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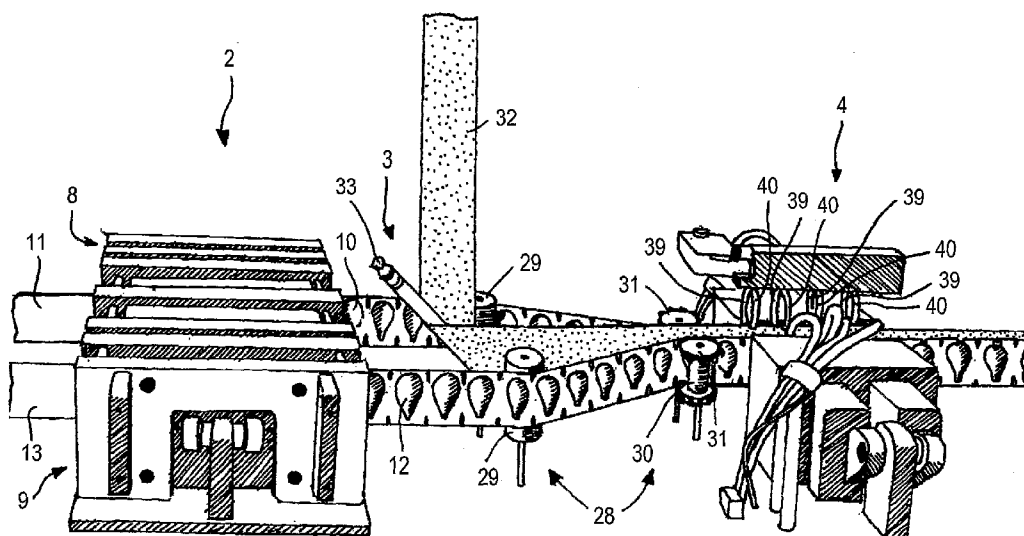
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(54) Title: CONTAINER, APPARATUS AND METHOD FOR PRODUCING A CONTAINER



(57) Abstract: An apparatus for packaging at least initially fluid products, comprises drawing forming means (2) arranged for drawing a first web (11) of sheet material and a second web (13) of said sheet material, said sheet material being deformable by drawing, heat-welding means (4), arranged downstream of said forming means (2), for welding said first web (11) to said second web (13), supplying means (3) being arranged between said forming means (2) and said heat-welding means (4), for supplying said heat-welding means (4) with a central web (32) interposed between said first web (11) and said second web (13).

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Container, apparatus and method for producing a container

The invention relates to a container, an apparatus and a method for producing a container, in particular for packaging food, pharmaceutical or cosmetic products.

5 Machines are known for packaging fluid products or products that solidify after being packaged, in which a first web and a second web, made of deformable material through drawing, are welded so that cavities formed by drawing on the first web are arranged at further cavities formed through drawing
10 on the second web so as to define a recess inside which the material to be packaged is then dispensed.

The recess thus defines a container of the product to be packaged.

A drawback of the known machines is that the producible
15 containers are not very versatile inasmuch as they enable only a product to be packaged inside each recess.

Further, each container is arranged for housing only a single dose of a packaged product.

An object of the invention is to improve known machines for
20 packaging fluid products or products that solidify after being packaged.

A further object of the invention is to produce more versatile containers that can, for example, accommodate different types of fluid products or products that solidify
25 after being packaged.

In a first aspect of the invention there is provided an apparatus for packaging at least initially fluid products, comprising drawing forming means arranged for drawing a first web of sheet material and a second web of said sheet
30 material, said sheet material being deformable by drawing, heat-welding means, arranged downstream of said drawing means, for welding said first web to said second web, characterised in that between said drawing means and said heat-welding means there is arranged supplying means
35 arranged for supplying said heat-welding means with a

central web interposed between said first web and said second web.

In a second aspect of the invention there is provided a method for packaging at least initially fluid products, comprising drawing a first web of sheet material and a second web of said sheet material, said sheet material being deformable by drawing, welding through heat-welding said first web and said second web after said drawing, characterised in that between said forming and said welding supplying a central web between said first web and said second web is provided.

In a third aspect of the invention there is provided a container comprising a first external wall and a second external wall, made of material that is deformable through drawing, said first wall and said second wall defining respectively a first cavity and a second cavity alongside one another, characterised in that it further comprises a dividing wall arranged for separating said first cavity from said second cavity.

Owing to the invention, containers are thus producible in which the first cavity and the second cavity made by the forming means respectively on the first web and on the second web are separated by the central wall.

In this manner the produced containers can house, inside a first chamber defined by the first cavity and inside a second chamber defined by the second cavity, several doses of the same material or different materials.

The containers are made owing to an apparatus that is capable of processing webs of sheet material that are deformable through drawing, for example made of a material comprising a film of aluminium.

In this manner the produced containers provide the contained products with great protection against light and prevent gas moving through the external walls.

In addition to that, the central wall is made so as to prevent the passage of gas or material between the first and the second chamber.

5 The containers according to the invention can be used for packaging a vast range of products.

The containers according to the invention, can for example be advantageously used in cases in which it is necessary to provide a container with several compartments to dispense doses of the same product at different moments.

10 The containers according to the invention can also be advantageously used for containing different products arranged for interacting at the moment of the dispensing, for example two components of a medical product.

The containers can also be used to contain doses of various
15 products to be used in different steps of the same treatment, for example aesthetic treatment in which the container houses a shampoo and a conditioner.

If the container houses different products, the first and the second chamber can be made so as to have a different
20 capacity.

The invention will be better understood and carried into effect with reference to the attached drawings, in which some embodiments of the invention are shown by way of non-limiting example, in which:

25 Figure 1 is a schematic plan view of an apparatus according to an embodiment of the invention;

Figure 2 is a perspective view of a portion of an embodiment of the apparatus in Figure 1;

30 Figure 3 is a fragmentary plan section of forming means of the apparatus in Figure 1;

Figure 4 is a perspective view of a web at the end of a first step of a drawing forming process;

Figure 5 is a perspective view like the one in Figure 4 at the end of a second step of the drawing forming process;

35 Figure 6 is a cross section of a continuous lateral web according to an embodiment of the invention;

Figure 7 is a cross section of a central web used to obtain a central wall of a container according to an embodiment of the invention;

5 Figure 8 is a side view of a web of containers according to the invention;

Figure 9 is a cross section of the container in Figure 8;

Figure 10 is a side view of the container produced by the apparatus in Figure 1.

10 Figures 1 and 2 relate to an apparatus 1 for packaging fluid products or products that solidify after being packaged according to an embodiment of the invention and comprising forming means 2, supplying means 3, heat-welding means 4, filling means 5, sealing means 6 and cutting means 7.

15 The forming means 2 comprises a first forming station 8 and a second forming station 9 alongside one another and arranged for obtaining, through drawing, respectively first cavities 10 on a first continuous web 11 and second cavities 12 on a second continuous web 13.

20 The first continuous web 11 and the second continuous web 13 are moved respectively to the first forming station 8 and the second forming station 9 through moving means that is not shown, for example grippers that are movable along a advance direction F, shown in Figure 1, and arranged downstream of the first forming station 8 and of the second forming station 9.

The moving means enables the continuous webs 11 and 13 to be indexed in synchronised manner.

30 The first continuous web 11 and the second continuous web 13 are unwound, during movement steps, by further supplying means, not shown, for example respectively by a first reel and by a second reel, and are advanced towards the forming means 2.

The first continuous web 11 and the second continuous web 13 are made of a material that is formable through drawing.

35 The first continuous web 11 and the second continuous web 13 comprise superimposed films made of various materials, for

example, as shown in Figure 6, a first film 60 that is hardly stretchable that is made of aluminium and a second film 61 made of heat-weldable plastics.

The moving means is arranged for positioning at each movement step a first portion 14 of the first continuous web 9 and a second portion 15 of the second continuous web 11 that are not yet formed between punch means 16 and forming recess means 17 of the respective forming station 8,9.

Figures 3, 4 and 5 relate to a forming step, during which the first continuous web 11 is formed by drawing inside the first forming station 8.

The forming step extends between a step in which the continuous web 11 is moved and a subsequent step in which the continuous web 11 is moved.

During the forming step, the punch means 16 approaches the forming recess means 17 and regions of the continuous webs 11 are pushed by reserve-forming blades 18 movable in a direction Z, shown in Figure 3, inside corresponding first forming recesses 19 so as to form reserves of material 20 inside the latter.

The reserves of material 20, which are visible in Figure 4, so obtained in the first continuous web 11, have a concave profile.

Subsequently, punches 21 of said punch means 16, interact with second forming recesses 22, alternating with the first forming recesses 19 on the forming recess means 17, to form the first cavities 10 on the first continuous web 11.

A first part 25 of the material pushed by the reserve-forming blades 18 to form the reserves of material 20, shown in Figure 5, exits the first forming recesses 19 and is dragged, as shown by the arrows R of Figure 5, to drawing zones 26, in which the punches 21 interact with the first continuous web 11.

A second part 27 of the material pushed by the reserve-forming blades 18 to form the reserves of material 20 is not dragged to the drawing zones 26, being too distant from the

latter, and maintains the concave profile also at the end of the drawing step.

The cavities 10 are thus formed without subjecting the continuous web 11 to stress that could alter the features of the continuous web 11 or damage the continuous web 11.

In particular, by so doing, drawing the continuous web 11 during the drawing step is avoided and lacerating the continuous web 11 is avoided.

Simultaneously, during a similar forming step, in the second forming station 9 the second cavities 12 on the second continuous web 13 are formed through drawing according to methods similar to those disclosed above.

During subsequent movement steps, the first continuous formed web 11 and the second continuous formed web 13 are indexed towards the heat-welding means 4 by the moving means.

Before arriving near the heat-welding means 4, a path of the webs 11 and 13 is deviated by deviating means 28, so as to bring the first continuous web 11 near to the second continuous web 13 and so that the first cavities 10 are arranged near the second cavities 12.

The deviating means 28 is made so as to deviate the webs 11 and 13 without altering the shape of the cavities 10, 12.

The deviating means 28 comprises a pair of idle rollers 29 and a pair of cylindrical elements 30 on which portions of the continuous webs 11 and 13 are wound.

The continuous webs 11, 13 come into contact with the rollers 29 along a surface 62 situated on a side of the continuous webs 11, 13 opposite the one in which the cavities 10 and 12 are obtained near zones 38 that are not drawn by the punches 21.

Advantageously, still to avoid deforming the cavities 10, 12 excessively, the rollers 29 have a large diameter compared with dimensions considered in the advance direction F, of the cavities 10, 12.

In order to prevent a stiff surface of each cylindrical element 30 deforming the cavities 10, 12, whilst the continuous webs 11, 13 are deviated, the cylindrical elements 30 are provided with end wheels 31 made of spongy material by means of which the contact develops with the continuous webs 11, 13 in zones sufficiently distant from the cavities 10, 12.

Also the end wheels 31 have a further large diameter compared with the dimension of the cavities 10, 12.

10 In order to diminish the portions of the continuous webs that are wound on the rollers 29 and on the end wheels 31 and therefore the deformation to which the webs are subjected to deviate the path thereof, each roller 29 is positioned at a sufficient distance from the corresponding cylindrical element 30, engaged on the same continuous web 11, 13.

Between the forming means 2 and the heat-welding means 4 there is interposed supplying means 3 arranged for supplying the heat-welding means with a central continuous web 32.

20 The supplying means 3 is arranged for positioning the central continuous web 32 in a position interposed between the first continuous web 11 and the second continuous web 13.

The supplying means 3 comprises a reel, which is not shown, from which the central continuous web 32 is unwound, and roller means, which is not shown, which is suitable for maintaining the latter taut during unwinding from the reel and inserting between the two continuous webs 11 and 13.

The supplying means 3 further comprises a tilted fixed shaft 30 33, shown in Figures 1 and 2 arranged between the continuous webs 11 and 13 for deviating the central continuous web 32 arriving from the roller means and directing the central continuous web 32 along a direction substantially parallel to the advance direction F so as to insert the central continuous web 32 between the two continuous webs 11 and 13 upstream of the heat-welding means 4.

The cylindrical elements 30 are arranged for bringing the first continuous web 11 and the second continuous web 13 near to the central continuous web 32 upstream of the heat-welding means 4.

5 The central continuous web 32 may be a web of plastics or a web, as shown in Figure 7, comprising a central film 34 made of metal material, for example aluminium, covered by two side films 35, made of heat-weldable plastics, arranged for enabling the central continuous web 32 to be welded to the
10 continuous webs 11 and 13 during a heat-welding step.

The heat-welding means 4 is arranged for welding the first web 11 and the second web 13 respectively on a first side surface 36 and on a second side surface 37 of the central continuous web 32.

15 The heat-welding means 4 comprises a pair of half moulds arranged for closing, heating the zones 38 of the continuous webs 11 and 13 that were not deformed during the drawing step and the corresponding zones of the first side surface 36 and of the second side surface 37 that they face, and
20 thus compacting the continuous webs 11 and 13 on the central continuous web 32.

In this manner, the second film made of heat-weldable plastics of the first continuous web 11 and of the second continuous web 13 are welded to the central continuous web
25 32, regardless of whether the latter is made entirely of plastics or has side films 35.

During the heat-welding step, there are inserted respectively between the first continuous web 11 and the central continuous web 32, and between the second continuous
30 web 13 and the central continuous web 32, first elongated elements 39 and second elongated elements 40, visible in Figure 2, which prevent welding forming along further zones 41 that extend from a peripheral zone of the continuous webs 11, 13 until respectively the first cavities 10 and the
35 second cavities 12.

Along said further zones conduits 42 shown in Figures 8 and 9 are defined at the end of the heat-welding step, the conduits 42 causing the cavities 10 and 12 to communicate with the external environment.

5 In order to facilitate inserting the elongated elements 39 and 40 between the central continuous web 32 and the continuous webs 11 and 13, there can be used a central continuous web 32 having a width that is greater than that of the continuous webs 11 and 13 and arranging the supplying
10 means 3 so that an excess of material 43 obtained with respect to a width of the continuous webs 11 and 13 is at an end of the central continuous web 32, which end is arranged for interacting with the elongated elements 39 and 40.

The first continuous web 11, the second continuous web 13
15 and the central continuous web 32 define, after being welded by the heat-welding means, a web of containers 44.

Further moving means that is not shown, for example further grippers that are movable along the advance direction F, index the web of containers 44 to the filling means 5 in a
20 manner synchronised with the moving means.

The filling means 5 is arranged for filling the first cavities 10 and the second cavities 12 with the fluid products or the products that solidify after packaging.

The filling means 5 comprises a plurality of movable nozzles
25 arranged for being inserted into the conduits 42 and for dispensing into the cavities 10 and 12 products to be packaged, for example the fluid products or the products that solidify after packaging.

Subsequently, the web of containers 44 is moved by the
30 further movement means to sealing means 6 arranged for closing by a further heat-welding step the conduit 42 so as to seal the cavities 10 and 12.

The web of containers 44 is then advanced by the further movement means to cutting means arranged for cutting the
35 latter so as to separate single containers 45.

Each container 45 is provided with a first chamber 48 defined by the first cavity 10 and with a second chamber 49 defined by the second cavity 12, and contains, depending on the products to packaged dispensed by the filling means 5, several doses of the same material or different materials.

The cutting means 7 can cut the web so as to obtain forms of the container 45 that are advantageously usable by a user.

For example, the zone 38 can be cut so as to provide a grip for the user and to simplify a container 45 opening operation.

In Figure 10 there is shown a container 45 provided with an edge 46 surrounding the first chamber 48 and the second chamber 49.

The edge 46 is provided with a gripping zone 51 having a greater width than the edge 46, which gripping zone 51 is situated in a lower portion of the container 45 and is arranged for being handled by the user.

In particular, in the gripping zone 51 a V-shaped notch 47 is obtained that enables the container 45 to be opened easily when it is desired to dispense the products contained therein.

The first chamber 48 and the second chamber 49 can be made so that one has different dimensions from the other, for example for housing other quantities of product, or that one has a different shape from the other one, so as to enable one chamber at a time to be open when containers are produced arranged for dispensing the contained products in different moments.

In this case, several suitably positioned notches can be provided in zones of the edge 46 arranged for enabling one chamber at a time to be opened.

Advantageously, the central continuous web 32 arranged for forming a dividing wall between the first chamber 48 and the second chamber 49, may comprise a central film 34 made of aluminium.

In this manner, when the container 45 contains two doses of the same product to be dispensed at different moments, a second dose that remains inside the container 45 longer is more protected and insulated from the external environment
5 inasmuch as the aluminium is provided with excellent barrier properties.

Further, when the container 45 contains two products that are different from one another, the presence of the film made of aluminium prevents interaction between the two
10 products in an optimum manner.

CLAIMS

1. Apparatus for packaging at least initially fluid products, comprising drawing forming means (2) arranged for drawing a first web (11) of sheet material and a
5 second web (13) of said sheet material, said sheet material being deformable by drawing, heat-welding means (4), arranged downstream of said forming means (2), for welding said first web (11) to said second web (13), characterised in that between said forming means (2) and
10 said heat-welding means (4), there is arranged supplying means (3) arranged for supplying said heat-welding means (4) with a central web (32) interposed between said first web (11) and said second web (13).
2. Apparatus according to claim 1, wherein said supplying
15 means (3) comprises a tilted shaft (33) for deviating a path of said central web (32) so as to interpose said central web (32) between said first web (11) and said second web (13).
3. Apparatus according to any preceding claim, wherein said
20 supplying means (3) comprises a reel arranged for supplying said central web (32).
4. Apparatus according to any preceding claim, wherein said
supplying means (3) comprises roller means arranged for maintaining said central web (32) taut inside said
25 supplying means (3).
5. Apparatus according to any preceding claim, wherein said
heat-welding means (4) is shaped so as to make a first chamber (48) between said central web (32) and said
first web (11) and a second chamber (49) between said
30 central web (32) and said second web (13).
6. Apparatus according to claim 5, wherein said heat-
welding means (4) comprises first elongated element
means (39) and second elongated element means (40),
arranged for being inserted respectively between said
35 first web (11) and said central web (32) and between
said second web (13) and said central web (32) to enable

conduit means (42) to be formed for connecting respectively said first chamber (48) and said second chamber (49) to an external environment.

- 5 7. Apparatus according to claim 5 or 6, and further comprising filling means (5) arranged for filling said first chamber (48) and said second chamber (49) with said products.
8. Apparatus according to claim 7, wherein said filling means (5) comprises movable nozzle means arranged for
10 being inserted in said conduit means (42) to dispense said products.
9. Apparatus according to claim 8, wherein said movable nozzle means comprises nozzles arranged for dispensing first products and second products respectively in said
15 first chamber (48) and in said second chamber (49).
10. Method for packaging at least initially fluid products, comprising drawing a first web (11) of sheet material and a second web (13) of said sheet material, said sheet material being deformable by drawing, welding through
20 heat-welding said first web (11) and said second web (13) after said drawing, characterised in that between said forming and said welding there is provided supplying a central web (32) between said first web (11) and said second web (13).
- 25 11. Method according to claim 10, wherein said supplying comprises deviating a path of said central web (32) by deviating means (33) to interpose said central web (32) between said first web (11) and said second web (13).
12. Method according to claim 10 or 11, wherein said
30 supplying comprises unwinding said central web (32) from reel means.
13. Method according to any one of claims 10 to 12, wherein said supplying comprises tensioning said central web (32) by roller means during said supplying.
- 35 14. Method according to any one of claims 10 to 13, wherein said welding comprises obtaining first chambers (48)

between said central web (32) and said first web (11) and second chambers (49) between said central web (32) and said second web (13).

15. Method according to any one of claims 10 to 14, wherein
5 said welding comprises inserting first elongated element means (39) and second elongated element means (40) respectively between said first web (11) and said central web (32) and between said second web (13) and said central web (32) to form conduit means (42)
10 arranged for connecting respectively said first chamber (48) and said second chamber (49) to an external environment.

16. Method according to claim 14 or 15, and comprising filling with said products said first chamber (48) and
15 said second chamber (49) through filling means (5).

17. Method according to claim 16, wherein said filling comprises inserting movable nozzle means in said conduit means (42) to dispense said products.

18. Method according to claim 17, wherein said dispensing
20 said products comprises dispensing first products and second products of said products respectively in said first chamber (48) and in said second chamber (49) by means of nozzles.

19. Method according to any one of claims 10 to 18 and
25 comprising cutting, by cutting means, said first web (11), said second web (13) and said third web (32) after said welding, so as to obtain a container (45) provided with said first chamber (48) and with said second chamber (49).

30 20. Method according to claim 19, in which said cutting comprises forming an edge (46) of said container (45) so as to define an undercut (47) arranged for facilitating opening of said container (45).

21. Container comprising a first external wall (11) and a
35 second external wall (13), made of material that is deformable through drawing, said first wall (11) and

said second wall (13) defining respectively a first cavity (10) and a second cavity (12) alongside one another, characterised in that said container further comprises a dividing wall (32) arranged for separating
5 said first cavity (10) from said second cavity (12).

22. Container according to claim 21, wherein said internal wall (32) comprises a film made of metal material (34).

23. Container according to claim 22, in which said film (34) is made of aluminium.

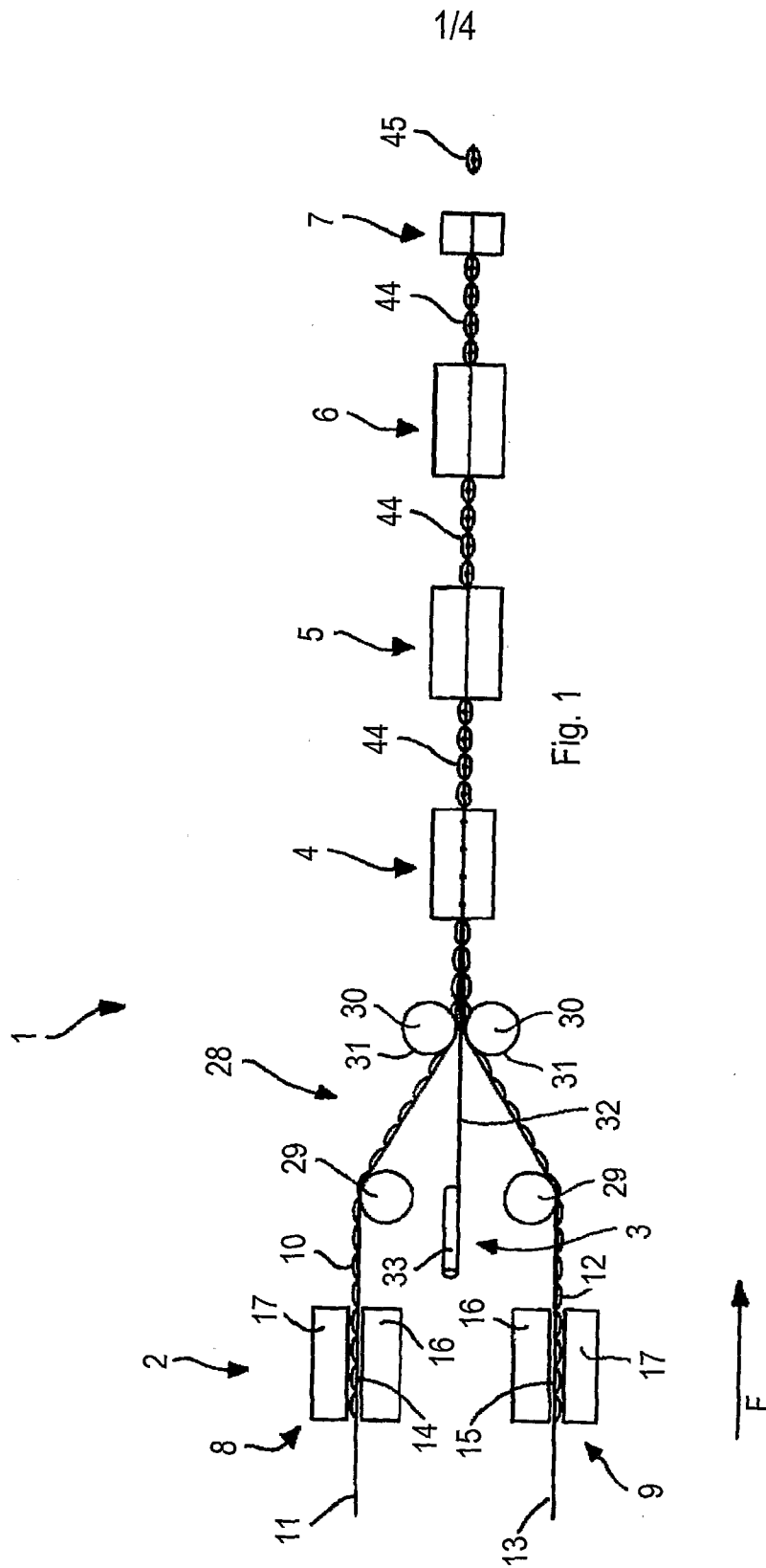
10 24. Container according to any one of claims 21 to 23, and comprising an edge (46) surrounding said first cavity (10) and said second cavity (12), wherein said first wall (11), said second wall (13) and said dividing wall (32) are welded together.

15 25. Container according to claim 29, wherein said edge (46) comprises a more extended zone (51) arranged for facilitating the use of the container (45).

20 26. Container according to claim 24, or 25, wherein said edge (46) comprises an undercut zone (47) arranged for facilitating the opening of said container (45) by lacerating and removing of a portion of said container.

27. Apparatus according to claim 26, wherein said undercut zone (47) is situated near said more extended zone (51).

25 28. Apparatus according to claim 26, or 27, wherein said undercut zone comprises a notch (47) made on said edge (46).



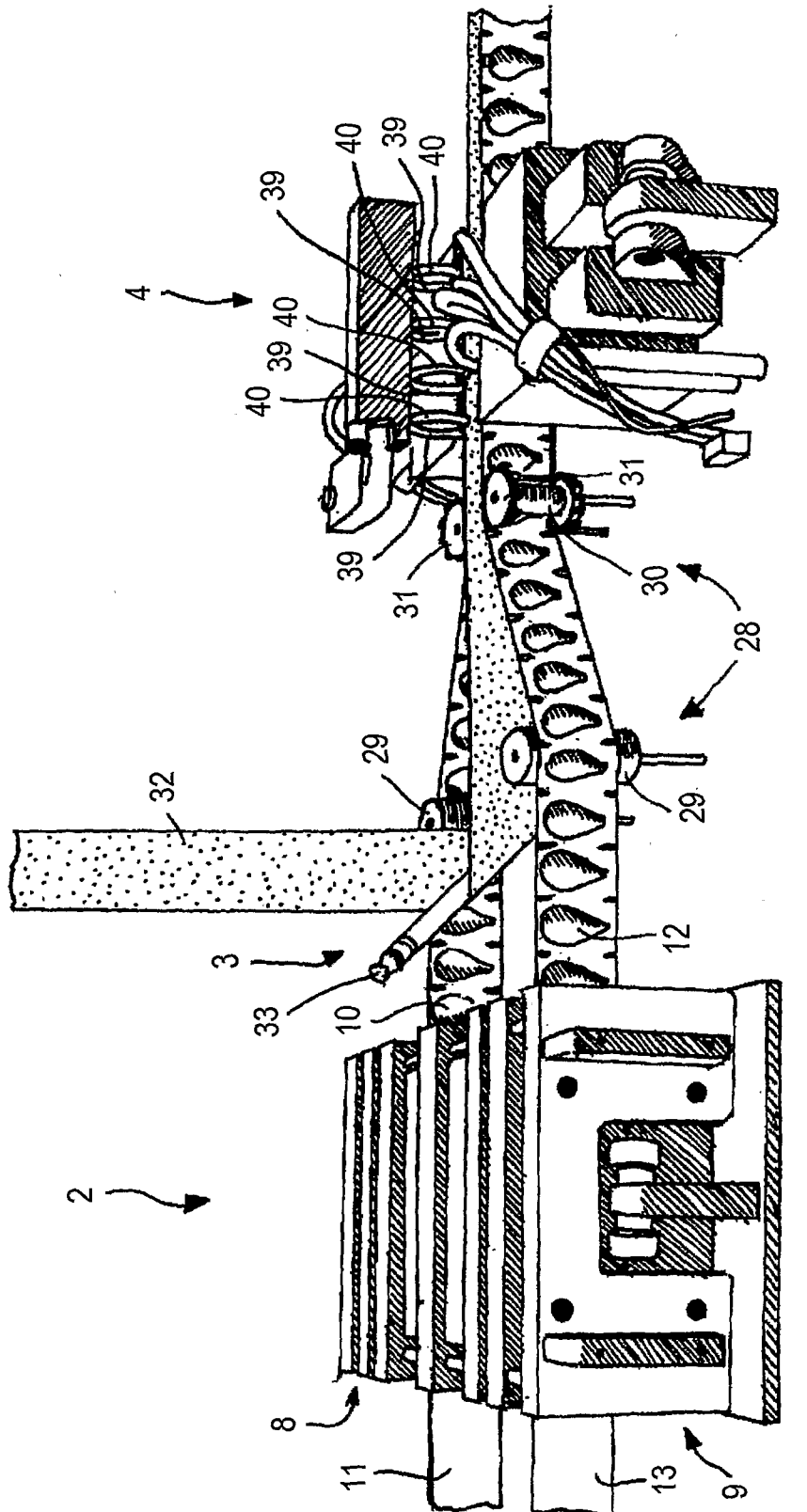
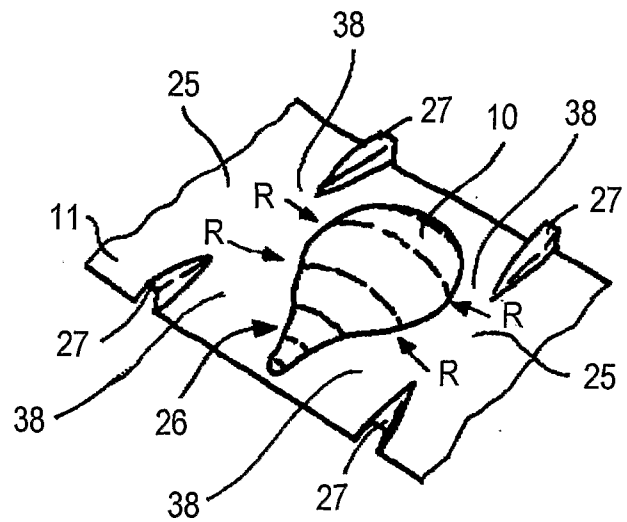
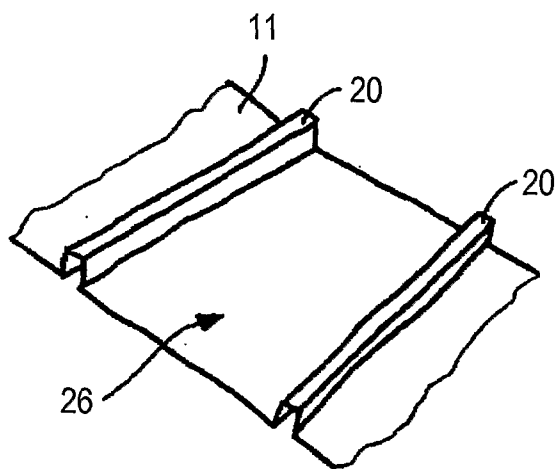
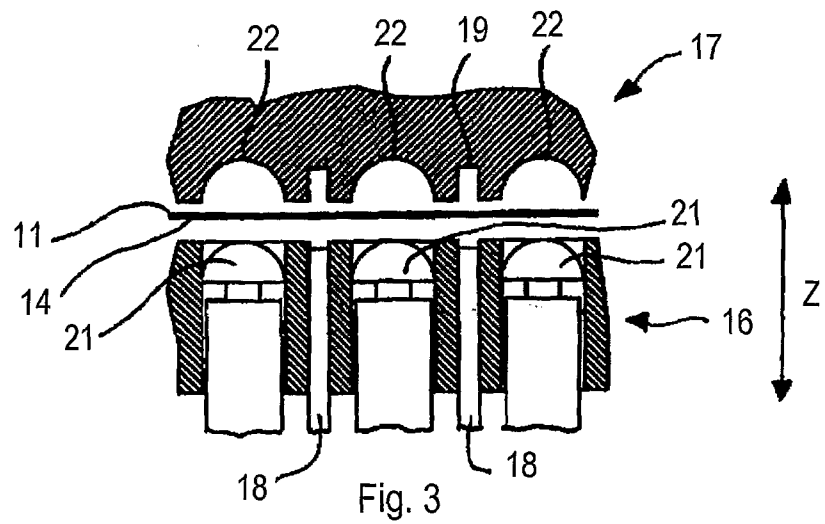


Fig. 2

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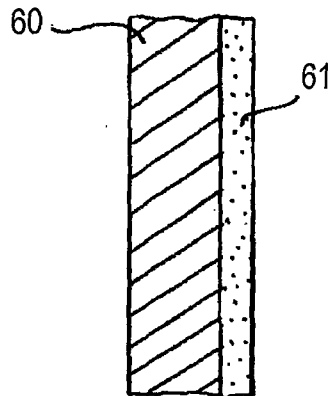


Fig. 6

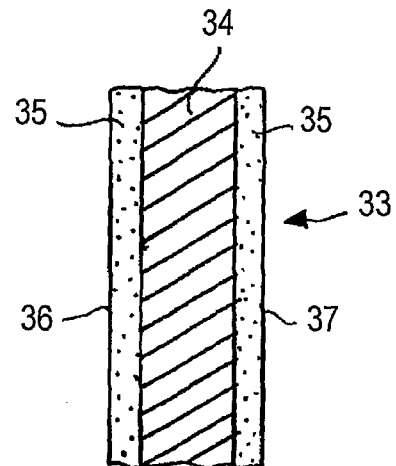


Fig. 7

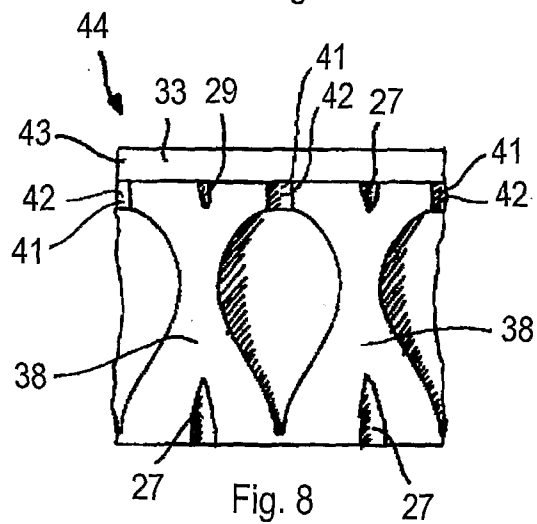


Fig. 8

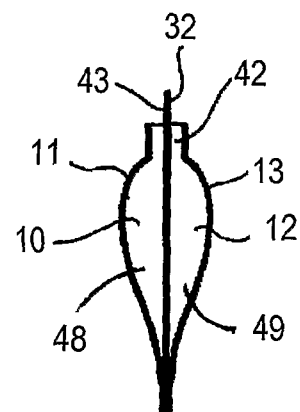


Fig. 9

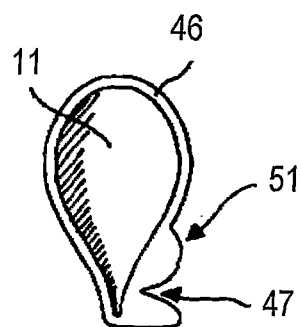


Fig. 10