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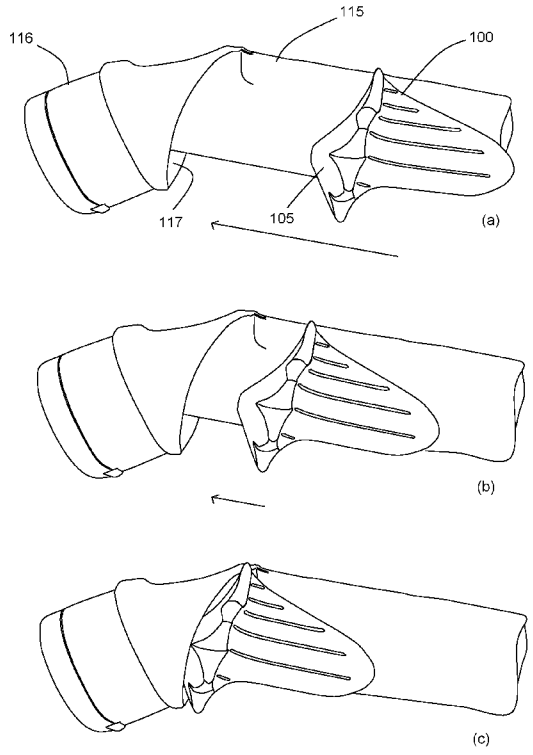

FIGURE 3

(57) Abstract: A method of manufacturing a device for extruding content from a tubular container, wherein the container has an opening proximate a distal end. The method comprising the steps of a) folding the body of a substantially tubular container lengthways from a proximal end to a distal end, b) wrapping a pliable mould around a portion of the folded body of said tubular container, c) forcing said mould toward the distal end of said container so as to engage the distal end of said mould with the distal end of said container and thus take an impression of the shape of the distal end of the container in a distal end of the mould, and d) removing said mould from the container and using said mould to create the shape of a distal end of the device. Further, a device for extruding content from a tubular container is being provided.

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EXTRUSION AID AND METHOD OF MANUFACTURE

The present invention relates to improvements in devices which assist in extruding viscous substance from a flexible container and to their method of manufacture. More particularly but not exclusively, the present invention relates to a device, and the associated method of manufacture, that when attached to a flexible tube container such as a toothpaste or moisturiser tube or the like and said device is moved along the tube from the lower section of the tube towards the tube lid, the lower section of the tube is compressed so as to displace the viscous contents of the tube toward, and ultimately out of, the opening at the tube lid. A preferred use for the present invention is thus the stripping out of the contents of a toothpaste or moisturiser tube. It will be apparent, though, that the present invention could also be used in many other situations concerning the removal of content from a flexible container.

Many devices exist which aim to tackle the everyday problem of removing the last few percent of content from a flexible tube container. The majority of said devices work on the basis of feeding the tube through a narrow gap such that movement of the device along the outer walls of the tube from a lower section towards the tube lid acts to squeeze said tube walls and strip, displace, extrude or the like, the contents of the tube in the direction of movement of the device.

An example of such a device is described in US4778082 A. This device comprises a handle and has a slot disposed near an edge thereof through which the flat end of a tube is inserted. Once a tube is inserted, the user may strip the tube contents from the tube by holding the base of the tube with one hand and pulling the device along the tube and away from the tube base.

However, the slot of this device will not readily accommodate tubes that differ significantly in diameter or width. The device also requires two-handed use, which is inconvenient should the device be being used to dispense toothpaste onto a toothbrush or moisturiser into a hand. Furthermore, the device is designed to be gripped at the flat, handle, portion and so the user cannot easily impart any force to further narrow the slot in order to squeeze any further the tube passed therethrough.

US5657903 A describes a device wherein the slot into which a tube is placed has one open side to thus enable tubes of varying sizes to be inserted. However, this device does not address the issue that the requirement of two-handed use leaves the user unable to hold an item such as a toothbrush with their free hand.

One-handed tube squeezers are known but typically rely on a complex arrangement of rollers, ratchets and a trigger as described, for example in US3291344 A.

Furthermore, one problem with the aforementioned tube squeezers remains that in forcing tube content from the tube base towards the lid a large proportion of content becomes stuck around the shoulders of the tube adjacent to the lid. Known tube squeezers do not address the issue of pressing against the shoulders and neck area of a tube which is proximate the tube lid. Thus a majority of content forced up towards the tube lid by the use of the prior art devices is driven into the areas surrounding the opening at the tube lid and not out of the opening itself.

A problem exists, therefore, of providing a device which overcomes the aforementioned issues by aiding the removal of content from a flexible tube container wherein said device may be operated with one hand, said device accommodates a broad range of container sizes, and said device is

simple to manufacture and use.

A problem also exists that flexible tube containers are used to store and dispense many different products, from, for example, toothpaste, moisturiser, glue, filler and sealant to resin, putty, paint and sauces. The containers therefore differ greatly in size and shape. Consequently, a 'one size fits all' device is not as effective as a bespoke device and so it would be advantageous to be able to quickly and easily form a bespoke extrusion aid for a particular container.

According to a first aspect of the present invention, there is provided a method of manufacturing a device for extruding content from a tubular container, wherein the container has an opening proximate a distal end,

the method comprising the steps of:

a) folding the body of a substantially tubular container lengthways from a proximal end to a distal end,

b) wrapping a pliable mould around a portion of the folded body of said tubular container,

c) forcing said mould toward the distal end of said container so as to engage the distal end of said mould with the distal end of said container and thus take an impression of the shape of the distal end of the container in the distal end of the mould,

d) removing said mould from the container and using said mould to create the shape of a distal end of the extrusion device.

By folding the container 'lengthways' it is meant folding the container

along a crease, wherein the crease is substantially parallel to a longitudinal axis of the container. Folding the container lengthways thereby results in a reduction of the containers width (for example, if the crease is disposed approximately in the centre of the container then folding lengthways will reduce the container's width by approximately half) but no reduction in length.

A method in accordance with the invention of manufacturing a device for extruding content from a tubular container has the distinct advantage that it becomes simple and quick to create a bespoke extrusion aid with a distal end shaped so as to engage as closely as possible with the walls and shoulders of said container. Thus extrusion aids suitable for use with at least the many different applications listed above may be manufactured, each with subtly different shapes at the distal end generated by the varying dimensions of flexible container used.

Furthermore, the step of folding the body of the tubular container may, advantageously, create a radially outward extending portion proximate the distal end of said container and step (c) may comprise engaging the mould with said radially outward extending portion of said container. This radially outward extending portion can be easily pushed against as, in use, the extrusion device is slid along the length of a container received therein. Therefore, it is advantageous to create a mould for manufacturing an extrusion device which has an end which matingly engages as closely as possible with the walls of a flexible container at the distal end. The mould can then be used to create said extrusion device that most closely engages with the desired container.

Preferably step (c) comprises forcing the mould lengthways along the length of said container.

The step of using the mould may be to create a head at the distal end of the device. The step of using the mould may be to create a bulbous head at the distal end of the device. By bulbous head it is meant a portion of the device which has a radius substantially greater than the radius of the majority of the device. In some embodiments, the bulbous head may be a substantially hemispherical protrusion at the distal end of the device. In some embodiments the dimensions of the bulbous head (radius, length, width etc.) may be greater than the corresponding dimensions of the reminder of the device. In this way the bulbous head provides an enlarged protrusion at the distal end of the device that can engage with a corresponding part of the tube to assist in forcing out the tube's contents. The bulbous head also provides a stop to prevent the user's finger sliding off the device.

The method may also include the step of using the mould to create a convex mouth indent at the distal end of the device. Such a step is to create a mould, and thus a device, which engages with the intended container as closely as possible.

Forcing the mould toward the distal end of the container may comprise removing substantially all of the contents of the tube such that, at the time the impression of the shape of the distal end of the container is taken, substantially all of the tube's contents have been removed. Preferably, the impression is taken when the tube has been substantially evacuated, or as much as possible of the tube's contents have been removed. Most preferably, the impression is taken when the tube is empty of all contents, to the extent that this is possible. This means that the distal end of the device is shaped so as to complementarily engage the container when the container is in a substantially empty configuration. This, in turn, means that when the distal end of the device is urged toward the distal end of the container, the container is urged into a substantially empty

configuration by virtue of the complementary engagement between the device and the container. The greater the degree of engagement between the device and the container, the more the container is forced into a configuration where it is empty of its contents. It will be apparent that movement of the device towards the 'lid' or opening of the container will force the container to resiliently deform to a geometry where the container is empty. In this way, movement of the device causes extrusion of the container's contents.

The present invention thus provides a device designed to distort the container or tube into a substantially empty configuration. Distorting the container or tube into this configuration necessarily results in the container evacuating its contents, thereby resulting in substantially all of the contents being removed from the container.

According to a second aspect of the present invention, there is provided a device for extruding content from a container, the device comprising:

a distal end and a proximal end,

first and second opposing engagement members that extend from the distal end to the proximal end to define two interior facing walls,

and a head proximate the distal end of the device,

wherein the two interior facing walls define a slot therebetween for receipt of the container,

said slot comprising an open end and a blind end.

By blind end it is meant a substantially closed end. Therefore, the slot may be substantially 'V' or 'U' shaped, with the blind end of the slot corresponding to the lower part of the 'V' or 'U'. In this way, the slot resembles an open channel or trough with a substantially 'V' or 'U' shaped cross section when taken at locations along its length. An extrusion device in accordance with the invention has the advantage that it may be made of one-piece of moulded plastic with no moving parts. As such the present invention is inexpensive, simple to manufacture and durable so as to withstand many years of regular use.

Furthermore, the bulbous head serves to, in use, engage with the head of the container received within the slot (i.e. the portion of the container near the container opening, out of which content is extruded). Engagement with said container head enables the user to push against this portion of the container.

Preferably, the device further comprises first and second opposing rails positioned on the interior walls of said engagement members, the first rail positioned on the interior wall of the first engagement member and the second rail positioned opposite the first rail on the interior facing wall of the second engagement member.

The rails enable the present invention to clip on to the container to be extruded by virtue of a close tolerance fit with the exterior walls of a container placed within the slot. As such, the present invention may be easily operated with one hand because the rails prevent the container received within the slot from inadvertently moving out of the slot in the direction of the open end of said slot.

Advantageously, the opposing engagement members are elastically deformable between a first position in which said members are proximate

each other and a second positon in which said members are ultimate from each other. This enables a user of the device to further grip onto a container received within the slot of the device and thus strip more difficult to remove content from said container by squeezing the engagement members of the present invention together.

Furthermore, any container content that has been impelled towards the container head when, in use, the extrusion device is forced along the container body from the proximal end (i.e. the base of the container) to the distal end (i.e. the head of the container) will collect at the container head in the container lid and around the portion of the container that surrounds the lid. Thus the container will generally be deformed by impelled content at this bottleneck so as to expand radially. As the container expands radially, the bulbous head of the present invention will engage with the now bulbous head of the container such that content collecting there can be pushed out of the container opening.

Typically, the content collecting at the head of a tube-like container is difficult to squeeze out. When the content is expensive, such as with luxury moisturiser, this can be particularly galling for the user.

Advantageously the bulbous head further comprises a convex portion, wherein the convex portion extends distally from the open end of the slot towards the blind end of the slot. The head may further comprise a sloped face projecting radially outward about the blind end of the slot, the face sloping proximally from a distal most point proximate the blind end of the slot. The head can be shaped in this manner such that, in use, it matingly engages with the exterior walls of a container inserted within the device; specifically the bulbous head may matingly engage with the region of a container surrounding the container opening, i.e. the shoulder portion of a container proximate the tube head.

The opposing engagement members may be elastically deformable between a first position in which said members are proximate each other and a second positon in which said members are ultimate from each other. This enables the device to be squeezed by a user such that a squeezing force can be further imparted to a tube when the device is in use.

Advantageously, the distal end of the device further comprises a mouth shaped to receive a portion of the distal end of the container in use. The mouth is preferably proximate the blind end of the slot and may be a convex indent formed about the blind end of the slot at the distal end of the device. Such an arrangement enables the head of the device, in use, to engage with the exterior walls of a container at the region where the container body meets the container shoulders. This is typically a region in which container content becomes lodged and is difficult to push out of said container. Advantageously, the device is shaped so as to engage with the container walls in a manner that is as flush and complementary as possible whilst accommodating as wide a variety of container sizes and volumes as possible.

A lip may extend radially outward from the slot defined by the engagement members, said lip preferably being positioned laterally along the device between the distal end and the proximal end. The lip is shaped so as to allow a user to push thereagainst and thus force the device, in use, along the length of a container received within the container slot.

Preferably, at least one rail runs parallel to the blind end of the slot defined by the engagement members. The rail may be positioned proximate the blind end of the slot defined by the engagement members. Advantageously, the rail has a profile which includes a slope from the interior wall of the associated engagement member in towards the centre

of the slot and in the direction of the blind end of said slot. The rail may have a profile which includes a projection substantially perpendicular from the interior wall of the associated engagement member in towards the centre of the slot. Furthermore, the at least one rail may taper towards the interior wall of the associated engagement member at the distal end of the device and may taper towards the interior wall of the associated engagement member at the proximal end of the device. Such an arrangement enables the device to clip onto the exterior walls of a container received within the slot such that one-handed operation is possible, i.e. no hand is required to hold the device onto a container received within the slot and one hand is sufficient to push the device along the length of a container received within the slot.

The width of the slot may reduce from a maximum at the distal end of the device to a minimum at the proximal end of the device. Similarly, the width of the slot may reduce from a maximum at the open end of said slot to a minimum at the blind end of said slot. These slot width reductions mean that it requires less force for a container to be received within the slot from proximal to distal direction and from a radially outward to a radially inward direction. Thus the force applied to the walls of a container received within the device gradually increases as the device is moved both distally and when the device is pushed onto a container to clip therearound.

A grip portion positioned on the exterior wall of at least one engagement member advantageously enables the device to be moved over a container received within the slot so as to force content from said container in the direction of movement of the device. The grip portion is preferably positioned on the device proximally with respect to the distal end and may comprise at least one raised portion extending in the longitudinal direction from the proximal end of the device towards the distal end of the

device. Advantageously, the grip portion extends from the proximal end of the device to the lip.

According to a further aspect of the present invention, there is provided a method of using the aforementioned device, comprising the steps of:

a) folding a tubular container lengthways,

b) inserting the proximal end of said container into the slot such that the fold line of said container is adjacent the blind end of the slot

c) sliding the device along the length of the inserted container from the proximal end of said container to the distal end,

d) pushing the distal end of the device against the distal end of the container.

Such a method enables the device of the present invention to be used to extrude content from a flexible walled container. By folding the container lengthways the contents of the tube are compressed in a manner which does not obstruct the flow of the contents from one end of the tube to the other. As stated above, folding lengthways does not change the length of the tube and so the device of the present invention may be slid along the entire length of the tube, after the tube has been folded. In some embodiments it may be preferred to fold the tube widthways before folding it lengthways in order to substantially half its length, depending on the needs of the user, to thereby further compact the contents of said tube before application of the device. The device may then be applied to the, reduced length, folded tube and slid along its length. Due to the extra fold, the folded tube will have greater thickness.

Advantageously, wherein the device comprises first and second opposing rails on the interior facing walls of the engagement members, step (b) may further comprise snap fitting the device to the inserted container by interaction with said first and second opposing rails. Step (b) may be performed by sliding the blind end of the slot on to the container from a direction substantially longitudinal to said fold line. Step (b) may be performed by sliding the blind end of the slot on to the container from a direction substantially perpendicular to said fold line of the container. Step (b) may be performed by sliding the blind end of the slot on to the container from a direction any angle between substantially longitudinal or substantially perpendicular.

Further advantageously, step (e) may be performed wherein the proximal end of the container is folded toward the proximal end of the device and received within the slot so as to be retained in position by the device. This step has the advantage of preventing content in the container from sliding back from the distal end to the proximal end when the device and container are not being held by a user.

In order that the invention may be well understood, there will now be described an embodiment thereof, given by way of example, reference being made to the accompanying drawings, in which:

Figure 1 is a perspective view of a device according to the invention;

Figure 2 is a side view of the bulbous head of the device of Figure 1;

Figure 3 (a) is a side view of the device of Figure 1 in a use position, the device positioned toward the proximal end of a container;

Figure 3 (b) is a side view of the device of Figure 1, the device positioned between the proximal end of a container and the distal end of a container;

Figure 3 (c) is a side view of the device of Figure 1, the device positioned toward the distal end of a container and engaging a shoulder region;

Figure 4 is side view of the device of Figures 1 – 3;

Figure 5 is a side view of the device of Figures 1 – 4, showing the opposite side to Figure 4;

Figure 6 is an end on view of the device of Figures 1 – 5, showing the opposite end to Figure 2;

Figure 7 is a side view of the device of Figures 1 – 6; and

Figure 8 is a side view of the device of Figures 1 – 7, showing the opposite side to Figure 7.

Referring firstly to Figures 1 and 2, there is shown an extrusion device 100 to help extrude, strip, squeeze or the like, content from a flexible walled container; such content being malleable, for example, moisturiser, toothpaste, glue, etc.

The extrusion device 100 comprises a body 101 formed from one piece of moulded plastic with a proximal end 102 separated axially from a distal end 103. At the proximal end 102 of the body 101 is located a grip region 104 and at the distal end 103 is located a bulbous head 105. The grip 104 and head 105 are separated by a radially outward extending lip

106 which provides a shoulder on which a user can push as, in use, they force the extrusion device 100 along the length of a flexible container.

A slot 107 runs along the length of the device 100 from the proximal end 102 to the distal end 103 and is a U-shaped channel. The slot 107 has a longitudinal axis substantially parallel to the longitudinal axis of the device 100 (the longitudinal axis of the device 100 being from the proximal end 102 to the distal end 103). The slot 107 has a blind end 108 and an open end 109, with both ends extending along the longitudinal axis of the slot, i.e., the open end 109 is the open part of the U-shaped channel and the blind end 108 is the bottom or closed part of the U-shaped channel. Two opposing engagement members 112 extend radially outwardly from the blind end 108 to the open end 109 to form the U-shaped channel. In this way, the opposing engagement members 112 also extend the length of the slot 107. As shown in Figure 1, the length of the slot 107 is substantially equal to the length of the device 100 and thereby the lengths of the opposing engagement members 112 extend substantially the length of the device 100. The slot 107 reduces from a maximum width at the open end 109 to a minimum width at the blind end 108. In this way the slot 107 opens out from the blind end 108 to the open end 109. The engagement members 112 and blind end 108 run axially along the length of the device 100 from approximately the centre of the head 105 at the distal end 103 to the proximal end 102. The open end 109 of the slot is positioned radially outward from the blind end 108 and also runs the length of the device 100 to thus form the u-shaped channel.

The head 105 of the device 100 comprises a sloped face 114 which projects radially outward about the blind end 108 of the slot 107. The face 114 slopes proximally from a distal most point at the blind end 108 of the slot 107.

First and second opposing rails 111 are positioned on the interior walls of the engagement members 112; the first rail positioned on the interior wall of the first engagement member 112 and the second rail positioned on the interior wall of the second engagement member 112. The rails 111 extend the full width of the engagement members 112 from the distal end 103 of the device 100 to the proximal end 102 and are parallel to the blind end 108 of the slot 107. Each rail 111 has a profile which comprises a slope from the interior wall of the associated engagement member 112 in towards the centre of the slot and in the direction of the blind end 108 of the slot 107. Each rail 111 then extends back to the interior wall of the associated engagement member 112 to meet there substantially perpendicularly. Furthermore, the distal and proximal ends of each rail 111 include a taper out from the associated interior wall to a point of maximum protrusion of said rail 111 into the u-shaped channel.

The grip region 104 comprises a series of spaced apart substantially parallel raised surfaces, i.e. ridges 113 which extend proximally from adjacent the lip 106. In a similar manner to the rails 111, each ridge 113 tapers outwardly from a minimum protrusion at the proximal and distal ends to a maximum protrusion.

The extrusion device 100 further comprises a mouth 110 located at the distal end 103. The mouth 110 is formed about the blind end 108 of the slot 107 and is a cut-out or convex indent in the sloped face 114. It is shaped in such a manner as to receive the folded distal end of a flexible container when the device 100 is in use.

Referring now to Figures 3 (a) (b) and (c), there is shown the device 100 in use. Firstly the user takes a flexible walled container 115 containing content to be removed and folds said container 115 in half lengthways from

the proximal end, or base, of the container 115, to adjacent the lid 116 of the container 115 located at the distal end. As can be seen from Figures 3 (a) (b) and (c) the length of the container 115 is substantially unchanged when folded in this way. The device 100 is then clipped onto the folded container 115 by receiving said container 115 within the slot 107 of the device 100. The rails 111 engage with the folded walls of the container 115 and secure the container 115 within the slot 107 via a friction tight fit. The arrangement of the rails 111, i.e. parallel to the blind end 108 of the slot 107, enable a clipped on device 100 to still move along the length of a container 115 to which said device 100 is clipped. The sloped profile of the rails 111 as hereinbefore described enables the container to be easily and snuggly received and fastened within the slot 107.

The user may then grip the device 100 by the grip region 104. Engagement between the ridges 113 and the user's fingers will minimise slipping when the user grips the device 100. The user may then slide the device 100 along the length of the folded container 115 toward the lid 116 of the container. This motion of the device 100 along the container 115 forces the container contents toward the lid of the device such that the remaining container contents accumulate around a shoulder region 117 of the container surrounding the lid 116. As the device is further slid along the length of the folded container 115, the bulbous head 105 of the device 100 is forced into the shoulder region 117. The bulbous head 105 also acts as a stop to prevent the user's fingers from sliding off the distal end of the device in use. The action of forcing the device 100 distally along the length of the container 115 impels the content of the container 115 towards the container lid 116, and any content which settles in the shoulder region 117 around the lid 116 is forced out of the container by the action of the bulbous head 105 of the device 100 engaging the walls of the container 115 at the shoulder region 117. The shape of the bulbous head 105 is such that the device matingly engages at the shoulder region 117 to thus

force a high percentage of content located there from said container, because, as will be descibred more fully below, the bulbous head 105 is shaped such as to force the container 115 into a substantially empty configuration.

In order that the bulbous head 105 is shaped to most effectively engage with the aforementioned shoulder region 117 of a container 115 received within the device 100, the device 100 is manufactured in the following manner:

A pliable mould is wrapped around a container 115 which has been folded lengthways in the aforementioned manner. The mould is forced lengthways along the container 115 and into the shoulder region 117 of said folded container 115 such that the distal end of the mould takes an impression of the container surface topography at the shoulder region 117.

Moving the mould lengthways along the container 115 and into the shoulder region 117 may result in substantially all of the contents of the container 115 being removed from the part of the container 115 that the mould has traversed – such that the remaining contents are all forced towards the shoulder region 117. Continuing to move the mould lengthways may result in any remaining contents in the shoulder region 117 being forced from the container, such that the mould may be forced into the shoulder region 117 when the container 115 is substantially empty – i.e. when the mould is forced into the shoulder region 117 the container 115 is in a substantially empty configuration. In other embodiments the container 115 may already be substantially empty of its contents before the mould is forced along the container 115 and into the shoulder region 117. The impression taken by the distal end of the mould may therefore be such that it is complementary to the container surface topography at the shoulder region 117 when the container 115 is in an empty configuration.

The mould is then removed from the container 115 and the impression of the shoulder region 117 formed in the mould is used as a basis for creating the shape of the bulbous head 105 of the device 100. This means that, if the impression is taken after the mould has been forced into the shoulder region 117 when the container is in a substantially empty configuration, the bulbous head 105 of the device 100 will be complementary to the empty container 115. The more the bulbous head 105, created in this way, is urged toward the distal end of the container 115, the more the container 115 is resiliently forced to adopt an empty configuration. Specifically, the fact that the head 105 is designed to complementarily engage the distal end of an empty container, the greater degree of engagement between the head 105 and the container, the more the container 115 is urged into an empty configuration. Therefore, when the degree of engagement between the head 105 and (the shoulder region 117 of) the container 115 is as maximal as possible, substantially all of the contents of the container 115 will have been evacuated.

In this way, the shape of the device 100 is such that urging the device 100 along the length of a container 115 forces the contents out of the container 115, as the container 115 is urged into an empty configuration. Movement of the device 100 along the container length so as to engage with the shoulder 117 of the container 115 therefore extrudes substantially all of the contents of the container 115.

Such a manufacturing method enables a skilled person to create devices according to the present invention that differ slightly in their bulbous head 105 geometry depending on the size and type of container the mould is taken from. Regardless of the shape or configuration of each individual container, taking the mould when the container is in an empty configuration ensures that the resulting device is shaped so as to urge the

container into this empty configuration. Movement of the device therefore extrudes substantially all of the contents of the container by urging it into its empty configuration. Thus it is possible to quickly and easily create bespoke extrusion devices for use on any specific sizes, shapes, geometries etc. of flexible container.

It will be apparent that the device 100 as herein described could be used with many size and type of flexible walled container. It will also be apparent that the container 115 need not be folded lengthways before a pliable mould is forced into the shoulder region 117 adjacent the container lid to thus take an impression of the container 115 surface topography at that point.

The present invention is therefore not limited to the specific embodiments described above. Alternative arrangements will be apparent to a reader skilled in the art.

CLAIMS

1. A method of manufacturing a device for extruding content from a tubular container, wherein the container has an opening proximate a distal end,

the method comprising the steps of:

a) folding the body of a substantially tubular container lengthways from a proximal end to a distal end,

b) wrapping a pliable mould around a portion of the folded body of said tubular container,

c) forcing said mould toward the distal end of said container so as to engage the distal end of said mould with the distal end of said container and thus take an impression of the shape of the distal end of the container in a distal end of the mould,

d) removing said mould from the container and using said mould to create the shape of a distal end of the device.

2. A method according to claim 1, wherein the step of folding the body of the tubular container creates a radially outward extending portion proximate the distal end of said container.

3. A method according to claim 2, wherein step (c) comprises engaging the mould with the radially outward extending portion of said container.

4. A method according to any of the previous claims, wherein step (c) comprises forcing the mould lengthways along the length of said container.

5. A method according to any of the previous claims, comprising the step of using the mould to create a head or bulbous head at the distal end of the device.

6. A method according to any of the preceding claims, comprising the step of using the mould to create a convex mouth indent at the distal end of the device.

7. A method according to any of the preceding claims wherein the container is substantially empty of all its contents at the time the impression is taken.

8. A method according to claim 7 wherein the distal end of the extrusion device is shaped so as to complementarily engage with the distal end of the tubular container, when the tubular container is in an empty configuration.

9. A method according to claim 7 or 8 wherein forcing the mould toward the distal end of said container comprises evacuating the container of substantially all of its contents.

10. A device for extruding content from a container, the device comprising:

a distal end and a proximal end,

first and second opposing engagement members that extend from the distal end to the proximal end thereby defining two interior facing walls and,

and a head proximate the distal end of the device,

wherein the two interior facing walls define a slot therebetween for receipt of the container,

said slot comprising an open end and a blind end.

11. A device according to claim 10 wherein the head is shaped so as to complementarily engage with an end of the container when the container is in an empty configuration.

12. A device according to claim 10, further comprising

first and second opposing rails positioned on the interior walls of said engagement members,

the first rail positioned on the interior wall of the first engagement member and the second rail positioned opposite the first rail on the interior facing wall of the second engagement member.

13. A device according to any of the previous claims, wherein the head comprises a convex portion.

14. A device according to claim 13, wherein the convex portion of the head extends distally from the open end of the slot towards the blind end of the slot.

15. A device according to any of the previous claims, wherein the head comprises a bulbous head with a sloped face projecting radially outward about the blind end of the slot, the face sloping proximally from a distal most point proximate the blind end of the slot.

16. A device according to any of claims the previous claims, wherein the opposing engagement members are elastically deformable between a first position in which said members are proximate each other and a second positon in which said members are ultimate from each other.

17. A device according to any of the preceding claims, wherein the distal end of the device further comprises a mouth shaped to receive a portion of the distal end of the container in use.

18. A device according to claim 17, wherein the mouth is proximate the blind end of the slot.

19. A device according to claim 17 or claim 18, wherein the mouth is a convex indent formed about the blind end of the slot at the distal end of the device.

20. A device according to any of the preceding claims, further comprising a lip extending radially outward from the slot defined by the engagement members.

21. A device according to claim 20, wherein the lip is positioned laterally along the device between the distal end and the proximal end.

22. A device according to any of the preceding claims, wherein at least one rail runs parallel to the blind end of the slot defined by the engagement members.

23. A device according to any of the preceding claims, wherein at least one rail is positioned proximate the blind end of the slot defined by the engagement members.

24. A device according to any of the preceding claims, wherein at least one rail has a profile which includes a slope from the interior wall of the associated engagement member in towards the centre of the slot and in the direction of the blind end of said slot.

25. A device according to any of the preceding claims, wherein the at least one rail has a profile which includes a projection substantially perpendicular from the interior wall of the associated engagement member in towards the centre of the slot.

26. A device according to any of the preceding claims, wherein the at least one rail tapers towards the interior wall of the associated engagement member at the distal end of the device.

27. A device according to any of the preceding claims, wherein the at least one rail tapers towards the interior wall of the associated engagement member at the proximal end of the device.

28. A device according to any of the preceding claims, wherein the width of the slot reduces from a maximum at the distal end of the device to a minimum at the proximal end of the device.

29. A device according to any of the preceding claims, wherein the width of the slot reduces from a maximum at the open end of said slot to a minimum at the blind end of said slot.

30. A device according to any of the preceding claims, further comprising a grip portion positioned on the exterior wall of at least one engagement member.

31. A device according to claim 30, wherein the grip portion is positioned on the device proximally with respect to the distal end.

32. A device according to claim 30 or claim 31, wherein the grip portion comprises at least one raised portion extending in the longitudinal direction from the proximal end of the device towards the distal end of the device.

33. A device according to any of claims 30 to 32 when dependent on at least claim 16, wherein the grip portion extends from the proximal end of the device to the lip.

34. A method of using a device according to any of claims 10 to 33, comprising the steps of:

a) folding a tubular container lengthways to create a radially outward extending portion proximate the distal end of said container,

b) inserting the proximal end of said container into the slot such that the fold line of said container is adjacent the blind end of the slot,

c) sliding the device along the length of the inserted container from the proximal end of said container to the distal end,

d) pushing the distal end of the device against the radially outward extending portion proximate the distal end of said container.

35. A method according to claim 34 wherein the device comprises first and second opposing rails on the interior facing walls of the engagement members, and step (b) further comprises snap fitting the device to the inserted container by interaction with said first and second opposing rails.

36. A method according to claim 34 or 35 wherein pushing the distal end of the device against the radially outward extending portion proximate the distal end of said container urges the container into an empty configuration.

37. A method according to any one of claims 34 to 36 wherein wherein pushing the distal end of the device against the radially outward extending portion proximate the distal end of said container removes the contents of the container.

38. A combination of a container and a device according to any of claims 10 to 33 wherein the device is capable of being urged along the length of the container and against a distal end of the container such that the contents are evacuated from the container.

39. A combination according to claim 38 wherein the device comprises an end designed to complementarily engage with the distal end of the container when the container is in an empty configuration.

40. A combination according to claim 39 wherein the device is shaped such that urging the device against the distal end of the container results in substantially all of the contents of the container being evacuated.

41. A device for extruding content from a container substantially as herein described, with reference to the accompanying drawings.

42. A method of using a device for extruding content from a container substantially as herein described, with reference to the accompanying drawings.

43. A method of manufacturing a device for extruding content from a

container substantially as herein described, with reference to the accompanying drawings.

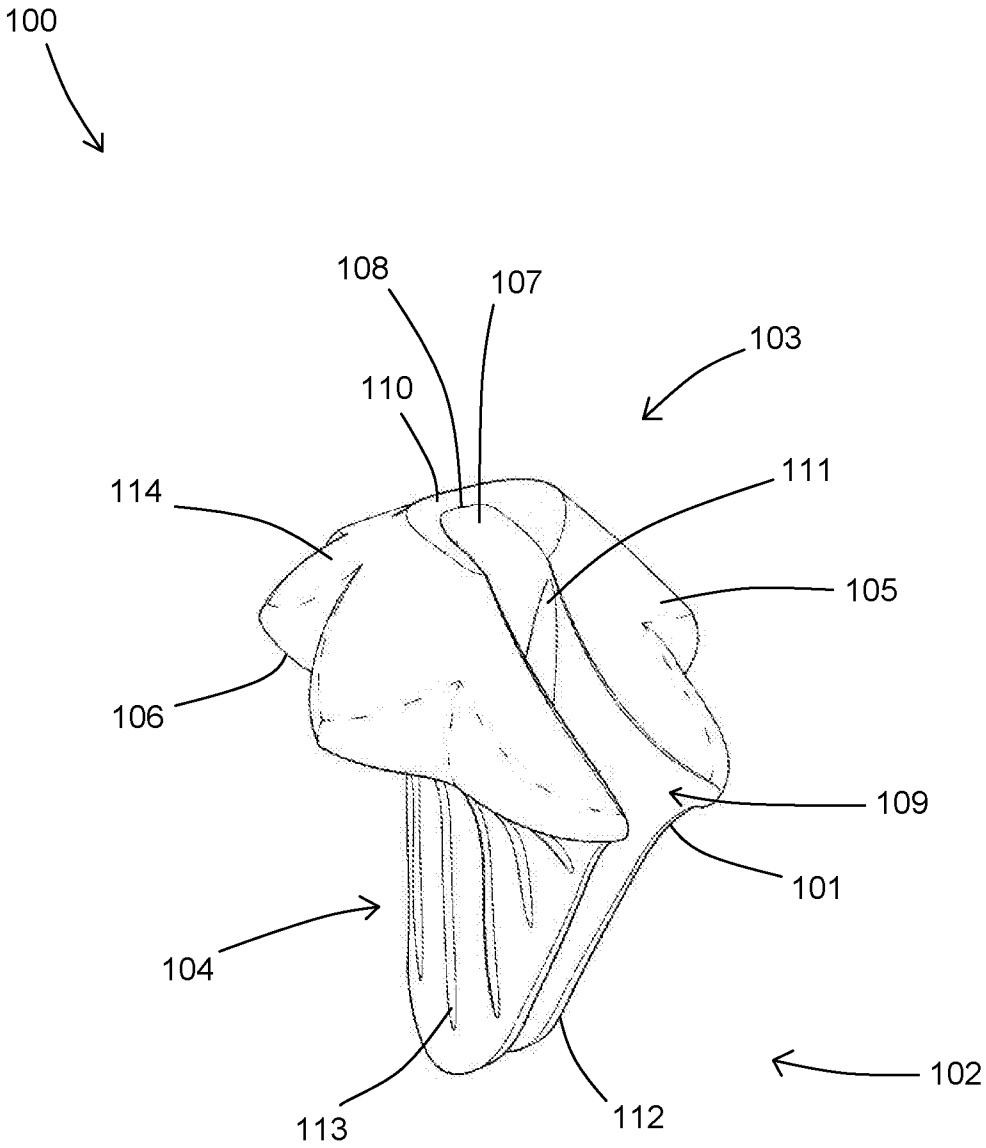

FIGURE 1

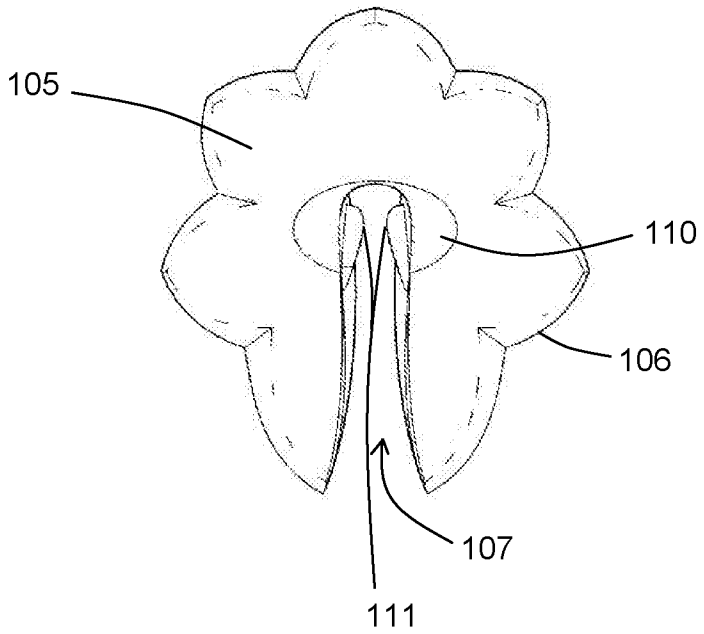

FIGURE 2

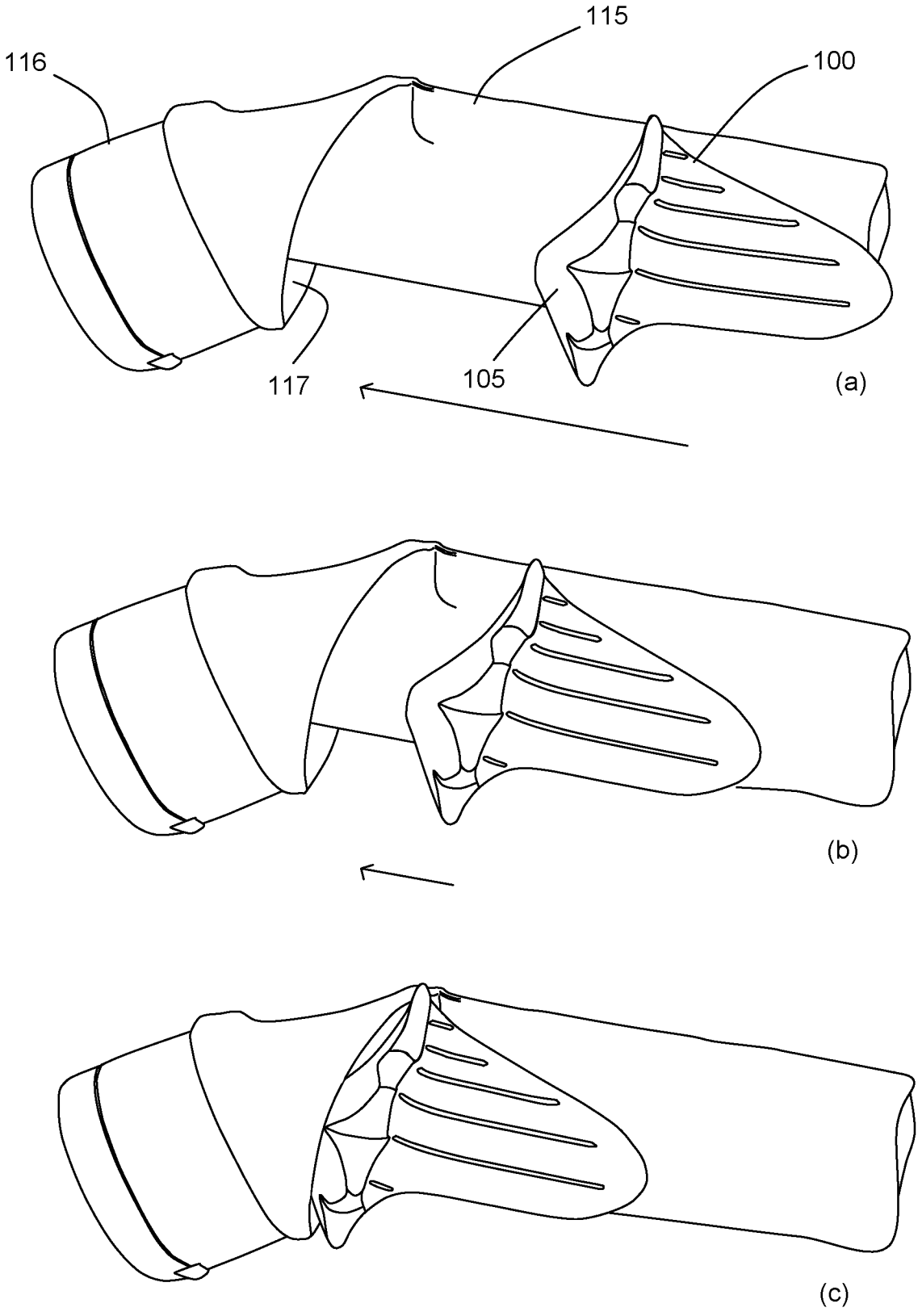

FIGURE 3

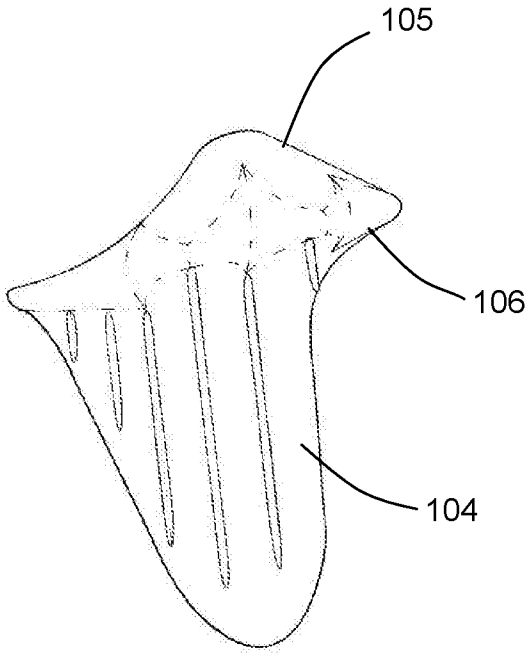

FIGURE 4

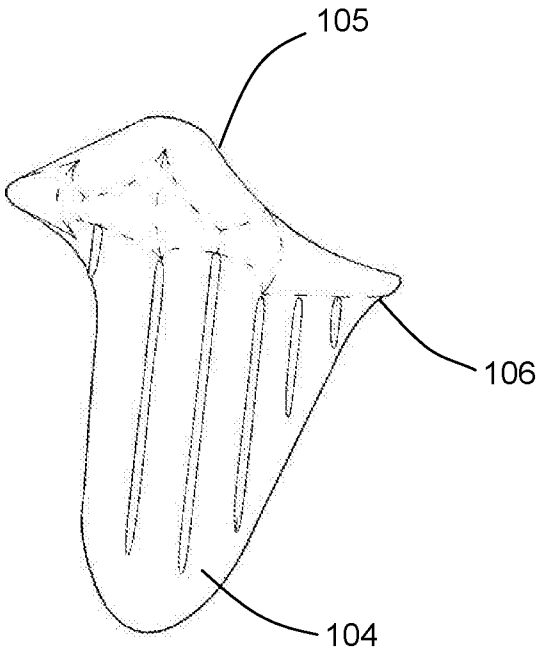

FIGURE 5

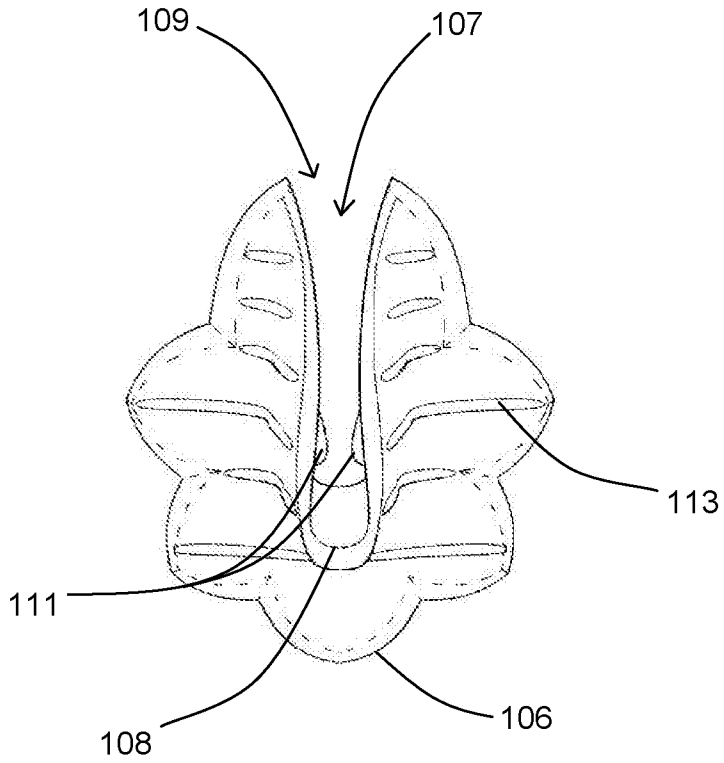

FIGURE 6

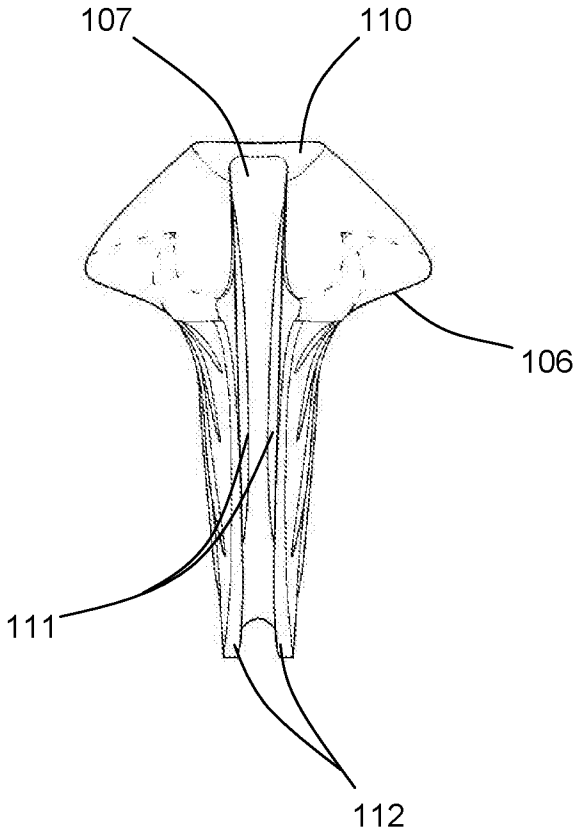

FIGURE 7

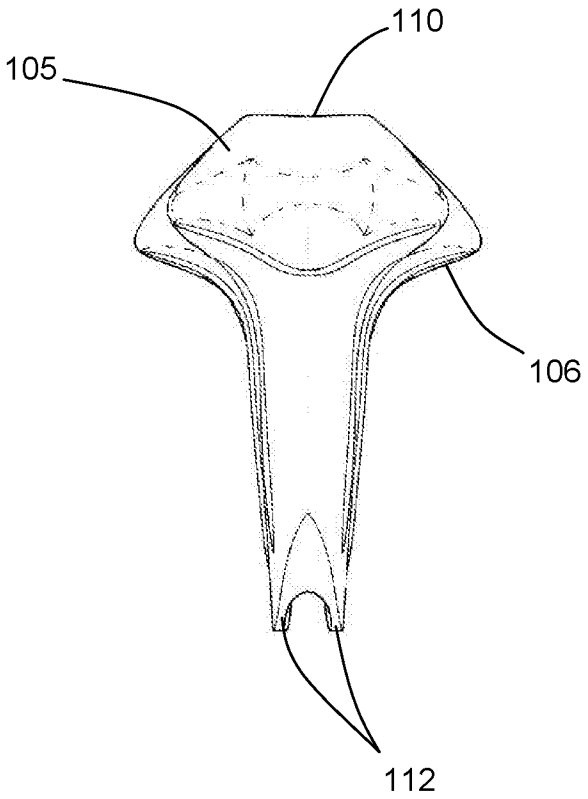

FIGURE 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2016/052988

A. CLASSIFICATION OF SUBJECT MATTER
INV. B29C33/38 B65D35/28
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B29C B65D B29L

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP H01 137850 U (TETSUO YOSHIDA) 20 September 1989 (1989-09-20)	10,11, 13,14, 30,41-43
A	figures 1-3	1,34

A	GB 1 302 892 A (FLOMARK LIMITED) 10 January 1973 (1973-01-10) figures 1-4	10

A	DE 20 2013 103549 U1 (UHU GMBH & CO KG [DE]) 28 August 2013 (2013-08-28) abstract figure 1	34

A	DE 11 42 131 B (KARL HENNERICH) 3 January 1963 (1963-01-03) figures 1-4	10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 December 2016	22/12/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Alink, Maarten

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2016/052988

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 35 34 667 A1 (TAEUBER WOLFRAM) 9 April 1987 (1987-04-09) claim 8 figure 2 -----	1

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2016/052988

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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GB 1302892 A	10-01-1973	NONE	
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