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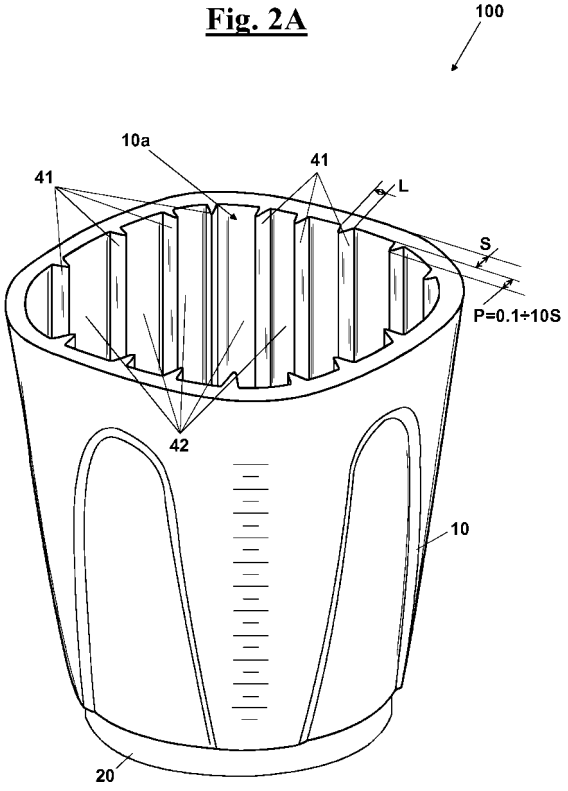
(54) Container structure for a fluid

(57) A container structure (100) for fluids, of plastic material, comprises a side wall (10), a bottom wall (20) and a head wall (30), which defining a closed innner chamber (40) having an inner side wall (10a). In addition, the container (100) comprises at least one inlet/outlet mouth (31), for the movement of the liquid towards/away from the inner chamber (40) and differential pressure means for making a pressure (50, 70) in the inner chamber (40) with respect to the outside of the container. In particular, the mouth (31) allows, furthermore, te operations of loading/unloading the fluid into/away from said container. In particular, the inner chamber (40) comprises a plurality of stiffening ribs (41) obtained by variation of the thickness of side wall 10 and extend for a predetermined thickness with respect to the inner side wall (10a) del container. The stiffening ribs (41) are adapted to opposing the container to collapse when the differential pressure means for making a pressure (50, 70) make in the chamber (40) a pressure less than the external pressure to the container.

Fig. 2A



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Description

Field of the invention

[0001] The present invention relates to a container structure for a liquid that is suitable for an industrial use, for example in the field of car repair workshops for recovering spent liquids, but also at a household use, as a useful instrument for various applications for suction or pressure spraying of liquids, as well as in the field of watercrafts and of agriculture.

Description of the prior art

[0002] Various types are known of containers for liquid among which the more common are those used in various industrial fields, conformed in order to meet different needs, for example adapted to operate in a pressurized way or in vacuum conditions.

[0003] Among these, containers or reservoirs are known that are used for suction and recovering spent liquids from a car for preparing it to demolition, such as fluids from an air conditioning system, a fuel tank, an oil tank, etc.

[0004] Structurally, this kind of containers is built normally of a metal material, in order to resist at a high relative pressure, both positive and negative. In addition, they have a high capacity in order to contain a volume of liquid that is useful for an application in the industry, in order to assist in a programmed way the need of emptying and disposing of a collected liquid. This structure, however, causes a complicated handling procedure between a working position and another, or when the containers have to be emptied, since when they are full the weight to carry becomes high.

[0005] Associated with the above described kind of containers furthermore, in the industrial fields, reservoirs for liquid are known that act as prechamber, i.e. as auxiliary container, with a low capacity, connected pneumatically, in a removable way, to the main metal reservoir of the kind described above. The function of the prechamber is to control the liquid recovered, for example in a step of changing the oil. This step is useful, for example, for testing the amount or for controlling the colour and the characteristics in a recovering process.

[0006] It is relevant to specify that the material of which the prechamber is made generally is a very strong plastic transparent or semitransparent material, or a glass material, since it must bear the negative pressure to which it is subject. The costs are high and the production process is then disadvantageous versus cost as well as versus a household use as suction vacuum container.

[0007] On the other hand, it is known that the prechamber cannot be used as a portable container, split from the main reservoir, for example to carry out a suction step of a liquid in a working position that is different from that to which it is dedicated.

[0008] This occurs because, in addition to not making a negative pressure inside, it does not provide a means for holding it and a support base located stably in a plane or on the ground.

[0009] Furthermore, common reservoirs exist for a household use adapted to contain a pressurized liquid, used with the function of sprayer. In this case, in fact, the container is brought at a predetermined pressure for spraying outside, by a spraying gun, the liquid contained inside.

[0010] Other containers, of plastic material, allow a suction function, as disclosed in US4827562A and in US2002116783A1.

[0011] A particular structure of such containers that are adapted for suction of liquids is described, for example, in US4341540A and GB2404848A. They comprise inner walls that are arranged substantially transversal with respect to an inlet port and to a feeding mouth in order to split the inner space and separate any debris or other input material from the feeding mouth but at the same time to not prevent a suction action.

[0012] Another type of container, described in US5996170A, comprises portions that are recessed with respect to the side surface of the container, and a stiffening means is provided that is adapted to prevent the container from collapsing when it is subject to a pressure that is negative with respect to the external pressure. In particular, the stiffening means has stiffening ribs.

Summary of the invention

[0013] It is therefore a general object of the present invention to provide a container structure for liquids that is suitable for an industrial use as well as fro a household use or in the field of do-it-yourself.

[0014] It is also a feature of the present invention to provide a container structure for liquids that is adapted to be subject to a positive pressure with a pressurization function or to a negative pressure with a suction function.

[0015] It is another feature of the present invention to provide a container structure for liquids capable of being transported easily.

[0016] It is also a feature of the present invention to provide a container structure for liquids that is modular responsive to the type of application which it is intended.

[0017] It is a further feature of the present invention to provide a container structure for liquids that is structurally easy to provide and cheap to manufacture.

[0018] These and other objects are achieved by a container structure for a fluid, said container made of plastic material, said container having a side wall, a bottom wall and a head wall united to each other in order to define a closed inner chamber having an inner side surface, said container comprising:

- at least one inlet/outlet mouth for flow of said fluid towards/away from said inner chamber and for loading/unloading said fluid into/away from said container;

- a differential pressure means for making a pressure in said inner chamber with respect to the outside of said container;

characterised in that in said inner chamber a reinforcement means is provided that extends from said side inner wall, in order to oppose to the collapse of said container when said differential pressure means for making a pressure creates in said inner chamber a pressure less than the external pressure with respect to said container, wherein said side wall has a thickness and said reinforcement means comprises a plurality of stiffening ribs that are made protruding from said inner side wall for an amount set between 0,1 and 10 times said thickness.

[0019] Such feature ensures that the structure of the plastic container does not deform if subject to negative pressure that would cause a collapse of the material and then a reduction of strength or a structural collapse of the inner chamber. As well known, in fact, the sole thickness of a plastic material used to provide a container is not capable of bearing values of negative pressure used commonly in the industrial fields, as well as pressures suitable for applications in the field of household or do-it-yourself. In particular, the stiffening ribs are obtained as a variation of the thickness of the side wall and extend for a predetermined thickness with respect to the inner side wall of the container.

[0020] In particular, said ribs have a width set between 0,3 and 3 times said thickness.

[0021] Advantageously, said inner side wall is split into faces and said ribs are arranged on each face in order to result in use substantially parallel and vertical ribs.

[0022] In a first exemplary embodiment, said container has, on said head wall, said inlet/outlet mouth and a connection mouth, separated from said inlet/outlet mouth, to which said differential pressure means is connected. This solution can be used when the container is used as portable container for suction of liquids.

[0023] In a second exemplary embodiment, said inlet/outlet mouth and said connection mouth coincide in a single mouth, obtained on said head wall, to which said differential pressure means is connected. In this case, the inlet/outlet mouth works also as connection mouth for connecting said differential pressure means. This exemplary embodiment can be used when the container is used in the industrial field, as prechamber of a liquid suction reservoir, as described below.

[0024] Advantageously, in said second exemplary embodiment an auxiliary connection mouth is provided. This way, it is possible to customize the container for the applications to which it is intended.

[0025] In a third exemplary embodiment, said container has, on said head wall, said inlet/outlet mouth, said connection mouth, to which said differential pressure means is connected, and a safety valve. In this case, the safety valve is provided in case the differential pressure means creates a positive pressure in the inner chamber.

[0026] Advantageously, said differential pressure means is selected from the group comprised of :

- a manual piston pump to obtain a pressurization/depressurization in said inner chamber;
- an automatic depressurization unit to obtain a depressurization in said inner chamber.

[0027] Advantageously, said piston pump comprises :

- a tubular body connected by a connection means to said connection mouth;
- an actuating element for a user that slides in said tubular body that is adapted to carry out an alternated movement to provide the pressurization/depressurization of the inner chamber.

[0028] Advantageously, said actuating element can be exchanged with respect to said tubular body in order to provide as desired a pressurization of said inner chamber or a depressurization of said inner chamber.

[0029] In particular, the distinct actuating elements are different from each other responsive to the return valve type so that when pumping they cause either a suction or a compression.

[0030] In particular, said automatic depressurization unit comprises:

- a feeding duct for a pressurized fluid, in particular compressed air;
- a silencer;
- a control duct connected to a pressure indicator.

[0031] Advantageously, said automatic depressurization unit comprises, furthermore, a fluid inlet duct. In particular, this solution can be used when the container is configured as prechamber for recovering spent oils, as described below.

[0032] In particular, a pneumatic means is provided with function of delivery/suction of said fluid connected to said inlet/outlet mouth, when said manual piston pump is present.

[0033] Alternatively, said pneumatic means with fluid suction function is connected to said fluid inlet duct of said automatic depressurization unit.

[0034] Advantageously, said means for delivery/suction is selected from the group comprised of :

- a delivery duct with an adjustable nozzle that changes the intensity and the scattering angle of the delivered fluid jet,
- suction probes with different diameters.

[0035] Advantageously, a connection mouth can be provided for a pneumatic connection of said container with an auxiliary reservoir. This way, it is possible to connect the container with a main collection reservoir of high capacity, for example used in the car repair workshops for recovering the spent fluids from a car, in particular oil,

so that the container, according to the invention, acts as depressurized prechamber.

[0036] Preferably, said connection mouth is obtained on the bottom wall of said container such that said container is arranged, in use, above said auxiliary reservoir. This way, the operations of connection of the container are easy and quick; this position makes furthermore ideal the step of conveying the fluids from the prechamber container into the auxiliary reservoir.

[0037] Advantageously, said container comprises auxiliary equipment for the use both as prechamber and as portable container.

[0038] In particular, a fluid inlet valve is provided that opens/closes the pneumatic connection between said container and said auxiliary reservoir.

[0039] For example, in a known step of recovering spent fluids from a car, the prechamber and the main reservoir are connected pneumatically. In particular, when inlet valve is open the chamber is brought to a predetermined depression of about -0,75 bar. Then, once achieved this value of depression, the inlet valve is closed. Then, a suction of liquids can be effected using only the container that works as prechamber. Once achieved a maximum fill level, which is visible from outside owing to the transparency of the plastic material, the connection valve is open. This way, the collected liquid in the container falls entirely into the main reservoir. In parallel, the value of pressure in the prechamber container returns substantially to the starting value avoiding a further waste of energy for obtaining again the predetermined pressure.

[0040] The prearrangement of the connection mouth and the interchangeability of the different differential pressure means, according to the invention, make the container modular and adapted to be implemented in many applications. In particular, it can be used both as portable container, with the function of a suction/diffusion means of a liquid, and as a suction vacuum container in the industrial field. In the former case, different solutions are possible since the suction function can be achieved either with the manual piston depressurization pump or with a Venturi depressurization unit, whereas the function of fluid supplier can be achieved through the pump or with a pressurization function or through other compression means. In the case of application in the industry, instead, it can be used, for example, as prechamber of known reservoirs for suction of liquids for collecting spent oils, as above described, using the automatic depressurization unit equipped with the inlet mouth.

[0041] These and other features are also advantageous from a structural viewpoint since the container, starting from a common base structure, i.e. the inner reinforced chamber, can be modulated simply combining or adding the many auxiliary components on the head wall.

[0042] Preferably, said container has a frusto-conical shape and provides a support base in which said bottom engages when the container is used as portable container.

[0043] Advantageously, said head wall is sealingly connected in a releasable way to the side wall as a cover. This way, the cover can be removed to allow a much easier maintenance and cleaning of the inner chamber.

[0044] In particular, said container provides a tubular housing for said probes that is mounted to a hook portion obtained on said side wall and fits in a recess obtained on said support base in order to be transported stably with said container.

[0045] Advantageously, a safety pneumatic means is provided in order to avoid risks for a user during the steps of pressurizing the inner chamber. In particular, said safety means is a safety valve arranged on said head wall and associated with a pressure indicator mounted as control instrument.

[0046] Advantageously, said plastic material is a semi-transparent plastic material and said container is manufactured by an injection moulding process. This way, the production cost is relatively low and it is possible to provide the container as a base component adapted to be turned into different configurations both for professional and for do-it-yourself applications as described above.

[0047] In particular, said container has on said side wall at least one capacity scale that indicates the fill level of the fluid contained in said inner chamber, preferably said capacity scale indicates capacity units selected among: litres; gallons; both the above described units.

Brief description of the drawings

[0048] The invention will be made clearer with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the attached drawings in which:

- figure 1 shows a perspective view of a container structure for liquid, according to the invention;
- figure 2 shows a cross section of the container for liquid of Fig. 1, with an inner chamber where the stiffening ribs are provided;
- figure 2A shows a perspective view of the container for liquid of Fig. 1, which highlights the inner arrangement of the stiffening ribs;
- figure 3 shows a top plan view of the container of Fig. 1, in which the inlet/outlet mouth of the fluid are obtained and the differential pressure means for making a pressure are applied;
- figure 4 shows a perspective partial view of a possible head wall to which a manual pump is connected that is adapted to pressurize/depressurize the inner chamber of the container;
- figure 5 shows a perspective view of an exemplary embodiment of the head wall without the connection mouth;
- figure 6 shows a possible application of the container for fluids of Fig. 5, according to the invention, used as prechamber for a reservoir for recovering spent

fluids;

- figures 7 and 8 show a cross sectional view of the fluid flow when the container as prechamber is used for recovering fluids, of Fig. 6.

Detailed description of some exemplary embodiments

[0049] In Fig. 1 a container structure 100 for fluids is shown, according to the invention, of plastic material, preferably a transparent or semitransparent material that is adapted to display the fill level of the liquid contained inside. Structurally container 100 has a side wall 10, integrated to a bottom wall 20 (visible in detail in Fig. 3) and a head wall 30, defining together a closed inner chamber 40 (Fig. 2) having an inner side wall 10a. In addition, container 100 comprises at least one inlet/outlet mouth 31, for the movement of the liquid towards/away from inner chamber 40 and a differential pressure means 50, 70 for making a pressure in inner chamber 40 with respect to the outside of the container. In particular, mouth 31 allows, furthermore, the operations of loading/unloading the fluid into/away from said container.

[0050] The container, as shown in Figs. 2 and 2A, provides in inner chamber 40 a plurality of stiffening ribs 41 that extend from the side inner wall 10a in order to oppose to a collapse of the container when the differential pressure means 50, 70 make in the chamber 40 a pressure less than the pressure outside the container.

[0051] More in particular, side wall 10 has a thickness S and the stiffening ribs 41 protrude from the inner side wall 10a for an amount P set between 0,1 and 10 times the thickness S.

[0052] More precisely, the container may have the side inner wall of the chamber 40 split into faces 42; the stiffening ribs 41 are arranged on each face such that they result in use substantially parallel and vertical ribs.

[0053] Such feature ensures that the structure of the plastic container 100 does not deform if subject to negative pressure, that would cause a collapse of the material and then reduction of strength or a structural collapse of inner chamber 40. As well known, in fact, the sole mechanical strength of a plastic material that is used to make container 100 is not capable of bearing values of negative pressure used commonly in the industrial fields, as well as pressures that are needed for applications in the field of household or do-it-yourself. In other words, the stiffening ribs 41 are obtained by variation of the thickness S of side wall 10 and extend for a predetermined thickness P with respect to the inner side wall 10a of the container.

[0054] In particular, as shown in Fig. 2A, the stiffening ribs 41 have a width L set between 0,3S and 3S. The variation of width L makes it possible to obtain ribs more or less resistant in order to bear a higher differential pressure. The cross section of stiffening ribs 41 can be a polygonal shape, in particular triangular or rectangular.

[0055] The applications and the modularity of the container for liquid, according to the invention, are different.

[0056] In a first exemplary embodiment, the container has, on head wall 30, the inlet/outlet mouth and a connection mouth 32, separated from the inlet/outlet mouth, to which the differential pressure means 50, 70 (Fig. 1 and 3) is connected. This solution is used when the container is used as portable container for suction of liquids.

[0057] In a second exemplary embodiment, the inlet/outlet mouth and the connection mouth coincide in a single mouth 33, which is obtained always on head wall 30, and to which the differential pressure means 50 (Fig. 5) is connected. This exemplary embodiment can be used when the container is used in the industrial field, as prechamber of a liquid suction reservoir, as described below.

[0058] In a third exemplary embodiment, the container has, on head wall 30, inlet/outlet mouth 31, connection mouth 32, to which the differential pressure means 70 is connected, and a safety valve 60 (Fig. 4). In this case, the safety valve is needed since the differential pressure means creates a positive pressure in the inner chamber.

[0059] In the exemplary embodiment shown in Fig. 1, the container comprises inlet/outlet mouth 31 with function of loading/unloading the fluid into/away from said container, and connection mouth 32, which is separated from inlet/outlet mouth 31 and is assembled to an automatic depressurization unit or a Venturi unit 50. In this case, inlet/outlet mouth 31 allows the circulation of the fluid between the inner chamber and the outside; this allows the suction function of the liquid.

[0060] In particular, mouth 31 comprises a screw threaded 31' cover associated with a connection 34 and connected in a screw threaded housing 34' obtained in cover 31' (as shown in Fig. 3). In particular, connection 34 allows a quick fastening with a pneumatic delivery/suction duct of the fluid (not shown), for example, selected from the group comprised of: a probe for suction of fluids, with nozzles of different diameter, when Venturi unit 50 is present, or a delivery duct with an adjustable nozzle for changing the scattering angle of the delivered fluid jet, when the container is used as fluid supplier, described below.

[0061] Similarly, connection mouth 32 provides a screw threaded plug 32' that connects in an interchangeable way the automatic depressurization unit 50 or alternatively, a manual device, in particular a piston pump 70, to obtain a pressurization/depressurization in the inner chamber (visible in Fig. 5), described below.

[0062] In particular, Venturi unit 50 comprises a fastening 51 for feeding compressed air connected pneumatically to a inner Venturi tube (not shown), a silencer 54 (visible in Fig. 3) and a control duct 55 connected to a pressure indicator 53. Unit 50 is operated by Venturimeter or Venturi tube that, as well known, has two branches, a first convergent branch and a second divergent branch, connected to each other. This conformation with a decrease of the cross section causes, in operative conditions, the acceleration of the fluid as input, in this case of the compressed air, and a subsequent depressurization of inner chamber 40. Therefore, such a system of

depressurization is completely independent and it does not need a continuous connection with the source of compressed air, by duct 51.

[0063] figure 4 shows the second exemplary embodiment of the container, comprising manual piston pump 70. In particular, it comprises a tubular body 70' connected by cover 32' to connection mouth 32 and an actuating element 75 for a user, which slides in tubular body 70' and reciprocates to obtain the pressurization/depressurization of inner chamber 40 of the container.

[0064] Advantageously, actuating element 75 is exchanged with respect to the tubular body in order to carry out as desired pressurization or a depressurization operation of inner chamber 40. In particular, different actuating elements can be used are responsive to the return valve type inside, not shown, so that, at pumping, they effect a suction or a compression of air.

[0065] In particular, the actuating element 75 is connected to a connection head 73, by a quick fastening as a bayonet coupling 72, which allows a quick replacement and comprises, furthermore, a grip portion 71 that allows a manual pumping as well as carrying the container. This solution is particularly useful when the container is used as portable container, since it does not need feeding the compressed air.

[0066] In addition, the exemplary embodiment of the container as fluid supplier of a pressurized liquid contained in inner chamber 40, provides a safety valve 60 in order to avoid risks for a user during the steps of pressurizing inner chamber 40. For example, the safety valve 60 can be associated with a manometer (not shown).

[0067] Figure 5, shows the second exemplary embodiment of container 100, where the inlet/outlet mouth and the connection mouth are associated in a single mouth 33 to which automatic depressurization unit 50' is connected. The latter, differently from unit 50, comprises, furthermore, an inlet duct 52 that is connected to housing 52' (Fig. 2) and recovers the liquid on the bottom of the container. The latter is used or not used, according to whether a separated inlet duct/outlet 31 is provided. For example, in the case of Fig. 1, the inlet/outlet duct of the fluid is mouth 31, and then duct 52 is not provided, whereas in the case of Fig. 5, the sucked liquid passes through duct 52 of depressurization unit 50'. In this case, in addition, also a space 36 is provided (visible in Fig. 5) in order to customize the container for the applications to which it is intended.

[0068] As shown in Fig. 6 the container, according to the invention, comprises, furthermore, a lower connection mouth 21 that is adapted to pneumatically connect container 100 with an auxiliary reservoir 200. This way, it is possible to connect container 100 with a main collection reservoir of higher capacity, for example used in the car repair workshops for recovering the spent fluids, in particular oil, of a car or other vehicles, so that container 100, according to the invention, acts as depressurized prechamber. With the prearrangement of connection mouth 21, in fact, the container in addition to the use as portable container, as shown in the exemplary embodiment of Fig. 1, 3 and 4, can be used with the both the function of diffuser of a liquid, such as by spraying, and the suction function.

[0069] Advantageously, the connection mouth 21 is obtained on the bottom wall 20 of the container such that container 100 is arranged in use above the auxiliary reservoir 200. This way, the operations of assembling the container are easy and quick; this position, furthermore, optimizes the step of conveying the fluids from the prechamber container into the auxiliary reservoir 200 (Fig. 7).

[0070] In particular, an inlet valve 26 provides inlet of the fluid by opening/closing the pneumatic connection, by a lever 27, between container 100 and auxiliary reservoir 200. For example, as shown in Figs. 7 and 8, in a step of recovering spent fluids from a car, the prechamber 100, i.e. the container, according to the invention, and the main reservoir 200 are connected pneumatically. More precisely, with inlet valve 26 open, through device 50', a predetermined negative pressure is reached, for example -0,75 bar. Then, once reached this negative pressure, inlet valve 26 is closed by lever 27. After suction of the liquid using only container 100 that works as prechamber, it is possible to test visually the amount of oils or fluids sucked. Once achieved a maximum fill level 95, which is visible from outside owing to the transparency of the plastic material, connection valve 26 is open. This way, the collected liquid in container 100 is transferred into the main reservoir until the former is fully emptied. In parallel, the value of pressure in the prechamber 100 is brought back, by the connection, substantially to the starting value without further waste of energy for obtaining again the predetermined pressure.

[0071] The prearrangement of the connection mouth and the interchangeability of the different differential pressure means, according to the invention, make the container modulable and adapted to be implemented to many applications. In particular, it can be used as portable container with the function of suction/diffusion means of a liquid both as suction and as vacuum container in the industrial field. In the former application, different solutions are possible since the suction function can be accomplished both with the manual piston pump and with the Venturi depressurization unit, whereas the function of fluid supplier can be accomplished both through the pump with a pressurization function or through other compression means. In the industrial field, instead, a possible application as described above is the use as prechamber of known reservoirs for suction of liquid, such as collection of spent oils.

[0072] These and other features are advantageous also from a structural viewpoint since the container, starting from a common base structure, i.e. the reinforced inner chamber, can be modulated simply by combining or by adding the many auxiliary components to the head wall.

[0073] Container 100 has preferably a frusto-conical shape and provides a support base 25, shown in Fig. 1,

where bottom 20 engages when the latter is used as portable container. In addition, head wall 30 is sealingly connected in a releasable way to side wall 10 through a plurality of distanced screws 86. This way, the latter can be withdrawn to make it possible maintenance and cleaning of inner chamber 40. The container provides furthermore, a tubular housing 80 for the probes, with a conical introduction portion 82, which is mounted to a hook portion 81 obtained on side wall 10 and fits in a housing 83 for application to the basis of support 25 in order to be transported stably with container 100.

[0074] In addition, the container has on the side wall at least one capacity scale that indicates the fill level of the fluid contained in inner chamber 40, preferably a capacity scale selected among: litres and/or gallons.

[0075] Always advantageously plastic material is a semitransparent plastic material and the container is manufactured by an injection moulding process. This way, the production cost is relatively low and it is possible to provide the container as a base component adapted to be turned into different configurations both for professional and for do-it-yourself as described above.

[0076] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

1. A container structure for a fluid, said container made of plastic material, said container having a side wall, a bottom wall and a head wall united to each other in order to define a closed inner chamber having an inner side surface, said container comprising:

- at least one inlet/outlet mouth for flow of said fluid towards/away from said inner chamber and for loading/unloading said fluid into/away from said container;
- a differential pressure means for making a pressure in said inner chamber with respect to the outside of said container;

characterised in that in said inner chamber a reinforcement means is provided that extends from said side inner wall, in order to oppose to a collapse of said container when said differential pressure means for making a pressure creates in said inner chamber a pressure less than the external pressure with respect to said container, wherein said side wall has a thickness and said reinforcement means comprises a plurality of stiffening ribs that are made protruding from said inner side wall for an amount set between 0,1 and 10 times said thickness.

2. A container structure, according to claim 1, wherein said ribs have a width set between 0,3 and 3 times said thickness.

3. A container structure, according to claim 1, wherein said inner side wall is split into faces and said ribs are arranged on each face in order to result in use substantially parallel and vertical ribs.

4. A container structure, according to claim 1, wherein said container has, on said head wall, said inlet/outlet mouth and a connection mouth, separated from said inlet/outlet mouth, to which said differential pressure means is connected.

5. A container structure, according to claim 1, wherein said inlet/outlet mouth and said connection mouth coincide in a single mouth, obtained on said head wall, to which said differential pressure means is connected.

6. A container structure, according to claim 1, wherein said container has, on said head wall, said inlet/outlet mouth, said connection mouth to which said differential pressure means is connected, and a safety valve.

7. A container structure, according to claim 1, wherein said differential pressure means is selected from the group comprised of:

- a manual piston pump to obtain a pressurization/depressurization in said inner chamber;
- an automatic depressurization unit to obtain a depressurization in said inner chamber,

in particular, said piston pump comprising:

- a tubular body connected by a connection means to said connection mouth;
- an actuating element for a user that slides in said tubular body that to carry out an alternated movement to provide a pressurization/depressurization of said inner chamber, wherein said actuating element can be exchanged with respect to said tubular body in order to provide as desired a pressurization of said inner chamber or a depressurization of said inner chamber.

8. A container structure, according to claim 7, where-

in said automatic depressurization unit comprises :

- a feeding duct for a pressurized fluid, in particular compressed air;
- a silencer;
- a control duct connected to a pressure indicator, in particular said automatic depressurization unit comprises furthermore, a fluid inlet duct.

8. A container structure, according to claim 1, wherein a pneumatic means is provided selected from the group comprised of:

- a pneumatic means with function of delivery/suction of said fluid connected to said inlet/outlet mouth, when said manual piston pump is present,
- a pneumatic means with function of fluid suction connected to said fluid inlet duct of said automatic depressurization unit,
- in particular, in either case, said means for delivery/suction is selected from the group comprised of:

  - a delivery duct with an adjustable nozzle that changes the intensity and the scattering angle of the delivered fluid jet;
  - suction probes with different diameters.

9. A container structure, according to claim 1, wherein a connection mouth can be provided for a pneumatic connection of said container with an auxiliary reservoir, in particular said connection mouth is obtained on the bottom wall of said container such that said container is arranged, in use, above said auxiliary reservoir, in particular, furthermore, an access valve is provided that opens/closes the pneumatic connection between said container and said auxiliary reservoir.

10. A container structure, according to claim 1, wherein said container comprises auxiliary equipment for use both as prechamber, and as portable container, in particular said container having frustoconical shape and providing a support base in which said bottom engages when the container is used as portable container.

Fig. 1

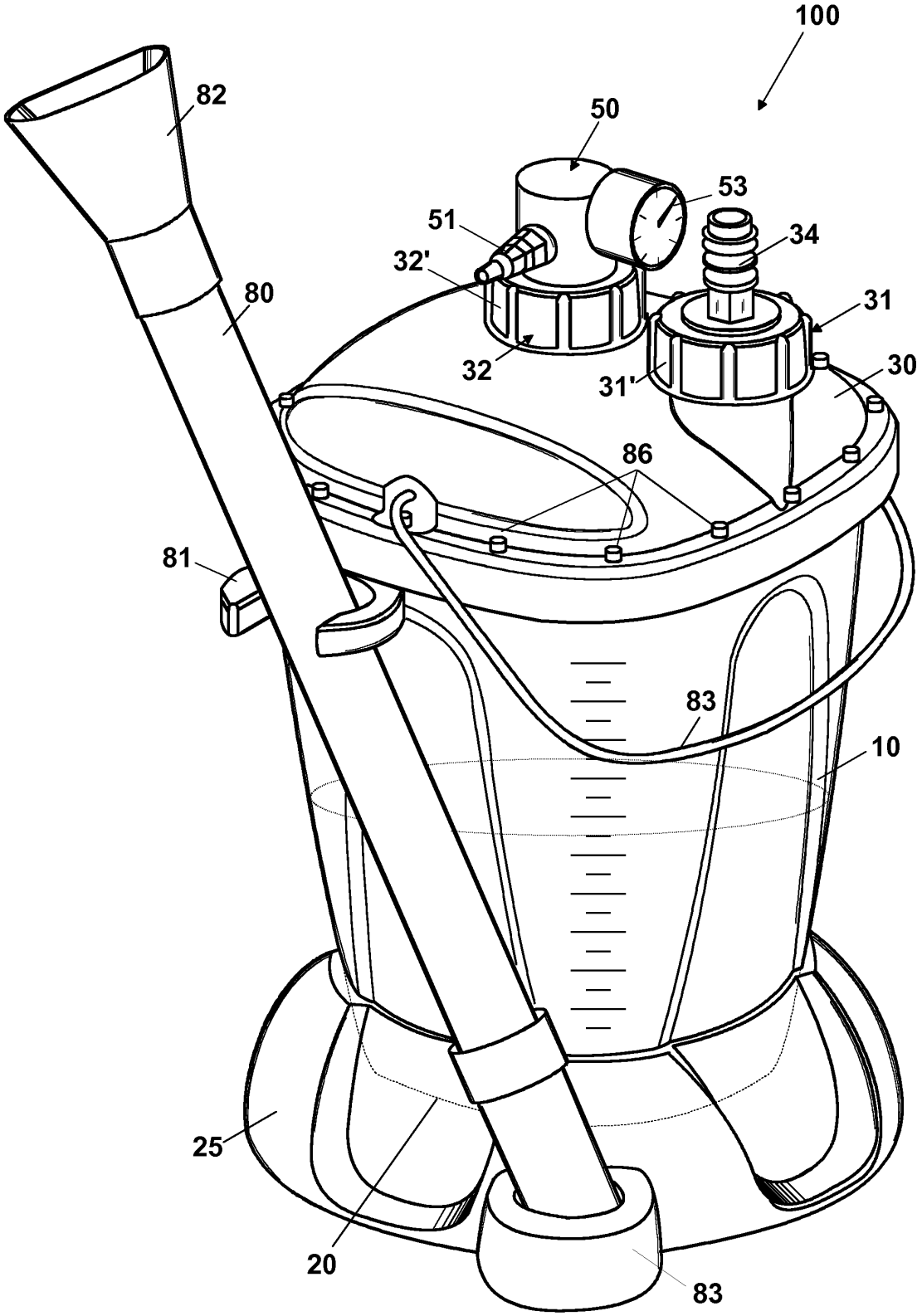


Fig. 2

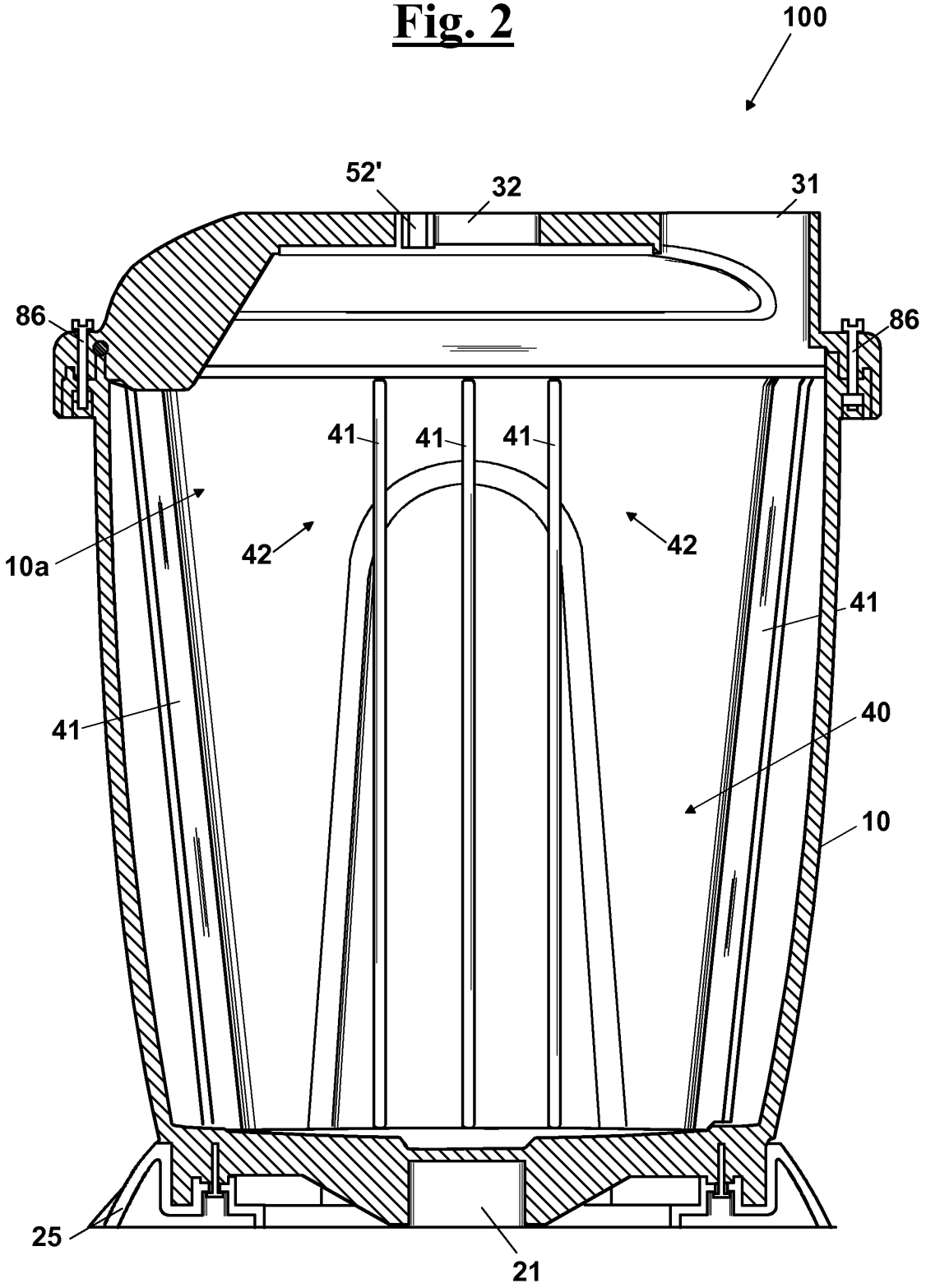


Fig. 2A

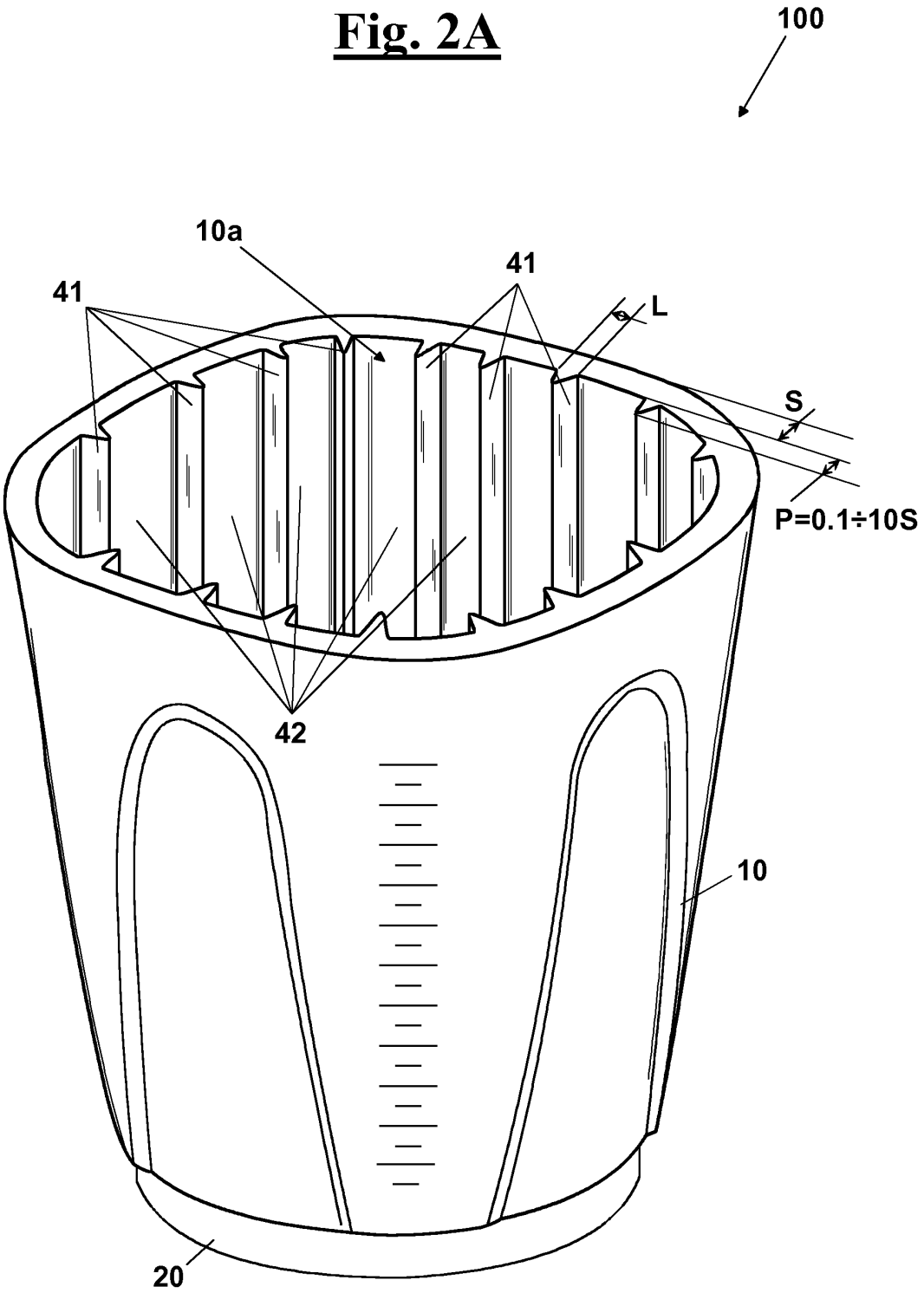


Fig. 3

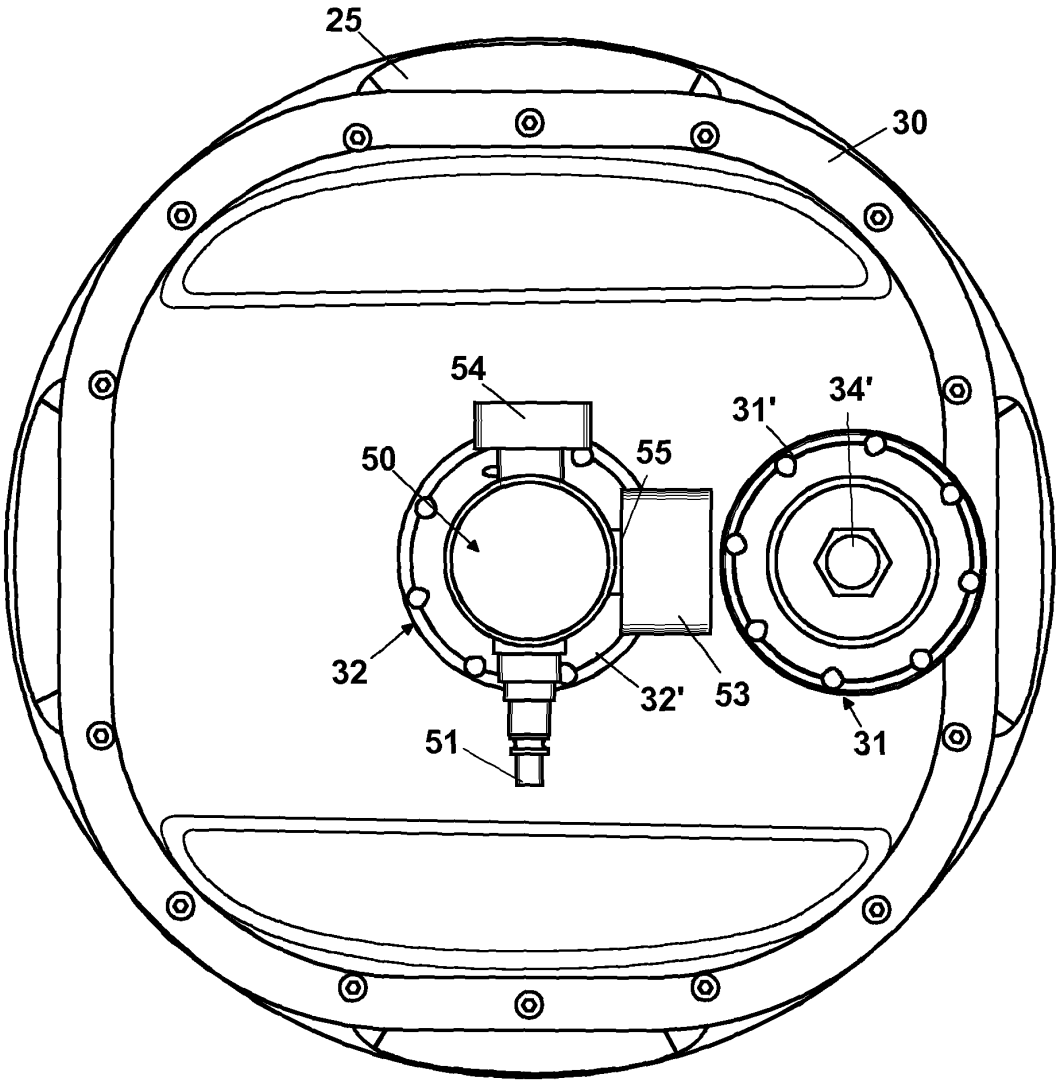


Fig. 4

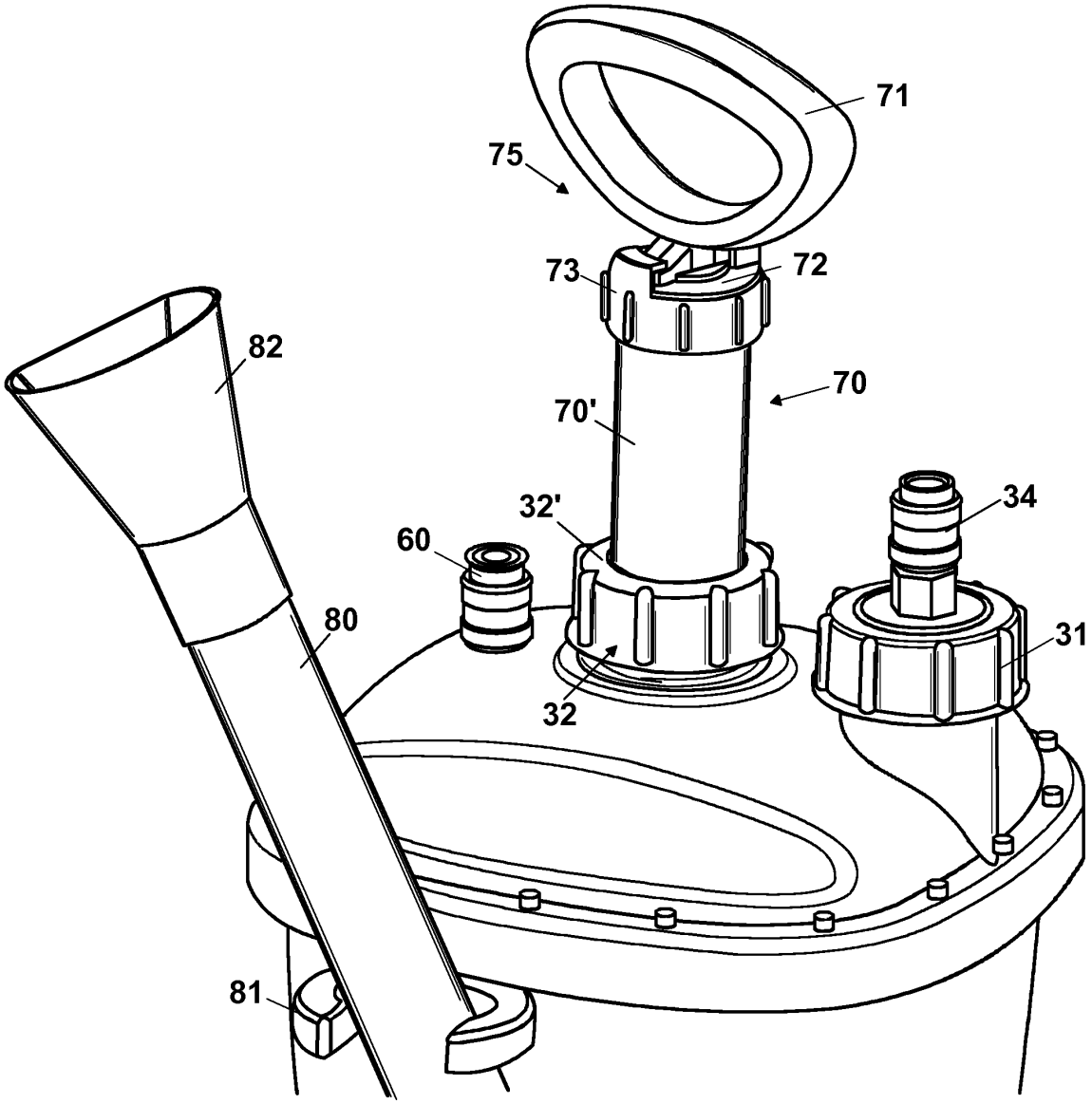


Fig. 5

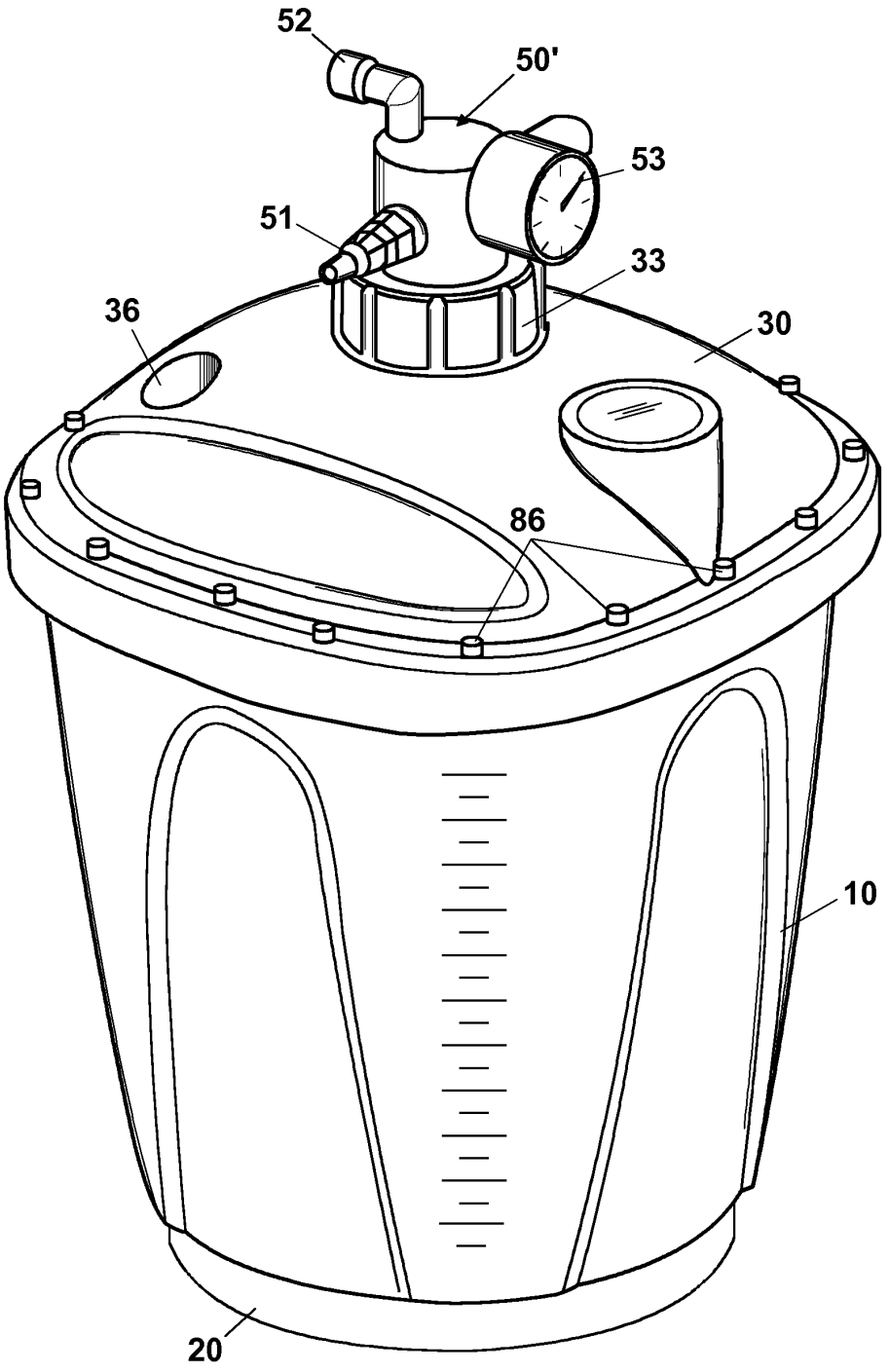
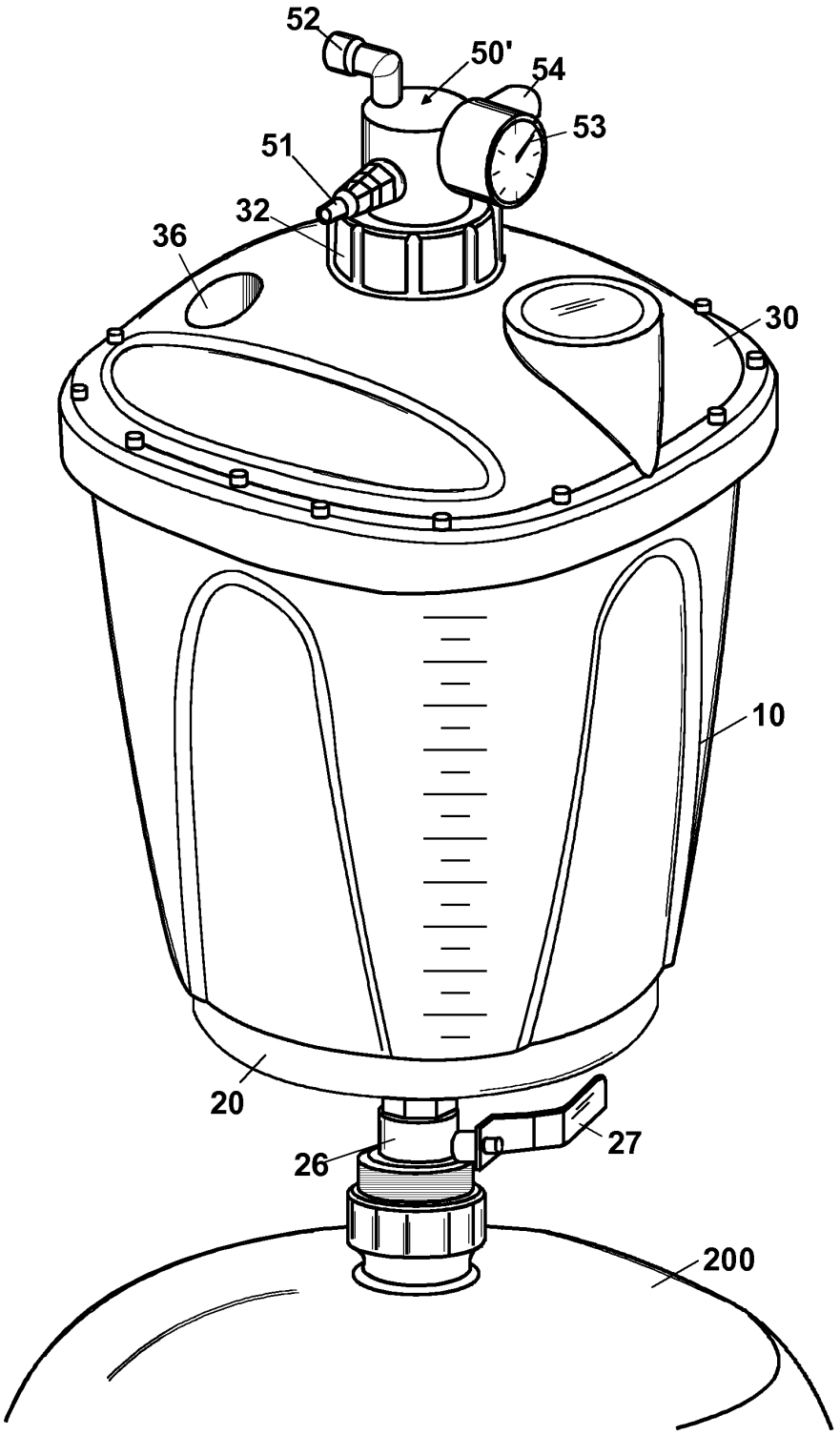


Fig. 6



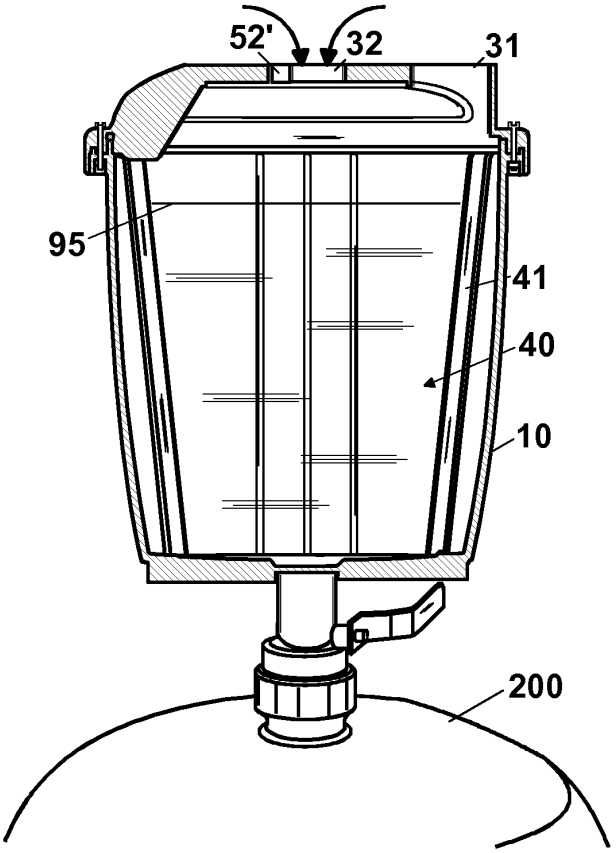


Fig. 7

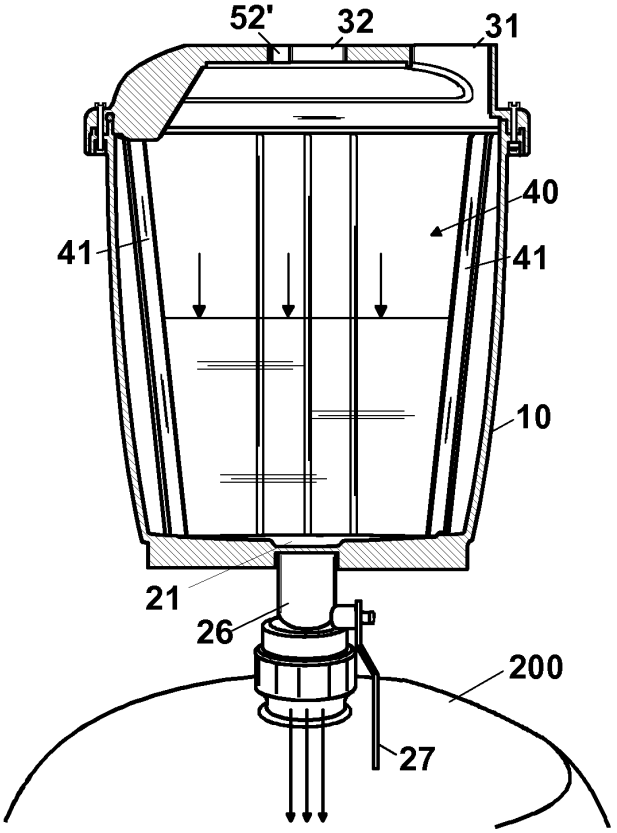


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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