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(71) Applicant: **Vang, Brian**
7700 Thisted (DK)

(72) Inventor: **Vang, Brian**
7700 Thisted (DK)

(74) Representative: **Nielsen, Henrik Sten et al**
Budde Schou A/S
Hausergade 3
1128 Copenhagen K (DK)

(54) A spout for a beverage bottle and a method of producing a spout preform

(57) A spout (10) for a beverage bottle (32) which comprises a sheet of flexible material (12) defining a first state, which constitutes a substantially flat perform state, in which the sheet of flexible material defines an outer circumferential edge (14). The sheet of flexible material is elastically bendable into a second state, in which the sheet of flexible material defines a pipe for being inserted into the mouth of the beverage bottle. The sheet of flexible material defines, when in the first state, a substantially semi elliptical fold line (16) extending from a first point (18) on the outer circumferential edge to a second point (20) on the outer circumferential edge delimiting a first region (22) of the sheet of flexible material, which is substantially semi elliptical. The first region, when in the second state which is bendable between an open state, in which the sheet of flexible material, defines an unobstructed channel within the pipe and a closed state, in which the semi elliptical region of the sheet of flexible material is folded into the channel and obstructs the pipe.

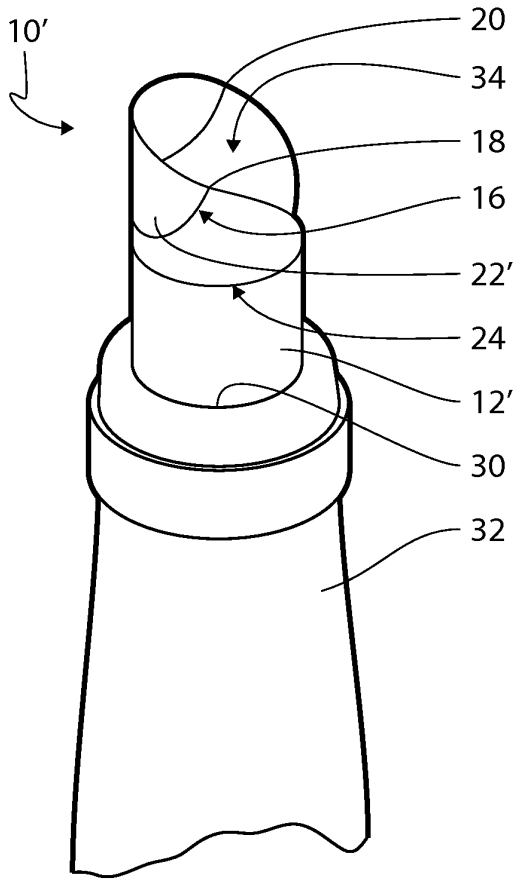


FIG. 2A

EP 2 952 441 A1

Description

Background

[0001] For several centuries it has been known to store beverages in bottles having the characteristic shape of a large body portion for containing the majority of the beverage and a slender neck portion defining a rim, which will be called a mouth in the present context, for controlled pouring of the beverage. During storage, the mouth of the beverage bottle is closed off by a closure typically in the form of a cork or cap. Thus, the mouth of the beverage bottle must necessarily define a certain rigidity and thickness in order to be able to accommodate and apply a sufficient sealing pressure onto the closure for preventing any leakage of beverage.

[0002] The thickness of the mouth of the beverage bottle constitutes a problem during pouring because it does not define a well defined flow separation point between the bottle and the air when the bottle is tilted from the upright non-pouring state to the substantially vertical pouring state. Thus, a certain skill and swiftness is required during pouring for achieving flow separation and avoiding that all of the beverage sticks to the bottle and flowing on the outside of the bottle typically missing the intended target being a beverage glass. However, as the skills in pouring beverage in most cases are mastered even by small children, an even more important issue is that of preventing a small amount of beverage, such as a few drops, to accumulate at the mouth when the pouring is ended by tilting the beverage bottle back to vertical state. The small amount of beverage remaining at the mouth of the bottle may flow along the outside of the beverage bottle and cause stains etc when hitting the table cloth.

[0003] The present inventor is the inventor of the pouring device covered by the European patent EP 0 560 777 B1. The above mentioned prior art document describes a piece of a suitable elastic and flexible sheet material which may be inserted into the bottle opening as a tubular shaped roll. The present inventor is also the creator of the trade mark Dropstop®. (A trade mark owned by Schur Intellectuals A/S, VR 1994 03146 and CTM 009313421)

[0004] Similar kinds of spouts have been described in the following prior art documents:

DE 3736245 A1 describes a technology of using a fluid repelling material at the mouth of the beverage bottle.

EP 0 329 883 describes a container having a neck having an integral dispesning spout.

EP 2 065 312 A1 and EP 2070829 A1 both describe a spout device having a strap which may be put around the neck of the beverage bottle.

EP 2 409 926 A1 describes a spout comprising a foil which has a rough surface for aerating the beverage flowing through the spout.

EP 2 620 382 A1 describes a drip catcher for aerating beverage. The drip catcher comprises a resilient flexible sheet material which can be deformed into a tubular roll and having a plurality of cuts and fold lines which can be deformed to project into the hollow interior of the tubular roll to form obstacles.

FR 589.771 relates to a beverage container having a slit which is closed during transport and which may be opened by means of a card for allowing the beverage to pour into the mouth of a user.

FR 1.198.362 relates to a pourer comprising a rectangular strip having in one edge a tab which may mate with the opposing edge.

GB 467,339 relates to an appliance to be fitted into the mouth of a bottle. The appliance is resilient in order to not injure the bottle whatever downward pressure may be put on the appliance.

GB 2 180 817 A relates to a drip collecting collar for a container for collecting drips from the container.

SE 52197 relates to a tapping spout having a sloped channel located at the outer wall of the spout and interconnecting with the inside of the spout in order to collect and guide any from the spout dripping liquid back to the inside of the spout.

US 1749253 relates to a pouring spout, in which any drips of liquid forming at a pouring mouth or tip are caught in a gutter arranged round this pouring mouth or lip and are returned to the interior of the vessel.

US 2005/0023308 relates to a device for the insertion of an anti drip element into the mouth of a bottle.

WO2012/175571 A relates to a drip-prevention system comprising a drip cutter that can be inserted into a bottle neck and a capsule that completely encloses the drip cutter. The capsule has a removable part and a part that can be used as a retainer for inserting the drip cutter.

WO2013/030363 relates to a drip stop device comprising a second plate like element for improving the oxygenation of the liquid.

[0005] Different methods of perforating and folding sheet materials are described in GB 886484, US 4063493, US 4674377, US 4715250, US 5033201, US 5189935 and US 5220858.

Summary of the invention

[0006] Going back to the sheet technology originally described in EP 0 560 777 B1, the roll of the sheet material defines a spout comprising a short channel and a very thin mouth constituting the edge of the sheet material which mouth firstly constitutes a very well defined flow separation point allowing even slow pouring, and secondly prevents any accumulation of beverage at the mouth, thus preventing any drops of beverage flowing outside the bottle after the bottle has been returned to the vertical state. This is a very simple but yet effective spout for most beverages such as carbonated beverages, non-carbonated beverages, alcoholic beverages, non-alcoholic beverages. The typical usage will be for wine and sparkling wine, however, other drinks such as beer, cola, water etc. may be poured using the present spout. Further, it is evident that the present spout may also be used for liquid products which are non-beverages such as oil, petrol etc.

[0007] The drawback which has been most apparent to the users of the above prior art spouts is the fact that the spout, once inserted into the bottle mouth, prevents the ordinary closing of the beverage by sealing off the mouth. Thus, the user must remove the spout in case the bottle should be sealed and the removing of the spout does involve the risk of spillage and the problem of accommodating the spout during the closed off state of the beverage bottle. Alternatively, leaving the spout in the bottle mouth may allow foreign substances to enter the beverages, such as dirt, dust, pollen, insects etc, and further may allow some of the volatile aroma of the beverage to escape.

[0008] Thus, there is a need for technologies for closing off a beverage bottle provided with a spout.

[0009] The above object together with numerous other objects, which will be evident from the below detailed description, are according to a first aspect of the present invention obtained by a spout for a beverage bottle comprising a sheet of flexible material, the spout defining a first state constituting a substantially flat perform state, in which the sheet of flexible material defines an outer circumferential edge, the sheet of flexible material being elastically bendable into a second state in which the sheet of flexible material defines a pipe for being inserted into the mouth of the beverage bottle, the sheet of flexible material defining, when in the first state, a substantially semi elliptical fold line extending from a first point on the outer circumferential edge to a second point on the outer circumferential edge delimiting a first region of the sheet of flexible material being substantially semi elliptical and the first region when in the second state being bendable between an open state, in which the sheet of flexible material defines an unobstructed channel within the pipe, and a closed state in which the semi elliptical region of the sheet of flexible material is folded into the channel and obstructing the pipe.

[0010] The present spout is provided and stored in the first state, i.e. the flat perform state occupying minimal space. When a new beverage bottle is opened, the sheet of flexible material is rolled up to form a pipe in the second state. The sheet of flexible material is elastically bendable, i.e. when in the second state, the sheet of flexible material has a tendency to return to the first state provided it is released. By placing the pipe in the mouth of the bottle, the second state is retained and a sealing force is applied by the tube onto the mouth. The thickness of the material is typically in the sub millimeter range and chosen together with the materials such that the sheet of flexible material may by hand force be elastically deformed into a tube without plastically deforming of the flexible material.

[0011] The substantially semi elliptical fold line may e.g. be a stamped or partially cut out line which will allow the user to fold the semi elliptical region in a simple and well defined manner. It is understood that the substantially semi elliptical fold line is extending from the outer circumferential edge along an elliptical curve inwardly and back outwardly to another point at the outer circumferential edge substantially producing a semi-ellipse. The word line should in the present context be understood as encompassing also curves other than straight lines. When in the second state, i.e. the pipe state, the semi elliptical region, i.e. the first region, may follow the general cylindrical outline of the pipe generating a channel within the pipe for the beverage. This constitutes the open state of the spout and corresponds to the state which the above mentioned prior art device is used.

[0012] The closed state corresponds to a state in which the semi elliptical region is pushed inwardly into the channel thereby blocking the channel. Although the elliptical region may not hermetically seal of the channel, it will prevent the above mentioned drawbacks, i.e. the ingress of foreign particles and the escape of aroma particles. It will also at least to a certain extend prevent oxygen from entering the bottle and may thus, at least for a short time storage, replace the ordinary closure. The cylindrical shape of the spout and the first region in principle act bistable and only allow the two states of the first region relative to the rest of the pipe, one being the open state and one being the closed state.

[0013] According to a further embodiment, the circumferential edge defines a circle. The circular shape of the spout in the first state yields in the second state a cylindrical wedge. Preferably, the pipe is formed such that the first region constitutes the top of the wedge. In this way, the closing and the opening of the spout will be simplified. According to a further embodiment, the sheet of flexible material is made of a plastic coated metal sheet. In this way the material may be made thin, flexible and elastically bendable, taking advantage of the elasticity of the plastic and the rigidity of the metal.

[0014] According to a further embodiment, the major axis of the first region is directed towards the center of the sheet of flexible material. Preferably, the first region defines a larger distance from the outer circumferential

edge to its most inward point than between the first and second point in order to allow a suitable elongated closing lip having an elliptical shape to form. When closed, the first region will define an angle in relation to the rest of the pipe of between about 10° and 90°, preferably between about 10° and 45°.

[0015] According to a further embodiment, the sheet of flexible material defining when in the first state a further substantially semi elliptical fold line extending from a third point on the outer circumferential edge to a fourth point on the outer circumferential edge delimiting a second region of the sheet of flexible material being substantially semi elliptical, the second region being separated from and having a longer major axis than the first region. It is generally known that the mouth diameter may vary between different kinds of bottles. Typically, a smaller bottle, such as a demi sized bottle, will have a mouth of smaller diameter compared to a standard sized bottle, whereas a larger bottle, such as a magnum sized bottle, will have a mouth of larger diameter compared to a standard sized bottle. Thus, the pipe formed by rolling up the sheet of flexible material will as well have a diameter which may vary depending on the bottle. Thus, the first region which is typically made suitable for the mouth of a standard sized bottle may be less suitable for closing off a magnum- or demi sized bottle. Thus, the sheet of flexible material may define when in the first state a further substantially semi elliptical fold line in order to allow the formation of a second region being a second substantially semi elliptical region. This second region may be either larger or smaller than the first region in order to be more suitable for closing off smaller or larger bottles. The non-used region will simply remain in the open state. It is understood that even more regions may be used, such as a third semi elliptical region. The complete first semi elliptical region should be located outside the bottle neck in order to allow a simple change between the open and closed states.

[0016] According to a further embodiment, the sheet of flexible material defines, when in the first state, a straight fold line extending from a fifth point on the outer circumferential edge to a sixth point on the outer circumferential edge delimiting a third region, the third region fully encompassing the first region. The straight fold line will form a stop line which will aid the user, both when introducing the pipe into the mouth of the bottle and when switching between the open state and the closed state.

[0017] According to a further embodiment, the sheet of flexible material defines, when in the first state, a further straight fold line extending from a seventh point on the outer circumferential edge to a eighth point on the outer circumferential edge delimiting a fourth region, the fourth region fully encompassing the second region. A second straight line may be used in relation to the second region in the same way as above provided such second region is present.

[0018] According to a further embodiment, the straight fold line defines an indentation being 1-3mm deep, preferably 2mm deep. The depth is suitable in order to provide a sufficiently large circular protrusion in the pipe.

[0019] According to a further embodiment, the straight fold line defines a center point being located 16-26 mm from the outer circumferential edge, preferably 18-24 mm, more preferably 20-22 mm, most preferably 21 mm. The straight fold line will form a circular line which will act as a stop bulge at the mouth of the beverage bottle preventing the pipe from falling into the bottle and allowing the pipe to be positioned at an optical position within the mouth. In the optimal position, about 1/3 of the pipe is located outside the mouth of the bottle and about 2/3 of the pipe is located within the neck of the bottle. In this way there is a minimal risk that the pipe will loosen from the bottle.

[0020] According to a further embodiment, the fold line comprises a pressed line or alternatively a series of perforations. Preferably, the series of perforations define apertures sufficiently small to prevent beverage flow at normal beverage pouring pressures. A pressed line will allow the semi elliptical region to be easily folded between the open state and the closed state, while a fold line comprising a series of small holes will be slightly more difficult to fold while being more esthetically acceptable since the holed will not be as visible as the pressed fold. An aperture having a diameter of up to some hundred μm will allow the beverage to remain within the spout due to the surface tension, whereas a larger aperture such as an aperture larger than one mm will allow beverage to flow through the hole which in the present context is undesired.

[0021] According to a further embodiment, the fold line defines a straight line adjacent the outer circumferential edge. In this way the folding of the first region between the open state and the closed state will be simplified. Further, the straight line part of the fold line yield a well defined closed state and thus prevent the first region from accidentally moving from the closed state to the open state.

[0022] According to a further embodiment, the sheet of flexible material defines, when in the first state, a surface area of between $1cm^2$ and $1dm^2$, preferably between $10cm^2$ and $50cm^2$. The size of the sheet of flexile material should not be too small since it should be able to fold to a pipe within the mouth of the beverage bottle, whereas a too large size of the sheet of flexible material will produce a large spout being rolled multiple times, which evidently is a waste of material. The above sizes achieve a tube which is rolled up in a standard wine bottle with a circumferential overlap of about 50%.

[0023] The above object together with numerous other objects, which will be evident from the below detailed description, are according to a second aspect of the present invention obtained by a method of producing a spout for a beverage bottle, the method comprising the steps of:

providing a sheet of flexible material,

stamping the sheet of flexible material into a substantially flat perform defines an outer circumferential edge,

stamping a substantially semi elliptical fold line extending from a first point on the outer circumferential edge to a second point on the outer circumferential edge delimiting a first region of the sheet of flexible material being substantially semi elliptical.

[0024] The present method according to the second aspect is preferably used to manufacture the spout according to the first aspect. The stamping procedure may be used for achieving both the cut for the circumferential edge and the fold for the substantially semi elliptical region.

[0025] According to a further embodiment, the stamping is made simultaneously in the same process step.

Brief description of the drawings

[0026]

FIG. 1A is a view of a flat spout in the perform state.
FIG. 1B is a view of a spout being rolled up from the perform state to the tubular state.
FIG. 1C is a view of a spout in the tube state.
FIG. 2A is a view of a spout in the open state.
FIG. 2B is a view of a spout in the closed state.
FIG. 2A is a view of a spout in the open state
FIG. 3 is a view of a first square spout
FIG. 4 is a view of a second square spout
FIG. 5 is a view of a third square spout
FIG. 6 is a view of a second circular spout
FIG. 7 is a view of a manufacturing plant for rotational stamping of spouts

Detailed description of the drawings

[0027] FIG. 1A shows a front view of a spout 10 for a beverage bottle (not shown). The spout 10 is in the present view in a perform state and comprises a flat sheet of flexible material 12 defining a circumferential edge 14 having a circular form. The piece of flexible material 14 comprises a semi elliptical fold line 16 which extends from a first point 18 on the circumferential edge 14 of the sheet of flexible material 12, inwardly along a substantially elliptical curve in a direction towards the centre of the sheet of flexible material 12, reaching an innermost point and returning to a second point 20 on the circumferential edge 14 of the sheet of flexible material 12.

[0028] The semi elliptical fold line 16 defines a semi elliptical region 22 on the sheet of flexible material 12. Further, the sheet of flexible material 12 comprises a straight fold line 24 following a straight line from a third point 26 on the circumferential edge 14 to a fourth point 28 on the circumferential edge 14 of the sheet of flexible material 12. The first and second points 18 20 are closer together than the third and fourth points 26 28.

[0029] In the present embodiment, the fold line 16 define an optional straight portion adjacent the circumferential edge 14. This straight portion simplifies the folding of the semi elliptical region 22 from the open state to the closed state as will be explained further below.

[0030] FIG. 1B shows a perspective view of a spout 10 when being rolled up to a tube as shown by the arrow. The sheet of flexible material 12 is rolled up by bending opposite parts of the circumferential edge 14 together. The sheet of flexible material 12 is elastically deformable and thus a force is required for deforming it from the flat shape. The sheet of flexible material 12 is bent such that the semi elliptical region 22 forms the top portion of the tube. The sheet of flexible material 12 is preferably made of a plastic coated aluminum foil.

[0031] FIG. 1C shows a perspective view of a spout 10' when rolled up to a tube and inserted into the mouth 30 of a beverage bottle 32. The elastic deformation force causes the sheet of flexible material 12' to seal against the inner wall of the neck part of the bottle 32. The circumferential edge 14 forms a well defined flow separation line preventing any spillage or drops of beverage. The spout 10' forms a tube having an internal channel 34 allowing beverage 36 to flow from the bottle 32 to the outside. The straight line fold 24 forms a circular bulge preventing the spout 10' from being pushed into the bottle 32.

[0032] FIG. 2A shows a perspective view of a rolled up spout 10' inserted into the mouth 30 of a beverage bottle 32 when in the open state. The semi elliptical region 22' is unfolded and follows the general form of the rest of the sheet of flexible material 12' such that the channel 34 is unobstructed and beverage may be poured.

[0033] FIG. 2B shows a perspective view of a rolled up spout 10" inserted into the mouth 30 of a beverage bottle 32 when in the closed state. The semi elliptical region 22" is bent or folded inwardly as shown by the arrow along the fold line 16 in order to obstruct the channel 34 of the spout 10". In this way, the spout 10" is closed off preventing any objects from entering the bottle 32 and preventing the escape of volatile aroma substances from the bottle 32. By unfolding the semi elliptical region 22", the beverage bottle 32 may be opened again.

[0034] FIG. 3 shows a front view of a spout 10a having a square shape in the perform state. Although the circular form may be preferred since it allows easy access to the semi elliptical region for simple opening and closing, it will be equally feasible to manufacture a square spout. In the present embodiment, the semi elliptical region 22 is located adjacent the side of the square.

[0035] FIG. 4 shows a front view of a spout 10b having a square shape in the perform state. The present embodiment differs from the previous spout 10a in that the semi elliptical region 22 is located at the corner of the square. In this way, the same advantages as by a circular spout may be achieved.

[0036] FIG. 5 shows a front view of a spout 10c having a square shape in the perform state. In the present em-

bodiment, the semi elliptical region 22 protrudes from the side of the square. In this way, the same advantages as by a circular spout may be achieved.

[0037] FIG. 6 shows a front view of a spout 10d having a circular shape in the perform state. The present spout 10d defines a first semielliptical region 22 and a second semi elliptical region 22a opposite the first semielliptical region 22. In this way, the spout may be used for bottle mouths having two different diameters. The first semielliptical region 22 has additional perforations 23 which gives the first semielliptical region 22 additional flexibility and aids in shaping the spout in the open position and simplifies the closing of the spout.

[0038] FIG. 7 shows a perspective view of a manufacturing plant 38, in which spouts 10 are manufactured by stamping. The plant 38 comprises a first roller 40 and a second roller 42 located opposite the first roller. A large sheet 44 of the flexible material is introduced between the rollers 40 42 as shown by the arrow. The first roller 40 comprises a multitude of dies 46, which each comprise a circumferential cutting blade 48 for generating the circumferential edge 14 of the sheet of flexible material 12 of the spout 10, a substantially semi elliptical profile 50 for generating the semi elliptical fold line 16 and a straight profile 52 for generating the straight fold line 24.

[0039] Although the above mentioned spout according to the present invention preferably is used as an operable and closable spout, it is evident that it may also be used as a permanently open spout in accordance with EP 0 560 777 B1.

List of parts with reference to the drawings:

[0040]

10. Spout
12. Sheet of flexible material
14. Outer circumferential edge
16. Semielliptical fold line
18. First point
20. Second point
22. Semielliptical region
23. Additional perforations
24. Straight line
26. Third point
28. Fourth point
30. Mouth
32. Bottle
34. Channel
36. Beverage
38. Manufacturing plant
40. First roller
42. Second roller
44. Large sheet
46. Profile
48. Cutting blade
50. Semielliptical profile
52. Straight line profile

Claims

1. A spout for a beverage bottle comprising a sheet of flexible material, said spout defining a first state constituting a substantially flat perform state in which said sheet of flexible material defines an outer circumferential edge, said sheet of flexible material being elastically bendable into a second state in which said sheet of flexible material defines a pipe for being inserted into the mouth of said beverage bottle, said sheet of flexible material defining, when in said first state, a substantially semi elliptical fold line extending from a first point on said outer circumferential edge to a second point on said outer circumferential edge delimiting a first region of said sheet of flexible material being substantially semi elliptical and said first region, when in said second state being bendable between an open state in which said sheet of flexible material defines an unobstructed channel within said pipe, and a closed state in which said semi elliptical region of said sheet of flexible material is folded into said channel and obstructing said pipe.

2. The spout according to claim 1, wherein said circumferential edge defines a circle.

3. The spout according to any of the preceding claims, wherein said sheet of flexible material is made of a plastic coated metal sheet.

4. The spout according to any of the preceding claims, wherein the major axis of said first region is directed towards the center of said sheet of flexible material.

5. The spout according to any of the preceding claims, wherein said sheet of flexible material defines, when in said first state, a further substantially semi elliptical fold line extending from a third point on said outer circumferential edge to a fourth point on said outer circumferential edge delimiting a second region of said sheet of flexible material being substantially semi elliptical, said second region being separated from and having a longer major axis than said first region.

6. The spout according to any of the preceding claims, wherein said sheet of flexible material defines, when in said first state, a straight fold line extending from a fifth point on said outer circumferential edge to a sixth point on said outer circumferential edge delimiting a third region, said third region fully encompassing said first region.

7. The spout according to claim 5 in combination with claim 6, wherein said sheet of flexible material defines, when in said first state, a further straight fold line extending from a seventh point on said outer circumferential edge to an eighth point on said outer

circumferential edge delimiting a fourth region, said fourth region fully encompassing said second region.

8. The spout according to any of the claims 6-7, wherein said straight fold line defines an indentation being 1-3mm deep, preferably 2mm deep.

9. The spout according to any of the claims 6-8, wherein said straight fold line defines a center point being located 16-26 mm from said outer circumferential ledge, preferably 18-24 mm, more preferably 20-22 mm, most preferably 21 mm.

10. The spout according to any of the preceding claims, wherein said fold line comprises a pressed line.

11. The spout according to any of the preceding claims, wherein said fold line defines a straight line adjacent said outer circumferential edge.

12. The spout according to any of the preceding claims, wherein said fold line comprise a series of perforations, preferably said series of perforations define apertures sufficiently small to prevent beverage flow at normal beverage pouring pressures.

13. The spout according to any of the preceding claims, wherein said sheet of flexible material defines, when in said first state, a surface area of between $1cm^2$ and $1dm^2$, preferably between $10cm^2$ and $50cm^2$.

14. A method of producing a spout for a beverage bottle, said method comprising the steps of:

providing a sheet of flexible material,
stamping said sheet of flexible material into a substantially flat perform defines an outer circumferential edge,
stamping a substantially semi elliptical fold line extending from a first point on said outer circumferential edge to a second point on said outer circumferential edge delimiting a first region of said sheet of flexible material being substantially semi elliptical.

15. The method according to claim 14, wherein said stamping is made simultaneously in the same process step.

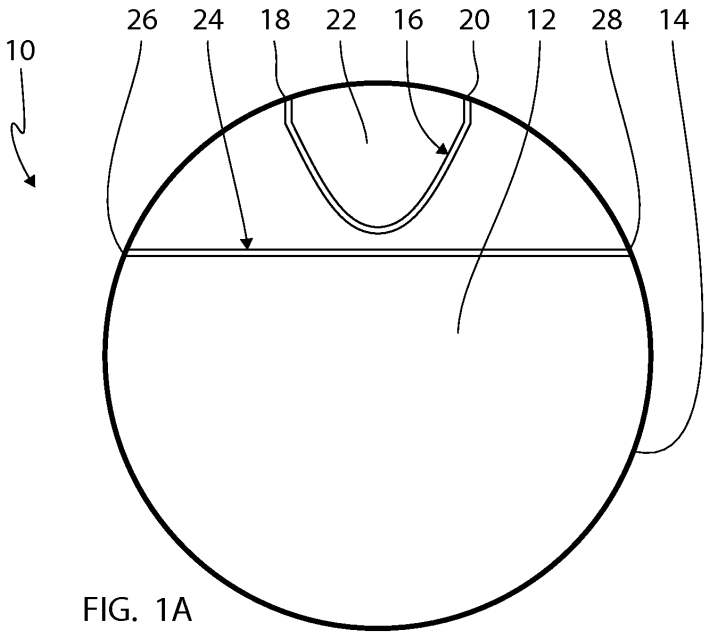


FIG. 1A

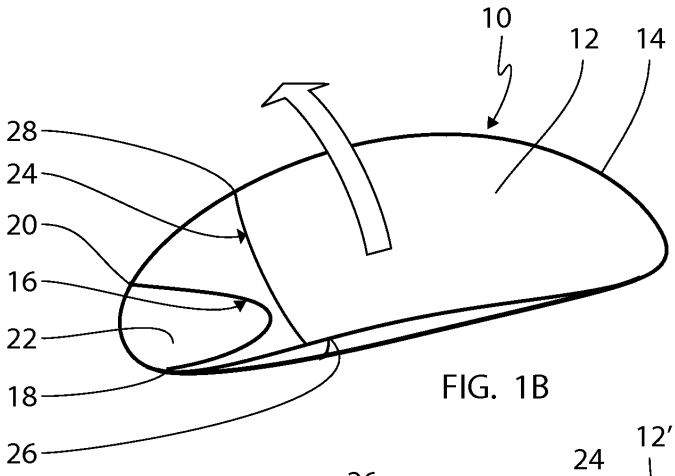


FIG. 1B

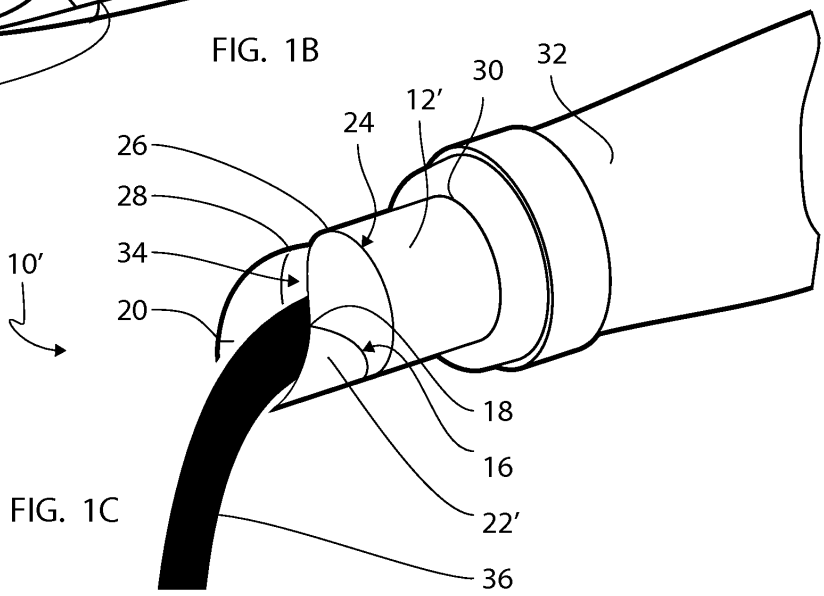


FIG. 1C

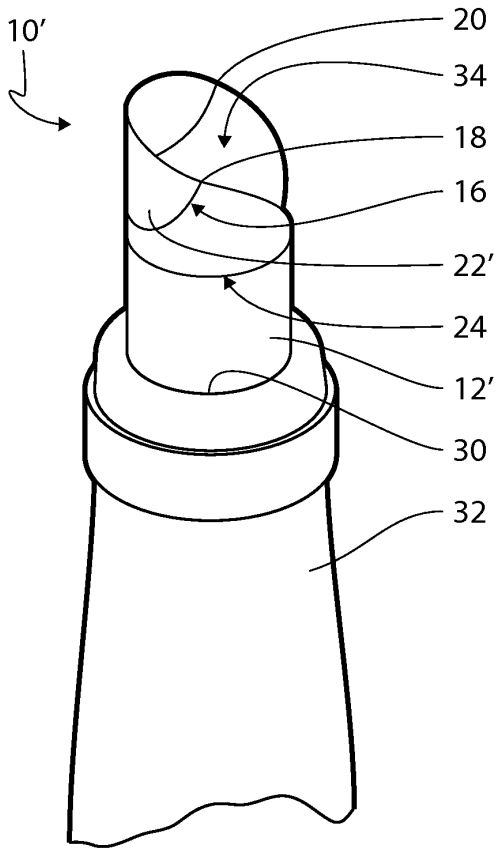


FIG. 2A

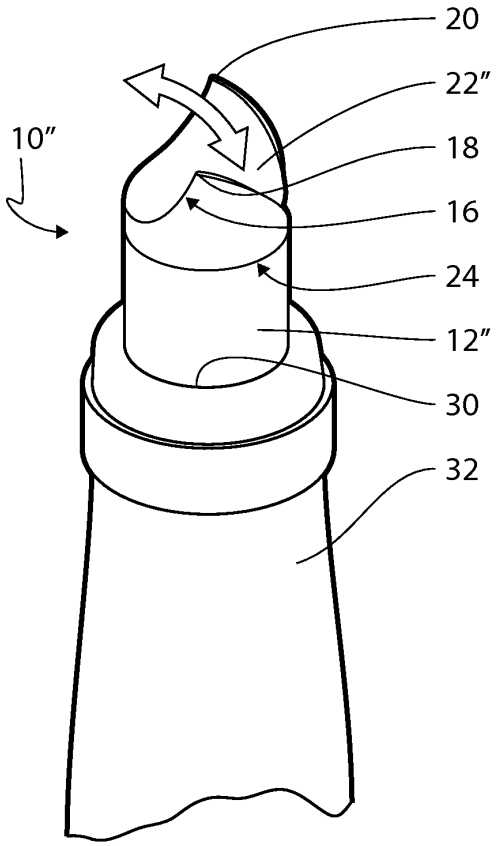


FIG. 2B

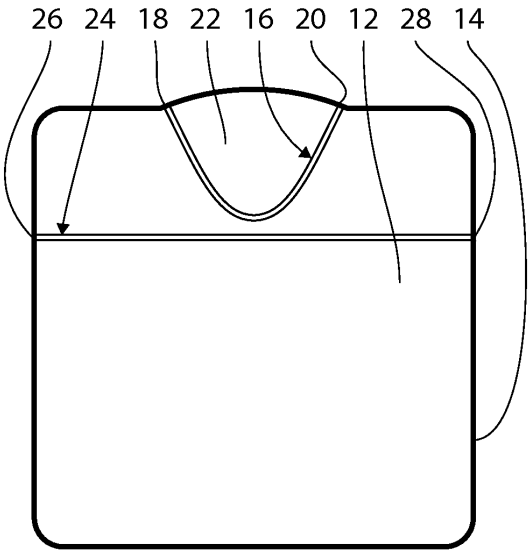


FIG. 3

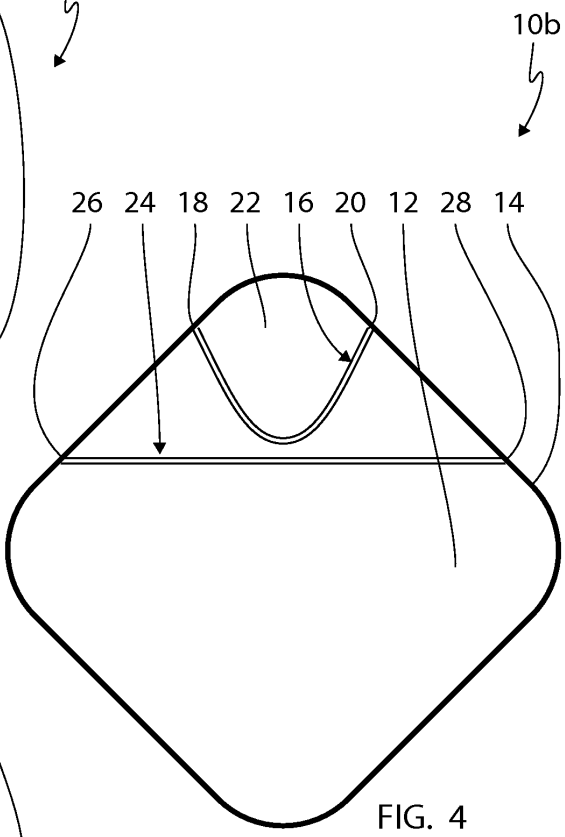


FIG. 4

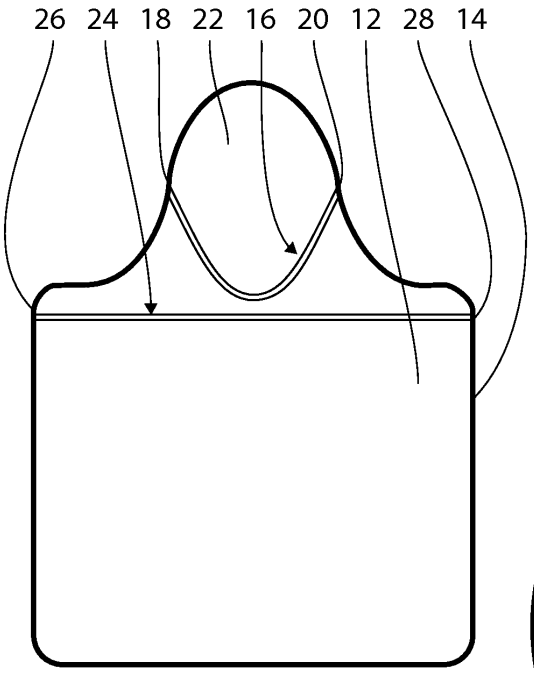


FIG. 5



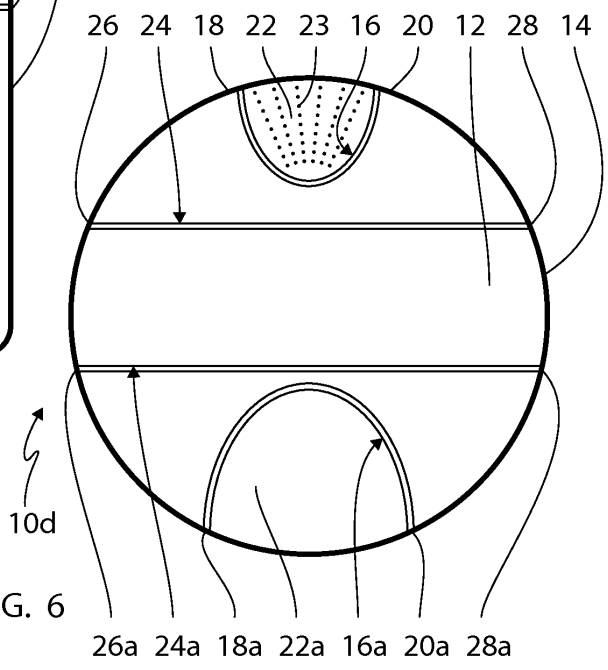


FIG. 6

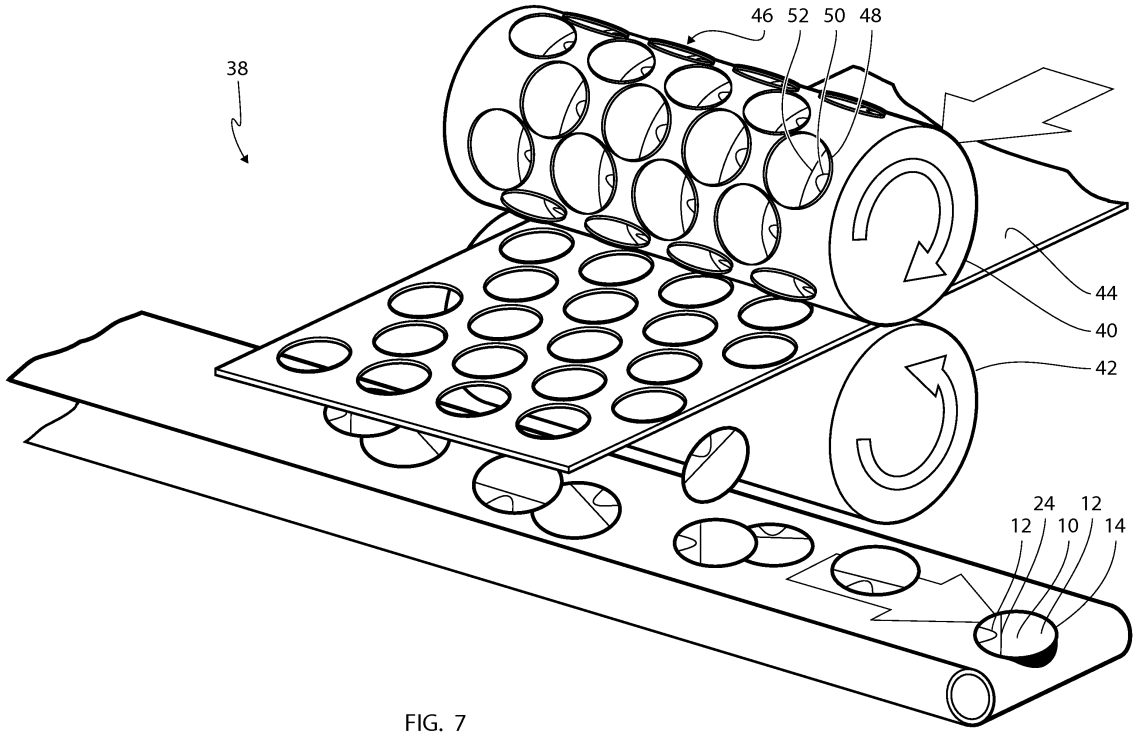


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
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