially and longitudinally in order to expel powder.

[0029] The device does not have any valves to prevent unwanted expulsion of powder as they are not necessary.

[0030] While this invention has been discussed primarily as a tool to remove dry and wet sand from skin, it is also envisaged to have a number of other uses made possible by varying the powder composition and brush head. For example, one variant of the device may be used for wound cleaning. In this embodiment, the bristles of the device are pre coated with antibacterial solution during the manufacturing process. However, during use, normal cleaning of device and brush head will suffice i.e. gentle detergent and water.

[0031] Another embodiment of the device may be used for cleaning dirty or sandy animals' paws or other parts of an animal, and particularly for animals who dislike being washed with water.

[0032] The device of the present invention can be used for cleaning the soles of shoes and trainers after walking on the beach cleaning toys, bikes, surfboards other equipment used in outdoor pursuits as well as cleaning inside of a vehicle such as a car or van.

[0033] Advantageously, the brush bristles may be dipped in antibacterial solution between uses.

[0034] While this invention has been described as having exemplary designs the present invention may be further modified within the scope of this disclosure.

Brief Description Of The Drawings

[0035] A number of embodiments of the device of the present application will now be described with reference to the accompanying drawings in which:

Figure 1(a) is an isometric view of an embodiment of the device;
Figure 1(b) is a different isometric view of the device of Figure 1(a);
Figure 2(a) is a cross sectional view of the device of Figure 1(a);
Figure 2(b) is a longitudinal sectional view of the device of Figure 1(a);
Figure 2(c) is a different longitudinal sectional view of the device of Figure 1(a);
Figures 3(a), (b), (c) and (d) are differing side views of the device of Figure 1(a);
Figures 3 (e) and (f) are differing cross sections of the device of Figure 1(a);
Figure 4 is an exploded view of the device of Figure 1(a);
Figure 5(a) is an isometric base view of one embodiment of a brush head in accordance with the invention;
Figure 5(b) is an isometric view of the brush head of Figure 5(a);
Figure 5(c) is a different isometric view of the brush head of Figure 5(a);
Figure 5(d) is a side view of the brush head of Figure 5(a);
Figure 6(a) is an isometric base view of an alternative embodiment of a brush head in accordance with the invention;
Figure 6(b) is an isometric view of the brush head of Figure 6(a);
Figure 6(c) is a different isometric view of the brush head of Figure 6(a);
Figure 6(d) is a side view of the brush head of Figure 6(a);
Figures 7(a), 7(b), 7(c) and 7(d) show various views of an alternative embodiment of a brush head in accordance with the invention;
Figures 8(a), 8(b), 8(c) and 8(d) show various views of an alternative embodiment of a brush head in accordance with the invention;
Figures 9(a), 9(b), 9(c) and 9(d) show various views of an alternative embodiment of a brush head in accordance with the invention;
Figures 10(a), 10(b), 10(c) and 10(d) show various views of an alternative embodiment of a brush head in accordance with the invention;
Figures 11(a), 11(b), 11(c) and 11(d) show various views of an alternative embodiment of a brush head in accordance with the invention;
Figure 12(a) is an isometric view of an embodiment of a brush head base;
Figure 12(b) is a top isometric view of the embodiment of Figure 12(a);
Figure 12(c) is a cross sectional view of the embodiment of Figure 12(a);
Figure 12(d) is a side view of the embodiment of Figure 12(a);

Figure 12(e) is a base isometric view of the embodiment of Figure 12(a);
Figure 13(a) is an isometric view of an embodiment of a brush head base;
Figure 13(b) is a top view of the embodiment of Figure 13(a);
Figure 13(c) is an isometric view of the embodiment of Figure 13(a);
Figure 13(d) is a base view of the embodiment of Figure 13(a);
Figure 13(e) is a long sectional view of the embodiment of Figure 13(a);
Figure 13(f) is a different long sectional view of the embodiment of Figure 13(a);
Figure 14(a) is an isometric view of an alternative embodiment of the device which comprises an alternative version of outer shell;
Figure 14(b) is another isometric view of the embodiment of Figure 14(a);
Figure 14(c) is a bottom view of the embodiment of Figure 14(a);
Figure 14(d) is a side view of the embodiment of Figure 14(a);
Figure 14(e) is another side view of the embodiment of Figure 14(a);
Figure 14(f) is another side view of the embodiment of Figure 14(a);
Figure 14(g) is a detail from Figure 14(f);
Figure 15(a) is an isometric view of an alternative body for use with the device;
Figure 15(b) is another isometric view of the embodiment of Figure 15(a);
Figure 15(c) is a cross sectional view of the embodiment of Figure 15(a);
Figure 15(d) is another cross sectional view of the embodiment of Figure 15(a);
Figure 15(e) is an isometric view of the embodiment of Figure 15(a) in its compressed state;
Figure 15(f) is another isometric view of the embodiment of Figure 15(e);
Figure 15(g) is a cross sectional view of the embodiment of Figure 15(e);
Figure 15(h) is another cross sectional view of the embodiment of Figure 15(e).

Detailed Description Of The Drawings

[0036] In this description, like parts are given like reference numerals. The reference numerals used are as follows:

device	100
body	110, 1110, 1210
outer shell	120, 1220
aperture	121
cap	1222
screw threads on body or shell	126, 1126
protrusions on outer shell	128, 1228
inner deformable receptacle	130, 1230
internal cavity	131, 1131
deformable region	132, 1232
end	140, 1140, 1240
eyelet	141, 1241
brush head	150, 250, 350, 450, 550, 650, 750, 850, 951,1050
base of brush head	151, 851, 1051, 1251
base of brush head with walls	251, 351, 451, 551, 651, 751, 951
bristles	152, 252, 352, 452, 552, 652, 752, 852
channels in centre of base	153, 853, 1053, 1253
channels spanning base	253, 353, 453, 553, 653, 753, 953
gap in bristles	154
screw threads on base	156, 256, 356, 456, 556, 656, 756, 856, 956, 1056
circular slots for bristles	157, 857, 1057
grid-like slots	257, 357, 457, 557, 657, 757, 957
walls of slots	258, 958
circumferential wall of brush	959
floor of brush head base	960
ridges on ridged body	1170
mouth	180,1180

[0037] Referring now to Figure 1 (a) and Figure 1(b), there is shown an embodiment of the device 100 comprising a body 110 dimensioned to fit in the hand of a user and a brush head 150 at one end of the body.

[0038] The brush head 150 comprises a base 151 and a plurality of bristles 152. Preferably the base 151 of the brush head 150 and the body 110 comprise screw threads (not shown) for securely and detachably connecting the brush head to the body.

[0039] The body 110 comprises an outer shell 120 formed from a relatively rigid material and an inner deformable receptacle 130 inside the outer shell 120 formed at least partially from an elastomeric material.

[0040] The outer shell 120 has apertures 121, preferably dimensioned to at least partially receive a user's fingers and thumb. Deformable regions 132 on the inner deformable receptacle 130 extend through the apertures 121 of the outer shell 120 such that a user can squeeze the deformable regions 132 of the inner deformable receptacle 130 through the apertures.

[0041] The inner deformable receptacle 130 contains powder (not shown) or another granular substance in its internal cavity (not shown). The inner deformable receptacle 130 comprises a mouth 180 which may be made from a substantially rigid material.

[0042] The brush head 150 has at least one small channel (not shown) at the base to allow fluid communication between the internal cavity of the deformable receptacle and the bristles of the brush, such that squeezing the inner deformable receptacle through the apertures provided in the outer shell allows the expulsion of powder from the internal cavity, through the small channel or channels, into the bristles of the brush head.

[0043] To prevent the device rolling when placed on a surface, protrusions 128 are provided on the outer shell 120.

[0044] Referring now to Figure 2(a), Figure 2(b) and Figure 2(c), there is shown the same embodiment of the device as that of Figure 1 (a) and Figure 1(b). The inner deformable receptacle 130 contains powder or another granular substance in its internal cavity 131.

[0045] Here it can be seen that the brush head 150 has at least one small channel 153 extending through the base 151 to allow fluid communication between the internal cavity 131 of the deformable receptacle 130 and the bristles 152 of the brush head 150, such that squeezing the inner squeeze 130 bottle through the aperture 121 provided in the outer shell 120 allows the expulsion of powder from the internal cavity 131, through the small channel 153 or channels, into the bristles 152 of the brush head 150.

Figure 2(a) is a cross sectional view through the base 151.

[0046] Referring now to Figure 3(a), 3(b), 3(c), 3(d), 3(e) and 3(f), there are shown different views of the device of Figures 1 and 2. In particular, the protrusions 128 for preventing rolling of the device are shown. While in this embodiment, two protrusions 128 are provided, of course, any number of protrusions in any pattern can be provided in other embodiments of the present invention.

[0047] Figure 3(f) is a cross sectional view through the bristles 152 of the brush head 150. There is a gap 154 in the bristles 152 in the centre of the brush head to allow powder expelled through small channels 153 at the centre of the base 151 to move up the length of the bristles 152. While in this embodiment, the channel or channels 153 are in the centre of the base 151 and the gap 154 in the bristles 152 is also in the centre, other arrangements such as evenly spaced channels and gaps are envisaged.

[0048] Referring now to Figure 4, there is shown an exploded view of the hand held device 100 comprising a brush of Figure 1(a) comprising a body 110 comprising a rigid outer shell 120, an inner deformable receptacle 130 and a brush head 150.

[0049] The assembly of the device is shown in Figure 4. As shown in Figure 4, to assemble the device, the inner deformable receptacle 130 is removably inserted into the outer shell 120; and the outer shell 120 is engaged with the base 151 of the brush head 150, thereby securing the inner deformable receptacle 130 inside the outer shell 120.

[0050] The mouth 180 of the inner deformable receptacle 130 forms a tight fit with the inner face of the screw thread 156 portion of the brush head base 150.

[0051] An eyelet 141 is provided at the end 140 of the shell 120. The eyelet 141 allows the attachment of a cord or string or any other kind of tether, or a clip or attachment for a tether for storage or transport. The end 140 or eyelet 141 or both may be formed from different materials to the shell or from the same material.

[0052] It can be seen that the base 151 of the brush head 150 comprises screw threads 156 on its outer surface and the outer shell comprises screw threads 126 on its inner surface for securely and detachably connecting the brush head to the outer shell. However, the screw threads 156 could alternatively, be provided on the inner surface and screw threads 126 on the outer surface.

[0053] Channels 153 are provided clustered generally around the centre of the base of the brush head 151 provide fluid communication between the bristles 152 and the internal cavity 131 of the deformable receptacle. These small channels 153 are distinct from the slots 157 in the base 150 in which the bristles 152 are held. Slots 157 extend partially through the base 151 of the brush head 150. In this embodiment, the slots are circular in cross section and are evenly spread across the base 150, however, other arrangements are also envisaged. For example, the slots may be arranged in a grid-like fashion, defined by planar walls.

[0054] Referring now to Figures 5(a), 5(b), 5(c), and 5(d), there are shown a brush head 250 in accordance with the invention. The brush head 250 comprises a base 251, bristles 252 and has channels 253 extending through the base. This arrangement differs from that of base 151 shown in Figures 1-4 in that there are five evenly spaced channels 253 spanning the base of 251.

[0055] The bristles are, preferably, arranged in a pre-determined pattern and comprise more than one length of bristles so, in this particular embodiment, the brush head comprises first bristles having a first length and second bristles having a second length. Instead of or as well as providing gaps in the bristles, shorter bristles may be positioned over at least some of the channels 253 to allow the powder to move down the length of the bristles. Alternatively, less dense bristles may be placed over the channels 253.

[0056] Bundles of bristles are secured in a grid-like array of slots 257. The grid-like slots 257 are defined by planar walls 258 which are parallel and perpendicular to one another. This arrangement of bristles 252 allows for dense packing of bristles 252 if desired. The brush head 250 comprises screw threads 256 for connection with a body component.

[0057] Referring now to Figures 6(a), 6(b), 6(c), and 6(d), there are shown a brush head 350 in accordance with the invention. The brush head 350 comprises a base 351, bristles 352 in slots 357 and has channels 353 extending through the base. Brush head 350 differs from brush head 250 in the arrangement of bristles.

[0058] Referring now to Figures 7(a), 7(b), 7(c), and 7(d), there are shown a brush head 450 in accordance with the invention. The brush head 450 comprises a base 451, bristles 452 in slots 457 and has channels 453 extending through the base. Brush head 450 differs from brush heads 250 and 350 in the arrangement of bristles.

[0059] Referring now to Figures 8(a), 8(b), 8(c), and 8(d), there are shown a brush head 550 in accordance with the invention. The brush head 550 comprises a base 551, bristles 552 in slots 557 and has channels 553 extending through the base. Brush head 550 differs from brush heads 250, 350 and 450 in the arrangement of bristles.

[0060] As can be seen from the drawings, there are a plurality of bristles of varying lengths included in the brush head 550. There are first bristles having a first length and second bristles having a second length; and third bristles having a third length and so on for multiples of bristles having different lengths. Some bristle lengths are shorter than others. As can be send in particular, in Figures 8(a) to 8(d), pre-determined pattern of these different bristle lengths is that the bristles are arranged in order of increasing length with the longest bristles being located towards the outer perimeter of the brush base, providing an apex point at the longest bristles. This arrangement is effective to reach into depths of varying dimensions such as in dog paws or soles of shoes, boots such as hiking boots and other boots and such like.

[0061] Referring now to Figures 9(a), 9(b), 9(c), and 8(d), there are shown a brush head 650 in accordance with the invention. The brush head 650 comprises a base 651, bristles 652 in slots 657 and has channels 653 extending through the base. Brush head 650 differs from brush heads 250, 350, 450 and 550 in the arrangement of bristles.

[0062] As can be seen from the drawings, there are a plurality of bristles of varying lengths included in the brush head 650. There are first bristles having a first length and second bristles having a second length; and third bristles having a third length and so on for multiples of bristles having different lengths. Some bristle lengths are shorter than others. As can be send in particular, in Figures 9(a) to 9(d), pre-determined pattern of these different bristle lengths is that the bristles are arranged in a predetermined order to provide a group of bristles having the longest bristles upstanding in a particular pattern from the shorter bristles.

[0063] Referring now to Figures 10(a), 10(b), 10(c), and 10(d), there are shown a brush head 750 in accordance with the invention. The brush head 750 comprises a base 751, bristles 752 in slots 757 and has channels 753 extending through the base. Brush head 750 differs from brush heads 250, 350, 450, 550 and 650 in the arrangement of bristles.

[0064] As can be seen from the drawings, there are a plurality of bristles of varying lengths included in the brush head 750. There are first bristles having a first length and second bristles having a second length; and third bristles having a third length and so on for multiples of bristles having different lengths. Some bristle lengths are shorter than others. As can be send in particular, in Figures 10 (a) to 10(d), pre-determined pattern of these different bristle lengths is that the bristles are arranged in a predetermined order to provide a group of bristles having the longest bristles upstanding in a particular pattern from the shorter bristles.

[0065] Referring now to Figures 11(a), 11(b), 11(c), and 11(d), there are shown a brush head 850 in accordance with the invention. The brush head 850 comprises a base 851, bristles 852 and has channels 853 extending through the base. Brush head 850 differs from brush heads 250, 350, 450, 550, 650 and 750 in the arrangement of bristles and in the arrangement of channels 153. Like the brush head base 151 shown in Figures 1-4, brush head base 851 has five small channels 853 clustered around the centre of the brush head. Like the brush head base 151 shown in Figures 1-4, slots 857 are circular in cross section and are spread evenly across the base 850.

[0066] Of course, it is to be understood that in some embodiments, the base of the cap can have an arrangement of hole/s centrally located as in Fig 11; or, in other embodiments, the holes can be distributed throughout the entire area of the base of cap as in fig 5-9.

As can be seen from the drawings, there are a plurality of bristles of varying lengths included in the brush head 850. There are first bristles having a first length and second bristles having a second length; and third bristles having a third length and so on for multiples of bristles having different lengths. Some bristle lengths are shorter than others. As can

be send in particular, in Figures 11 (a) to 11(d), pre-determined pattern of these different bristle lengths is that the bristles are arranged in a predetermined order to provide a group of bristles having the longest bristles upstanding in a particular pattern from the shorter bristles.

[0067] Referring now to Figures 12(a), 12(b), 12(c), 12(d), and 12(e), there is shown brush head base 951, similar to that of Figure 5(a) with the bristles removed for illustration. Like reference numerals refer to like features. The base 951 is substantially hollow. The brush head base 951 comprises slots 957 defined by upstanding planar walls 958; the walls are arranged in a grid-like arrangement, preferably, in a generally, cruciform arrangement, with a pair of walls being parallel to each other arranged perpendicularly to another pair of walls which are parallel to each other. The slots 957 extend substantially along the length of the upstanding circumferential wall 959 as far as the floor 960 of the brush head base 951. The floor 960 comprises spaced apart channels 953 which are in communication with the body when the brush head base 951 is engaged with the body. Thus, the channels 953 extend through the base 951, providing fluid communication between the body and the slots 957 into which the bristles are secured. Screw threads 956 are provided on the outer surface of the base 951 for connection with a body. In use, powder from the storage compartment in the body 110 is expelled

[0068] Referring now to Figures 13(a), 13(b), 13(c), 13(d), and 13(e), there is shown an alternative brush head base 1051 with the bristles removed for illustration. Base 1051 is substantially solid. The slots 1057 for holding the bristles have circular cross sections, like those of Figures 1-4 and Figure 11. The slots 1057 can be seen extending most of the way through the base 1051. The channels 1053 through which powder may be expelled are shown extending through the base 1051.

[0069] Referring now to Figures 14(a), 14(b), 14(c), 14(d), 14(e), 14(f), 14(g) and 14(h), there is shown another embodiment of the device comprising an alternative body 1210 connected to brush head base 1251. It should be understood that the body 1210 is suitable for connection with any of the aforementioned brush heads.

[0070] The body 1210 comprises an outer shell 1220 formed from a relatively rigid material and an inner deformable receptacle 1230 inside the outer shell 1220 formed at least partially from an elastomeric material.

[0071] This body 1210 differs from that previously shown in that removable caps 1222 are provided covering the apertures on the outer shell 1220, such that the deformable regions 1232 of the inner deformable receptacle 1230 are covered by the caps 1222 on the outer shell 1220.

[0072] The provision of the caps 1222 prevents unintended compression of the inner deformable receptacle 1230; however, a user can apply pressure to the cover caps and this pressure will be applied by the cover caps to the inner deformable walls of the receptacle so as to release material from the reservoir when intended to release it. This is of particular advantage in that this arrangement avoids the need for any other cover or packaging over or around the outer shell. This is particularly environmentally friendly.

[0073] The caps 1222 may be integrally formed with the outer shell 1220 during moulding and subsequently rendered removable by providing incisions.

[0074] Alternatively, the caps 1222 on the outer shell 1220 may be formed from a different material to that of the outer shell 1220. For example, caps 1222 may be formed from a relatively elastomeric material and the remainder of the outer shell 1220 may be formed from a relatively rigid material. This arrangement allows easier removal of the caps if desired, or allows the user to compress the inner deformable receptacle by applying pressure to the caps.

[0075] The caps 1222 may be more or less rigid than the material deformable regions 1232, but preferably the caps are more rigid than the deformable regions 1232 to prevent accidental compression of the receptacle 1230. However, as indicated above, a user can apply pressure to the cover caps and this pressure will be applied by the cover caps to the inner deformable walls of the reservoir so as to release material from the reservoir when intended to release it. The caps 1222 may be removably connected with the outer shell 1220 by providing a push fit or snap fit arrangement. Alternatively the caps 1222 may be hingedly connected at one or more contact points with the perimeter of the aperture(s) in the outer shell.

[0076] The inner deformable receptacle 1230 contains powder (not shown) or another granular substance in its internal cavity (not shown).

[0077] The brush head base 1251 comprises five channels 1253 at the base to allow fluid communication between the internal cavity of the deformable receptacle and the bristles of the brush. Preferably the brush head base 1251 and the body 1210 comprise screw threads (not shown) for securely and detachably connecting the brush head to the body.

[0078] To prevent the device rolling when placed on a surface, protrusions 1228 are provided on the outer shell 1220. An eyelet 1241 for connection with a cord for storage or transport is provided at the end 1240 of the outer shell 1220. Referring now to Figures 15(a), 15(b), 15(c), 15(d), there is shown an alternative embodiment of a body 1110 for connection with any of the aforementioned brush heads.

[0079] Body 1110 is almost entirely formed from elastomeric material. Body 1110 comprises a series of ridges 1170 and must be compressed longitudinally, with an action much like expelling air from an accordion, to expel powder.

[0080] In use, the internal cavity 1131 of the body 1110 is filled with powder. In use the entire body may be compressed to dispense powder into the bristles of the brush by pressing the end 1140, which may be formed from relatively rigid

material, towards the mouth 1180. This body differs from that previously described in that it has no rigid outer shell or inner deformable receptacle- the roles of both parts are assumed by the accordion-like body 1110.

[0081] Body 1110 comprises a rigid mouth 1180 with screw threads 1126 on its inner surface for connection with a brush head.

[0082] Figures 15(e), 15(f), 15(g) and 15(h) show the body 1110 in its compressed state. Thus the body 1110 can be fully compressed when empty and conveniently easily transportable in the compressed state and takes up less space in a bag, for instance. The portability of the device is a further advantage of the present invention.

[0083] While this invention has been discussed primarily as a tool to remove dry and wet sand from skin, it is also envisaged to have a number of other uses made possible by varying the powder composition and brush head. For example, one variant of the device may be used for wound cleaning. Another embodiment may be used for cleaning dirty or sandy animals' paws or other parts of an animal, and particularly for animals which dislike being washed with water. The device of the present invention can be used without the powder for cleaning the soles of shoes and trainers after walking on the beach cleaning toys, bikes, surfboards and equipment for other outdoor pursuits, as well as cleaning inside of a vehicle such as a car or a van.

[0084] The words comprises/comprising when used in this specification are to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers , steps, components or groups thereof.

[0085] It is understood that this application covers any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains.

Claims

1. A hand held device comprising an elongate body, the elongate body comprising, at one end thereof, a brush comprising a plurality of bristles in a pre-defined arrangement; the elongate body comprising an internal cavity defining a storage compartment adapted to hold a drying agent, means for releasing the drying agent from the storage compartment and for delivery to the bristles of the brush such that the drying agent can be controllably delivered from the storage compartment to the bristles for dispensing from the bristles for use in removing sand, dirt and other foreign substances from humans, pets and apparatus; and wherein, preferably, the drying agent comprises a natural drying agent or an artificial drying agent, most preferably, selected from one or more of the following: granular material, powder, talc, or other particulate material.

2. A device as claimed in claim 1 further comprising a brush head for securing the bristles of the brush to said brush head, the brush head being configured for fluid communication with the storage compartment, such that the drying agent can be delivered from the storage compartment to the bristles for dispensing from the bristles for use in removing sand, dirt and other foreign substances from humans, pets and apparatus.

3. A device as claimed in any preceding claim wherein the device comprises an elongate body dimensioned to fit in the hand of a user and comprising a brush head at one end of the elongate body.

4. A device as claimed in any preceding claim wherein the brush head comprises a plurality of bristles towards one end of the elongate body; and preferably, the storage compartment being in sealable engagement with the brush head, optionally, the seal being provided about the mouth of the storage compartment and the seal being provided by the material at the mouth of the storage compartment being adapted to provide sealing engagement with the brush head.

5. A device as claimed in claim 3 or claim 4 wherein the device further comprises an outer shell.

6. A device as claimed in claim 5 wherein the outer shell is formed from a relatively rigid material such as a polymeric material.

7. A device as claimed in claim 6 wherein the outer shell is formed from PBT, ASA, ABS or bamboo.

8. A device as claimed in any of the preceding claims wherein the storage compartment is provided by a deformable receptacle.

9. A device as claimed in any of claims 5 to 8 wherein the deformable receptacle is housed inside the outer shell.

10. A device as claimed in claim 8 wherein the deformable receptacle is formed at least partially from an elastomeric material such as silicone, rubber, PVC, TPE, TPE-S or TPU.

11. A device as claimed in any one of claims 5 to 10 wherein the outer shell comprises at least one aperture through which a user may apply pressure, either directly or indirectly, to the inner deformable receptacle.

12. A device as claimed in claim 11 wherein the device comprises a closure cap adapted to cover the at least one aperture in the outer shell; preferably, the device comprises two apertures located opposed each other on the outer shell wall and correspondingly shaped and dimensioned removable closure caps to removably cover the aperture(s).

13. A device as claimed in any one of the preceding claims wherein the brush head comprises at least one channel to allow fluid communication between the internal cavity of the deformable receptacle and the bristles of the brush, such that squeezing the inner deformable receptacle through the aperture provided in the outer shell allows the expulsion of the drying agent from the internal cavity, through the small channel or channels, into the bristles of the brush head, optionally, the channel being formed in the brush head base.

14. A device as claimed in claim 13 wherein a removable closure tab is included cover the channels prior to first use or between uses in order to prevent humidity damaging the drying agent in the internal cavity.

15. A device as claimed in any preceding claim wherein the brush head also comprises slots which extend partially into the base into which the bristles or bundles of bristles are fixed.

16. A device as claimed in any one of the preceding claims wherein the brush head comprises engagement means for connecting the brush head to the elongate body whereby the brush head is adapted to be changed or renewed easily between uses.

17. A device as claimed in claim 16 wherein the engagement means for connecting the brush head to the elongate body comprises a screw thread arrangement.

18. A device as claimed in claim 16 wherein the engagement means for connecting the brush head to the elongate body comprises a push fit engagement.

19. A device as claimed in any one of the preceding claims wherein the deformable receptacle is open at one end; and adapted for engagement with the brush head.

20. A device as claimed in any one of claims 1 to 19 wherein the deformable receptacle is provided with a nozzle which, when the deformable receptacle is engaged with the brush head, is arranged so that the nozzle extends through a small channel in the base of the brush head.

21. A device as claimed in claim 20 wherein the nozzle is configured to control the volume of drying agent dispensed in use, and also allows a first brush head to be changed for a second brush head, without risk of accidental release of drying agent from the deformable receptacle.

22. A device as claimed in any of claims 3 to 21 wherein the inner deformable receptacle and outer shell are manufactured using injection mouldings.

23. A device as claimed in any of the preceding claims wherein the device is formed from synthetic materials.

24. A device as claimed in any of claims 1 to 22 wherein the device is formed from natural materials such as wood or bamboo.

25. A device as claimed in any preceding claim wherein the bristles are made from synthetic or semi-synthetic materials such as Nylon, Tafre, or natural fibres such as bamboo, flax, or hair, for instance, hair selected from any one of the following animals: goat, boar or squirrel.

26. A device as claimed in any preceding claim wherein the bristles are manufactured from a mixture of synthetic and or natural fibre filaments that have been crimped or tapered at an irregular pitch, and angle and straight natural/ synthetic fibre filaments

27. A device as claimed in any of claims 25 to 26 wherein the formation, density shape and length of the bristles ensures that they touch the skin at the right angle and reach the difficult areas such as between the toes, fingers and under the folds of small children.

28. A device as claimed in any of claims 25 to 27 wherein the bristles comprise at least two lengths of bristles carried on a brush head so as to effectively remove dry and wet sand.

29. A device as claimed in any preceding claim wherein the device comprises a seal between the deformable receptacle and the base of the brush head.

30. A device as claimed in claim 29 wherein the seal is substantially solid but has openings which allow the expulsion of the drying agent when the deformable receptacle is compressed.

31. A device as claimed in any of the preceding claims further comprising a removable closure tab for removably covering the openings prior to first use or between uses in order to prevent humidity damaging the drying agent in the internal cavity.

32. A device as claimed in claim 1 wherein the device comprises a body formed from elastomeric material so that the entire body may be compressed to dispense the drying agent into the bristles of the brush.

33. A device as claimed in claim 32 wherein the body comprises an accordion-like shape and can be compressed longitudinally to dispense the drying agent.

34. A device as claimed in any preceding claim wherein the storage compartment is adapted to hold a drying agent comprising a particulate material including a powder and wherein the drying agent is preferably a natural drying material, and preferably made from plant extracts and minerals.

35. A device as claimed in claim 34 wherein the drying agent comprises ingredients selected from antibacterial agents, antifungal agents, anti-inflammatory compounds, antioxidants and vitamin E.

36. A device as claimed in claim 34 or 35 wherein the drying agent also comprises an insect repellent.

37. A device as claimed in any one of claims 34 to 36 wherein the drying agent comprises sun blocking components such as zinc oxide or titanium dioxide.

38. A device as claimed in any of claims 5 to 36 wherein in use, only a portion of the device is compressible under action of a user's finger(s) and/or thumb, said portion being the deformable regions of the inner reservoir which are accessible through the apertures provided in the outer shell.

39. A device as claimed in any preceding claim wherein accidental expulsion of drying agent is minimised by the shape and configuration of the body which must be compressed substantially and longitudinally in order to expel drying agent.

40. The brush bristles may be dipped in antibacterial solution between uses.

41. A device as claimed in any preceding claim wherein the device comprises a connector for attaching string, cord, ribbon or other material for hanging the device if desired.

42. A device as claimed in any preceding claim wherein the bristles are arranged in a pre-determined pattern and comprise more than one length of bristles.

43. A device as claimed in claim 42 wherein the brush head comprises first bristles having a first length and second bristles having a second length.

44. A device as claimed in claim 43 wherein the first bristles and second bristles are arranged to cooperate together to distribute drying agent delivered from the storage cavity/storage compartment for effective removal of matter such as granular or particulate matter.

45. A device as claimed in any preceding claim wherein the bristles of the device are coated with antibacterial solution, having been pre-coated with the antibacterial solution during manufacturing.

46. A kit comprising a deformable receptacle and a plurality of interchangeable brush heads, each suited to different jobs with varying bristle lengths, varying bristle numbers, varying bristle textures, densities and materials.

47. A kit as claimed in claim 46 comprising a first brush head comprising relatively hard bristles for removing sand effectively from soles of shoes and apparatus; and a second brush head comprising relatively softer bristles for use when removing sand or debris from skin, in particular, sensitive skin.

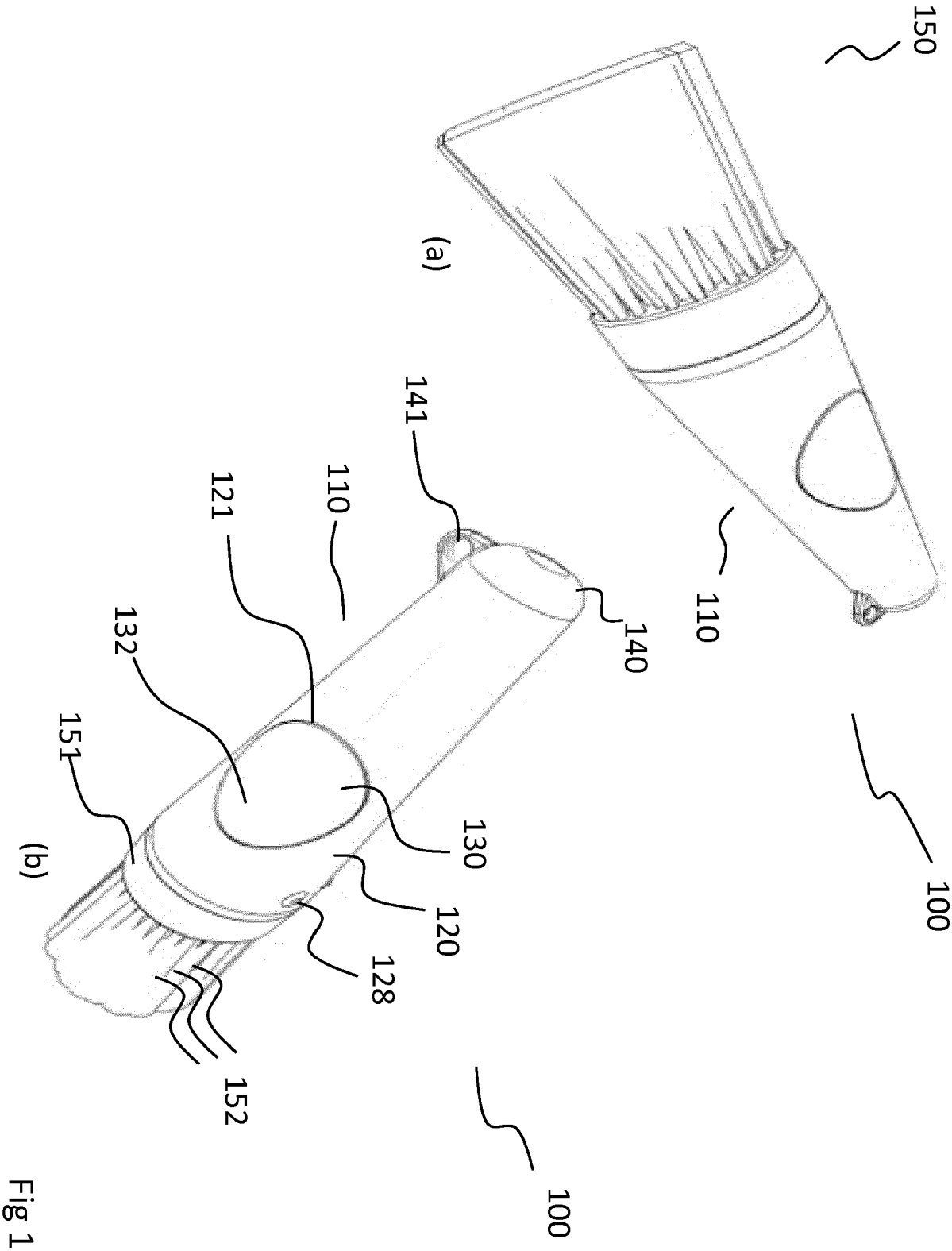

Fig 1

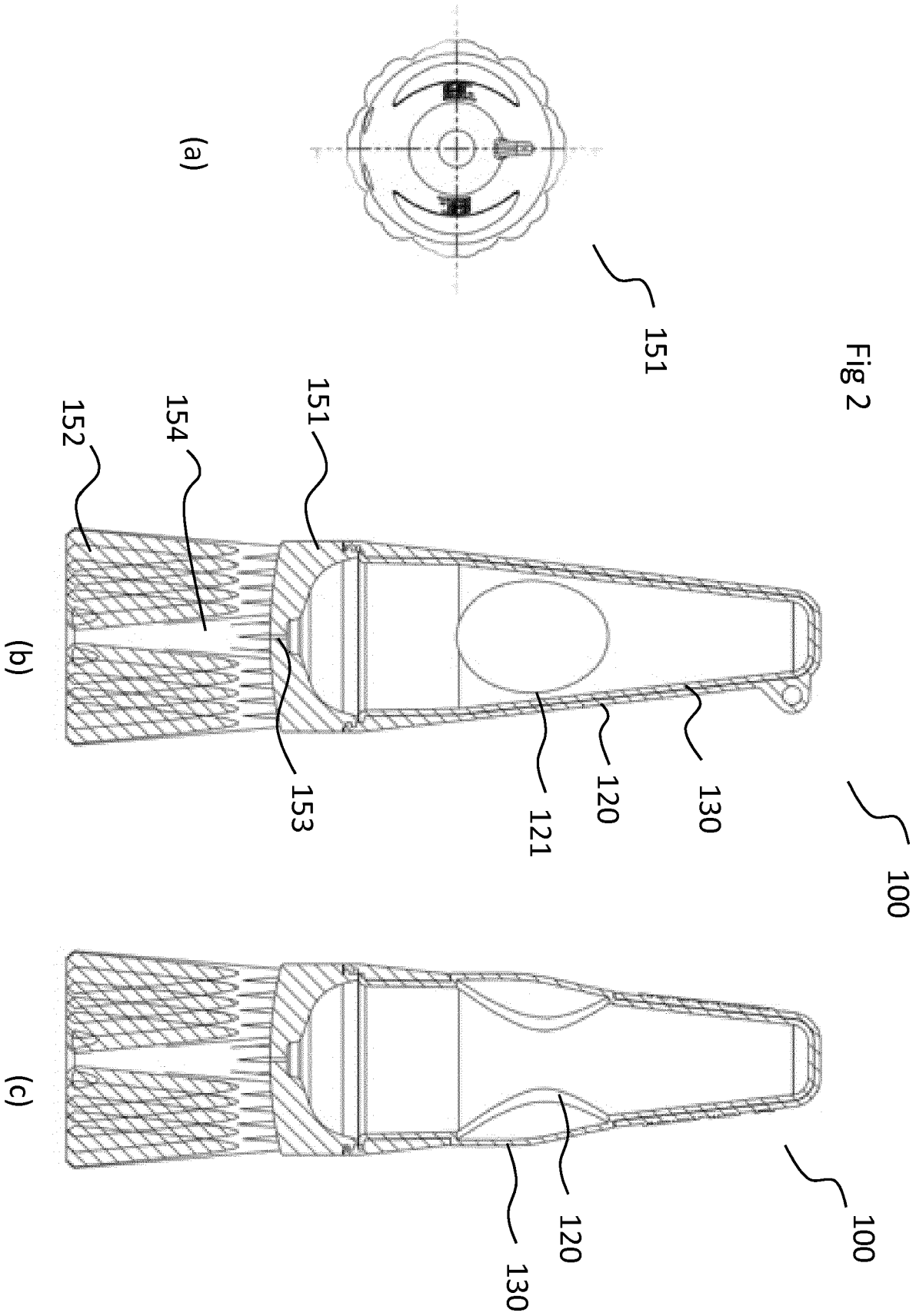

Fig 2

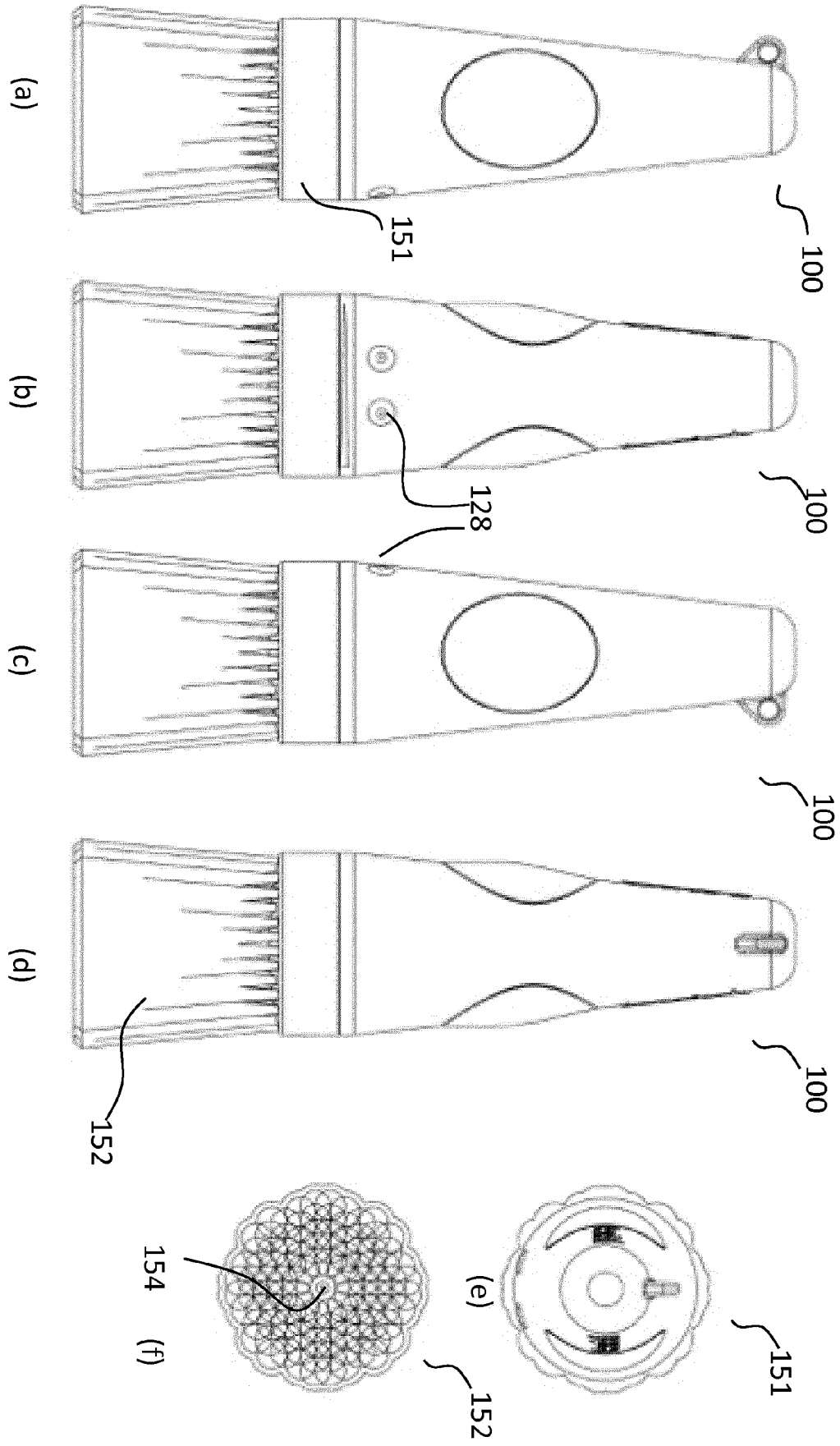

Fig 3

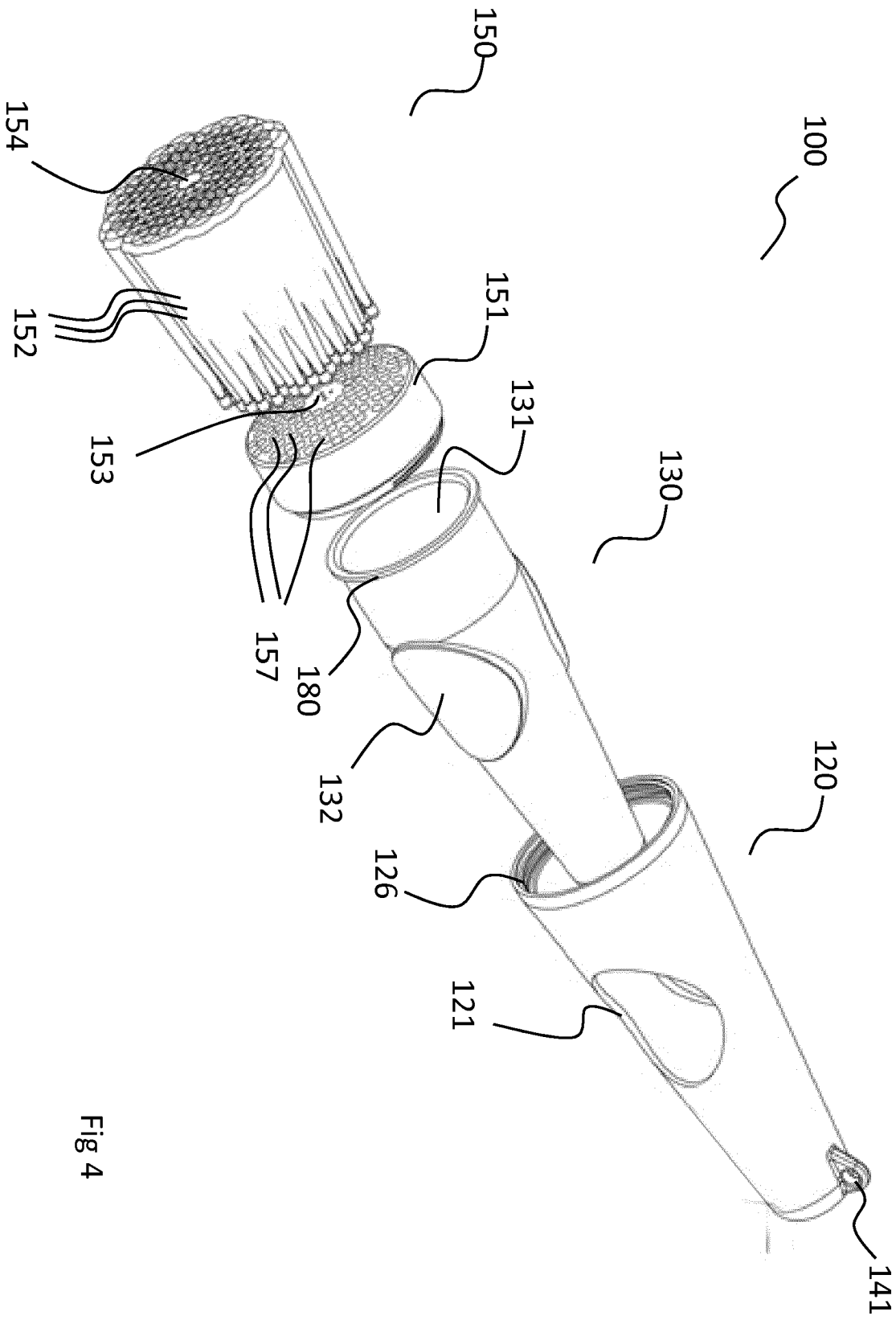

Fig 4

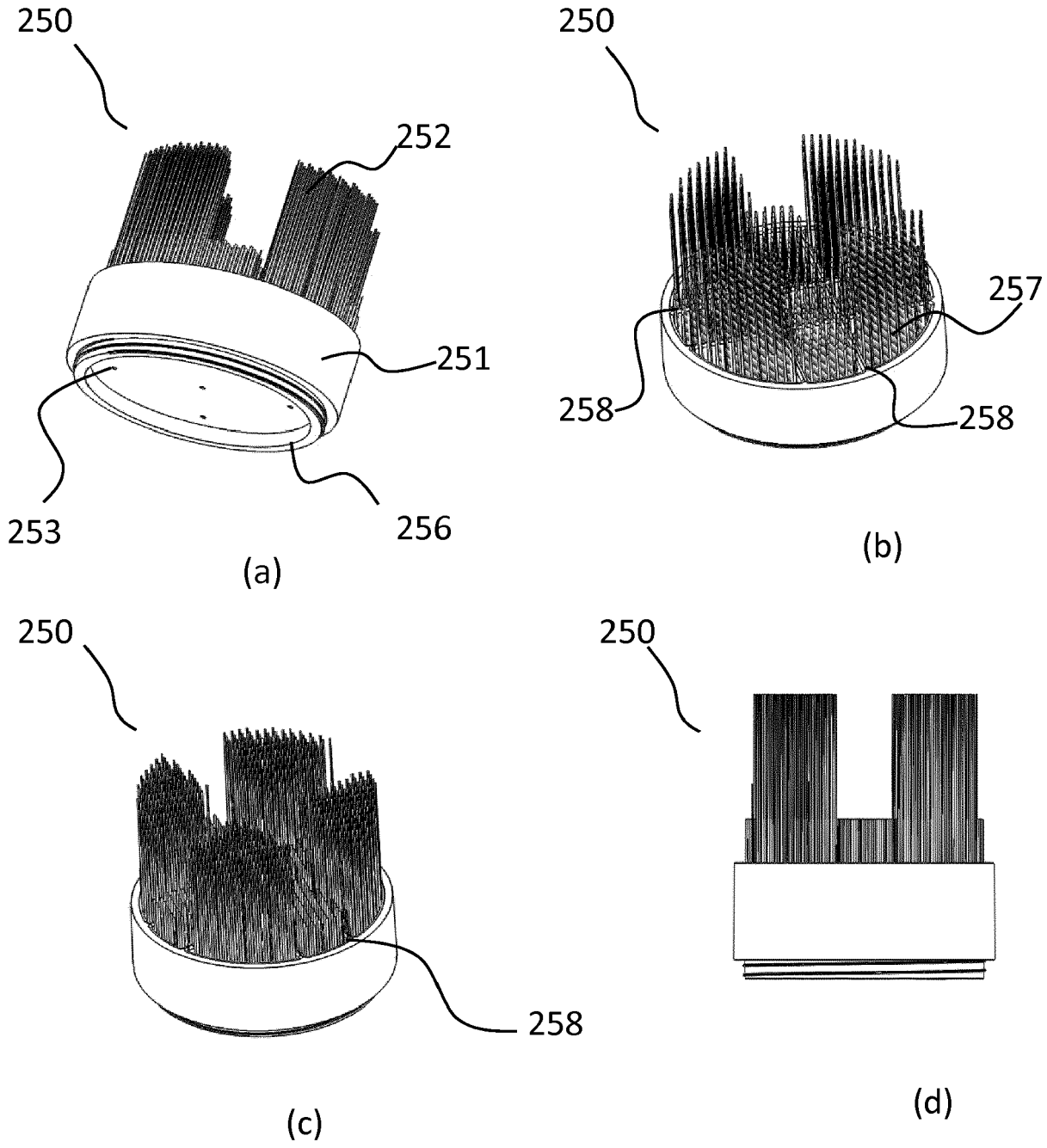

Fig 5

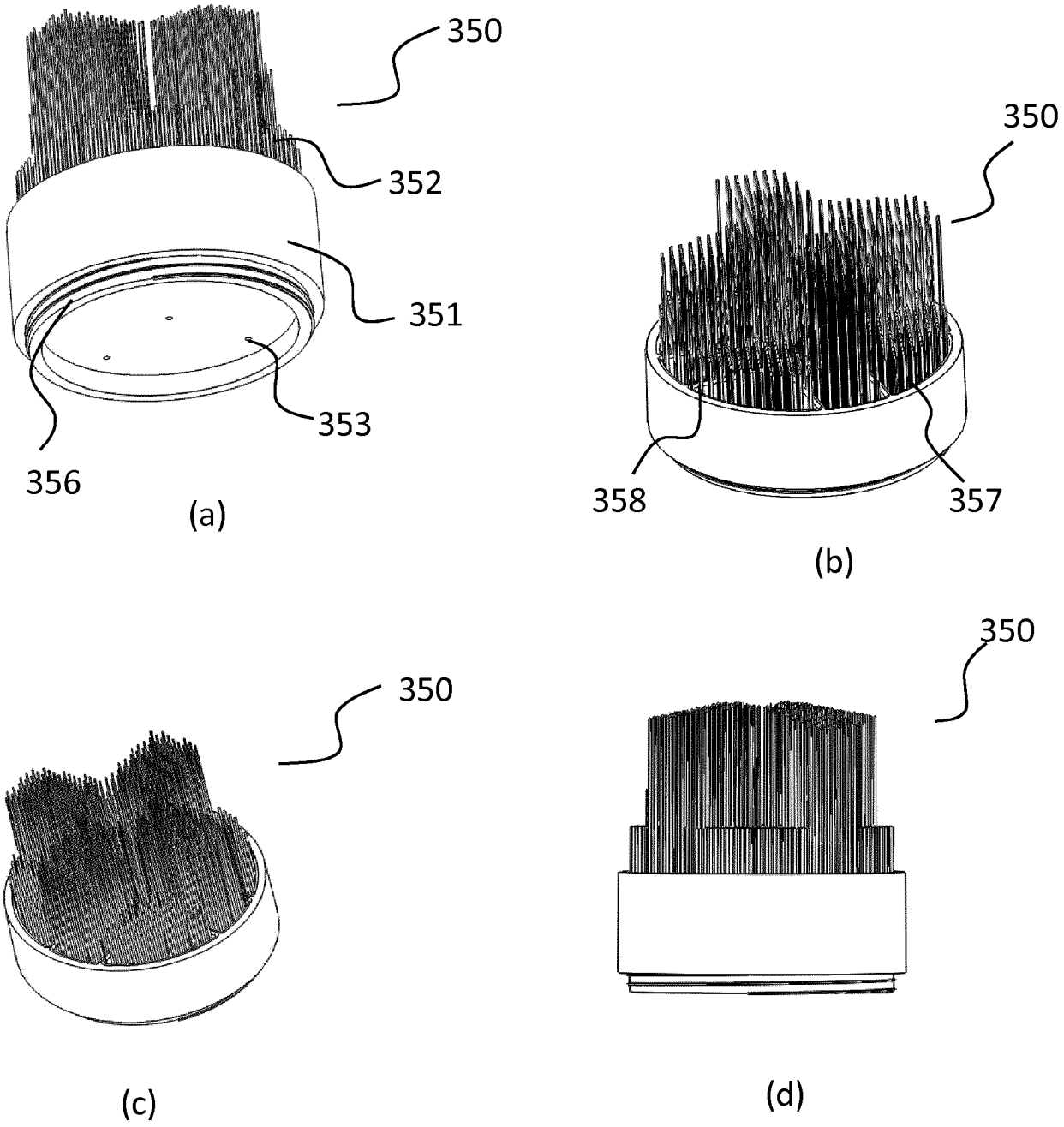

Fig 6

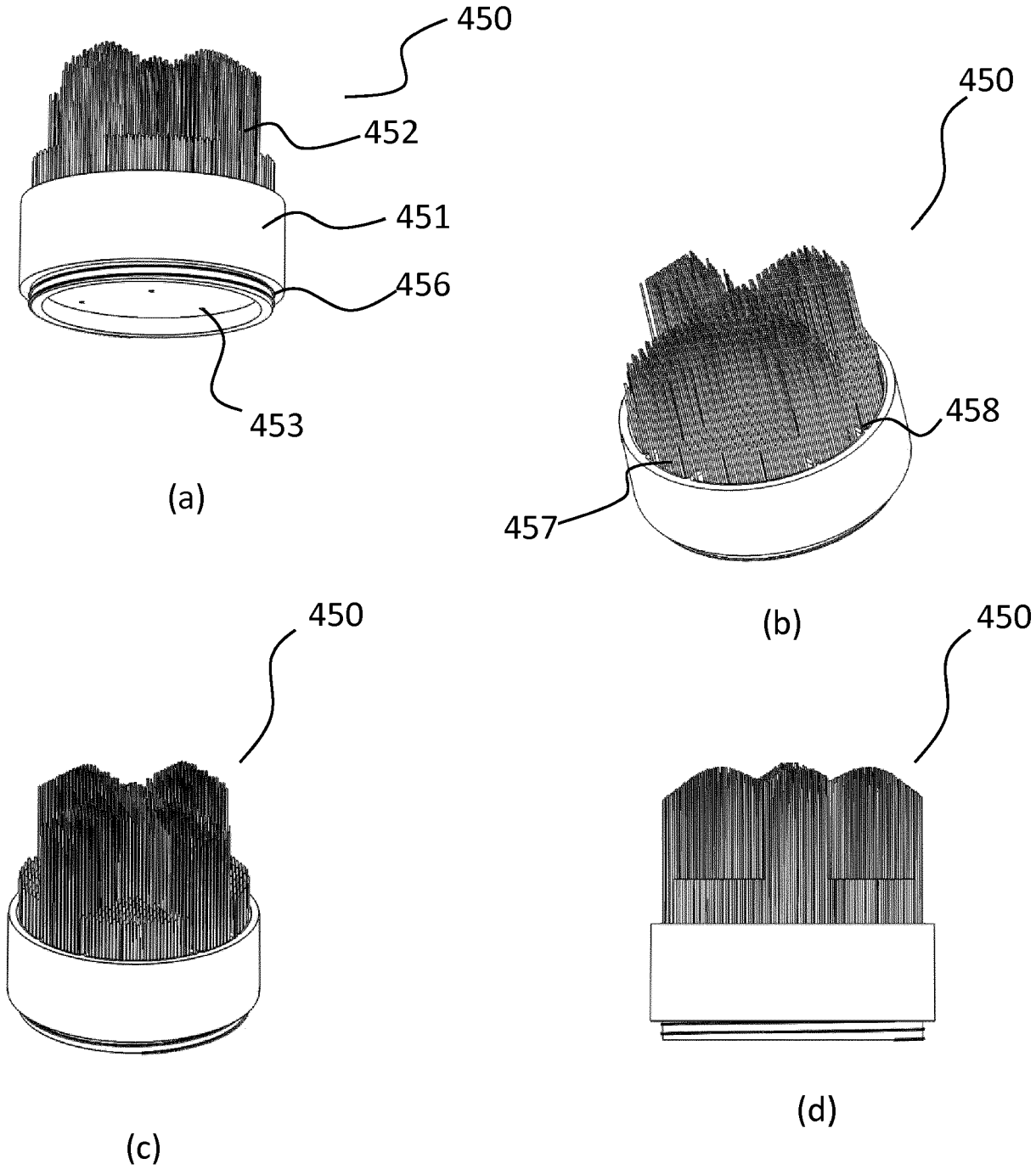

Fig 7

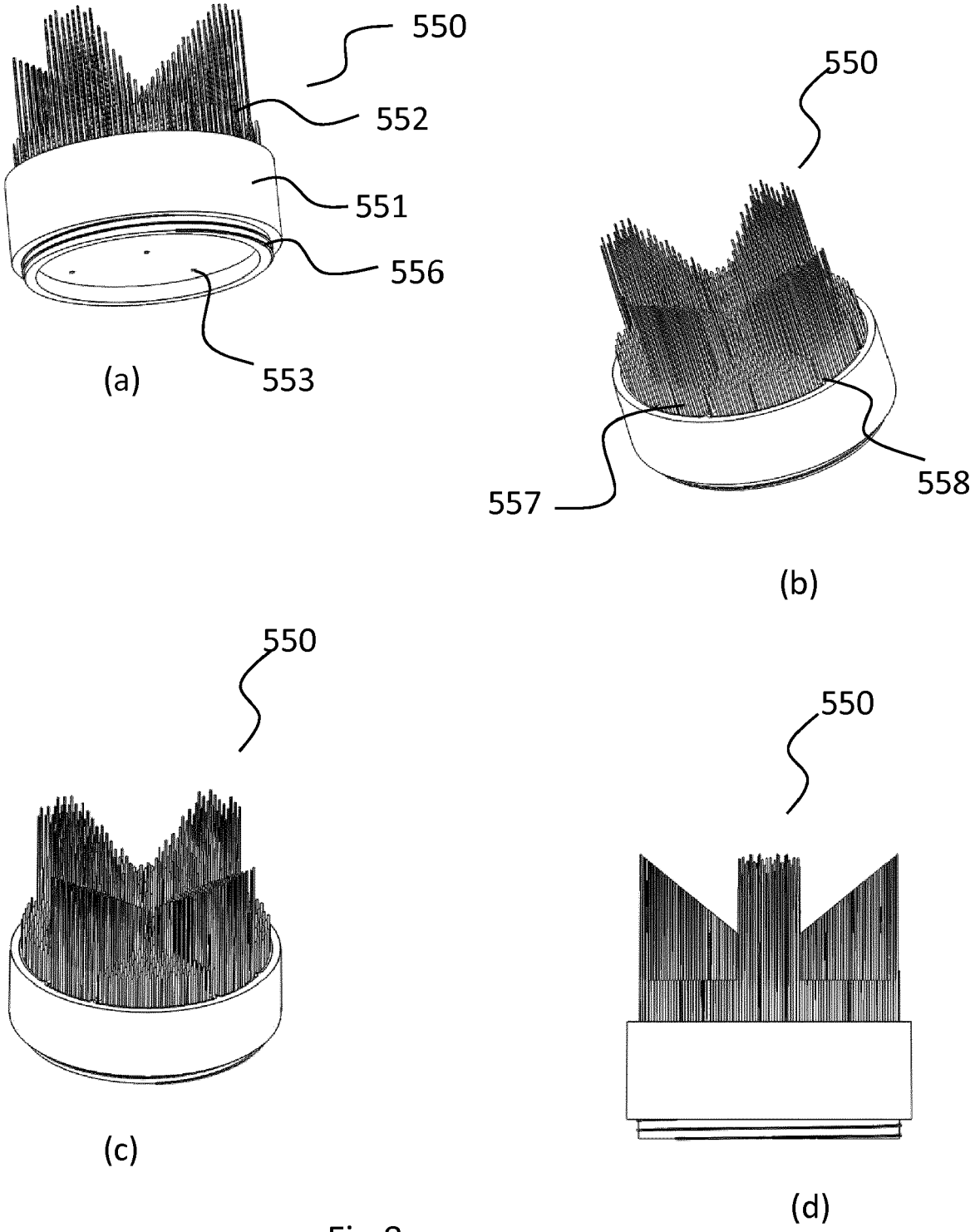

Fig 8

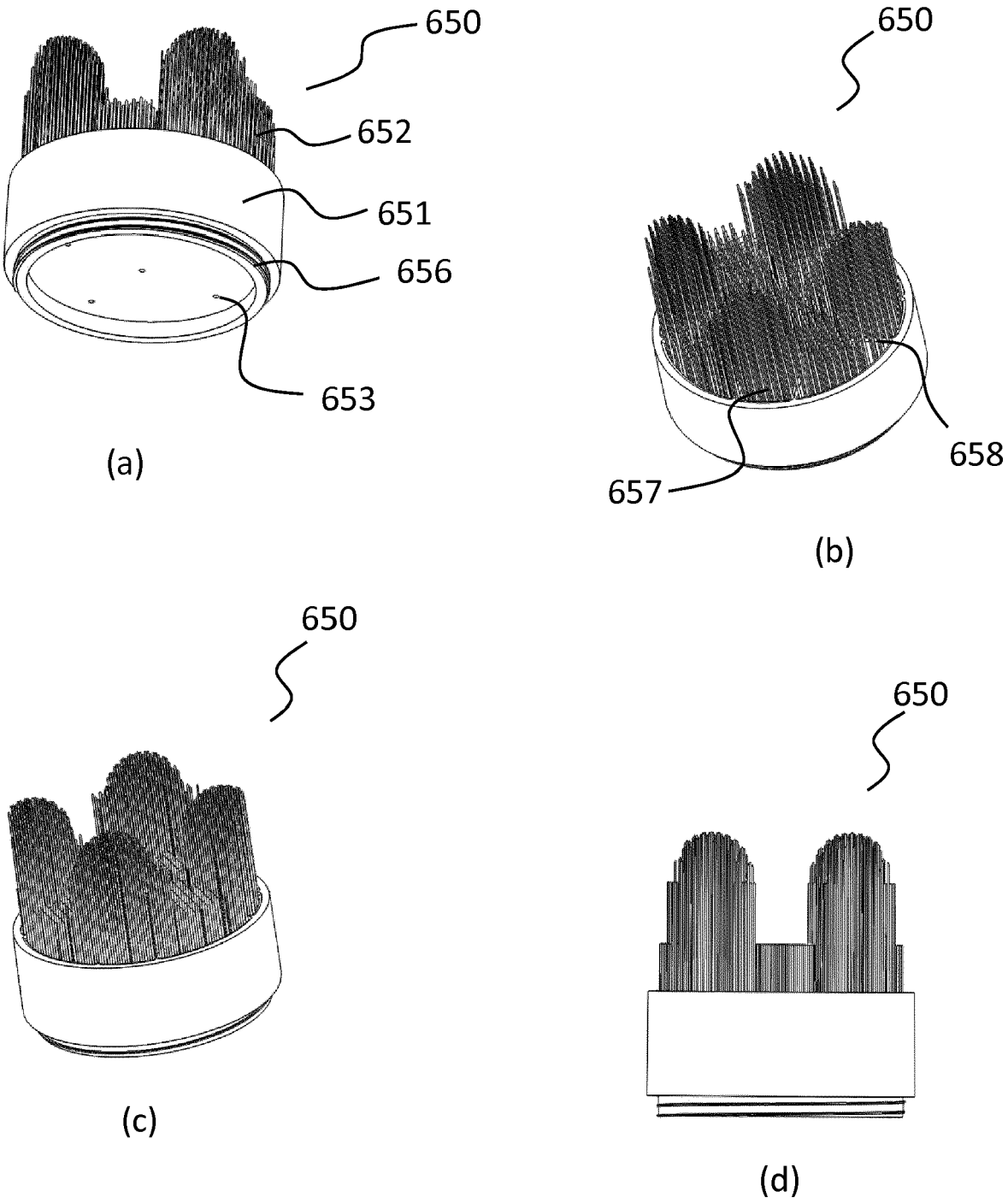

Fig 9

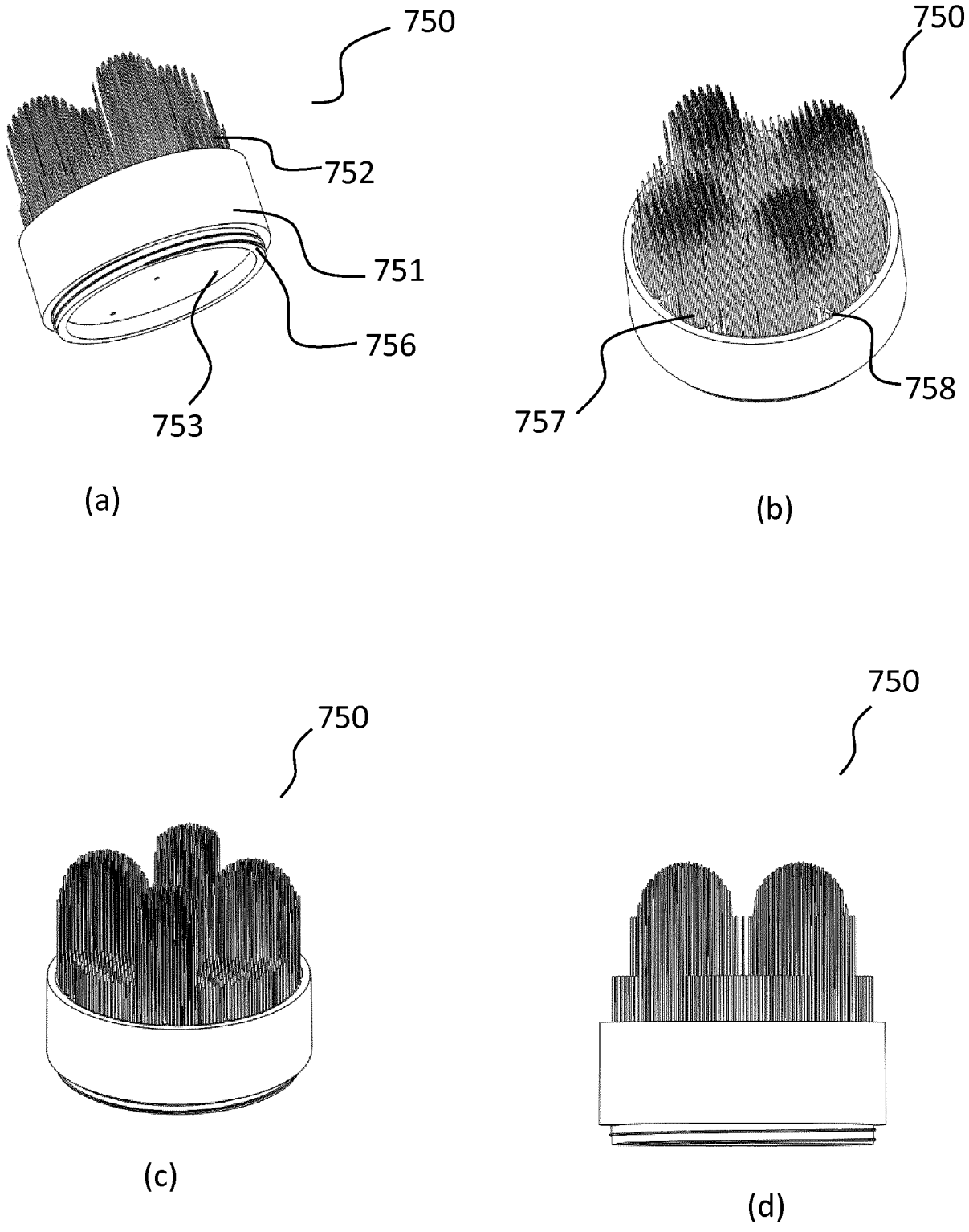

Fig 10

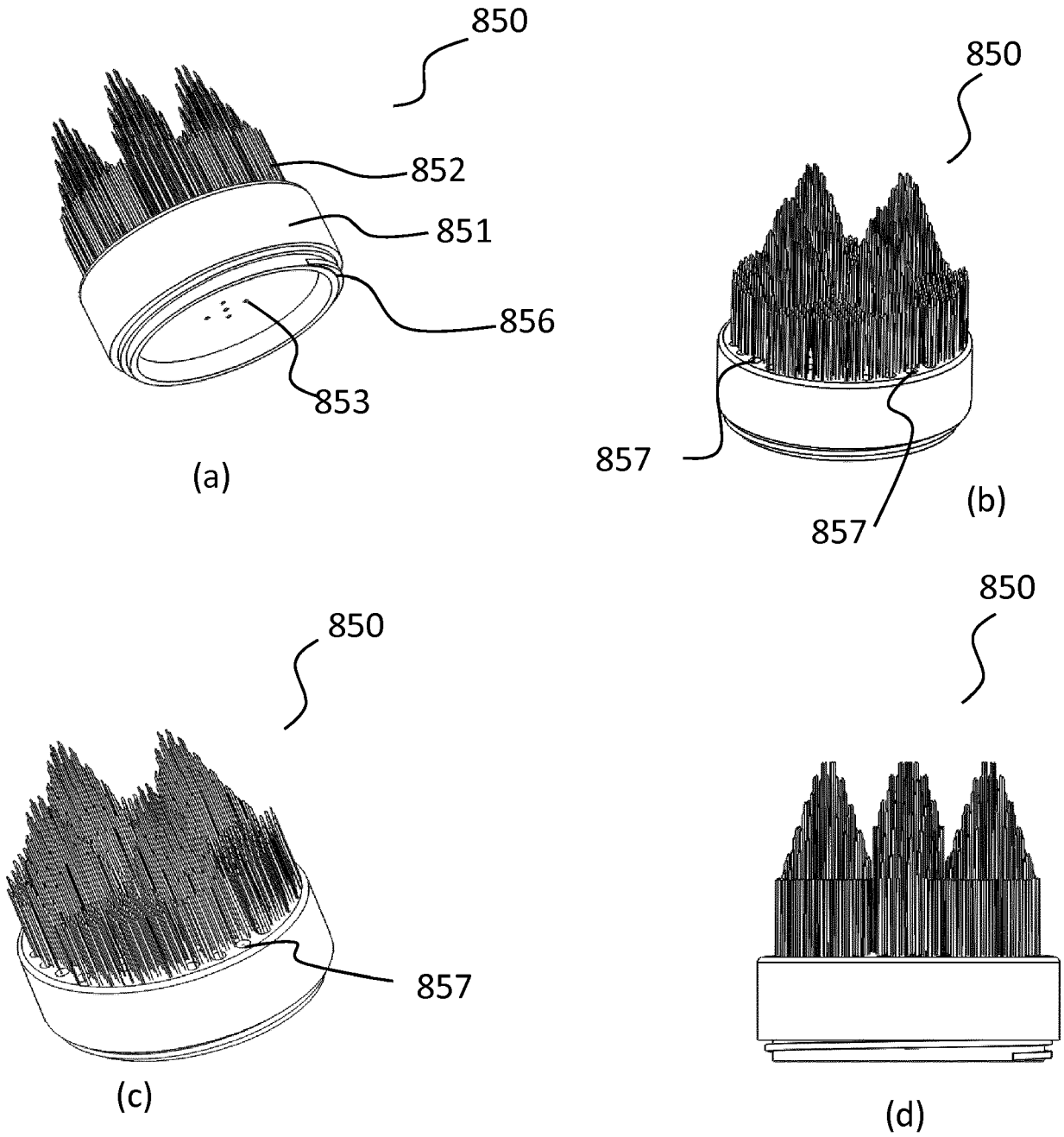

Fig 11

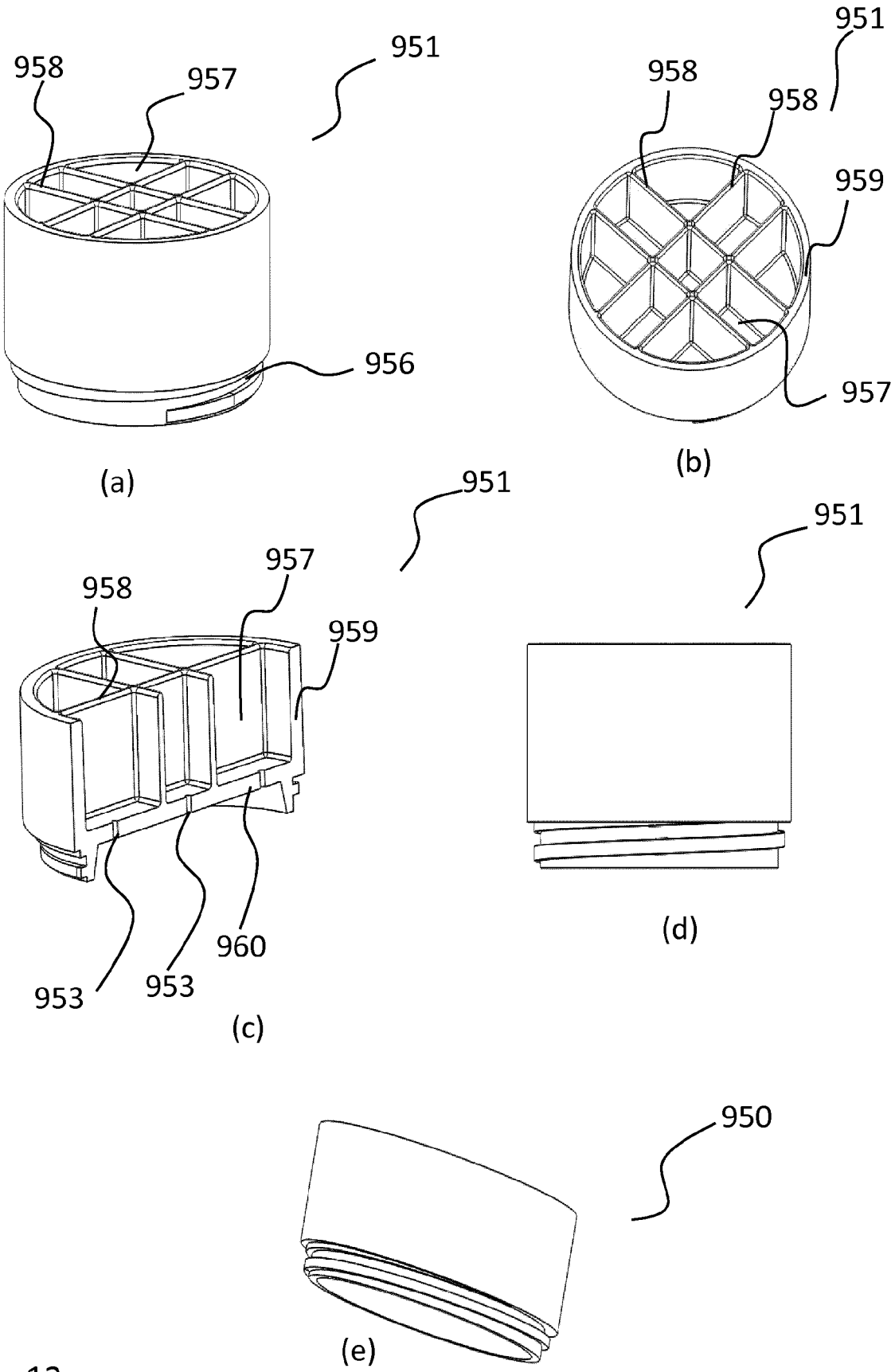
958
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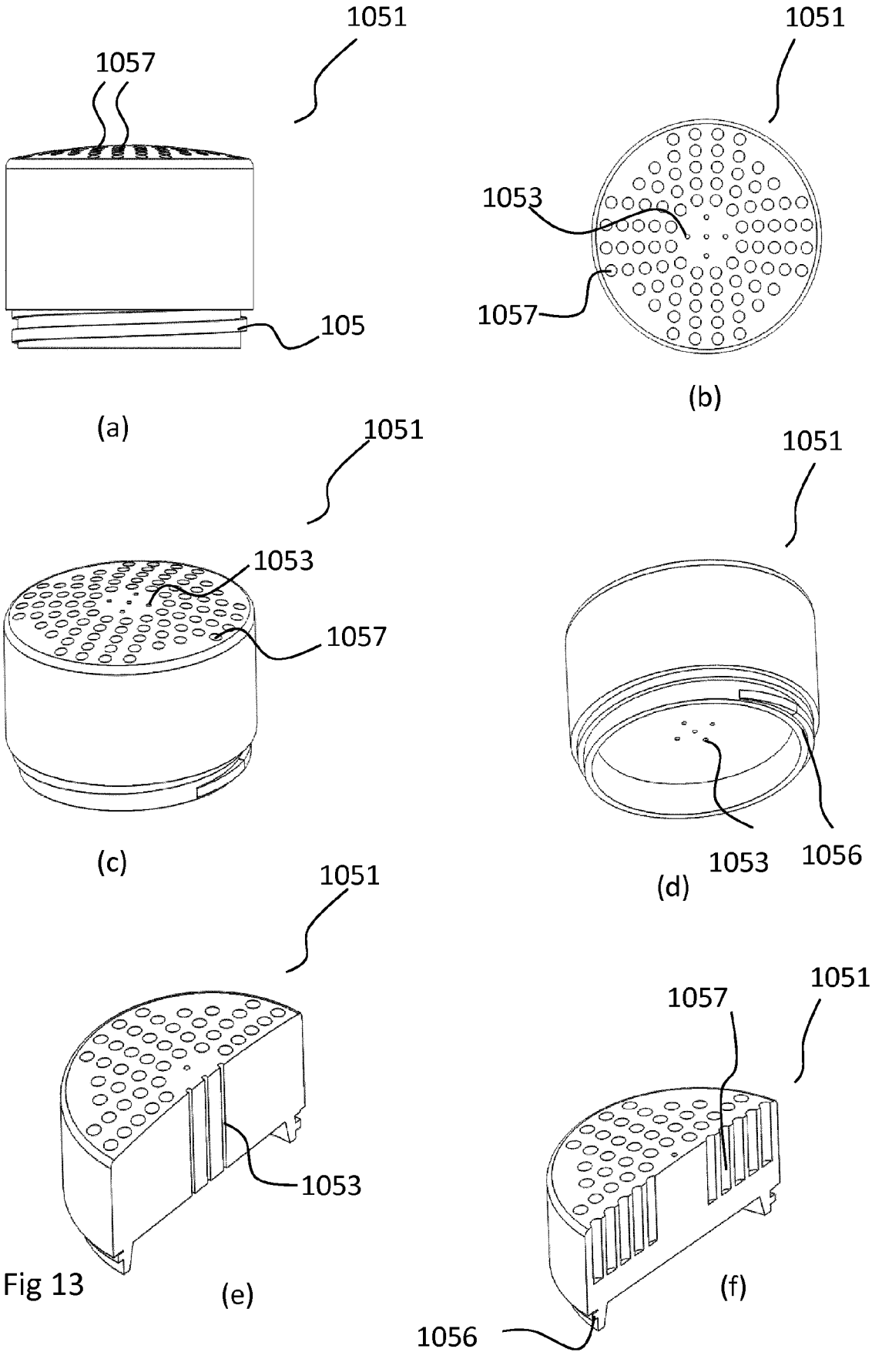
Fig 12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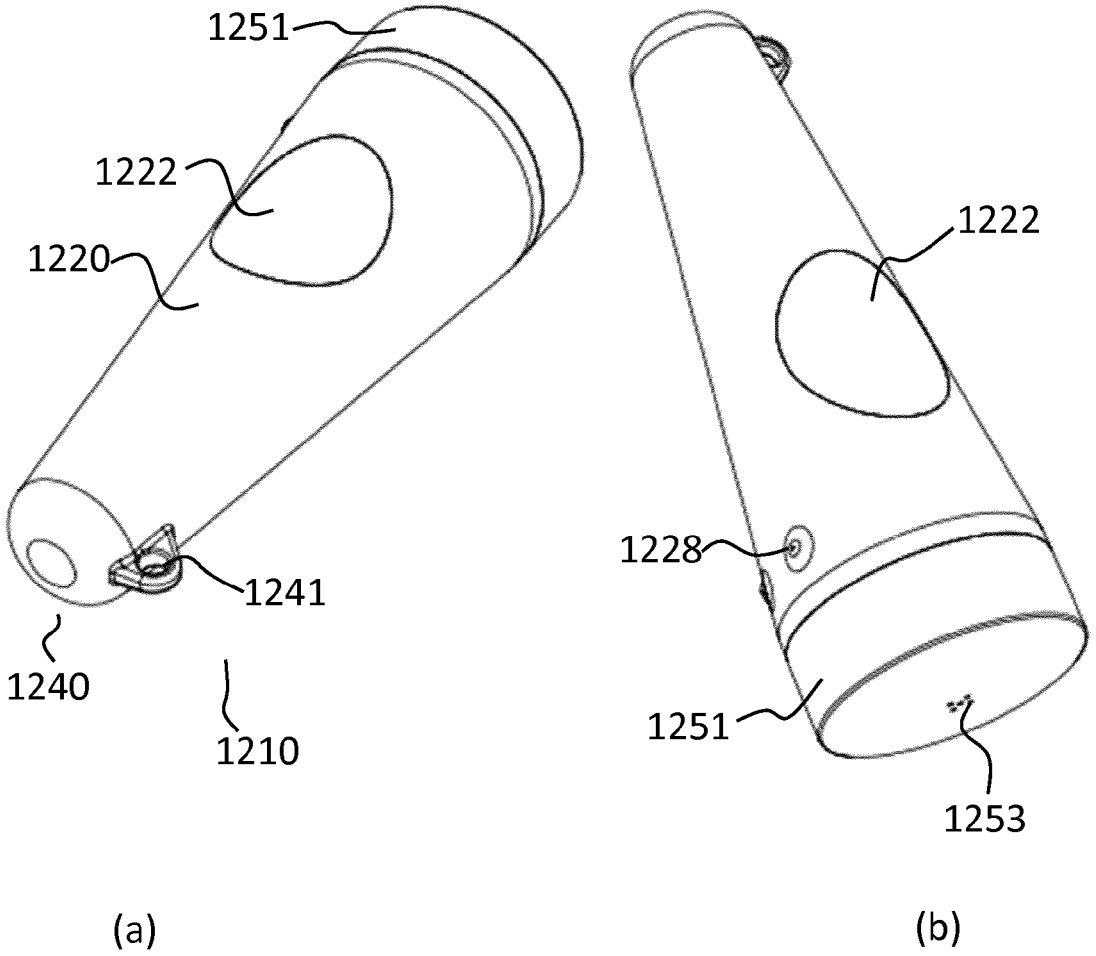
1056
(f)

Fig 13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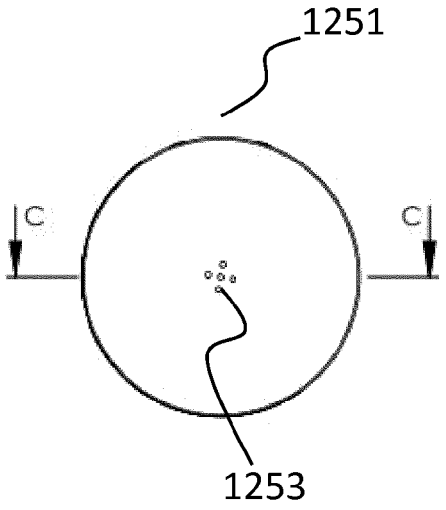
1253

(b)


1251
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1253

(c)

Fig 14

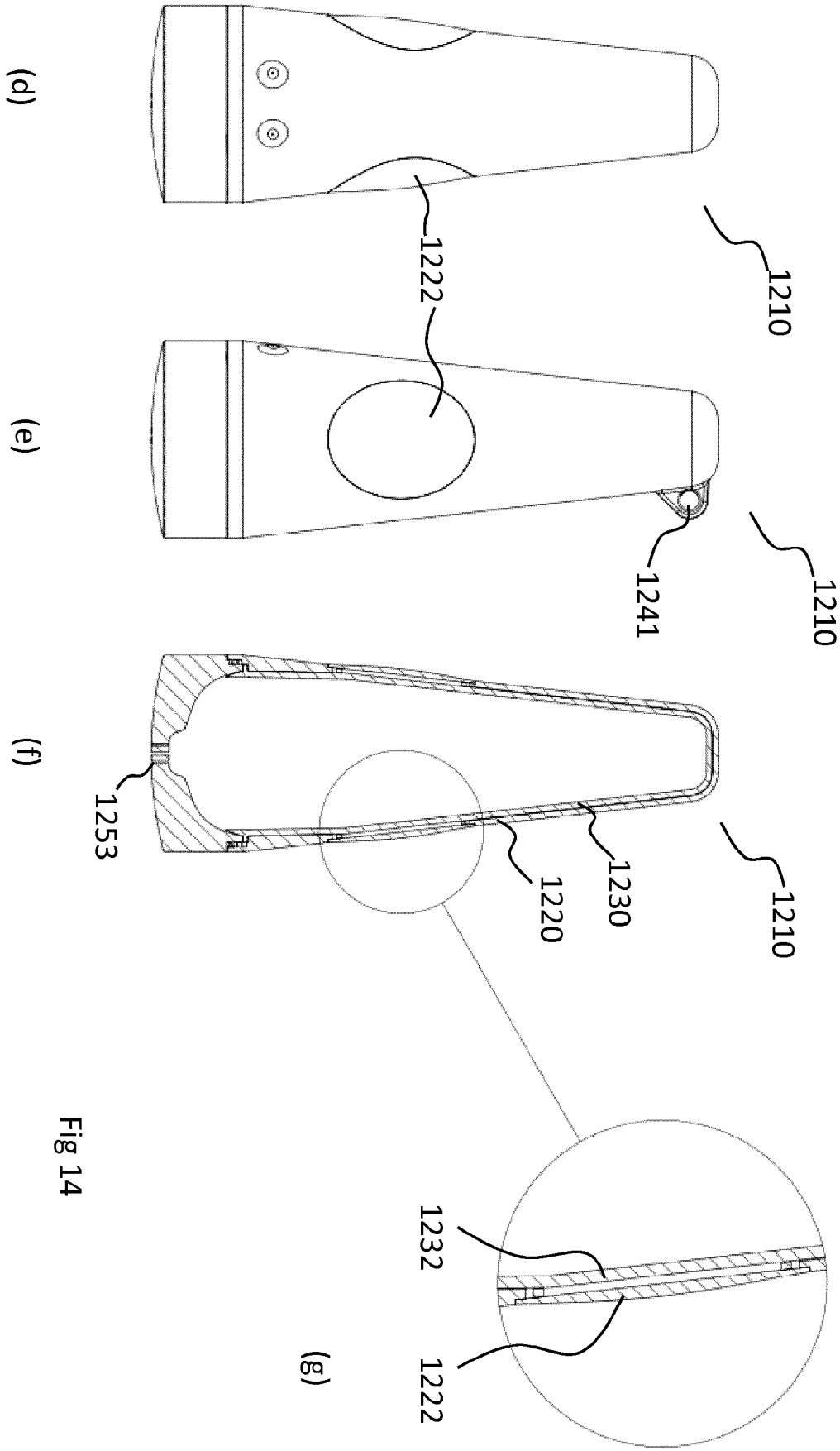


Fig 14

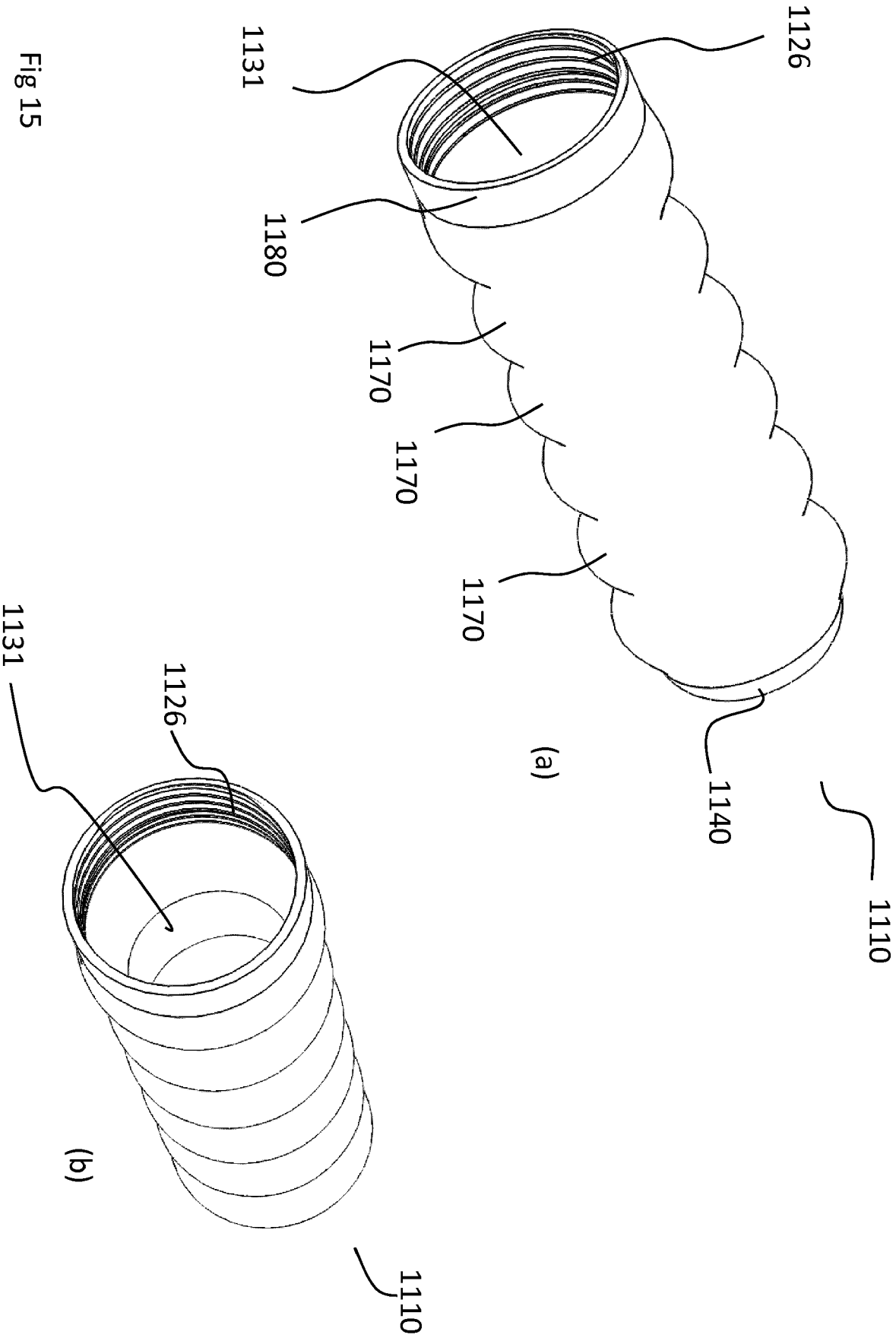
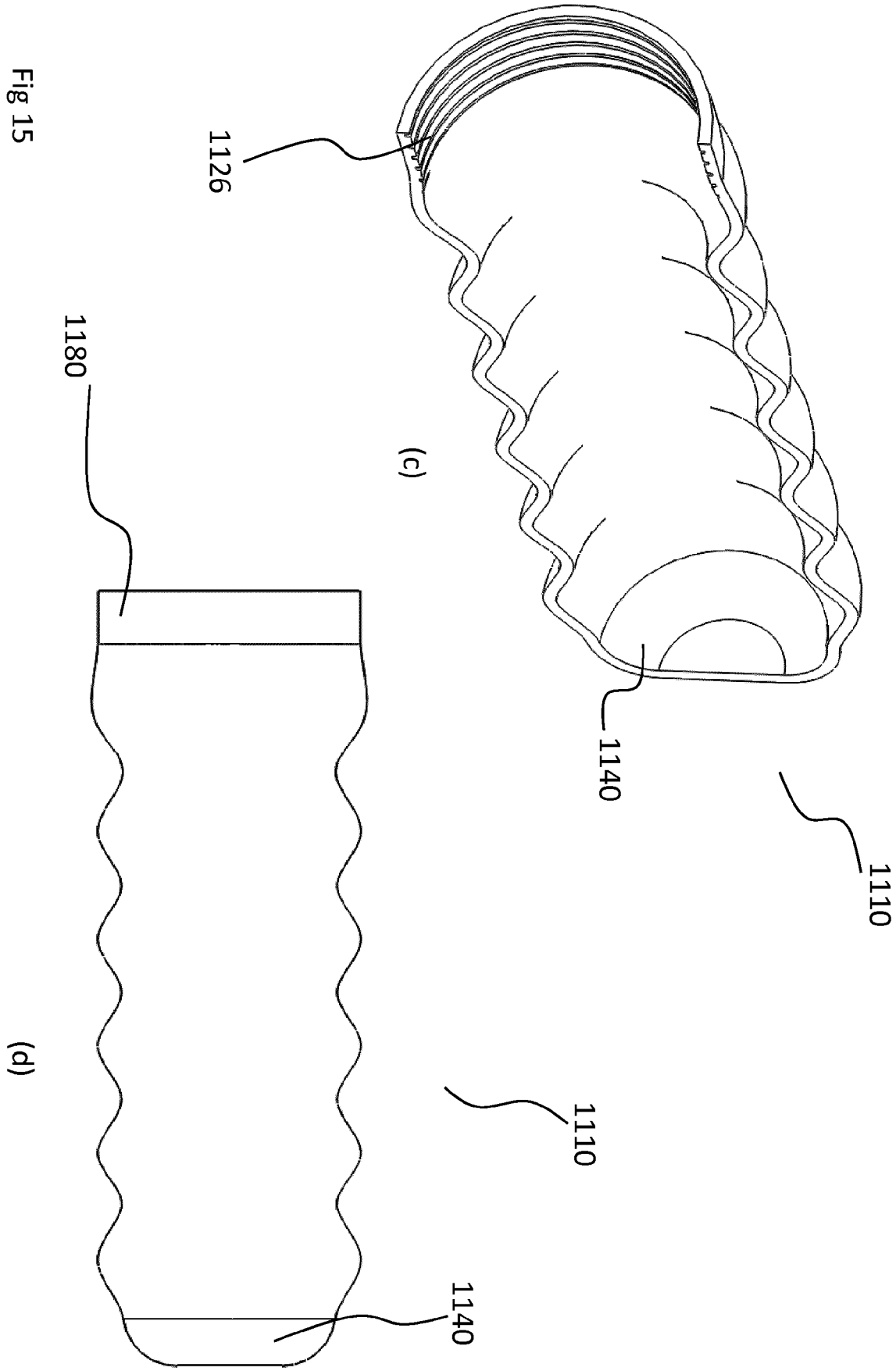


Fig 15

Fig 15



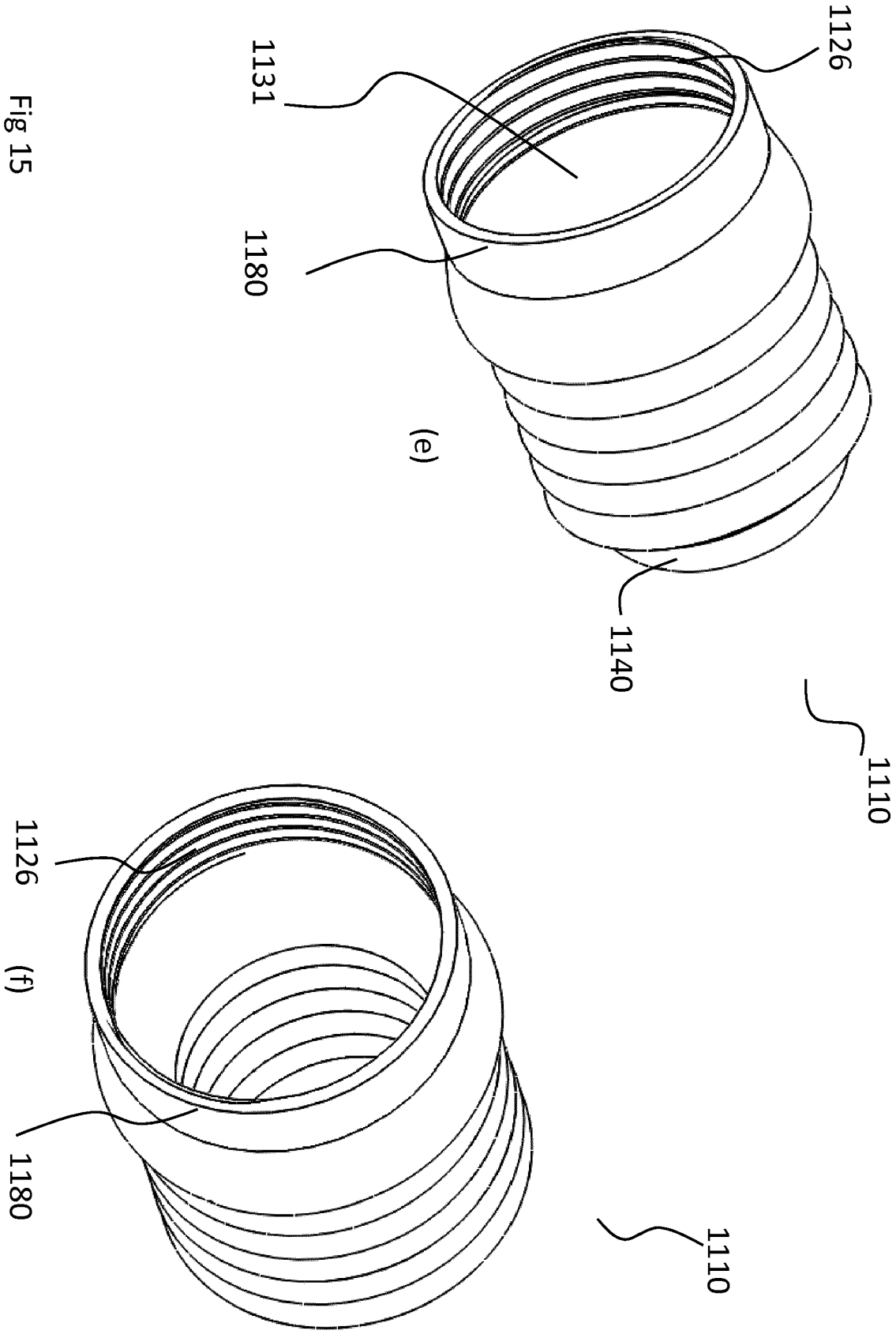


Fig 15

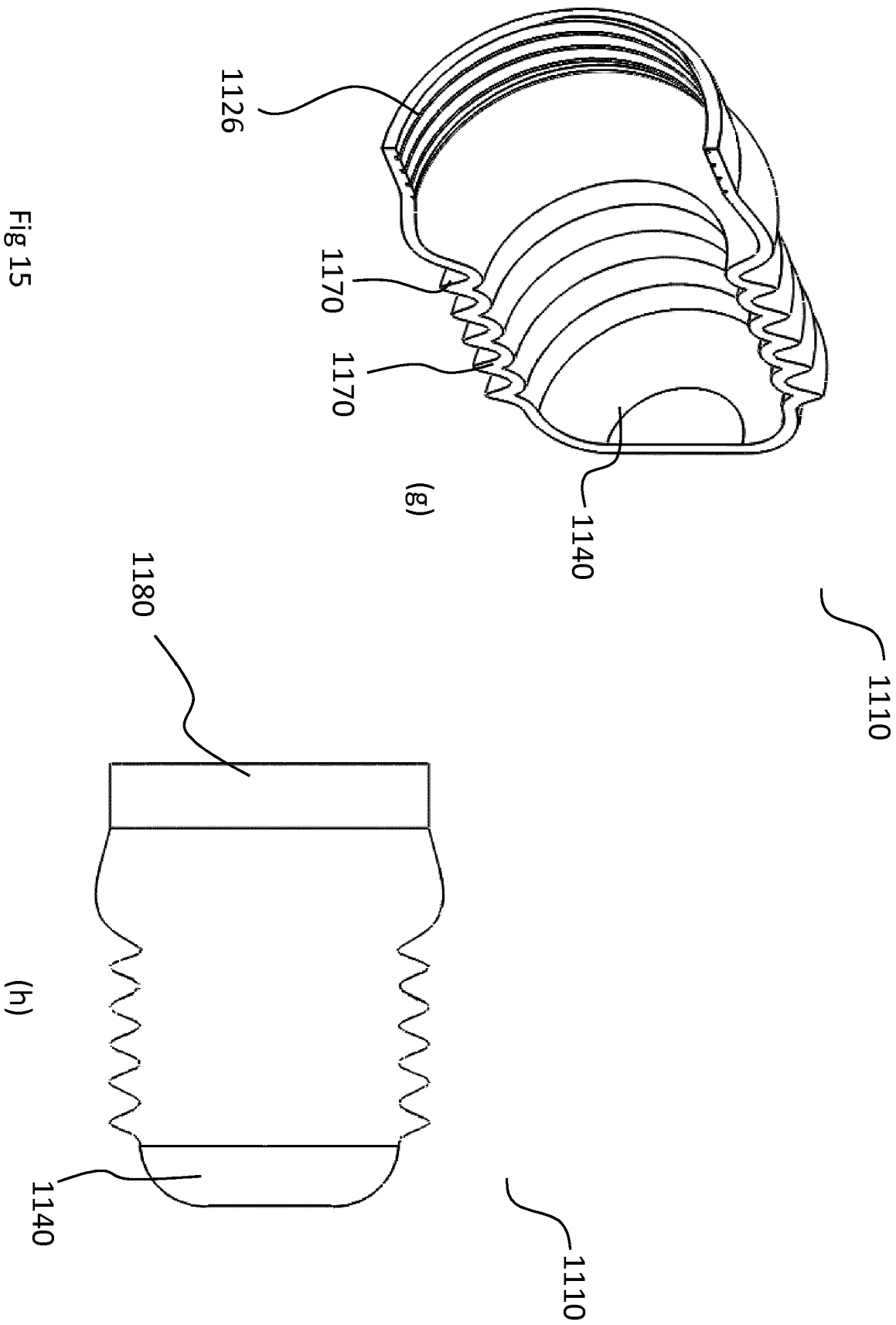


Fig 15