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(54) **Container and method of making the same as well as method and device for filling the same**  
Behälter und Verfahren zu dessen Herstellung und Verfahren und Vorrichtung zu dessen Befüllung  
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## Description

### Field of the Invention

**[0001]** The present invention relates to a container as defined in the preamble to appended claim 1, a method for making said container, and a method and a device for filling said container.

### Background Art

**[0002]** Many different kinds of containers for liquid or pulverulent substances are currently available. The containers can either be rigid and made of a rigid material, such as metal, glass, paper or plastic, or be made of a flexible material, usually paper or plastic.

**[0003]** In the handling of foodstuffs special demands are made on containers in respect of their hygienic properties, on the one hand in connection with the packaging of foodstuffs and, on the other hand, in connection with the consuming of foodstuffs. Particularly great demands are made in connection with the handling and packaging of sensitive foodstuffs, such as milk.

**[0004]** SE-B-412,357 discloses a container of paper, which is a parallelepiped and in which a tubular duct means in a connecting portion between two side walls is arranged. Owing to the shape of the container and the inherent rigidity of paper a self-supporting container is formed. The duct means consists of an internal layer of a non-sealable material and an external layer of a sealable material, which at one end extends beyond the non-sealable material to enable sealing of the duct means. The rigidity of the paper and the shape of the container also result in the cross-sectional shape of the duct means in the container following the side walls to form practically an elongate opening or slot when emptying the container.

**[0005]** This container is of the type that is made and filled simultaneously by making containers from below from a filled "tube" of container material. Devices for making and filling such containers are very large and expensive and therefore suited for large-scale operation only.

**[0006]** It is difficult to make such a tubular duct means, whose internal layer at one end is terminated inside the external layer. Moreover, it is an extremely complicated operation to insert a duct means between the side walls of the container when forming this in a filled state.

**[0007]** Heavy demands are currently made on containers in terms of their environmental influence. It should be possible to make and transport containers with a low consumption of energy and, after use, take care of them in an environmentally friendly manner. Further, consumers require that the container be easy to handle.

**[0008]** The container according to SE-B-412,357 is in itself difficult to handle since a user holding the container in its filled, open state runs the risk of spillage by squeez-

ing the side walls of the container.

**[0009]** Moreover, the container comprises a plurality of materials, such as paper, polyethylene and aluminium, which makes it difficult to take care of the container waste in an environmentally friendly manner.

**[0010]** Document WO 95/31329 refers to a bag manufacturing process and a device for producing such bags. The bag discloses a container having flexible walls defining a compartment and a duct means extending from the compartment to the surroundings. The duct means is arranged in one of the corners or in one of the edges, e.g. the bottom edge. The duct means is sealed in the empty state of the container before filling. In the empty state the upper edge portion of the container is unsealed in order of permitting filling of the container.

**[0011]** Further, document US 4 583 352 refers to an apparatus and processes for handling, filling and sealing a pouch in an aseptic environment. The apparatus and process includes a pouch carrier and upper pouch grippers for holding the pouch during sterilization, filling and sealing. Vacuum jaws in an aseptic chamber engage, stretch and open the pouch, and a cutter cuts off a removable pouch seal before the pouch is opened. Once opened, the pouch is filled, closed, sealed and moved out of the chamber through the bath.

**[0012]** In spite of the presence of a large amount of different containers there is a need for a new kind of container which in a better way satisfies the various demands that are currently placed on containers.

### Summary of the Invention

**[0013]** An object of the present invention is to provide a new and improved container. Special objects are to provide a container which can be made at low cost, has a low weight and is easy to handle.

**[0014]** A specific object is to provide an improved container for foodstuffs, especially for foodstuffs for which asepsis is necessary.

**[0015]** A further object is to provide a new and appropriate method of making a container.

**[0016]** Besides, an object is to provide an improved method and device for packing a liquid or pulverulent substance.

**[0017]** According to the invention, these and other objects, which will appear from the following specification, are now achieved by a container, a method for making said container, as well as a method and a device for filling said container, which are of the types defined by the features stated in claims 1, 13, 21 and 24, respectively.

**[0018]** According to a first aspect, the invention thus resides in a container with flexible walls which are interconnected to form a closed compartment, the volume of which is dependent on the relative position of the walls. Two opposing side walls are joined along a common connecting portion, and the container has a duct means, the material composition of which is uniform along its entire length and which extends between the two side

walls from the compartment to the outside of the container and is sealed when the container is in an empty state before filling.

**[0019]** By a duct means being formed between the compartment and the outside of the container, a strong opening of a predetermined size is formed. As a result, it will be easy on the one hand to fill the container and, on the other hand, in consumption, to empty the container since the size and position of the opening are pre-defined. Moreover, it will be possible to close and open the container several times, on the one hand when making and filling the container to ensure good hygiene and, on the other hand, in consumption to ensure good keeping qualities and taste, which is a great advantage in foodstuffs, especially in foodstuffs for which hygiene and aseptis are necessary.

**[0020]** A great advantage of the inventive container is that making and filling thereof can take place in completely separate plants, and that this makes the container well suited for small-scale industry.

**[0021]** As mentioned above, the duct means is sealed when making the container. Provided that the container is made in sterile conditions or is sterilised after manufacture, an unfilled container with a sterile compartment can thus be obtained. This container can then be conveyed to a separate filling plant with maintained sterility. Therefore the filling plant need not comprise equipment for sterilisation of the compartment of the container, which is cost-effective and particularly advantageous for small-scale filling plants.

**[0022]** By the container having flexible walls, it may, when finished, be flattened and transported in flat state in a most space-saving manner.

**[0023]** Thanks to the combination of the container having flexible walls, which yields a collapsing container, and a duct means, a container for foodstuffs is provided, which besides before filling and after consumption can be pressed together and is extremely space-saving.

**[0024]** The duct means has a flexible wall, which makes it possible to press the entire container together. On the one hand, space can be saved and, on the other hand, the handling in manufacture and filling is simplified.

**[0025]** In a preferred embodiment, the duct means is made of the same material as the side walls, which is a great advantage when disposing of the container after use.

**[0026]** Moreover, the duct means can be integrated with the side walls or be formed as a separate piece inserted between the side walls.

**[0027]** The container is made of a flexible material, especially a plastic material. The plastic material advantageously comprises heat sealable surface layers. The thickness of the material preferably is in the range 100-200  $\mu\text{m}$ . The duct means can be made with a greater thickness than the walls, for instance about 200  $\mu\text{m}$  when the walls have a thickness of about 100  $\mu\text{m}$ .

**[0028]** According to an embodiment, the duct means is along essentially half its external circumference connected with one side wall of the connecting portion and along essentially the other half of its external circumference connected with the other side wall of the connecting portion. This results in a stable and symmetric connection of the duct means. This embodiment is especially advantageous when the duct means has a flexible wall since, when handling an empty container, a straight connecting portion with a flat duct means arranged therein is obtained.

**[0029]** In a particularly preferred embodiment, the duct means comprises on its inside a heat sealable material, which facilitates sealing of the duct means to close the same in an optional position along the duct means.

**[0030]** In a preferred embodiment, the duct means extends a distance away from the edge and is terminated with a terminal edge arranged on the outside of the container. This terminal edge can be sealed when making the container, in which case the container in empty and flat state can easily be sterilised and remain sterilised until it is to be filled. Before filling, the container can be opened by the terminal edge being removed, for instance cut off, and after filling, the new terminal edge can be sealed to close the container. When the contents of the container then are to be consumed, the duct means can once more be opened by cutting off the terminal edge. A great advantage of the duct means is that it can be sealed by the consumer by inserting a plug into the duct means at its terminal edge.

**[0031]** The container described above is well suited especially for consumer products having a volume of up to a few litres and a weight of up to a few kilos. It is particularly suitable for foodstuffs such as milk.

**[0032]** In another embodiment of the container, the separately manufactured duct means extends a distance inwards from the connecting portion to an inner end, the side walls comprising a projecting portion or appendage which surrounds the duct means and in which the connecting portion on each side of the duct means has a curved portion and an edge portion extending from the curved portion in parallel with the duct means. Thus an annular space forms round the duct means.

**[0033]** When the container in filled state is positioned with the duct means directed downwards, a radial pressure is exerted on the duct means, and when a tubular valve means is inserted in the duct means, a sealing effect is thus established between the duct means and the valve means. The container according to this embodiment is particularly suitable for cooperation with dispensers for serving a liquid such as water. It is particularly preferred in this embodiment that the inner end of the duct means is sealed when the container is filled.

**[0034]** According to a second aspect, the invention provides a method for making a container for liquid or pulverulent contents, comprising the steps defined in claim 13.

**[0035]** In an embodiment of the manufacturing method according to this second aspect, the side walls are separated before arranging the duct means therebetween. In a special embodiment, the duct means is inserted between the side walls while advancing the container as well as the duct means in a common direction of travel. This renders rational and rapid mounting of the duct means possible. Preferably, a plurality of containers are manufactured and advanced in a web, a plurality of duct means being supplied to the web to be arranged between the side walls of the containers in the web. It is a considerable advantage that the container can be made in large series in this way since this results in low manufacturing costs.

**[0036]** According to a third aspect, the invention provides a method of filling a container. The method comprises the steps defined in claim 21. As a result, a method is provided, which is well suited especially for packing sensitive foodstuffs in containers which have been sterilised in advance.

**[0037]** According to a fourth aspect, the invention provides a device for filling a container. The device comprises an opening means, which is adapted to open, by cutting the container, and a filling nozzle, which is arranged in the end of a filling duct and is further defined by the features of the characterising portion of claim 24. With this device, hygienic filling with a liquid is achieved, and during filling the liquid cannot contact the surroundings.

**[0038]** In a preferred embodiment, the filling nozzle is made of an elastic material. It is particularly preferred that the filling nozzle in the end portion has an elongate outlet with edge portions which are directed to each other and which preferably engage each other to seal the outlet in the absence of application of outer forces. As a result, liquid is prevented from contacting the surroundings before and after filling a container.

**[0039]** In a particularly preferred embodiment, the filling device comprises a chamber which in filling surrounds the duct means and the filling nozzle, to ensure a clean environment round these by letting a clean gas flow on their outside.

**[0040]** In one more preferred embodiment, the filling device is provided with a squeezing member acting on a deformable tube, which is included in the filling duct, to control the flow in the filling duct. This results in a valve means with smooth internal surfaces which prevent bacteria from collecting and thus ensure an aseptic environment.

**[0041]** With the container according to the above aspects of the invention, considerable improvements have thus been achieved when packing liquid foodstuffs. The container is consumer-friendly and is suited to be manufactured in a cost-effective manner and be sterilised in advance since it is flat and collapsed in empty state, and therefore its compartment is essentially empty of gas as well. A great advantage is also that the container is sealed in this state. Manufacture, sterilisation and filling

can be carried out in different places and at different times while maintaining good hygienic conditions. The flexibility of the process up to a completed, filled container will be great.

#### Brief Description of the Drawings

**[0042]** The invention will now be described in more detail with reference to the accompanying drawings, which for the purpose of exemplification illustrate preferred embodiments of the invention and in which

Figs 1 and 2 are perspective views of a first embodiment of a filled container according to the invention; Figs 3 and 4 are perspective views of a second embodiment of a filled container according to the invention;

Fig. 5 illustrates a container in empty state arranged in a web, a portion of a neighbouring container being shown;

Fig. 6 is a cross-sectional view along line V-V in Fig. 5;

Fig. 7 illustrates on a slightly reduced scale a container according to Fig. 5 with parts removed to illustrate the composition of the container;

Fig. 8 is a detail view of a special embodiment of a handle of the container;

Fig. 9 is a perspective view of a third embodiment of the container in filled state;

Fig. 10 is a longitudinal section of the container shown in Fig. 9 in open state;

Fig. 11 is a longitudinal section perpendicular to the section shown in Fig. 10 and illustrates the container in closed state and a device for sealing thereof;

Fig. 12 is a perspective view of the manufacture of containers according to the invention;

Fig. 13 illustrates in more detail a manufacturing step when making the container;

Fig. 14 is a side view of a device for filling a container, certain parts being removed for better clarity;

Fig. 15 is a longitudinal section, along the direction of travel of the containers, of the device shown in Fig. 14 for filling a container, certain parts being removed for better clarity;

Fig. 16 is a view of a sterile environment rail in a view along line XIV-XIV in Fig. 15;

Fig. 17 is a cross-sectional view of the sterile environment rail according to Fig. 15 along line XV-XV in Fig. 15;

Fig. 18 is a cross-sectional view of a device for sealing a filled container;

Fig. 19 is a sectional view along line XVII-XVII in Fig. 18;

Fig. 20 is a side view of a filling nozzle; and

Fig. 21 is a longitudinal section of the filling nozzle according to Fig. 20 along line XIX-XIX.

Description of Currently Preferred Embodiments of the Invention

Container

**[0043]** The container 10 will now be described with reference to Figs 1 and 2, which illustrate a first preferred embodiment of the container in filled state seen obliquely from above and obliquely from below, respectively. The container 10 is intended for liquid or pulverulent contents and is particularly suitable for foodstuffs requiring a high degree of hygiene and asepsis, such as milk. The container is of the collapsing type, i.e. of compressible or foldable type, and comprises three flexible walls, viz. two opposing side walls 12 and a bottom wall 14, which are made of a plastic material and interconnected to form a compartment, the volume of which is dependent on the position of the walls 12, 14. The two side walls 12 are welded together along a common connecting portion 20. A separate duct means 16, which is also made of a flexible plastic material, is formed between the side walls 12 transversely of the connecting portion 20 and extends from the compartment to the outside of the container 10, on the opposite side of the container 10 in relation to the bottom wall 14.

**[0044]** The duct means 16 is tubular and has a flexible wall of a material and quality similar to that of the side walls 12. A duct means without a longitudinal seam, for instance an extruded tube, is particularly preferred. The side walls 12 form a common edge from which the duct means 16 projects perpendicularly a distance and is terminated with a terminal edge 18 which is arranged on the outside of the container and which is sealed by the internal surfaces of the duct means 16 being welded together. The container 10 can easily be opened by the sealed terminal edge 18 being cut off, for instance with a pair of scissors. Then the container 10 can be resealed by inserting a plug (not shown) in the duct means.

**[0045]** A carrying means 30 is arranged in the connecting portion 20 at a first side of the duct means 16 and consists of an opening area 32 which comprises a first essentially round opening 34 and a second essentially elongate opening 36. As a result, the carrying means forms a handle 30 which makes it possible for the user to carry the container 10 with four fingers while at the same time a force-absorbing portion forms between the openings so that the handle 30 does not fold or is not deformed in any other way when the container 10 is being carried. The two openings 34, 36 of the handle 30 extend at an angle of about 25° to a vertical line through the container 10. Experiments have shown that an angle in the range 20-30° yields comfortable handling of the container 10. On the opposite side of the duct means 16, the connecting portion 20 is designed as a tab 22 to facilitate opening and closing of the container 10.

**[0046]** Figs 3 and 4 illustrate a second preferred embodiment of a container 10' in filled state.

**[0047]** The container 10' differs from the one shown in Figs 1 and 2 only by the duct means 16 being integrated with the side walls of the container. The side walls 12' of the container are each formed with a projection U, which when welding together the side walls 12' along the connecting portion 20' forms said duct means 16'. It is true that the duct means 16' will not be as rigid and easy to handle as the duct means formed as a separate member which is inserted between the side walls, but on the other hand a duct means 16' according to the second embodiment allows a more rational manufacture of the containers 10' since one manufacturing step, i.e. the insertion of the duct means between the side walls, can be eliminated.

**[0048]** Fig. 5 shows an empty container 10 according to said first embodiment and a portion of a trailing container, which are made in a web as will be described in more detail below. A number of connecting surfaces are also to be seen.

**[0049]** Fig. 6 illustrates on a slightly reduced scale the container 10 shown in Fig. 5 with the nearest side wall removed. The figure thus shows the inside of a farther side wall 12, a duct means 16 connected therewith, a bottom wall 14 folded along a fold line 15, and the design of the connecting portion 20, along which the two side walls 12 are interconnected. In the bottom area 42 of the container 10, the side walls 12 are connected with the bottom wall 14 on the hand via a lower connecting portion 24, along which each side wall 12 is connected to the bottom wall 14 and, on the other hand, via two lateral connecting portions 26, along which all three walls 12, 14 are interconnected by a common welding seam. The compartment 40 of the container 10 thus is defined by the side walls 12 and the bottom wall 14. The connecting portion 20 forms boundary lines 28 facing the compartment 40.

**[0050]** The duct means 16 is arranged on the opposite side of the container 10 in relation to the bottom wall 14. This design results in a container from which a liquid can be poured in a comfortable manner.

**[0051]** The compartment 40 comprises an above-mentioned bottom area 42, a central area 44, in which the boundary lines 28 associated with the connecting portions 20 and facing the compartment are parallel, and an upper arched area 46, in which the boundary lines 28 extend arcuately towards each other to the inside edge of the duct means 16. With this design, the container 10 stands stable independently of the extent to which it is filled.

**[0052]** The tubular duct means 16 is flat and, in a portion 25 arranged in the connecting portion 20, connected to one side wall 12 along half its external circumference and to the other side walls 12 along half its other external circumference. On the inside of the container 10, the duct means 16 extends transversely of the entire connecting portion 20 to the compartment 40.

**[0053]** Fig. 7 is a cross-sectional view of the container 10 according to said first embodiment, from which it is

evident how the various parts 12, 14, 16 of the container 10 are welded together. The container 10, which is shown in empty state, is sealed for maintained cleanliness before filling. At the upper end of the container 10, the terminal edge 18 of the duct means 16 is sealed by its internal surfaces being welded together. The side walls 12 are with their internal surfaces welded together with the external surfaces of the duct means 16 in the connecting portion 20. It is important for the internal surfaces of the duct means 16 not to be welded together in the area of the connecting portion 20 when the side walls 12 and the duct means 16 are being connected with each other, which is advantageously achieved by hot sealing. To ensure this, it is preferred for the duct means 16 to have a greater wall thickness than the side walls 12, so that heat applied from outside by hot press jaws can weld the side walls 12 and the duct means 16 together before the heat has reached the inside of the duct means 16. In an alternative embodiment, the inside of the duct means 16 can be coated with a material which has a higher melting point than the materials in the joint 20 between the duct means 16 and the side walls 12.

**[0054]** In case the duct means 16' is integrated with the side walls 12' of the container 10', as is the case with the container 10' according to said second embodiment, the manufacture of the duct means 16' is most simple. A sealing tool (not shown) for welding together the side walls 12' is designed so that the duct means 16' forms in connection with the welding together of the side walls 12' along the sealing portion 20'. The duct means can thus be made with the same wall thickness as the side walls, and moreover no internal material with a higher melting point is required.

**[0055]** In the lower area of the container 10, the bottom wall 14 with its upwardly directed fold line 15 and the two side walls 12 are shown, which are joined with the bottom wall 14 in a welding seam along the lower connecting portion 24.

**[0056]** Fig. 8 shows a special embodiment of the carrying means or handle 30 of the container. A deformation zone 50 is to be seen, comprising a deformation area 54, 56 at each one of the two openings 34, 36. Each deformation area 54, 56 is formed of a portion, in which the two juxtaposed side walls 12 are not interconnected. Thus the deformation areas 54, 56 will have great flexibility and extend along the side of the opening area 32 facing the edge. The deformation areas 54, 56 are deformed if the user holds the container 10 in the opening area 32 with his hand. Thus, the side walls 12 round the opening area 32 are prevented from cutting into the user's hand.

**[0057]** Furthermore, Fig. 8 illustrates a stiffening means in the form of a gas-filled duct 52, which is arranged between the opening area 32 and the edge of the connecting area 20. This results in great rigidity of the carrying means 30 although the side walls 12 are made of a flexible material. By the duct 52 being filled with gas, preferably air, no further material is supplied,

which would make the container 10 heavier and complicate the handling of the container 10 after use.

**[0058]** The containers illustrated in Figs 1-8 are in filled state intended to be stored standing and are suited especially for consumption of liquid foodstuffs, such as milk and juice. A preferred size is about 1-3 l.

**[0059]** Fig. 9 shows a third embodiment of a container 110 according to the invention. In this design, the container 110 is adapted to be suspended for dispensing its contents and is especially suited for larger amounts of about 5-15 l and use in dispensers. A preferred field of application is in drinking-water dispensers. The composition of the container 110 largely corresponds to the above-described first embodiment of the container. The differences are above all that the container 110, compared therewith, is used in the inverted position and thus has an upper wall 114 corresponding to the bottom wall 14 and a duct means 116 arranged at its lower end.

**[0060]** The upper wall 114 is, together with the side walls 112 of the container 110, extended upwards to form two carrying means 130 which comprise flaps 132 and openings 134 formed therein. Consequently, the container 110 can be suspended from holding sticks 60 in connection with storage, transport and dispensing.

**[0061]** Fig. 10 illustrates the design of the container 110 at its lower end, the nearest side wall 112 being removed for good clarity and the duct means 116 being shown in longitudinal section. It is apparent that, in the same manner as described above, the duct means 116 is along one half of its circumference connected with one side wall 112 and along the other half of its circumference connected with the other side wall in the connecting portion 120 of the container 110. However the duct means 116 extends in this embodiment a distance into the compartment 140 of the container 110 from the connecting portion 120. At the same time the side walls 112 form a projecting appendage portion 113 which surrounds the duct means 116 to form an annular projecting blind duct 142 round the duct means 116 in the compartment 140.

**[0062]** The connecting portion 120 is connected with the duct means 116 transversely thereof and has, on each side of the duct means 116, a curved portion 122 and an edge portion 124 extending from the curved portion 122 in parallel with the duct means 116.

**[0063]** In the shown position, the duct means 116 is in position to be emptied or filled, the duct means 116 being open both at its inner end 117 and at its outer end 118. In connection with the manufacture of the container 110, the outer end 118, however, is sealed. In connection with filling, the container is opened by cutting off the sealed end 118.

**[0064]** After filling, the container 110 is closed by the inner end 117 of the duct means 116 being sealed, as shown in Fig. 11, which shows the duct means 116 in a longitudinal section perpendicular to the one shown in Fig. 10. A pair of hot press jaws 70 are pressed against the side walls 112, as indicated by double arrows 72.

The Figure illustrates a stage immediately after that. To prevent the side walls 112 from being connected with the duct means 116, the internal surfaces of the duct means 116 are preferably made of a material with a lower melting point than the internal surfaces of the side walls 112 and the external surfaces of the duct means 116.

**[0065]** When at a later stage the container 110 is to be emptied, the duct means 116 is opened with a stabilizing means to the position as shown in Fig. 10. Then the container 110 can be emptied with the aid of a valve means (not shown) having a cylindrical circumferential surface and inserted into the duct means 116. Then liquid in the projecting blind duct 142 will under pressure press the duct means 116 against the valve means and thus seal against leakage.

**[0066]** The container according to the embodiments of the invention as described above can be made of an optional flexible material, plastic being preferred. Such plastic materials are especially preferred as are heat sealable in any case in the relevant surface layers. A preferred plastic material comprises a body layer of polyolefin material with a filler, preferably chalk. This material has been found to yield good barrier properties, especially against gases, at low cost. It is also possible to arrange a gas barrier of EVA or EVOH. The thickness of the material of the containers is preferably in the range 100-200  $\mu\text{m}$ .

#### Manufacture of the Container

**[0067]** Below follows a description of the manufacture of a container of the type that has been described above with reference to Figs 1 and 2. Fig. 12 shows how the walls of the container are joined to a common web. Two identical side wall webs 212 are conducted in a parallel, opposite relationship along a production line. At the same time a bottom wall web 214, which is folded to a double-wall shape, is inserted between the two side wall webs 212.

**[0068]** Fig. 12 shows an assembly station 240 and how the three plastic webs 212, 214 are joined and interconnected at a connecting station 220 by heat sealing to form a container web 210. The heat sealing operation is accomplished by hot press jaws 218. At a punching station 225, handles and portions of material arranged between the containers are punched.

**[0069]** Then the container web 210 reaches an insertion device 250, by which duct means are mounted. A tubular web 216 is unwound from a duct storage coil 209 and cut to duct means 16, which are then inserted between the side walls of the web by the insertion device 250 to form completed containers 10 in the container web 210, which is wound into a storage coil 230.

**[0070]** Fig. 13 illustrates parts of the assembly station 240 in more detail, from which it is evident how the tubular web 216 is fed by means of a feeding device 242 into an insertion device 250 and cut to duct means 16

of a suitable length by means of a cutting device 246.

**[0071]** The insertion device 250 comprises a circular insertion wheel 251, which is operated intermittently by a driving motor 348 and has a holding slot 252 which extends along the circumference of the wheel 251 and in which the duct means 16 are held.

**[0072]** The circumference of the insertion wheel 251 further extends in an insertion position adjacent to the container web 210 to insert the duct means 16 between the side walls 12 of the containers 10. The assembly station 240 comprises a separating device 260 to separate the side walls 12 when inserting the duct means 16. The separating device 260 comprises two vacuum rolls 262, one on each side of the container web 210, which are located at a distance from the web 210 and connected to a vacuum assembly (not shown). On the circumference of the vacuum rolls 262 apertures 264 are formed, to which suction is applied by the vacuum assembly, causing the side walls 12 to be separated, as shown.

**[0073]** Moreover the assembly station 240 comprises a first connecting device 270 and a second connecting device 280. The first connecting device 270 has two hot press jaws 272, one on each side of the container web 210, to join the two side walls 12 with each other and with the duct means 16 along the open connecting portion 20. The second connecting device 280, which is arranged downstream of the first connecting device 270, also has two hot press jaws 282, which are arranged each on one side of the inserted duct means 16 for sealing thereof.

**[0074]** The suction force from the vacuum rolls 262 is applied while moving both the container web 210 and the circumference of the insertion wheel 250 in the direction of travel of the web 210, so that the duct means 16 is inserted obliquely between the side walls 12. When the duct means 16 is perpendicular to the web 210, both the web 210 and the insertion wheel 250 are stopped, and the suction to the vacuum roll 262 is interrupted.

**[0075]** In this stationary position, the press jaws 272 of the first connecting device 270 are pressed against the outside of the side walls 12. At the same time, a new piece of tube 216 is inserted, on the other side of the insertion wheel 250, into the slot 252 of the wheel 250 and is cut to form a new duct means 16. The idle time is also used by the second connecting device 280 which simultaneously seals the duct means 16 and, thus, the associated container 10 at a stage located downstream.

**[0076]** In addition to the components mentioned above, the device for making containers comprises a feeding device 290 in the form of two rollers 291 and an indexing device (not shown) for controlling the feeding so that a correct positioning of the duct means 16 is ensured. In an alternative embodiment, the external end of the duct means 16 can be sealed before the duct means 16 is inserted between the side walls 12.

**[0077]** As shown in Fig. 12, the completed containers 10 are wound into coils 230. A great advantage of the

containers 10, especially when used for foodstuffs, is that they can be sterilised by radiation in an extremely simple manner by exposing the coils 230 to axially directed radiation, in which case the radiation that passes through the inside of the containers 10 merely need to penetrate joints in the axial end portions (not shown) of the coil 230.

#### Filling of the Container

**[0078]** Fig. 14 is a side view, in the direction of travel, of a device 300 for filling a container 10 of the type as described above with reference to Figs 1 and 2 preferably with a liquid. The device will be described below with reference to milk, but it is suited also for filling with other liquids and pulverulent substances.

**[0079]** The filling device 300 comprises a carrying means 310, a filling duct 315 which is connected to a storage tank (not shown) and consists of a deformable tube 320 with a filling nozzle 325 at its lower end, and a squeezing means 330 which is arranged round a throttle portion 322 of the tube 320 and which comprises a supporting device 331 arranged at a first side of the tube 320 and a squeezing member 332 arranged at the opposite side of the tube 320. A plurality of components have been removed from the filling device 300 shown in Fig. 14 for better clarity.

**[0080]** The supporting device 331 of the squeezing means 330 is fixedly connected to the carrying means 310 and forms a concavely curved squeezing surface 333 facing the tube 320. The squeezing member 332 is circular and suspended from the carrying means 310 in an asymmetrically pivotable manner. Thus, the squeezing member 332 forms a convex squeezing surface 334 facing the tube 320 and the supporting device 331. The squeezing member 332 is pivotable in the manner indicated by the double arrow 335 and thus opens the duct 315 by a combined motion downstream and outwardly away from the tube 320 and closes the duct 315 by a combined motion upstream inwardly towards the tube 320. By closing occurring in a combined squeezing motion and upstream motion, a subatmospheric pressure is generated in the tube 320 downstream of the squeezing means 330, thereby preventing dripping from the filling nozzle between filling operations.

**[0081]** The filling device 300 also comprises a control means (not shown) which controls the opening and closing of the duct 315 with the aid of the squeezing means 330. The control means is also connected to a meter (not shown) for measuring the amount of liquid that has passed. The control means is arranged to start measuring at the same time as the duct 315 opens and to close the duct in response to a predetermined amount being measured. The meter can be designed in one of several ways, for instance for weighing the container 10 during filling, measuring the volume that flows through the duct 315 or measuring the time that passes after the duct 315 has been opened.

**[0082]** The carrying means 310 which carries the tube 320 and the squeezing means 330 is vertically adjustable in a frame 340 in such manner that the filling nozzle 325 can be inserted into a container 10 to begin the filling operation and can be removed from the container after filling.

**[0083]** On the frame 340 there is arranged an opening means 350 in the form of two pivotable opening arms 352, at the ends of which suction cups 354 are mounted. The suction cups are connected to a vacuum source. By pivoting, by means of the opening arms 352, the suction cups 354 to the sides of the duct means 16 of the container 10 and then applying suction to the suction cups 354 while at the same time the opening arms 352 are pivoted slightly outwards, the duct means 16 opens so that the filling nozzle 352 can be inserted into the same, which is effected by moving the carrying means 310 downwards.

**[0084]** Fig. 14 also shows a pair of conveying arms 345 which are arranged on rotatable conveying rods 346 which are adapted to reciprocate. When conveying a web 210 of containers 10, the conveying arms 345 are pivoted to engage the web 210, whereupon the conveying rods 346 perform a striking motion in the travelling direction of the web 210 to move the web 210. Subsequently, the conveying arms 345 are pivoted away from the web 210 and the conveying rods 346 are returned to the starting position to repeat the procedure.

**[0085]** The filling nozzle 325, which is shown in more detail in Figs 20 and 21, has an end portion 326 of elongate cross-section, which in its transverse direction tapers off to an elongate outlet 27 with opposing edge portions 328 which engage each other. The end portion 326 also tapers slightly in the longitudinal direction of the elongate cross-section, as is evident from Fig. 20. The filling nozzle 325 is made of an elastic material, preferably a plastic, for instance silicone rubber, and is self-closing, i.e. the edge portions 328 of the outlet 327 engage each other to seal the outlet 327 in the absence of application of outer forces. The filling nozzle has at its end facing away from the end portion 326 a connecting portion 329 to be connected to the filling duct 315. A thus designed filling nozzle 325 is particularly suitable to be inserted into the duct means 16 of the container 10 and seal against the inside thereof.

**[0086]** Fig. 15 is a side view of a filling device 300 like the one shown in Fig. 14. There is shown a chamber 360 which is arranged round the filling nozzle 325 and the duct means 16 of the containers 10, said chamber comprising a rail 362, in which the duct means 16 is guided, a bellows 364 surrounding the filling nozzle 325, and a delivery duct 366 for sterile gas, such as hot sterile air.

**[0087]** Fig. 15 shows a web 210 of containers 10, which are conducted into a filling device 300 in the direction of arrow 3, which is the travelling direction of the web. In position A, a closed container 10 is shown, whose duct means 16 is sealed in its outer end portion

18. An opening means in the form of a cutting device 370 with a motor 374 and a rotating cutting blade 372 which is arranged on each side of the web 210 and of which only one is shown, is arranged in the rail 362 to open the container 10 by cutting off the sealed end portion 18 of the duct means 16.

**[0088]** After the cutting device 370, seen in the direction of travel 3, the filling nozzle 325 of the filling duct 315 is arranged, and one step further, a sealing station 380 which is shown in more detail in Figs 18 and 19 is to be found, comprising two hot press jaws 382, which are also shown in Fig. 16 and mounted on holding arms 284 to seal the duct means 16 of the filled containers 10.

**[0089]** The rail 362, the appearance of which is shown in more detail in Figs 16 and 17, is elongate and has an essentially vertical rectangular cross-section with a slot 363 which is formed in its underside and in which the duct means 16 is guided. The slot 363 is adjacent to the filling nozzle 325 expanded to an elliptic opening 365 to allow opening of the duct means 16 and insertion of the filling nozzle 325 into the same. Furthermore, the rail 362 comprises adjacent to the filling nozzle 325 a cylindrical connecting portion 368 arranged on its upper side and intended for the bellows 364.

**[0090]** In operation of the filling device 300, sterile gas flows into the bellows 364 through the delivery conduit 366 and further into the rail 362. The gas then escapes through the slot 363. The bellows 364 permits a sterile environment round the filling nozzle 325 while at the same time the nozzle can be raised and lowered unimpededly. With the chamber 360 it is ensured in an easy and reliable manner that filling occurs in a sterile environment.

**[0091]** When filling an empty and previously sterilised container 10, it is first inserted into the sterile environment in the rail 362, whereupon the collapsed and empty container 10 is opened in the cutting device 370. The open container 10 is then conveyed to the filling nozzle 325, adjacent to which the opening means 350 expands the duct means 16 and the filling nozzle 325 is inserted into the same. In this connection, the squeezing means 330 opens and the container 10 is filled with milk, which increases the volume thereof, the meter beginning to measure the amount of liquid supplied to the container. When a predetermined amount has been measured, the squeezing means 330 closes in response thereto. When closing, a subatmospheric pressure forms in the tube 320 adjacent to the filling nozzle 325, and therefore its outlet opening 327 is sealed. The container 10 is then conveyed further to the sealing station 380 where it is sealed once more.

**[0092]** Owing to the fact that unclean air from the environment will not on any occasion get a chance to enter the container 10 after sterilisation, an extremely hygienic environment will be obtained for the liquid contained in the container 10.

**[0093]** When cleaning the filling device 300, the rail 362 together with the bellows 364 is removed by means

of a releasing device 367. These parts are then cleaned in a separate bath. A cleaning cup (not shown) with a tube connection is mounted round the filling nozzle, whereupon a cleaning agent is circulated in the filling duct 315 and round the filling nozzle 325. Then the cleaning cup is removed, and the rail 362 with the bellows 364 is mounted once more. The slot 363 of the rail 362 is then sealed in a gas-tight manner with the aid of a collecting means which has an outlet, whereupon the filling nozzles 325 are moved down to the filling position and sterilisation with hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is carried out, the gas being supplied through the inlet 366 and discharged through the outlet of the collecting means. After removal of the collecting means and having allowed milk to flow through the filling duct 315, the production can be begun again. Thus, the filling device is easy to keep clean and to clean, thereby ensuring good hygienic conditions.

**[0094]** Although merely devices for making and filling a container having a separate duct means inserted between its side walls have been described, it will be appreciated that by making suitable modifications, these devices can also be used to make containers, whose duct means is integrated with the side walls of the container. The scope of the invention thus is defined only by the appended claims.

## Claims

1. An empty container to be filled with liquid or pulverulent contents, comprising

walls (12, 14; 12', 14'; 112, 114) which are interconnected to form a compartment (40; 140), including two opposing side walls (12; 12'; 112) being joined along a common connecting portion (20; 20'; 120), and a wall (14; 14') interconnected with the two side walls (12; 12'; 112) forming a bottom wall in the container the walls being flexible so that the volume of the compartment is dependent on the relative position of the walls (12, 14; 12', 14'; 112, 114), said container having a duct means (16; 16'; 116) which is formed at the connecting portion between the two side walls (12; 12'; 112) and extends from the compartment (40; 140) to the outside of the container (10; 10'; 110), and which is formed to constitute a pouring duct, through which said contents are to be poured out of the compartment (40; 140), the duct means having a flexible wall with a uniform composition of materials along its entire length, and being sealed, **characterised in that** the compartment (40; 140) is closed; that the duct means (16; 16'; 116) is centrally arranged on the opposite side of the container in relation to the bottom wall (14, 14'); and that the

duct means (16; 16'; 116) is formed to constitute a filling duct, through which said contents are to be supplied to the compartment (40; 140).

2. A container as claimed in claim 1, wherein the compartment (40; 140) is sterile.
3. A container as claimed in claim 1 or 2, wherein the duct means on its inside comprises a heat sealable material.
4. A container as claimed in any one of claims 1-3, wherein the wall of the duct means is made of the same material as the container side walls (12; 12'; 112).
5. A container as claimed in any one of claims 1-4, wherein the terminal edge (18) of the duct means (16; 16') is sealed by the internal surfaces of the duct means (16; 16') being welded together.
6. A container as claimed in claim 5, which is in flat state.
7. A container as claimed in any one of the preceding claims, which has a carrying means (30) which has an opening area (32) arranged in the connecting portion (20; 20').
8. A container as claimed in any one of the preceding claims, wherein the connecting portion (20; 20') on two opposite sides of the compartment (40) has boundary lines (28), which are directed to the compartment and which in a central area (44) adjoining the bottom area (42) extend in parallel from the bottom wall (14; 14') and, in an arched area (46) adjoining the central area (44), extend arcuately towards each other to the duct means (16; 16').
9. A container as claimed in any one of preceding claims, wherein the duct means (16') is integrated with the container side walls (12').
10. A container as claimed in any one of claims 1-8, wherein the duct means (16; 116) is designed as a separate piece inserted between the side walls (12; 112) and extends transversely of the connecting portion (20; 120).
11. A container as claimed in claim 10, wherein the duct means (116) extends a distance inwards from the connecting portion (120), the side walls (112) comprising a projecting portion (113), which surrounds the duct means (116) and in which the connecting portion (120) on each side of the duct means (116) has a curved portion (122) and an edge portion (124) extending from the curved portion (122) in

parallel with the duct means (116).

12. A container as claimed in claim 11, wherein the inner end (117) of the duct means (116) is sealed.
13. A method of making a container (10; 10') according to any one of the claims 1-12, comprising the steps of
  - making the container having two opposing side walls (12; 12') and a bottom wall (14, 14');
  - forming a duct means (16; 16') between the two opposing side walls (12; 12') in a central position on the opposite side of the container in relation to the wall (14) forming bottom in the container, so that the duct means (16; 16') extends from the compartment (40) to the outside of the container (10; 10');
  - joining the side walls (12; 12') along a connecting portion (20; 20');
  - sealing the duct means (16; 16'), and thus, the associated container.
14. A method as claimed in claim 13, wherein the duct means (16; 16') is designed so as to extend a distance away from the upper edge of the container (10; 10').
15. A method as claimed in claim 13 or 14, wherein the container (10; 10') is sterilised.
16. A method as claimed in any one of claims 13-15, wherein the duct means (16') is integrated with the container side walls (12').
17. A method as claimed in any one of claims 13-15, wherein the duct means (16) is formed as a separate piece, which is inserted between the side walls (12) of the container.
18. A method as claimed in claim 17, wherein the step of forming the duct means (16) between the side walls (12) is preceded by the step of separating the side walls (12).
19. A method as claimed in claim 17 or 18, wherein the duct means (16) is inserted between the side walls (12) while the container (10) and the duct means (16) are being advanced in a common direction of travel.
20. A method as claimed in any one of claims 17-19, wherein a plurality of containers (10) are made and advanced in a web (210), a plurality of duct means (16) being supplied to the web (210) to be arranged between the side walls of the containers (10) in the web (210).
21. A method of filling a container (10; 10') according to

any one of claims 1-12 with liquid or pulverulent contents, comprising the steps of

opening from outside, by cutting the sealed duct means (16; 16') of the container (10; 10'), using a cutting means (370) which cuts off the sealed end of the duct means (16; 16') and then by an opening means (350) expanding the duct means, inserting a filling nozzle (325) in the duct means (16; 16') and arranging said filling nozzle (325) to seal against the inside of the duct means (16; 16'), and introducing, through the filling nozzle (325), the contents into the container (10; 10') while simultaneously increasing the volume of the compartment (40) by separating the walls.

22. A method as claimed in claim 21, wherein a filling duct (315), which is connected to filling nozzle (325), is opened in a throttle portion (322), which is included in the duct (315) and in which the duct (315) comprises a deformable tube (320), by a squeezing means (330), which acts on the sides of the tube (120), being moved from a squeezing position to begin the filling operation, the duct (315) being closed by the squeezing means (330) being returned to the squeezing position to terminate the filling operation.

23. A method as claimed in claim 22, wherein the amount of liquid with which the container (10; 10') is being filled, is measured, the measuring operation beginning when the duct (315) is opened, and the duct (315) being closed in response to a predetermined amount being measured.

24. A device for carrying out the method according to any one of claims 21-23, comprising an opening means (350), which by cutting is adapted to open the container, and a filling nozzle (325), which is arranged in the end of a filling duct (315),

**characterised in that**

the opening means (350) is adapted to open and expand the duct means (16; 16') of the container (10; 10') after its sealed end has been cut off using a cutting means (370); and

the filling nozzle (325) has a tapering end portion (326) which is elongate in cross-section, to be inserted into the duct means (16; 16') and to seal against the inside thereof after opening of said duct means (16; 16').

25. A device as claimed in claim 24, wherein the filling nozzle (325) is made of an elastic material, preferably plastic.

26. A device as claimed in claim 24 or 25, wherein the filling nozzle (325) in the end portion (326) has an elongate outlet (327) with opposing edge portions

(328), which preferably engage each other to seal the outlet (327) in the absence of application of outer forces.

27. A device as claimed in any one of claims 24-26, which comprises a chamber (360), which surrounds the end portion (326) of the filling nozzle (325) and has an enclosing means (364) for the duct means and a gas inlet (366), to ensure an aseptic clean environment in the chamber (360) when filling the container (10; 10').

28. A device as claimed in any one of claims 24-27, wherein the filling duct (315) comprises a throttle portion (322) for controlling a flow of liquid through the filling duct (315), the throttle portion (322) comprising a deformable tube (320), and a squeezing means (330) which is adapted to act on the sides of the tube (320) being arranged along the tube (320).

**Patentansprüche**

1. Leerer Behälter, der mit flüssigem oder pulverförmigem Inhalt zu füllen ist und umfasst:

Wände (12, 14; 12', 14', 112, 114), die miteinander verbunden sind und eine Kammer (40; 140) bilden und die zwei einander gegenüberliegende Seitenwände (12; 12'; 112), die an einem gemeinsamen Verbindungsabschnitt (20; 20'; 120) verbunden sind, und eine Wand (14; 14') enthalten, die mit den zwei Seitenwänden (12; 12'; 112) verbunden ist und eine Bodenwand in dem Behälter bildet,

wobei die Wände flexibel sind, so dass das Volumen der Kammer von der relativen Position der Wände (12, 14; 12', 14'; 112, 114) abhängt, der Behälter eine Leitungseinrichtung (16; 16'; 116) aufweist, die an dem Verbindungsabschnitt zwischen den zwei Seitenwänden (12; 12'; 112) ausgebildet ist und sich von der Kammer (40; 140) zur Außenseite des Behälters (10; 10'; 110) erstreckt und die so ausgebildet ist, dass sie eine Ausgießleitung bildet, über die der Inhalt aus der Kammer (40; 140) auszugießen ist, die Leitungseinrichtung eine flexible Wand mit einer einheitlichen Materialzusammensetzung über ihre gesamte Länge aufweist und abgedichtet ist, **dadurch gekennzeichnet, dass:**

die Kammer (40; 140) geschlossen ist;

die Leitungseinrichtung (16; 16'; 116) mittig an der in Bezug auf die Bodenwand (14; 14') gegenüberliegenden Seite des Behälters ange-

- ordnet ist; und
- die Leitungseinrichtung (16; 16'; 116) so ausgebildet ist, dass sie eine Einfüllleitung bildet, über die der Inhalt der Kammer (40; 140) zugeführt wird.
2. Behälter nach Anspruch 1, wobei die Kammer (40; 140) steril ist.
  3. Behälter nach Anspruch 1 oder 2, wobei die Leitungseinrichtung an ihrer Innenseite ein heißsiegelbares Material umfasst.
  4. Behälter nach einem der Ansprüche 1-3, wobei die Wand der Leitungseinrichtung aus dem gleichen Material besteht wie die Behälter-Seitenwände (12; 12'; 112).
  5. Behälter nach einem der Ansprüche 1-4, wobei die Abschlusskante (18) der Leitungseinrichtung (16; 16') durch die Innenflächen der Leitungseinrichtung (16; 16') abgedichtet ist, die miteinander verschweißt sind.
  6. Behälter nach Anspruch 5, der sich in flachem Zustand befindet.
  7. Behälter nach einem vorangehenden Ansprüche, der eine Trageeinrichtung (30) aufweist, die einen Öffnungsbereich (33) hat, der in dem Verbindungsabschnitt (20; 20') angeordnet ist.
  8. Behälter nach einem der vorangehenden Ansprüche, wobei der Verbindungsabschnitt (20; 20') an zwei einander gegenüberliegenden Seiten der Kammer (40) Begrenzungslinien (28) aufweist, die zu der Kammer hin gerichtet sind und die sich in einem Mittelbereich (44) an den Bodenbereich (42) angrenzend parallel von der Bodenwand (14; 14') erstrecken und sich in einem gebogenen Bereich (46) an den Mittelbereich (44) angrenzend bogenförmig aufeinander zu zu der Leitungseinrichtung (16; 16') erstrecken.
  9. Behälter nach einem der vorangehenden Ansprüche, wobei die Leitungseinrichtung (16') integral mit den Behälter-Seitenwänden (12') ausgebildet ist.
  10. Behälter nach einem der Ansprüche 1-8, wobei die Leitungseinrichtung (16; 116) als ein separates Teil ausgeführt ist, das zwischen die Seitenwände (12; 112) eingeführt ist und sich quer zu dem Verbindungsabschnitt (20; 120) erstreckt.
  11. Behälter nach Anspruch 10, wobei sich die Leitungseinrichtung (116) über eine Strecke von dem Verbindungsabschnitt (120) nach innen erstreckt, die Seitenwände (112) einen vorstehenden Abschnitt (113) umfassen, der die Leitungseinrichtung (116) umgibt und der in dem Verbindungsabschnitt (120) an jeder Seite der Leitungseinrichtung (116) einen gekrümmten Abschnitt (122) und einen Kantenabschnitt (124) aufweist, der sich von dem gekrümmten Abschnitt (122) parallel zu der Leitungseinrichtung (116) erstreckt.
  12. Behälter nach Anspruch 11, wobei das innere Ende (117) der Leitungseinrichtung (116) abgedichtet ist.
  13. Verfahren zum Herstellen eines Behälters (10; 10') nach einem der Ansprüche 1-12, das die folgenden Schritte umfasst:
    - Herstellen des Behälters mit zwei einander gegenüberliegenden Seitenwänden (12; 12') und einer Bodenwand (14; 14');
    - Ausbilden einer Leitungseinrichtung (16; 16') zwischen den zwei einander gegenüberliegenden Seitenwänden (12; 12') an einer Mittelposition an der in Bezug auf die Wand (14), die den Boden in dem Behälter bildet, gegenüberliegenden Seite, so dass sich die Leitungseinrichtung (16; 16') von der Kammer (40) zur Außenseite des Behälters (10; 10') erstreckt;
    - Verbinden der Seitenwände (12; 12') an einem Verbindungsabschnitt (20; 20');
    - Abdichten der Leitungseinrichtung (16; 16') und damit des dazugehörigen Behälters.
  14. Verfahren nach Anspruch 13, wobei die Leitungseinrichtung (16; 16') so ausgeführt ist, dass sie sich über eine Strecke von der Oberkante des Behälters (10; 10') weg erstreckt.
  15. Verfahren nach Anspruch 13 oder 14, wobei der Behälter (10; 10') sterilisiert ist.
  16. Verfahren nach einem der Ansprüche 13-15, wobei die Leitungseinrichtung (16') integral mit den Behälter-Seitenwänden (12') ausgebildet wird.
  17. Verfahren nach einem der Ansprüche 13-15, wobei die Leitungseinrichtung (16) als ein separates Teil ausgebildet wird, das zwischen die Seitenwände (12) des Behälters eingeführt wird.
  18. Verfahren nach Anspruch 17, wobei dem Schritt des Ausbildens der Leitungseinrichtung (16) zwischen den Seitenwänden (12) der Schritt des Trennens der Seitenwände (12) vorangeht.
  19. Verfahren nach Anspruch 17 oder 18, wobei die Lei-

tungseinrichtung (16) zwischen die Seitenwände (12) eingeführt wird, während der Behälter (10) und die Leitungseinrichtung (16) in einer gemeinsamen Bewegungsrichtung transportiert werden.

20. Verfahren nach einem der Ansprüche 17-19, wobei eine Vielzahl von Behältern (10) aus einer Bahn (210) bestehen und als solche transportiert werden und eine Vielzahl von Leitungseinrichtungen (16) der Bahn (210) zugeführt wird, um sie in der Bahn (210) zwischen den Seitenwänden der Behälter (10) anzuordnen.
21. Verfahren zum Füllen eines Behälters (10; 10') nach einem der Ansprüche 1-12 mit flüssigem oder pulverförmigen Inhalt, das die folgenden Schritte umfasst  
Öffnen von außen, indem die abgedichtete Leitungseinrichtung (16; 16') des Behälters (10; 10') unter Verwendung einer Schneideinrichtung (370) geschnitten wird, die das abgedichtete Ende der Leitungseinrichtung (16; 16') abschneidet, und dann Aufweiten der Leitungseinrichtung mit einer Öffnungseinrichtung (350),  
Einführen einer Fülldüse (325) in die Leitungseinrichtung (16; 16') und Anordnen der Fülldüse (325), so dass sie an der Innenseite der Leitungseinrichtung (16; 16') abdichtet, und  
Einleiten des Inhaltes in den Behälter (10; 10') über die Fülldüse (325), wobei gleichzeitig das Volumen der Kammer (40) vergrößert wird, indem die Wände getrennt werden.
22. Verfahren nach Anspruch 21, wobei ein Füllleitung (315), die mit der Fülldüse (325) verbunden ist, in einem Drosselabschnitt (322) geöffnet wird, der in der Leitung (315) enthalten ist und in dem die Leitung (315) eine verformbare Röhre (320) umfasst, mit einer Quetscheinrichtung (330), die auf die Seiten der Röhre (120) wirkt, und die von einer Quetschposition aus bewegt wird, um mit dem Füllvorgang zu beginnen, wobei die Leitung (315), die von der Quetscheinrichtung (330) geschlossen wird, an die Quetschposition zurückgeführt wird, um den Füllvorgang zu beenden.
23. Verfahren nach Anspruch 22, wobei die Menge an Flüssigkeit, mit der der Behälter (10; 10') gefüllt wird, gemessen wird und der Messvorgang beginnt, wenn die Leitung (315) geöffnet wird, und die Leitung (315) in Reaktion darauf geschlossen wird, dass eine vorgegebene Menge gemessen worden ist.
24. Vorrichtung zum Ausführen des Verfahrens nach einem der Ansprüche 21-23, die eine Öffnungseinrichtung (350), die so eingerichtet ist, dass sie den Behälter durch Schneiden öffnet, und eine Fülldüse

(325) umfasst, die in dem Ende einer Füllleitung (315) angeordnet ist,

**dadurch gekennzeichnet, dass:**

die Öffnungseinrichtung (350) so eingerichtet ist, dass sie die Leitungseinrichtung (16; 16') des Behälters (10; 10') öffnet und aufweitet, nachdem ihr abgedichtetes Ende unter Verwendung einer Schneideinrichtung (370) abgeschnitten worden ist; und

die Fülldüse (325) einen sich verjüngenden Endabschnitt (326) aufweist, der im Querschnitt länglich ist und in die Leitungseinrichtung (16; 16') einzuführen ist und an der Innenseite derselben nach dem Öffnen der Leitungseinrichtung (16; 16') abdichtet.

25. Vorrichtung nach Anspruch 24, wobei die Fülldüse (325) aus einem elastischen Material, vorzugsweise Kunststoff, besteht.

26. Vorrichtung nach Anspruch 24 oder 25, wobei die Fülldüse (325) in dem Endabschnitt (326) einen länglichen Auslass (327) mit einander gegenüberliegenden Kantenabschnitten (328) aufweist, die vorzugsweise miteinander in Kontakt sind, um den Auslass (327) abzudichten, wenn keine äußeren Kräfte wirken.

27. Vorrichtung nach einem der Ansprüche 24-26, die eine Kammer (360) umfasst, die den Endabschnitt (326) der Fülldüse (325) umgibt und eine Einschließereinrichtung (364) für die Leitungseinrichtung sowie einen Gaseinlass (366) aufweist, um eine aseptische saubere Umgebung in der Kammer (360) zu gewährleisten, wenn der Behälter (10; 10') gefüllt wird.

28. Vorrichtung nach einem der Ansprüche 24-27, wobei die Füllleitung (315) einen Drosselabschnitt (322) zum Steuern eines Stroms von Flüssigkeit durch die Füllleitung (315) umfasst und der Drosselabschnitt (322) eine verformbare Röhre (320) sowie eine Quetscheinrichtung (330) umfasst, die so eingerichtet ist, dass sie auf die Seiten der Röhre (320) wirkt und entlang der Röhre (320) angeordnet ist.

## Revendications

1. Récipient vide à remplir de liquide ou de contenus pulvérulents, comprenant  
des parois (12, 14 ; 12', 14' ; 112, 114) qui sont interconnectées afin de former un compartiment (40 ; 140), comprenant deux parois latérales opposées (12 ; 12' ; 112) étant jointes le long d'une partie

de raccordement commune (20 ; 20' ; 120), et une paroi (14 ; 14') interconnectée avec les deux parois latérales (12 ; 12' ; 112) formant une paroi de fond dans le récipient.

les parois étant flexibles afin que le volume du compartiment soit dépendant de la position des parois les unes par rapport aux autres (12, 14 ; 12', 14' ; 112, 114),

ledit récipient ayant un moyen de conduit (16 ; 16' ; 116) formé sur la partie de raccordement entre les deux parois latérales (12 ; 12' ; 112) et s'étendant à partir du compartiment (40 ; 140) vers l'extérieur du récipient (10 ; 10' ; 110) et qui est formé afin de constituer un conduit de coulée, au travers duquel lesdits contenus sont écoulés du compartiment (40 ; 140).

le moyen de conduit ayant une paroi flexible avec une composition uniforme de matériaux le long de son entière longueur, et étant scellé, **caractérisé en ce que**

le compartiment (40 ; 140) est fermé ;

**en ce que** le moyen de conduit (16 ; 16' ; 116) est disposé centralement sur le côté opposé du récipient par rapport à la paroi du fond (14, 14') ; et **en ce que** le moyen de conduit (16 ; 16' ; 116) est formé de manière à constituer un conduit de remplissage, au travers duquel lesdits contenus sont amenés au compartiment (40 ; 140).

2. Récipient selon la revendication 1, dans lequel le compartiment (40 ; 140) est stérile.
3. Récipient selon l'une des revendications 1 ou 2, dans lequel le moyen de conduit comprend à l'intérieur un matériau thermoscellable.
4. Récipient selon l'une des revendications 1 à 3, dans lequel la paroi du moyen de conduit est constituée du même matériau que les parois latérales du récipient (12 ; 12' ; 112).
5. Récipient selon l'une des revendications de 1 à 4, dans lequel l'arête du terminal (18) du moyen de conduit (16 ; 16') est scellé par les surfaces intérieures du moyen de conduit (16 ; 16') étant soudées l'une à l'autre.
6. Récipient selon la revendication 5, qui est dans un état plat.
7. Récipient selon l'une quelconque des revendications précédentes, muni d'un moyen de transport (30) ayant une zone d'ouverture (32) disposée dans la partie de raccordement (20 ; 20').
8. Récipient selon l'une quelconque des revendications précédentes, dans lequel la partie de raccordement (20 ; 20') sur les deux côtés opposés du

compartiment (40) est munie de lignes de séparation (28), qui sont dirigées vers le compartiment et qui dans une zone centrale (44) joignant la zone de fond (42) s'étendent en parallèle à partir de la paroi de fond (14 ; 14') et, dans une zone de voûte (46) joignant la zone centrale (44), s'étendent de manière arquée l'une vers l'autre jusqu'au moyen de conduit (16 ; 16').

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9. Récipient selon l'une quelconque des revendications précédentes, dans laquelle le moyen de conduit (16') est intégré dans les parois latérales du récipient (12').
10. Récipient selon l'une quelconque des revendications 1 à 8, dans lequel le moyen de conduit (16 ; 116) est conçu en tant que pièce de séparée insérée entre les parois latérales (12 ; 112) et s'étend de manière transversale des parties de raccordement (20 ; 120).
11. Récipient selon la revendication 10, dans lequel le moyen de conduit (116) s'étend sur une distance vers l'intérieur à partir de la partie de raccordement (120), les parois latérales (112) comprenant une partie faisant saillie (113), qui entoure le moyen de conduit (116) et dans lequel la partie de raccordement (120) sur chaque côté du moyen de conduit (116) ayant une partie en courbe (122) et une partie d'arête (124) s'étendant à partir de la partie en courbe (122) en parallèle du moyen de conduit (116).
12. Récipient selon la revendication 11, dans lequel l'extrémité intérieure (117) du moyen de conduit (116) est scellée.
13. Procédé de fabrication d'un récipient (10 ; 10') selon l'une quelconque des revendications de 1 à 12, comprenant les étapes consistant à  
fabriquer le récipient ayant deux parois latérales opposées (12 ; 12') et une paroi de fond (14', 14') ;  
former un moyen de conduit (16 ; 16') entre les deux parois latérales opposées (12 ; 12'), et ainsi le récipient associé, afin que le moyen de conduit (16 ; 16') s'étende à partir du compartiment (40) vers l'extérieur du récipient (10 ; 10') ;  
joindre les parois latérales (12 ; 12') le long d'une partie de raccordement (20 ; 20') ;  
sceller le moyen de conduit (16 ; 16') dans une position centrale sur le côté opposé du récipient par rapport à la paroi (14) formant le fond du récipient.
14. Procédé selon la revendication 13, dans lequel le moyen de conduit (16 ; 16') est conçu de manière à ce qu'il s'étende sur une distance éloignée de l'arête supérieure du récipient (10 ; 10').

15. Procédé selon l'une des revendications 13 ou 14, dans lequel le récipient (10 ; 10') est stérilisé.
16. Procédé selon l'une quelconque des revendications 13 à 15, dans lequel le moyen de conduit (16') est intégré avec les parois latérales du récipient (12').
17. Procédé selon l'une quelconque des revendications 13 à 15, dans lequel le moyen de conduit (16) est formé en tant que pièce séparée, qui est insérée entre les parois latérales (12) du récipient.
18. Procédé selon la revendication 17, dans lequel l'étape de formation d'un moyen de conduit (16) entre les parois latérales (12) est précédée par l'étape de séparation des parois latérales (12).
19. Procédé selon la revendication 17 ou 18, dans lequel le moyen de conduit (16) est inséré entre les parois latérales (12) alors que le récipient (10) et le moyen de conduit (16) sont avancés dans une direction commune de déplacement.
20. Procédé selon l'une quelconque des revendications 17 à 19, dans lequel une pluralité de récipients (10) est conçue et avancée dans une toile (210), une pluralité de moyens de conduit (16) étant fournie à la toile (210) à disposer entre les parois latérales des récipients (10) dans la toile (210).
21. Procédé de remplissage d'un récipient (10 ; 10') selon l'une quelconque des revendications 1 à 12, avec du liquide ou des contenus pulvérulents, comprenant les étapes consistant à  
ouvrir à partir de l'extérieur, en découpant le moyen de conduit étanche (16 ; 16') du récipient (10 ; 10'), à l'aide de moyen de découpage (370) qui découpe l'extrémité étanche du moyen de conduit (16 ; 16') et ensuite par un moyen d'ouverture (350), évaser le moyen de conduit,  
insérer une buse de remplissage (325) dans le moyen de conduit (16 ; 16') et disposer ladite buse de remplissage (325), afin de la sceller contre l'intérieur du moyen de conduit (16 ; 16'), et  
introduire, au travers de la buse de remplissage (325), les contenus dans le récipient (10 ; 10') tout en augmentant simultanément le volume du compartiment (40) en séparant les parois.
22. Procédé selon la revendication 21, dans lequel un conduit de remplissage (315), raccordé à une buse de remplissage (325), est ouvert dans une partie de papillon (322), qui est incluse dans le conduit (315) et dans lequel le conduit (315) comprend un tube déformable (320), par un moyen de compression (330), qui agit sur les côtés du tube (120), étant déplacée à partir d'une position de compression pour commencer l'opération de remplissage, le conduit (315) étant formé par le moyen de compression (330) est replacé dans la position de compression afin d'achever l'opération de remplissage.
23. Procédé selon la revendication 22, dans lequel le volume de liquide avec lequel le récipient (10 ; 10') est rempli, est mesuré, l'opération de mesure commençant lorsque le conduit (315) est ouvert, et le conduit (315) étant fermé en réponse à un volume prédéterminé mesuré.
24. Dispositif afin de réaliser le procédé selon l'une quelconque des revendications 21 à 23, comprenant un moyen d'ouverture (350), qui est adapté par découpage pour ouvrir le récipient, et une buse de remplissage (325) qui est disposée dans l'extrémité du conduit de remplissage (315), **caractérisé en ce que** le moyen d'ouverture (350) est adapté pour ouvrir et évaser le moyen de conduit (16 ; 16') du récipient (10 ; 10') après que l'extrémité étanche ait été découpée à l'aide d'un moyen de découpage (370), et la buse de remplissage (325) est munie d'une partie d'extrémité conique (326) qui est allongée en coupe, pour être insérée dans le moyen de conduit (16 ; 16') et pour sceller contre l'intérieur de celui-ci après ouverture dudit moyen de conduit (16 ; 16').
25. Dispositif selon la revendication 24, dans lequel la buse de remplissage (325) est constituée de matériau élastique, de préférence le plastique.
26. Dispositif selon l'une des revendications 24 ou 25, dans lequel la buse de remplissage (325) dans la partie d'extrémité (326) a une sortie allongée (327) avec des parties d'arêtes opposées (328), qui s'engagent de préférence l'une l'autre afin de sceller la sortie (327) en l'absence d'application de forces extérieures.
27. Dispositif selon l'une quelconque des revendications 24 à 26, comprenant une chambre (360) entourant la partie d'extrémité (326) de la buse de remplissage (325) et un moyen d'enceinte (364) pour le moyen de conduit et une entrée de gaz (366), afin de s'assurer d'un environnement propre aseptisé dans la chambre (360), lorsque l'on remplit le récipient (10 ; 10').
28. Dispositif selon l'une quelconque des revendications 24 à 27, dans lequel le conduit de remplissage (315) comprend une partie de papillon (322) pour contrôler le débit de liquide au travers du conduit de remplissage (315), la partie de papillon (322) comprenant un tube déformable (320), et un moyen de compression (330) qui est adapté pour agir sur les parois du tube (320) disposé le long du tube (320).

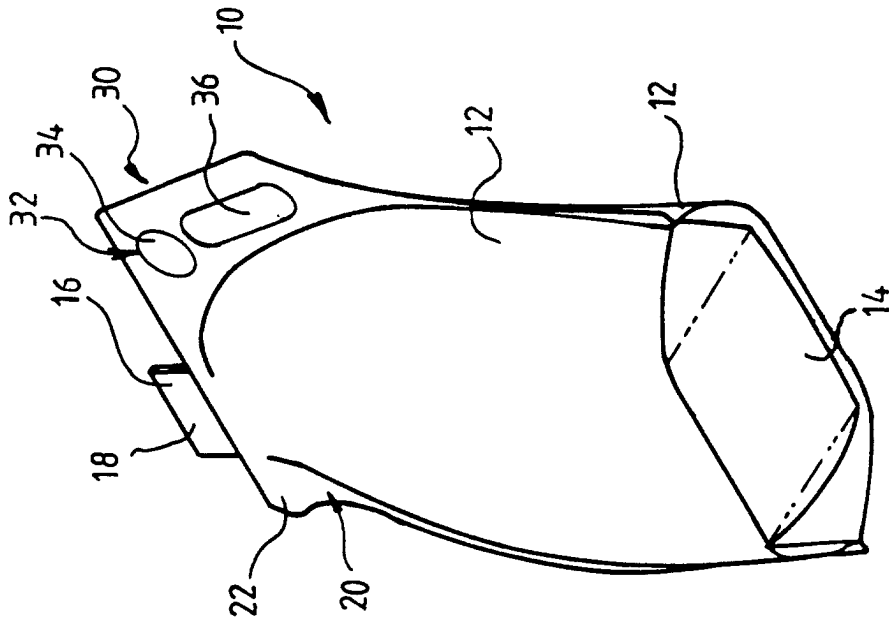


Fig. 2

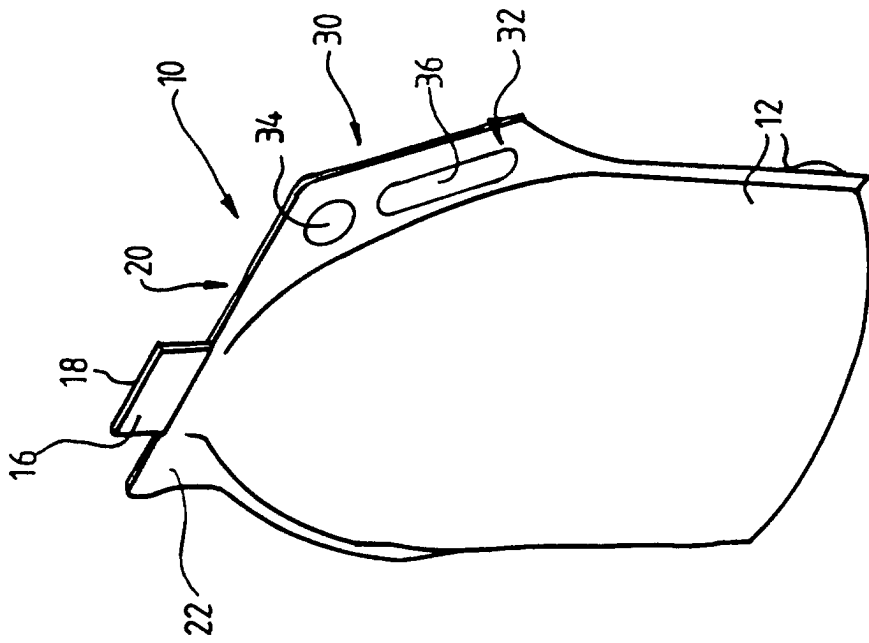


Fig. 1

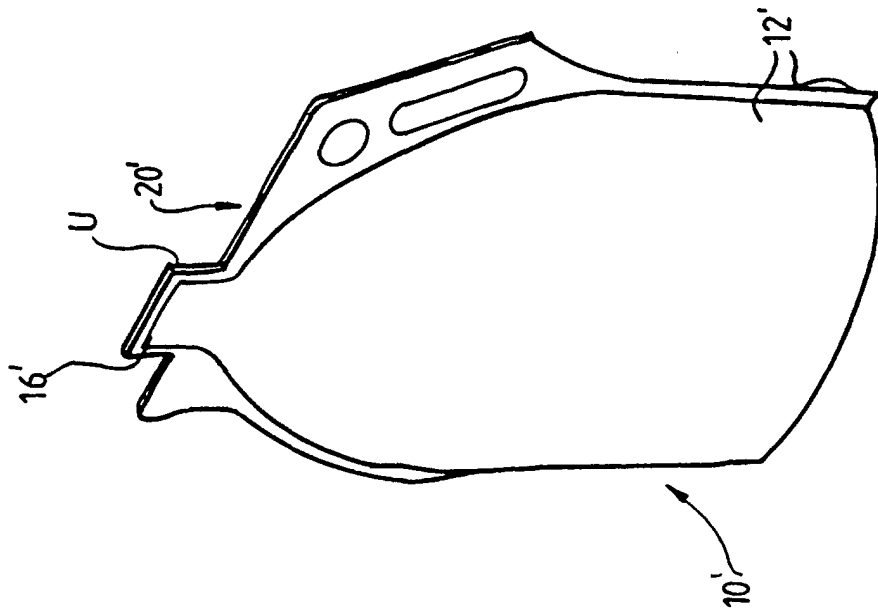


Fig. 3

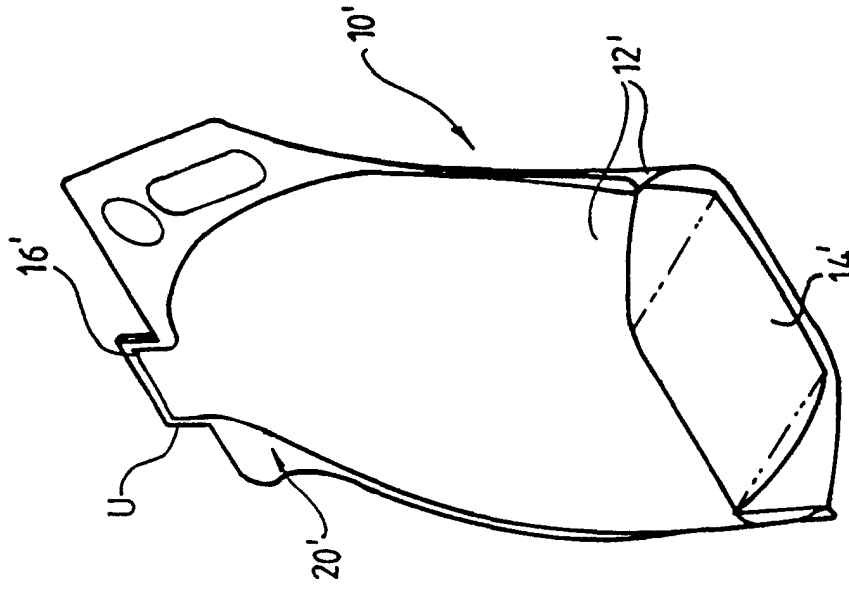


Fig. 4

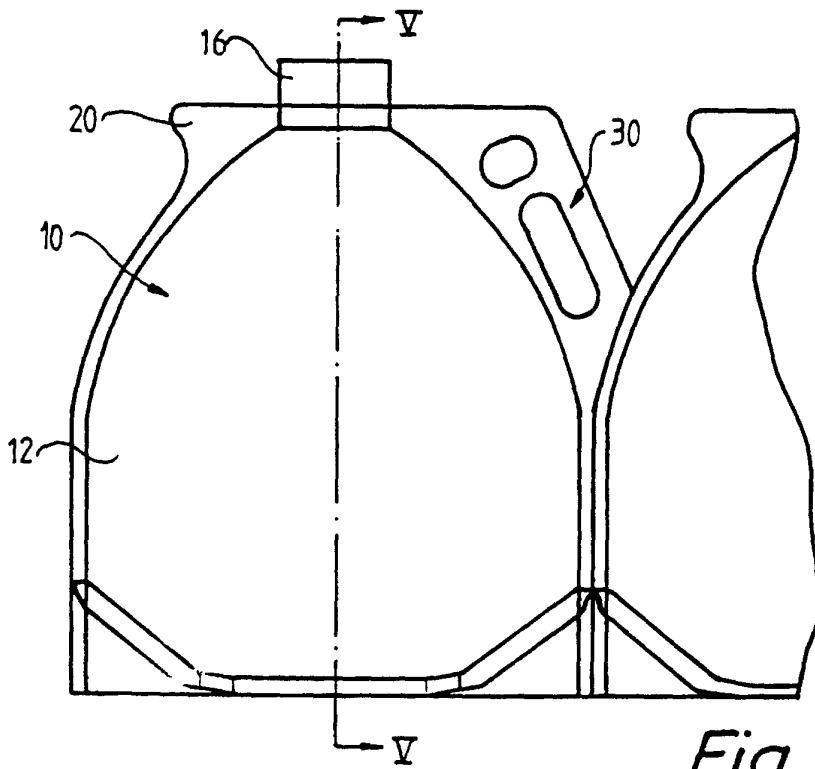


Fig. 5

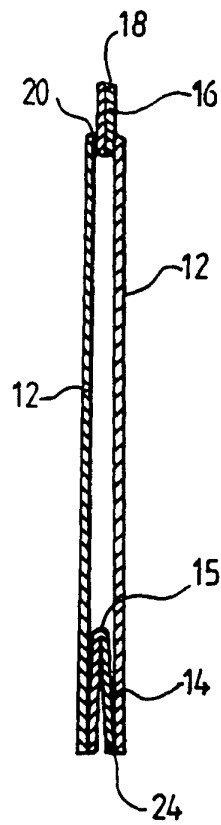


Fig. 6

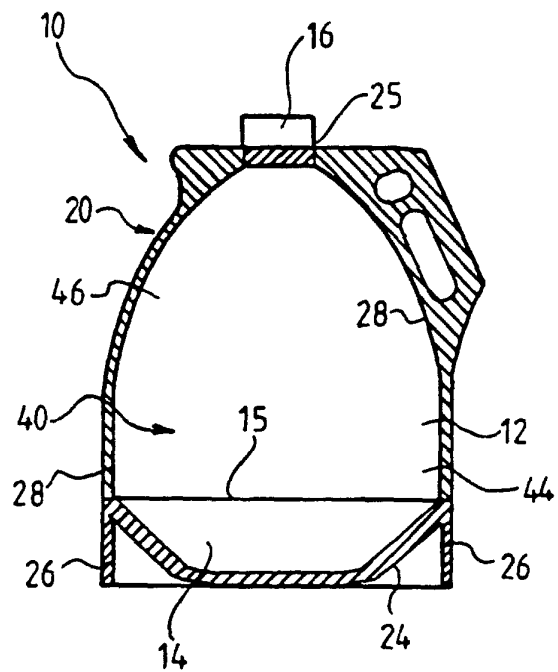
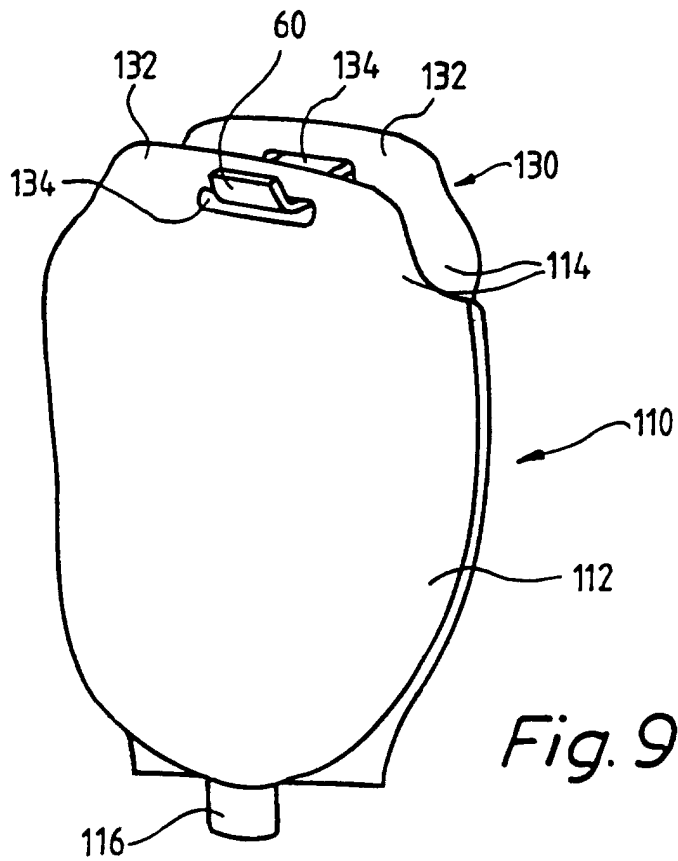
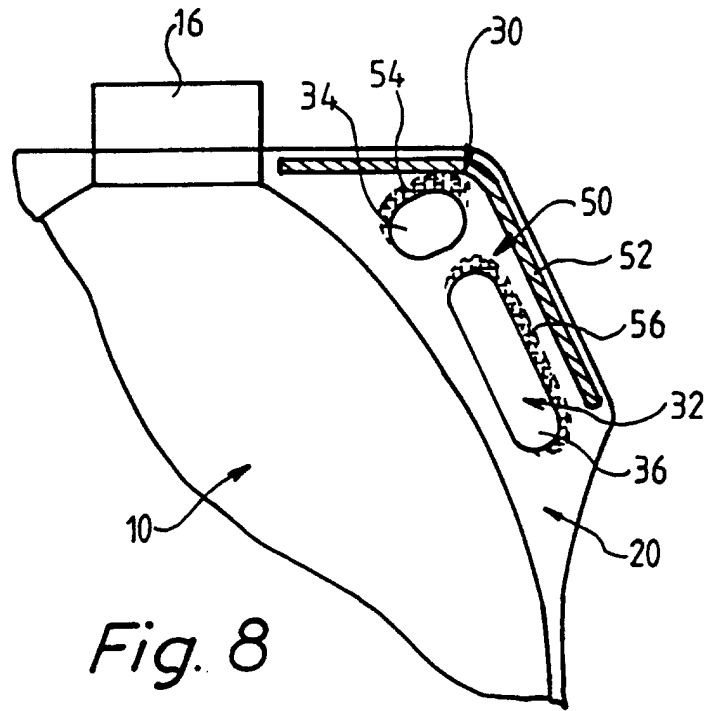
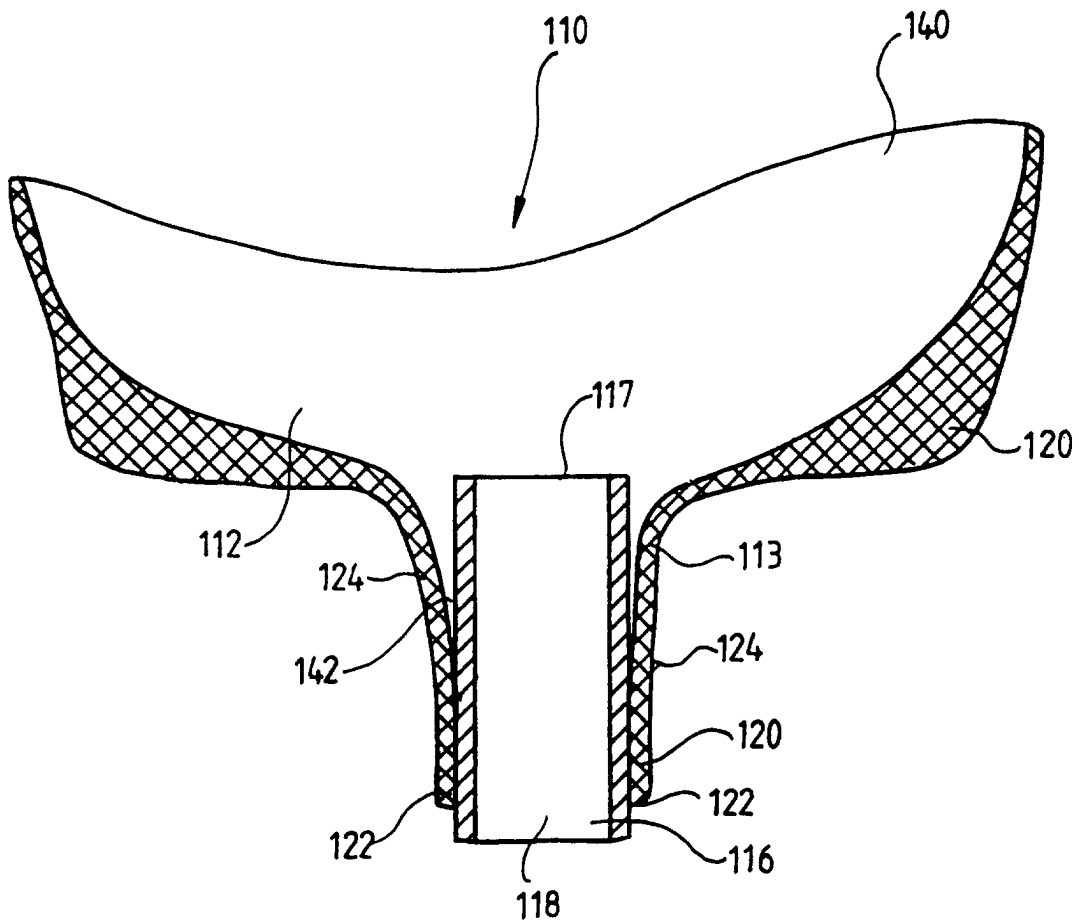
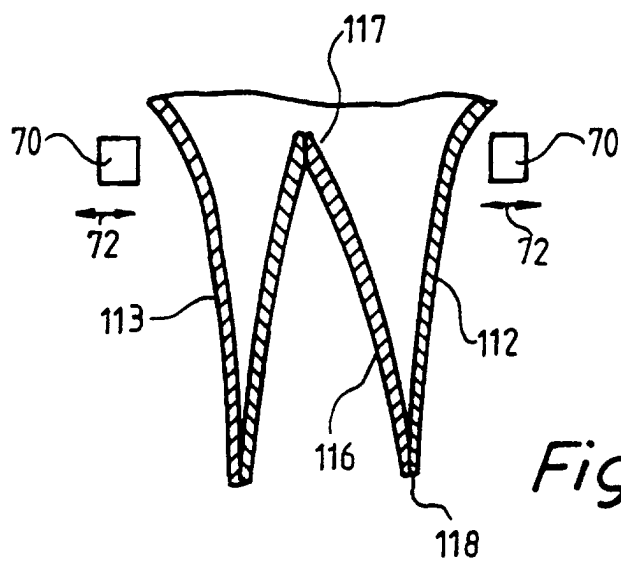


Fig. 7





*Fig. 10*



*Fig. 11*

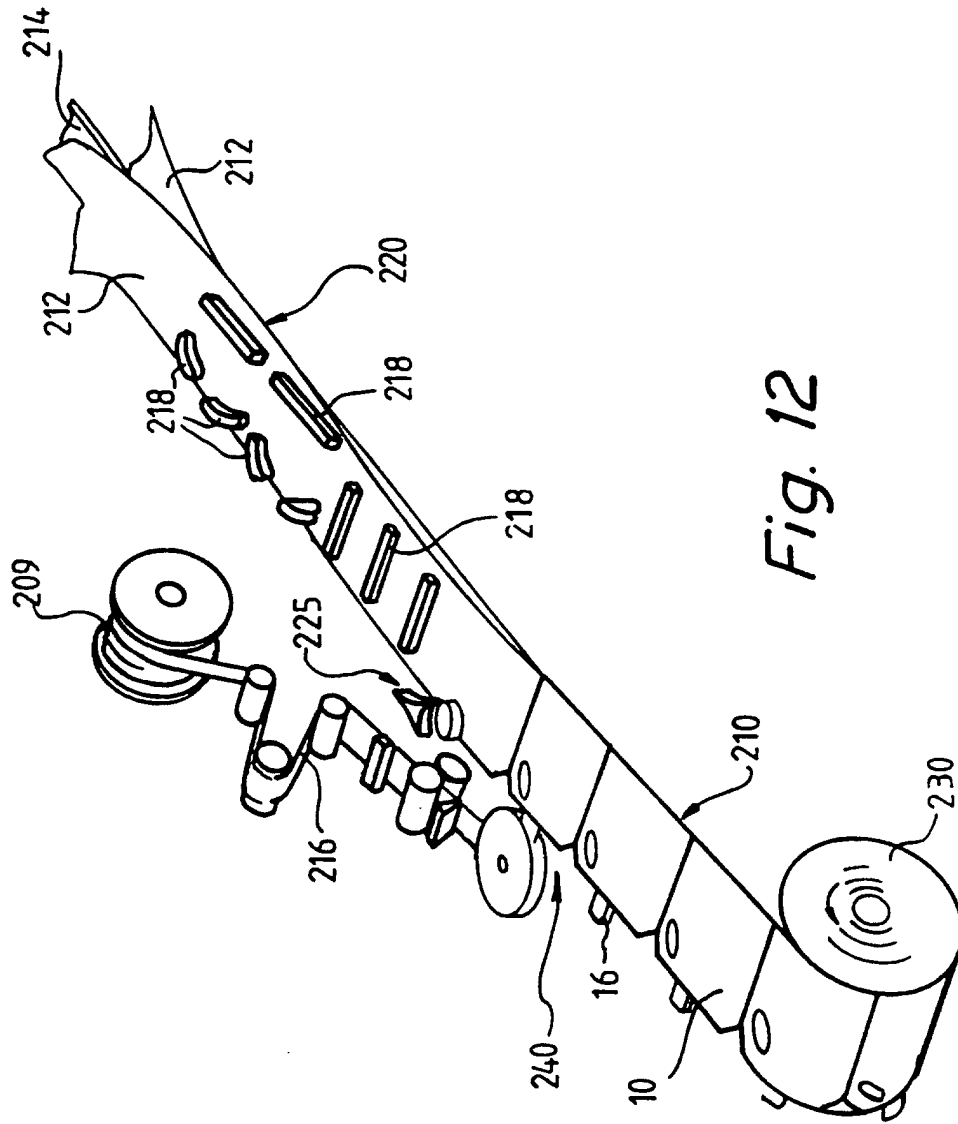


Fig. 12

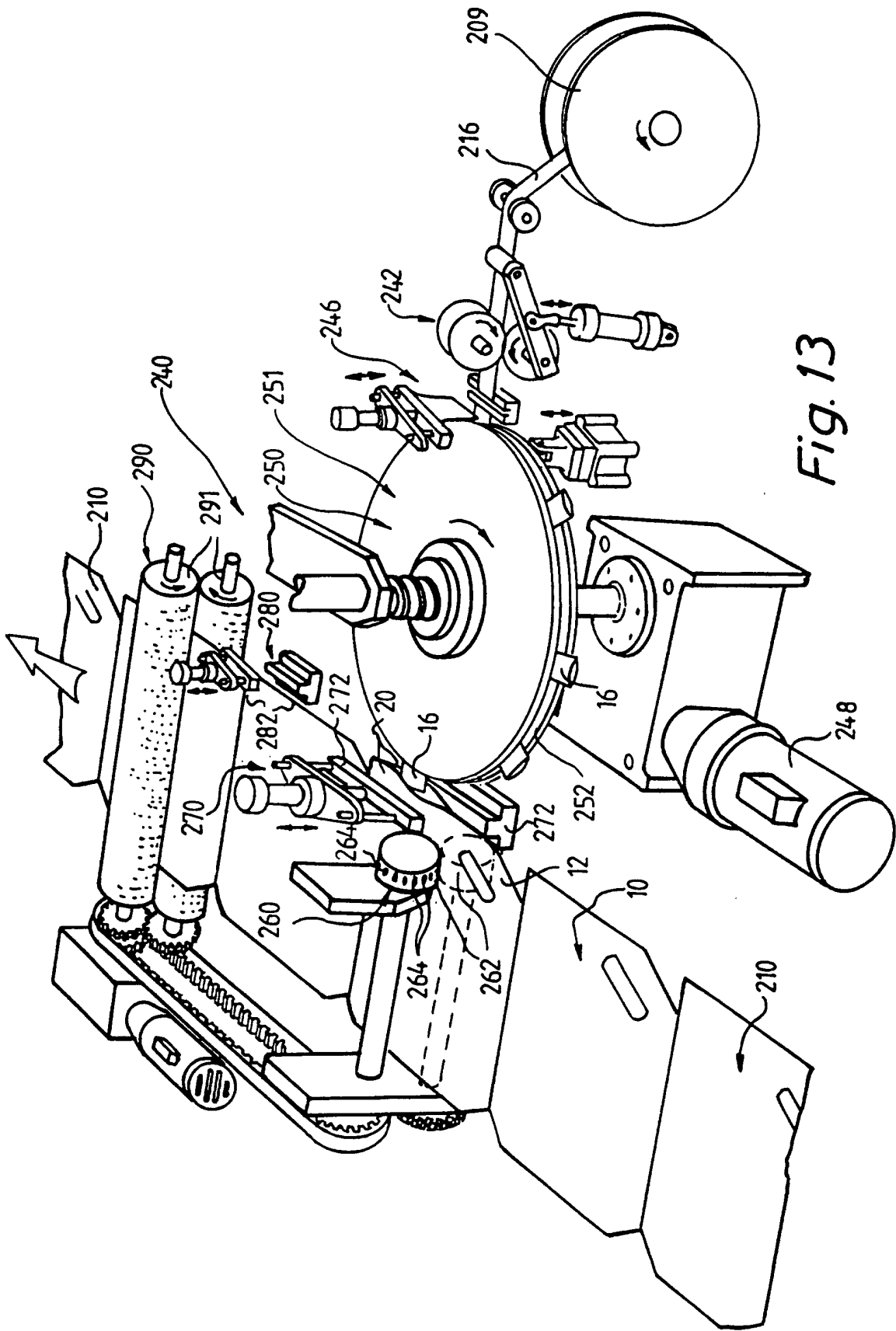
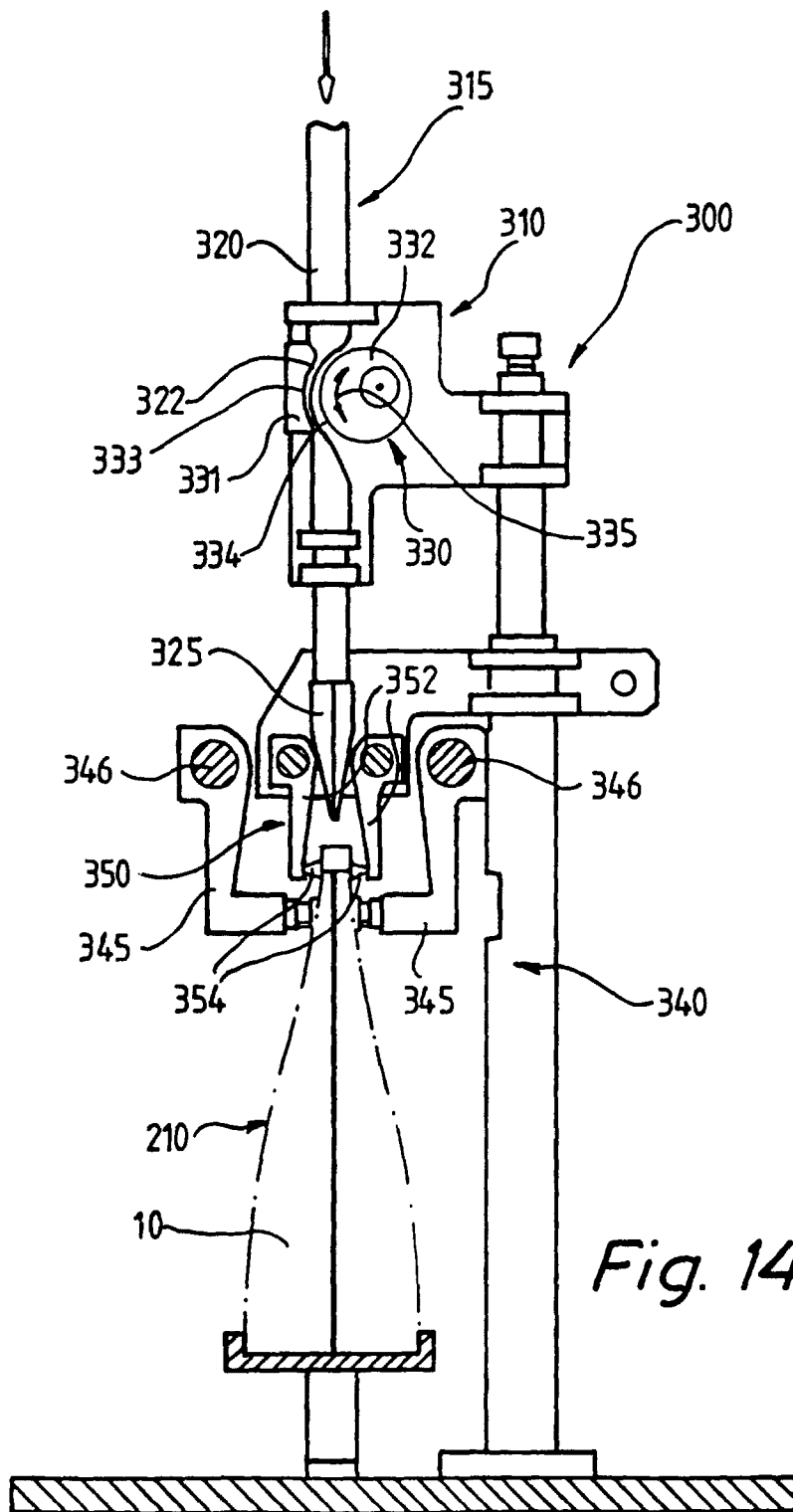


Fig. 13



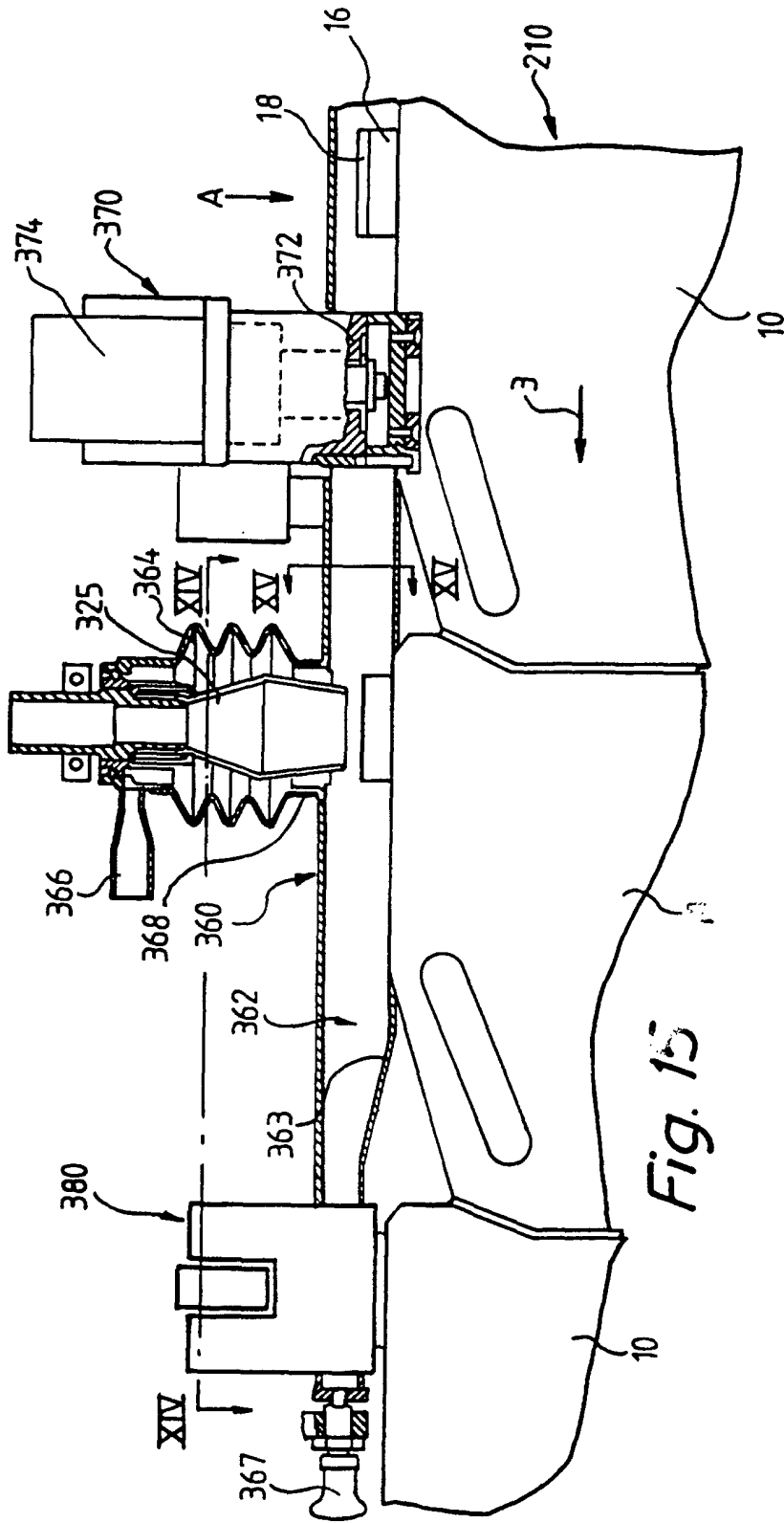


Fig. 15

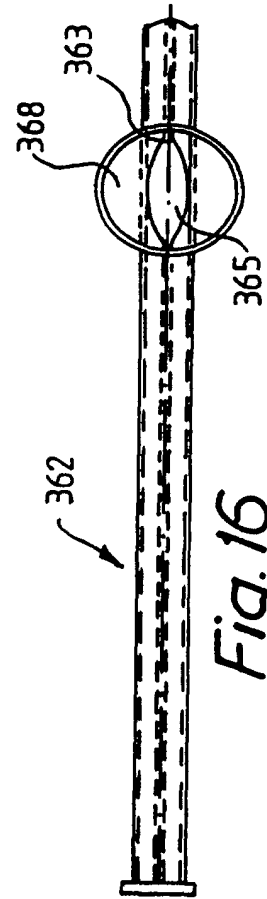


Fig. 16

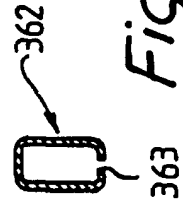


Fig. 17

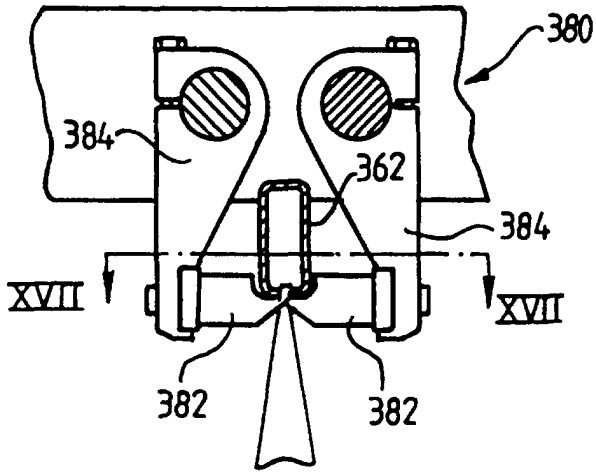


Fig. 18

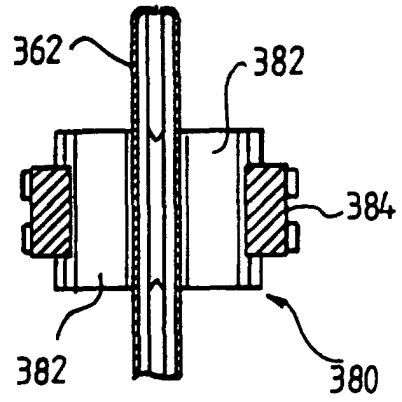


Fig. 19

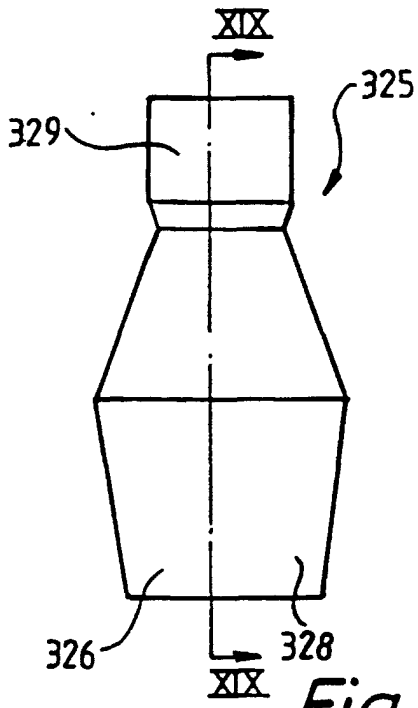


Fig. 20

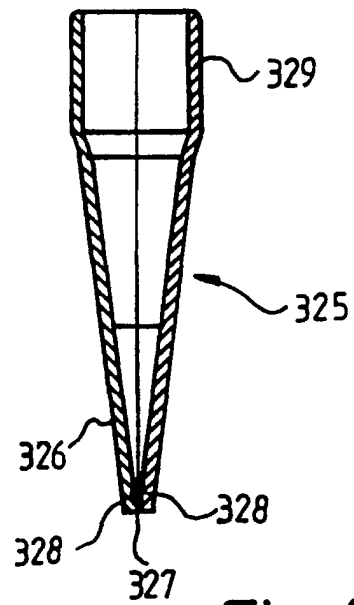


Fig. 21