



(11)

EP 4 477 574 A1

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.12.2024 Bulletin 2024/51

(51) International Patent Classification (IPC):
B65D 75/58^(2006.01)

(21) Application number: **23178739.1**

(52) Cooperative Patent Classification (CPC):
B65D 75/5883

(22) Date of filing: **12.06.2023**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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(54) **ATTACHMENT STRUCTURE FOR SPOUT**

(57) An attachment structure (142) for a spout (140) including a nozzle portion (150) defining an elongated channel (157) and a flange structure (152) coupled to the nozzle portion. The attachment structure includes a base portion (144) configured to be engaged to the flange structure and defining a passage (146) adapted to be arranged coaxially to the elongated channel. The attachment structure includes a first finger portion (164) and a second finger portion (166) arranged spaced apart from each other and extending in a substantially longitudinal direction from the base portion. The first finger portion defines a first opening (182) and the second finger portion defines a second opening (184). The attachment structure includes an end wall (174) connecting the pair of finger portions and arranged opposite to the passage. The first opening and the second opening allow an exchange of the liquid between a bag container and the spout in an open position.

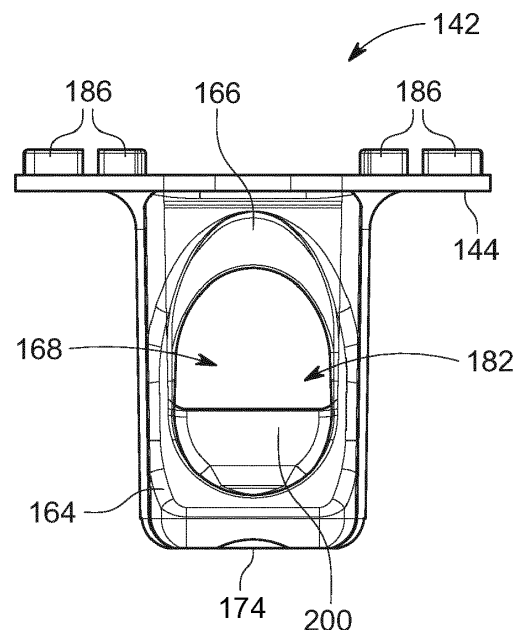


FIG. 4

Description

TECHNICAL FIELD

[0001] The present disclosure relates, generally, to a spout assembly, and more particularly to an attachment structure adapted to be coupled to a spout to facilitate a dispensing of a liquid from a bag container in an inverted position of the bag container.

BACKGROUND

[0002] Stand-up pouches with a spout are, generally, used to store various types of liquid, for example, food items such as ketchup, soup, etc., and non-food items, such as shampoo, liquid soaps, laundry detergent etc.. The stored product is dispensed from the pouch by inverting the pouch vertically. However, during vertically inverting the pouch for dispensing the liquid, an undesired and uncontrolled outflow of the liquid from the pouch happens, leading to a spillage.

SUMMARY

[0003] One aspect of the disclosure is to provide an attachment structure that can be engaged/attached to a spout to control an outflow of a liquid from a pouch in an inverted position of the pouch, thereby preventing a spillage of the liquid.

[0004] Another aspect of the disclosure is to provide an attachment structure that facilitates a selective flow of a liquid from a pouch.

[0005] Another aspect of the disclosure is to an attachment structure that enables a user to convert a standard spout to a finger spout that in conjunction with a bag container of a pouch acts as a valve to control flow of the liquid from the bag container in an inverted position of the bag container.

[0006] The above and other aspects of the disclosure are provided by an attachment structure for a spout of claim 1. The spout is adapted to be coupled to a bag container configured to store and dispense a liquid. The spout includes a nozzle portion defining an elongated channel and adapted to extend outwardly of the bag container and a flange structure coupled to the nozzle portion adapted to be arranged inwardly of the bag container.

[0007] In some embodiments, the attachment structure includes a base portion configured to be engaged to the flange structure and defining a passage adapted to be arranged coaxially to the elongated channel. The base portion is adapted to be arranged inside the bag container. The attachment structure further includes a first finger portion and a second finger portion arranged spaced apart from each other and extending in a substantially longitudinal direction from the base portion. The first finger portion defines a first opening adapted to be arranged facing a front wall of the bag container and the

second finger portion defines a second opening adapted to be arranged facing a rear wall of the bag container. The attachment structure further includes an end wall connecting the pair of finger portions and arranged opposite to the passage. The first opening and the second opening allow an exchange of the liquid between the bag container and the spout in an open position. The first opening is adapted to be covered by the front wall of the bag container and the second opening is adapted to be covered by the rear wall of the bag container in response to pressing of the bag container and holding the finger portions by a user to prevent the exchange of the liquid between the spout and the bag container. In this manner, the user can have better control over the filling and dispensing of the liquid. Specifically, the closing of the openings by the pressing the rear wall and the front wall against the finger portions prevents an outflow of the liquid from the bag container while vertically inverting the bag container.

[0008] In some embodiments, the flange structure includes at least one engagement structure and the base portion includes at least one retention structure adapted to be coupled with the at least one engagement structure to enable removable coupling of the spout with the attachment structure. The arrangement of engagement structure and the retention structure allows for easy attachment and detachment of the attachment structure with the spout.

[0009] In some embodiments, the attachment structure further includes a separator/deflector extending vertically towards the base portion from the end wall and is arranged between the first and second finger portions. The separator/deflector is configured to divide and deflect a liquid, received from the passage, towards the first and second openings. This separation and deflection of the liquid helps in reducing the turbulence of the liquid during filling of the liquid inside the bag container, thereby minimizing the foam generated during the filling process.

[0010] In some embodiments, the deflector/separator includes a divider extending substantially vertically and arranged substantially centrally between the first and second finger portions and a pair of guide structures extending on opposite sides of the divider and configured to direct and guide the liquid towards the first and second openings. The divider and the pair of guide structures together provide greater control over the filling process, ensuring that the liquid is filled into the bag container more precisely and consistently and reduces turbulence inside the liquid during liquid filling process.

[0011] In some embodiments, the pair of guide structures are arranged at a bottom of the divider and extends in a horizontal direction from the divider to smoothly direct and guide the liquid towards the first and second openings.

[0012] In some embodiments, an angle between the divider and the guide structure is between 110 degrees and 140 degrees. The angle between 110 degrees and 140 degrees facilitates a smooth flow of the liquid stream from the divider to the associated opening along the

associated guide structure, reducing turbulence inside the liquid, resulting in a more stable and controlled flow of the liquid, reducing the risk of foam formation during filling of the liquid inside the bag container.

[0013] In some embodiments, the deflector/separator includes fillet portions defined at an interface of each of the pair of guide structures with the divider. The fillet portions enable a smooth transition of the flow of the liquid from the divider to the guide structures.

[0014] In some embodiments, the divider includes a first surface extending from a vertex of the divider to one of the pair of guide structures and a second surface extending from the vertex of the divider to other of the pair of guide structures. An angle defined between the first surface and the second surface at the vertex is an acute angle. This enables dividing of the liquid received from the port into two liquid streams, while minimizing the turbulence and splashing of the liquid upon impact of the liquid with the divider.

[0015] One aspect of the disclosure is to provide a spout assembly adapted to be coupled to a bag container having a spout and an attachment structure removably coupled to the spout to control an outflow of a liquid from the bag container in an inverted position of the bag container.

[0016] One more aspect of the disclosure is to provide a spout that facilitates reduced foaming and splashing of the liquid inside the bag container while filling a liquid inside the bag container.

[0017] The aspects are provided by a spout assembly adapted to be coupled to a bag container configured to store and dispense a liquid. The spout assembly includes a spout having a nozzle portion defining an elongated channel and adapted to extend outwardly of the bag container and a flange structure coupled to the nozzle portion and adapted to be arranged inwardly of the bag container. The spout assembly further includes an attachment structure removably coupled to the spout. The attachment structure includes a base portion configured to be removably engaged to the flange structure and defining a passage adapted to be arranged coaxially to the elongated channel. The base portion is adapted to be arranged inside the bag container. The attachment structure further includes a first finger portion and a second finger portion arranged spaced apart from each other and extending in a substantially longitudinal direction from the base portion. The first finger portion defines a first opening adapted to be arranged facing a front wall of the bag container and the second finger portion defines a second opening adapted to be arranged facing a rear wall of the bag container. The attachment structure further includes an end wall connecting the pair of finger portions and arranged opposite to the passage. The first opening and the second opening allow an exchange of the liquid between the bag container and the spout in an open position. The first opening is adapted to be covered by the front wall of the bag container and the second opening is adapted to be covered by the rear wall of the bag

container in response to pressing of the bag container and holding the finger portions by a user to prevent the exchange of the liquid between the spout and the bag container. In this manner, the user can have better control over dispensing of the liquid from the bag container.

[0018] In some embodiments, the flange structure includes at least one engagement structure and the base portion includes at least one retention structure adapted to be coupled with the at least one engagement structure to enable removable coupling of the spout with the attachment structure. The arrangement of engagement structure and the retention structure allows for easy attachment and detachment of the attachment structure with the spout.

[0019] In some embodiments, the attachment structure further includes a separator/deflector extending vertically towards the base portion from the end wall and is arranged between the first and second finger portions. The separator/deflector is configured to divide and deflect a liquid, received from the passage, towards the first and second openings. This separation and deflection of the liquid helps in reducing the turbulence of the liquid during filling of the liquid inside the bag container, thereby minimizing the foam generated during the filling process.

[0020] In some embodiments, the deflector/separators includes a divider extending substantially vertically and arranged substantially centrally between the first and second finger portions and a pair of guide structures extending on opposite sides of the divider and configured to direct and guide the liquid towards the first and second openings. The divider and the pair of guide structures together provide greater control over the filling process, ensuring that the liquid is filled into the bag container more precisely and consistently and reduces turbulence inside the liquid during liquid filling process.

[0021] In some embodiments, the pair of guide structures are arranged at a bottom of the divider and extends in a horizontal direction from the divider to smoothly direct and guide the liquid towards the first and second openings.

[0022] In some embodiments, an angle between the divider and the guide structure is between 110 degrees and 140 degrees. The angle between 110 degrees and 140 degrees facilitates a smooth flow of the liquid stream from the divider to the associated opening along the associated guide structure, reducing turbulence inside the liquid, resulting in a more stable and controlled flow of the liquid, reducing the risk of foam formation during filling of the liquid inside the bag container.

[0023] In some embodiments, the deflector/separators includes fillet portions defined at an interface of each of the pair of guide structures with the divider. The fillet portions enable a smooth transition of the flow of the liquid from the divider to the guide structures.

[0024] In some embodiments, the divider includes a first surface extending from a vertex of the divider to one of the pair of guide structures and a second surface extending from the vertex of the divider to other of the

pair of guide structures. An angle defined between the first surface and the second surface at the vertex is an acute angle. This enables dividing of the liquid received from the port into two liquid streams, while minimizing the turbulence and splashing of the liquid upon impact of the liquid with the divider.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0025] Having thus described example embodiments of the present disclosure in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 illustrates a top perspective view of a pouch arranged in an inverted position, in accordance with an embodiment of the disclosure;

FIG. 2 illustrates a front view of a spout assembly including a spout and an attachment structure of the pouch of FIG. 1, in accordance with an embodiment of the disclosure;

FIG. 3 illustrates a perspective view of a bottom portion of the attachment structure of the spout assembly of FIG. 2, in accordance with an embodiment of the disclosure;

FIG. 4 illustrates a front perspective view of the attachment structure of the spout assembly of FIG. 2, in accordance with an embodiment of the disclosure;

FIG. 5 illustrates a side perspective view of the attachment structure of the spout assembly of FIG. 2, in accordance with an embodiment of the disclosure;

FIG. 6 illustrates a bottom view of the spout of the spout assembly of FIG. 2, in accordance with an embodiment of the disclosure;

FIG. 7 illustrates a top view of the attachment structure of the spout assembly of FIG. 2, in accordance with an embodiment of the disclosure;

FIG. 8 illustrates a sectional view of the attachment structure of the spout assembly depicting an enlarged view of a deflector and showing two walls of a bag container arranged at a gap from openings of the attachment structure, in accordance with an embodiment of the disclosure;

FIG. 9 illustrates a sectional view of the attachment structure of the spout assembly depicting two walls of the bag container abutting finger portions of the attachment structure and closing the openings of the

finger portions, in accordance with an embodiment of the disclosure; and

FIG. 10 illustrates a schematic view depicting the liquid being divided into two liquid streams by a divider of the deflector and being directed towards the openings, in accordance with an embodiment of the disclosure.

DETAILED DESCRIPTION

[0026] In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. It will be apparent, however, to one skilled in the art that the present disclosure can be practiced without these specific details. In other instances, apparatus and methods are shown in block diagram form only in order to avoid obscuring the present disclosure.

[0027] Reference in this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present disclosure. The appearance of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Further, the terms "a" and "an" herein do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced items. Moreover, various features are described which may be exhibited by some embodiments and not by others. Similarly, various requirements are described which may be requirements for some embodiments but not for other embodiments.

[0028] Some embodiments of the present disclosure will now be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all, embodiments of the disclosure are shown. Indeed, various embodiments of the disclosure may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout. The use of any term should not be taken to limit the spirit and scope of embodiments of the present disclosure.

[0029] The embodiments are described herein for illustrative purposes and are subject to many variations. It is understood that various omissions and substitutions of equivalents are contemplated as circumstances may suggest or render expedient but are intended to cover the application or implementation without departing from the spirit or the scope of the present disclosure. Further, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting. Any heading utilized within this description is for convenience only

and has no legal or limiting effect.

[0030] Referring to FIG. 1, a pouch 100 for storing and dispensing a liquid is shown. The pouch 100 includes a bag container 102 and a spout assembly 104 coupled to the bag container 102 to facilitate a filling of the liquid inside the bag container 102 and dispensing of the liquid from the bag container 102. The bag container 102 defines a chamber (not shown) to store a liquid. In the illustrated embodiments, the bag container 102 is a flexible container 112 having a base 114 and a pair of side-walls, for example, a front wall 116 and a rear wall 118 extending vertically upwardly from the base 114. The front wall 116 and the rear wall 118 are arranged opposite to each other and extend vertically from an outer edge of the base. Further, the side edges of the front wall 116 and the rear wall 118 are attached/coupled/fused with each other. Also, top edges of the front wall 116 and the rear wall 118 are partially fused/engaged/attached with each other, defining a top structure 120, for example, a top edge 122, of the bag container 102. In the illustrated embodiment, the bag container 102 is made of a flexible material adapted to be squeezed to a collapsed configuration. In the collapsed configuration, some portions of the front wall 116 and the rear wall 118 may be arranged abutting each other such that the base 114 is also folded along a center line such that the base 114 is disposed between lower portions of the front wall 116 and the rear wall 118. Also, when the bag container 102 is squeezed at a location proximate to a portion of the spout assembly 104 arranged inside the bag container 102 using fingers, the inner surfaces of the front and the rear wall 116, 118 contact the portion of the spout assembly 104, as shown in FIG. 8.

[0031] In an embodiment, as shown in FIG. 1, the top structure 120 includes a first top portion 124, for example, a first top edge portion 126, extending substantially horizontally and parallel to the base 114, and a second top portion 134, for example, a second top edge portion 136, extending at an angle 'A' relative to the first top portion. The first top edge portion 126 extends from a first side edge 138 towards a second side edge 139, while the second top edge portion 136 extends from the first top edge portion 126 to the second side edge 139. In some embodiments, the angle of inclination of the second top edge portion 136 relative to the first top edge portion 126 is between 0 degrees and 50 degrees. Further, the top edge portion 122 defines an opening and the spout 140 extends through the opening and is coupled to the bag container 102. The spout assembly 104 is arranged substantially perpendicularly to the top structure 120 (i.e., the second top edge portion 136).

[0032] Referring to FIG. 2, the spout assembly 104 includes a spout 140 and an attachment structure 142 adapted to be coupled to the spout 140. As shown in FIG. 2 and FIG. 6, the spout 140 is adapted to be coupled to the top structure 120 of the bag container 102 and includes a nozzle portion 150 extending outwardly of the bag container 102 and a flange structure 152 coupled to the

nozzle portion 150 and adapted to be arranged inwardly of the bag container 102. The nozzle portion 150 includes a substantially cylindrical tube 156 defining an elongated channel 157 (shown in FIG. 6) with a port 158 (shown in FIG. 1) arranged at a first end 160 of the spout 140. The port 158 provides an inlet for filling the bag container 102 with the liquid as well as allows outlet of the liquid from the bag container 102. The spout 140 may further include a cap 162 (shown in FIG. 2) adapted to be threadably engaged or press fitted to the cylindrical tube 156 of the spout 140.

[0033] The flange structure 152 is coupled to the top structure 120 of the bag container 102. It may be appreciated that the flange structure 152 includes a channel 163 (shown in FIG. 6) to facilitate the flow of liquid from the spout 140 to the attachment structure 142 and vice-versa. Accordingly, while filling the liquid to the bag container 102, the liquid flows through the cylindrical tube 156 and enters the attachment structure 142 through the channel 163 of the flange structure 152.

[0034] The attachment structure 142 is configured to be disposed inside the bag container 102 and may be removably attached to the flange structure 152. Referring to FIGS. 2 to 5 and FIGS. 7 to 9, the attachment structure 142 includes a base portion 144 adapted to be removably engaged to the flange structure 152 and defining a passage 146 (best shown in FIGS. 7 to 9) arranged coaxially to the elongated channel 157 of the nozzle 150 and the channel 163 of the flange structure 152. The attachment structure 142 further includes a first finger portion 164 and a second finger portion 166 (shown in FIGS. 3 to 5 and FIGS. 8 and 9) arranged spaced apart from each other defining a space 168 between them. The finger portions 164, 166 extend downwardly from the base portion 144 and extend in a substantially longitudinal direction. Also, the attachment structure 142 may include a pair of sidewalls 170, 172 (best shown in FIG. 3) arranged opposite to each other and connected to the finger portions 164, 166. Further, the attachment structure 142 includes an end wall 174 (i.e., cover portion 174) arranged opposite to the base portion 144 and located at a second end of the attachment structure 142.

[0035] To facilitate a flow of liquid to the bag container 102 from the attachment structure 142 and to the attachment structure 142 from the bag container 102, each of the finger portions 164, 166 defines an opening, for example, the first finger portion 164 defines a first opening 182 and the second finger portion 166 defines a second opening 184, as shown in FIGS. 3 and 6. It may be appreciated that the spout assembly 104 is coupled with the bag container 102 such that the front wall 116 of the bag container 102 is arranged facing the first finger portion 164 (i.e., the first opening 182) and the rear wall 118 of the bag container 102 is arranged facing the second finger portion 166 (i.e., the second opening 184), as shown in FIG. 8 and FIG. 9. Accordingly, as shown in FIG. 9, the openings 182, 184 are closed when the front wall 116 and rear wall 118 are disposed

abutting the first finger portion 164 and the second finger portion 166, respectively, in response to the squeezing of the bag container 102 and holding the attachment structure 142 of the spout assembly 104 between the fingers by a user. The front wall 116 and the rear wall 118 move away from the finger portions 164, 166 upon release of the pouch 100 (i.e., the attachment structure 142), allowing the flow through the openings 182, 184, as shown in FIG. 8.

[0036] To enable the engagement/coupling of the attachment structure 142 with the spout 140, the base portion 144 of the attachment structure 142 includes at least one retention structure 186, while the flange structure 152 includes at least one engagement structure 188 adapted to engage with the at least one retention structure 186 of the flange structure 152. In some embodiments, the at least one retention structure 186 includes a plurality of protrusions extending outwardly from a body 190 of the base portion 144. In such a case, the at least one engagement structure 188 includes a plurality of grooves/slots adapted to receive the plurality of protrusions of the at least one retention structure 186. Alternatively, the at least one retention structure 186 may include a plurality of slots or grooves defined by the body 190 of the base portion 144, while the at least one engagement structure 188 includes a plurality of protrusions adapted to extend inside the plurality of grooves/slots of the at least one retention structure 186. It may be envisioned that the at least one retention structure 186 and the at least one engagement structure 188 engaged with each other such that the channel 163 of the flange structure 152 aligns with the passage 146 of the base portion 144 and a leak proof joint is formed between the flange structure 152 and the base portion 144. In some embodiments, one or more sealing members may be arranged between the base portion 144 and the flange structure 152 to prevent any leakage of liquid. In some embodiments, the at least one retention structure 186 and the at least one engagement structure 188 may be omitted, and in such cases, the flange structure 152 and the base portion 144 are adhesively attached to each other. In some embodiments, flange structure 152 and the base portion 144 are engaged with each other by heating.

[0037] Additionally, or optionally, the attachment structure 142 includes a separator/deflector 200 extending vertically towards the base portion from the end wall 174. The separator/deflector 200 is arranged inside the space 168 defined between the first finger portion 164 and the second finger portion 166, and is configured to divide and deflect the liquid, received from the spout, towards the first and second openings 182, 184 of attachment structure. To divide, deflect, and guide the liquid towards the two openings 182, 184, the separator/deflector 200 includes a divider 202 arranged substantially centrally to the separator 200 and a pair of guide structures 204, 206 arranged on opposite sides of the divider 202 and extending towards the openings 182, 184. For example, a

first guide structure 204 extends towards the first opening 182 from a bottom of the divider 202 and in a lateral direction, while a second guide structure 206 extends towards the second opening 184 from the bottom of the divider 202 in an opposite lateral direction. The divider 202 is configured to divide/split the liquid stream into two parts and is arranged substantially centrally of the space 168, while the guide structures 204, 206 are adapted to direct and guide the two streams of the liquid towards the first and second openings 182, 184, as shown in FIG. 3 and FIG. 10. In some embodiments, the divider 202 may be configured to divide the liquid into two equal parts.

[0038] As best shown in FIG. 8, the divider 202 includes a first surface 210 and a second surface 212 arranged facing the first opening 182 and the second opening 184, respectively. Also, the first surface 210 and the second surface 212, each extends at an inclination relative to the end wall 174 or a central longitudinal axis of the attachment structure 142 such that a distance between the first surface 210 and the second surface 212 decreases in a direction away from the end wall 174. Accordingly, the divider 202 includes a vertex 216 disposed vertically above and distally to the end wall 174. In some embodiments, the vertex 216 includes a substantially convex shape having a radius between 0.15 millimeters and 0.25 millimeters, and the angle between the first surface and the second surface at the vertex 216 is an acute angle 'B'. In some embodiments, the angle 'B' is between 5 degrees to 20 degrees.

[0039] Further, the pair of guide structures 204, 206 extend in a horizontal direction from the divider on either side such that a first angle 'F' is defined between the first surface 210 and an upper surface of the first guide structure 204 and a second angle 'S' is defined between the second surface 212 and an upper surface of the second guide structure 206. In an embodiment, the first angle 'F' and the second angle 'S', each is an obtuse angle. In some embodiments, the first angle 'F' and the second angle 'S' are equal. Alternatively, the first angle 'F' may be different from the second angle 'S'. In some embodiments, the first angle 'F' and the second angle 'S', each is between 110 degrees and 140 degrees. The separator/deflector 200 further includes fillet portions 220, 222 defined at interfaces of each of the pair of guide structures 204, 206 with the divider 202. The fillet portions 220, 222 facilitate a smooth transition of the flow of the liquid from the divider 202 to the guide structures 204, 206, restricting the flow separation. In an embodiment, radius of each of the fillet portions 220, 222 is between 1.8 millimeters and 2.1 millimeters.

[0040] The attachment structure 142 is coupled to the spout 140 to facilitate controlled dispensing of the liquid from the pouch 100 in the inverted position. The dispensing of the liquid from the pouch 100 may be controlled by squeezing of the bag container 102 while holding the attachment structure 142 of the spout assembly 104 between the fingers by the user, such that the walls 116, 118 of the bag container 102 is arranged abutting

the finger portions 164, 166 (i.e., the openings 182, 184). Accordingly, the openings 182, 184 are closed and the flow stopped, leading to reduced spillage, and more controlled flow of the liquid via the spout assembly 104. Moreover, the attachment structure 142 having the separator/deflector 200 helps in reducing turbulence during filling of the liquid in the bag container 102. The deflector 200 receives the liquid, during filling of the bag container 102, divides the liquid into two streams and guides the liquid streams towards the openings 182, 184 of the attachment structure 142 through which the liquid flows inside the bag container 102. Accordingly, the deflector 200 prevents the liquid stream to directly hit the end wall 174, and therefore, restricts the foaming and splashing of the liquid inside the attachment structure 142 before exiting the spout assembly 104. Due to the guide structures 204, 206, the turbulence of the liquid is reduced.

[0041] Many modifications and other embodiments of the disclosures set forth herein will come to mind to one skilled in the art to which these disclosures pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the disclosures are not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Moreover, although the foregoing descriptions and the associated drawings describe example embodiments in the context of certain example combinations of elements and/or functions, it should be appreciated that different combinations of elements and/or functions may be provided by alternative embodiments without departing from the scope of the appended claims. In this regard, for example, different combinations of elements and/or functions than those explicitly described above are also contemplated as may be set forth in some of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

Claims

1. An attachment structure (142) for a spout (140) adapted to be coupled to a bag container (102) configured to store and dispense a liquid, the spout (140) comprising a nozzle portion (150) defining an elongated channel (157) and adapted to extend outwardly of the bag container (102) and a flange structure (152) coupled to the nozzle portion (150) adapted to be arranged inwardly of the bag container (102),
characterized in that
the attachment structure (142) includes
a base portion (144) configured to be engaged to the flange structure (152) and defining a pas-

sage (146) adapted to be arranged coaxially to the elongated channel (157), wherein the base portion (144) is adapted to be arranged inside the bag container (102), and
a first finger portion (164) and a second finger portion (166) arranged spaced apart from each other and extending in a substantially longitudinal direction from the base portion (144), wherein the first finger portion (164) defines a first opening (182) adapted to be arranged facing a front wall (116) of the bag container (102) and the second finger portion (166) defines a second opening (184) adapted to be arranged facing a rear wall (118) of the bag container (102), and an end wall (174) connecting the pair of finger portions (164, 166) and arranged opposite to the passage (146),
wherein the first opening (182) and the second opening (184) allow an exchange of liquid between the bag container (102) and the spout (140) in an open position, and
the first opening (182) is adapted to be covered by the front wall (116) of the bag container (102) and the second opening (184) is adapted to be covered by the rear wall (118) of the bag container (102) in response to pressing of the bag container (102) and holding the finger portions (164, 166) by a user to prevent the exchange of the liquid between the spout (140) and the bag container (102).

2. The attachment structure (142) of claim 1, wherein the flange structure (152) includes at least one engagement structure (188) and the base portion (144) includes at least one retention structure (186) adapted to be coupled with the at least one engagement structure (188) to enable removable coupling of the spout (140) with the attachment structure (142).
3. The attachment structure (142) of any one of preceding claims further comprising a deflector (200) extending vertically towards the base portion (144) from the end wall (174) and is arranged between the first and second finger portions (164, 166), wherein the deflector (200) is configured to divide and deflect a liquid, received from the passage (146), towards the first and second openings (182, 184).
4. The attachment structure (142) of claim 3, wherein the separator (200) includes
a divider (202) extending substantially vertically and arranged substantially centrally between the first and second finger portions (164, 166), and
a pair of guide structures (204, 206) extending on opposite sides of the divider (202) and configured to direct and guide the liquid towards the

first and second openings (182, 184).

5. The attachment structure (142) of claim 4, wherein the pair of guide structures (204, 206) are arranged at a bottom of the divider (202) and extends in a horizontal direction from the divider (202). 5
6. The attachment structure (142) of claim 4 or claim 5, wherein an angle between the divider (202) and the guide structure (204, 206) is between 110 degrees and 140 degrees. 10
7. The attachment structure (142) of any one of claims 4 to 6, wherein the deflector (200) includes fillet portions (220, 222) defined at an interface of each of the pair of guide structures (204, 206) with the divider (202). 15
8. The attachment structure (142) of any one of claims 4 to 7, wherein the divider (202) includes 20
 - a first surface (210) extending from a vertex (216) of the divider (202) to one of the pair of guide structures (204, 206), and
 - a second surface (212) extending from the vertex (216) of the divider (202) to other of the pair of guide structures (204, 206), 25
 - wherein an angle defined between the first surface (210) and the second surface (212) at the vertex (216) is an acute angle. 30
9. A spout assembly (104) adapted to be coupled to a bag container (102) configured to store and dispense a liquid, the spout assembly (104) comprising:
 - a spout (140) including
 - a nozzle portion (150) defining an elongated channel (157) and adapted to extend outwardly of the bag container (102), and 40
 - a flange structure (152) coupled to the nozzle portion (150) and adapted to be arranged inwardly of the bag container (102); and
 - an attachment structure (142) removably coupled to the spout (140),
 - characterized in that**
 - the attachment structure (142) includes
 - a base portion (144) removably engaged to the flange structure (152) and defining a passage (146) arranged coaxially to the elongated channel (157), wherein the base portion (144) is adapted to be arranged inside the bag container (102), and 50
 - a first finger portion (164) and a second finger portion (166) arranged spaced apart 55

from each other and extending in a substantially longitudinal direction from the base portion (144), wherein the first finger portion (164) defines a first opening (182) adapted to be arranged facing a front wall (116) of the bag container (102) and the second finger portion (166) defines a second opening (184) adapted to be arranged facing a rear wall (118) of the bag container (102), and an end wall (174) connecting the pair of finger portions (164, 166) and arranged opposite to the passage (146), wherein the first opening (182) and the second opening (184) allow an exchange of liquid between the bag container (102) and the spout (140) in an open position, and the first opening (182) is adapted to be covered by the front wall (116) of the bag container (102) and the second opening (184) is adapted to be covered by the rear wall (118) of the bag container (102) in response to pressing of the bag container (102) and holding the finger portions (164, 166) by a user to prevent the exchange of the liquid between the spout (140) and the bag container (102).

10. The spout assembly (104) of claim 9, wherein the flange structure (152) includes at least one engagement structure (188) and the base portion (144) includes at least one retention structure (186) removably coupled with the at least one engagement structure (188).
11. The spout assembly (104) of claim 9 or claim 10 further comprising a deflector (200) extending vertically towards the base portion (144) from the end wall (174) and is arranged between the first and second finger portions (164, 166), wherein the deflector (200) is configured to divide and deflect a liquid, received from the passage (146), towards the first and second openings (182, 184).
12. The spout assembly (104) of claim 11, wherein the deflector (200) includes
 - a divider (202) extending substantially vertically and arranged substantially centrally between the first and second finger portions (164, 166), and
 - a pair of guide structures (204, 206) extending on opposite sides of the divider (202) and configured to direct and guide the liquid towards the first and second openings (182, 184).
13. The spout assembly (104) of claim 12, wherein the pair of guide structures (204, 206) are arranged at a bottom of the divider (202) and extends in a horizon-

tal direction from the divider (202).

- 14.** The spout assembly (104) of claim 12 or claim 13, wherein an angle between the divider (202) and the guide structure (204, 206) is between 110 degrees and 140 degrees. 5
- 15.** The spout assembly (104) of any one of claims 12 to 14, wherein the deflector (200) includes fillet portions (220, 222) defined at an interface of each of the pair of guide structures (204, 206) with the divider (202). 10

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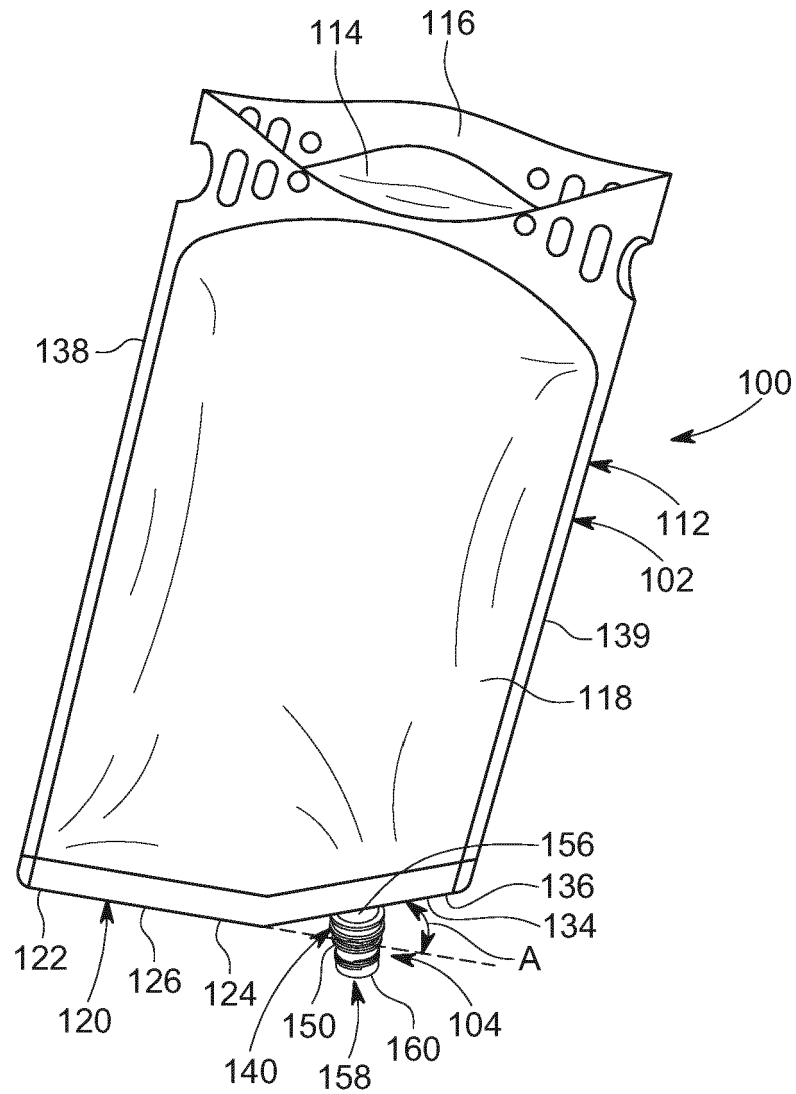


FIG. 1

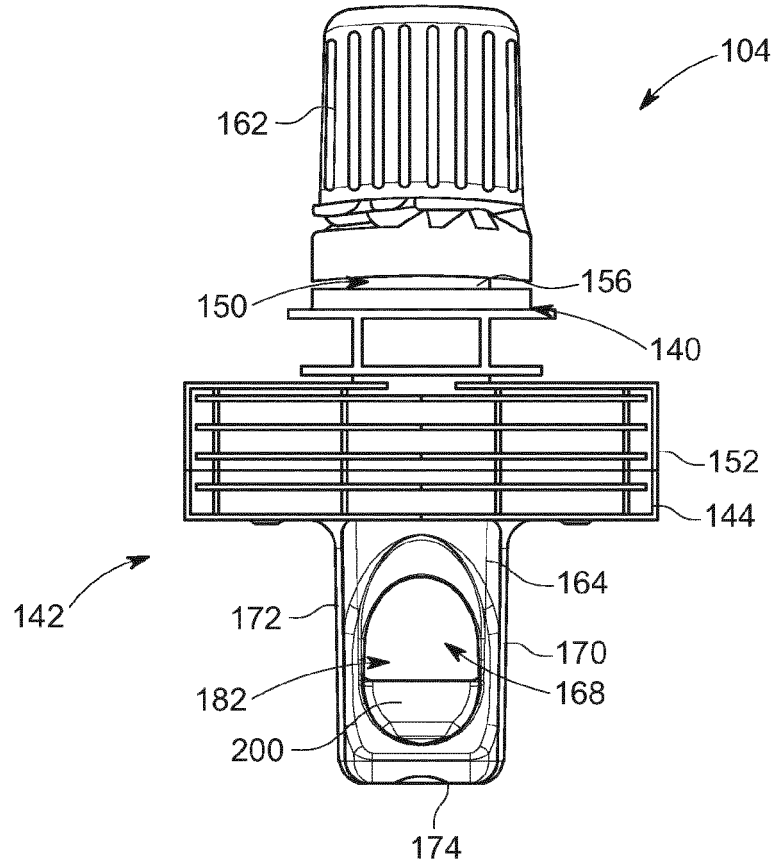


FIG. 2

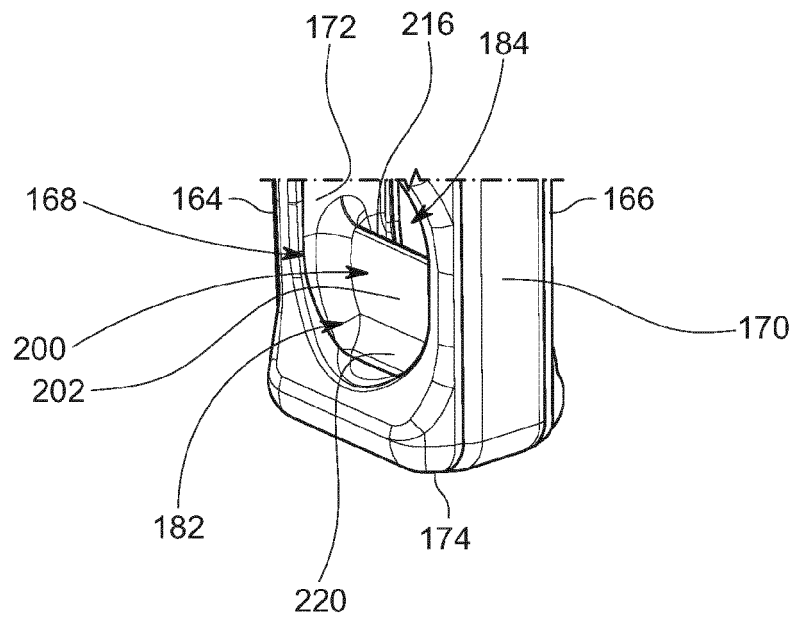


FIG. 3

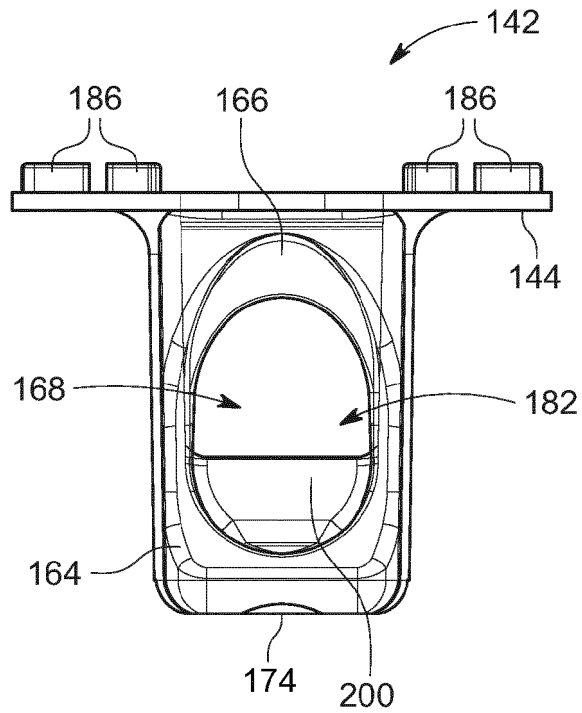


FIG. 4

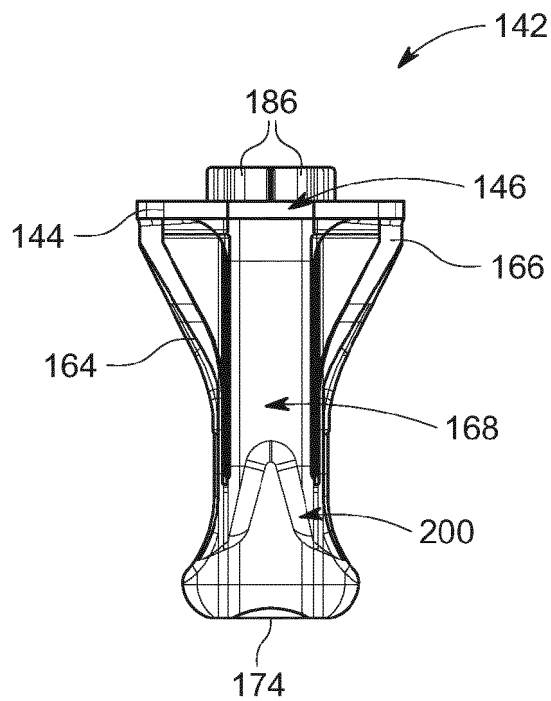


FIG. 5

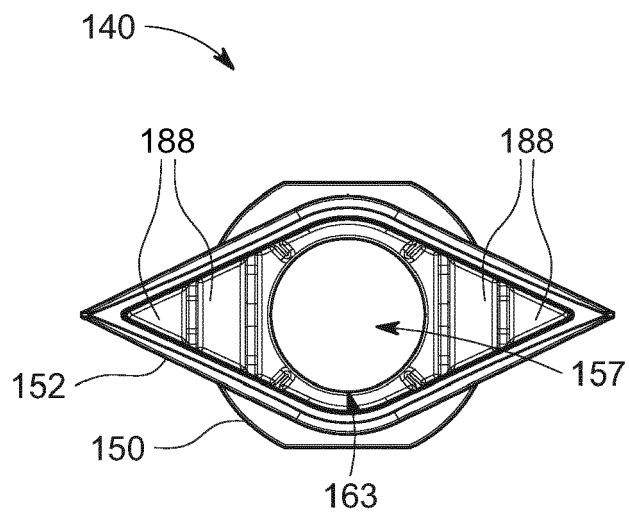


FIG. 6

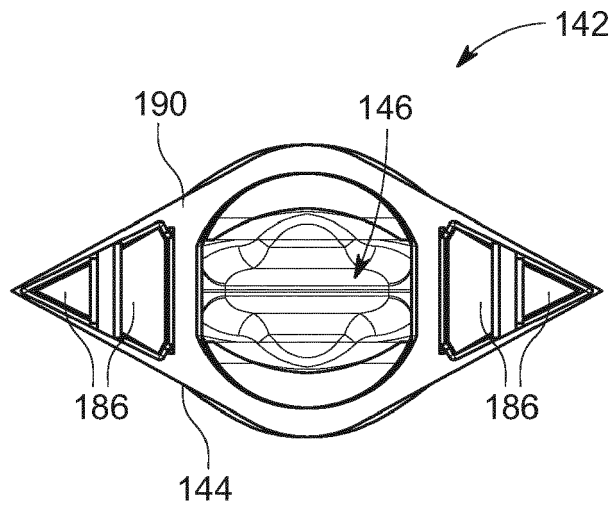


FIG. 7

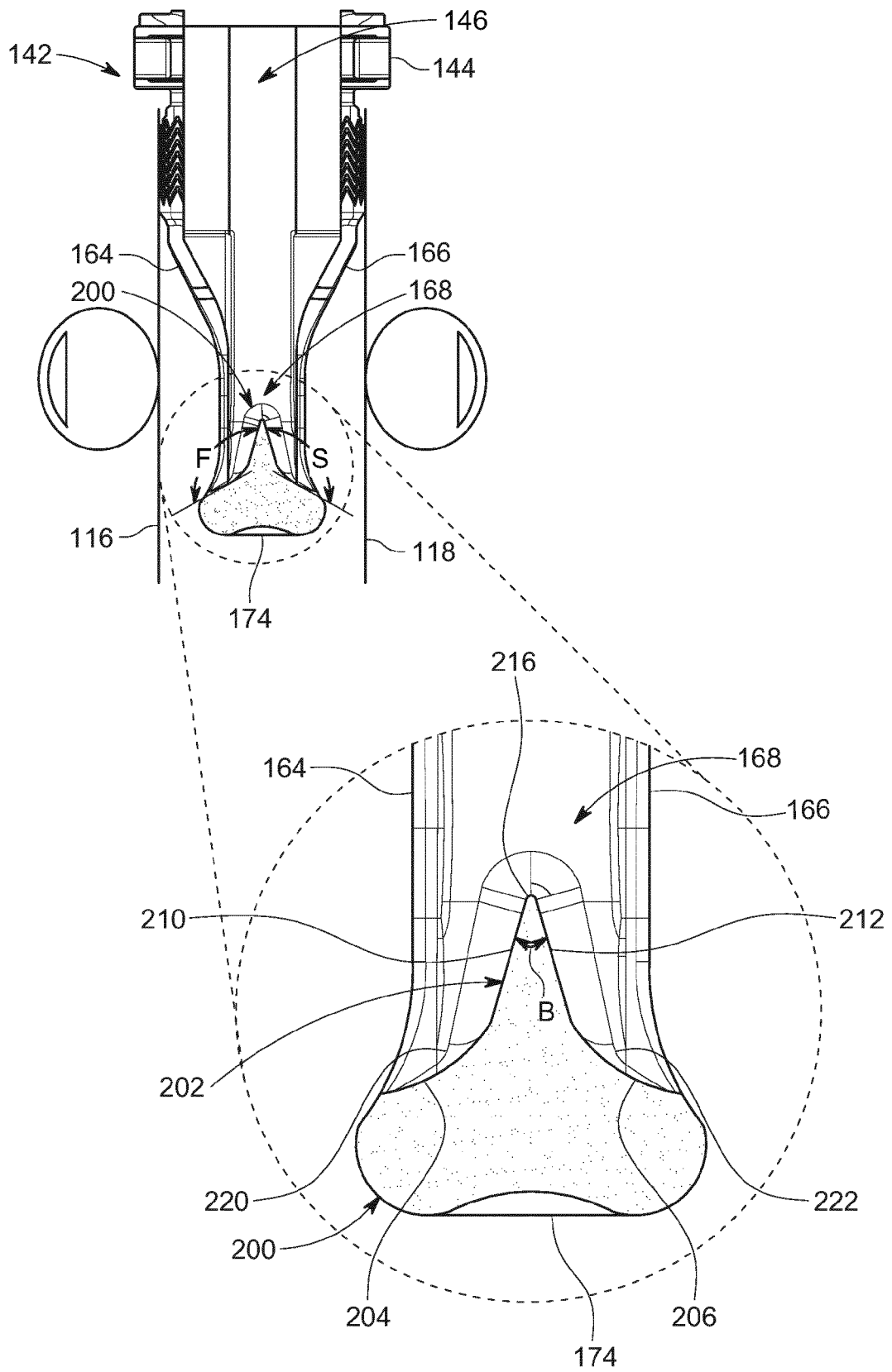


FIG. 8

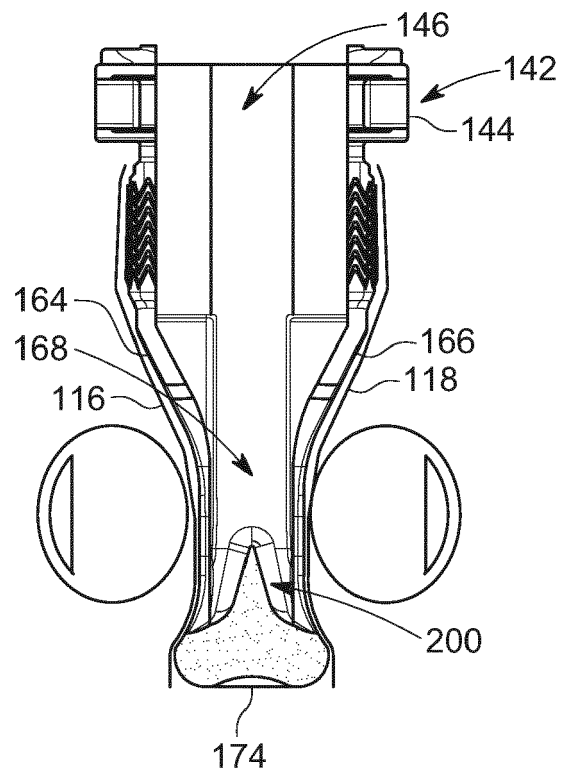


FIG. 9

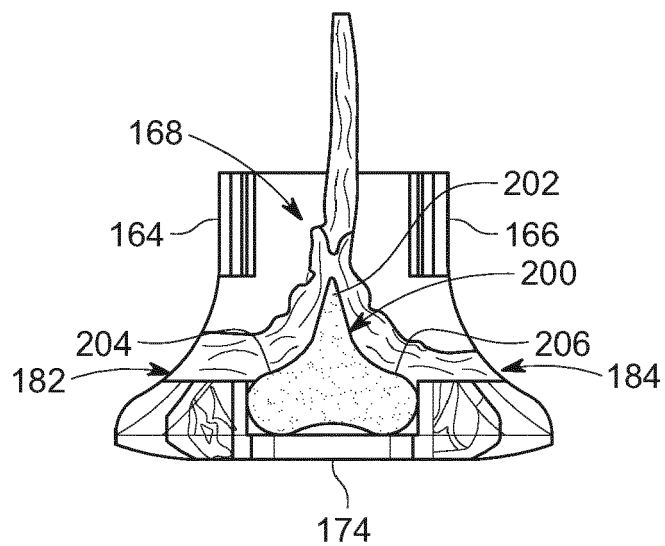


FIG. 10



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 8739

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A	* abstract * * machine translation; paragraphs [0013] - [0017], [0029] - [0030]; figures 1-5 *	2-15	
X	US 11 459 138 B2 (HOSOKAWA YOKO KK [JP]) 4 October 2022 (2022-10-04)	1	
A	* column 5, lines 24-35 * * column 8, lines 25-44 * * figures 1-2 *	2-15	TECHNICAL FIELDS SEARCHED (IPC) B65D
X	JP H05 44841 U (1) 15 June 1993 (1993-06-15) * machine translation; paragraphs [0011] - [0013]; figures 1-3 *	1	
A	JP 2009 136619 A (JMS CO LTD) 25 June 2009 (2009-06-25) * abstract * * machine translation; paragraphs [0012], [0015], [0026] - [0037], [0042]; figures 1-3, 5D *	1-15	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 October 2023	Examiner Leijten, René
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03.82 (P04C01)

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EP 23 17 8739

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