



(11)

EP 2 646 326 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
10.08.2016 Bulletin 2016/32

(51) Int Cl.:
B65D 1/20 (2006.01) **B65D 21/02** (2006.01)
A47L 15/00 (2006.01)

(21) Application number: **11788874.3**

(86) International application number:
PCT/EP2011/071536

(22) Date of filing: **01.12.2011**

(87) International publication number:
WO 2012/072753 (07.06.2012 Gazette 2012/23)

(54) **A SUCTION SYSTEM FOR DRAWING A SUBSTANCE, PREFERABLY A FLUID, OUT OF A CANISTER**

SAUGSYSTEM FÜR EINEN EINE FLUIDE SUBSTANZ ENTHALTENEN KANISTER

SYSTÈME D'ASPIRATION POUR UN BIDON CONTENANT UN FLUIDE

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

(30) Priority: **01.12.2010 PCT/EP2010/068648**

(43) Date of publication of application:
09.10.2013 Bulletin 2013/41

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(56) References cited:
EP-A1- 1 510 462 EP-A1- 2 241 241
WO-A1-2007/138350 DE-A1- 19 709 536
DE-A1-102009 052 029 US-A- 4 928 861
US-A- 5 402 909

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Description

Technical field of the invention

[0001] This invention relates to a suction system for drawing a substance, preferably a fluid, out of a canister, wherein the suction system comprises a canister, a connector closure and a suction lance for emptying the substance out of the canister.

Background of the invention

[0002] Devices and systems for emptying canisters filled with a substance, e.g. a fluid, are known in practice in various forms. These known devices often incorporate a suction lance that is inserted into the canister and that is pointing from an opening of the canister into the canister for sucking the substance out when coupled to a suction device (EP 1 510 462 A1). Due to this, the positioning of the suction lance inside the canister is different every time a canister is used. Further, using known suction lances in order to empty the canister so that it is free of residue, a residual amount of substance always remains in the canister.

[0003] For the disposal of canisters that are filled with dangerous or harmful substance for example it is desirable to reduce the amount of substance that is left in the canister to a minimum. Moreover, an unintended contact of a person handling the emptied canister with the substance is to be avoided in order to reduce health risks.

SUMMARY OF THE INVENTION

[0004] It is therefore an object of the present invention to provide a suction system for sucking a substance, preferably a fluid, from a canister, which enables a complete emptying of the canister without the risk of a person handling the canister to get into contact with the substance held in the canister.

[0005] This object is solved by a suction system according to claim 1 of the present invention.

[0006] Accordingly, a suction system for sucking a substance, preferably a fluid, from a canister, comprises a canister for holding a substance, preferably a fluid, wherein the canister comprises a body, wherein the body comprises a top part, a side part and a bottom part, at least one nozzle, preferably located at the top part of the body, wherein the nozzle comprises a first opening and a second opening suitable for filling the substance into the body, wherein the first opening and the second opening are both arranged in the nozzle, a suction lance for sucking the substance out of the body of the canister, wherein the suction lance comprises an upper end and a lower end, wherein the upper end is connected to the first opening and the lower end is located next to the bottom part of the canister, and a connector closure for sealing the canister, wherein the connector closure is designed to seal and/or open the first opening and/or the

second opening separately at the same time, wherein the connector closure further comprises a venting means for venting the inside of the body of the canister, wherein the suction lance is formed integrally as part of the body of the canister.

[0007] The canister further comprises a second opening, preferably at the top part of the body, suitable for filling the substance into the body. This allows for the second opening to be designed different to the first opening. For example a second opening with a large diameter allows for an improved, faster filling of the substance into the canister, while the first opening may be designed comprising a diameter optimised for extracting the substance out of the canister. The first opening and the second opening are both arranged in the nozzle. This reduces the manufacturing costs of the canister, by reducing the complexity of the design and also by avoiding the costs for an additional closure for the second opening. The first opening and the second opening may have different cross sectional areas and/or different shapes. The first opening may be arranged eccentrically to the geometrical centre of the nozzle.

[0008] Further, the connector closure is designed to seal and/or open the first opening and/or the second opening separately at the same time, wherein the connector closure further comprises a venting means for venting the inside of the body of the canister. This allows for the first opening and/or the second opening to be closed and/or sealed by the connector closure, and if needed to be opened or re-opened the first opening and the second opening separately and independently of each other, if desired. The venting means may for example be designed in form of a venting valve or a venting membrane, allowing a gas, e.g. air, to flow into the canister whilst stopping the substance from leaving the canister via the venting means. This enables pressure compensation when the canister is attached to a suction machine, extracting the substance out of the canister by means of an underpressure, a vacuum for example.

[0009] Through the integration of the suction lance into the side part of the body of the canister, it is possible to define the position where the lower end of the suction lance is positioned inside the canister. The suction lance may, at least partially, extend along and/or across the top part of the canister and form an integrated part of the top part of the body. The canister and the suction lance are designed as one-piece. This makes the positioning of the lower end of the suction lance at the lowest point inside the body of the canister possible for every canister, where the remaining substance will move to, when being sucked out of the canister. In order to improve this, the bottom part of the canister may be designed to comprise a lowest point at the lower end of the suction lance. This enables the efficient, residue free removal of the substance out of the body of the canister. By forming the suction lance as an integral part of the body of the canister, it is ensured, that the lower end of the suction lance is positioned at the optimal position, i.e. the lowest point

inside the body, with every canister designed according to the invention. Further, the integration of the suction lance into the canister makes the handling of the suction lance by a person, for example the introduction of the suction lance into the canister, unnecessary and therefore allows for a clean and safe handling. Especially after the canister is used and emptied of the substance, a handling of the suction lance is not necessary at all, because the canister according to the invention forms, especially in connection with a later described connector closure and a suction system, a closed system for extracting the substance. The closed system avoids any leakage during connecting the canister, emptying the canister and/or disconnecting the canister. Thus, with this clean, safe and efficient canister the danger of contaminating and harming a person handling the emptied canister is avoided.

[0010] According to an embodiment of the invention, the first opening opens out into the second opening, in particular sideways, within the nozzle. The suction lance may, at least partially, extend along the top part of the body. The suction lance is, with its upper end, connected to the first opening. The first opening may be connected to, in particular to the side of, the nozzle and in particular to the second opening within the nozzle. The first opening may open into the second opening within the nozzle, connectable to the connector closure. The first opening may be connected to a suction machine via the connector closure in order to suck the substance out of the canister through the suction lance and the first opening. This allows for a reduction in the height of the nozzle and the connector closure.

[0011] According to a preferred embodiment of the invention, the connector closure comprises a connector insert and/or a connector cover. The connector closure may be designed as a single part or two part connector closure. The connector closure may comprise a connector insert and/or a connector cover. The connector insert may be arranged inside the first and/or second opening and may be designed to fit the first and/or second opening and to seal the first and/or second opening recloseable. The connector insert may be designed to connect to the first and/or second opening while extending the first and/or second opening in order to be connectable to a suction machine, in particular a flange of a suction machine, in order to allow the sucking of the substance from the canister. The connector insert may close the second opening, in particular after filling of the canister with the substance, while providing the first opening to be connectable to a suction machine. The connector cover may be arranged on the first and/or second opening and/or the nozzle, in particular a first and/or second opening with a connector insert, and may be designed to fit the first and/or second opening and/or the nozzle and to seal the first and/or second opening recloseable. The connector cover may comprise access openings in order to allow access to for example openings, venting means or connector pieces arranged on the connector insert. Arranged on the first and/or second opening and/or the nozzle

means that the connector cover is designed and arranged like a lid, for example a screw-on or snap-on lid, covering at least partially the first and/or second opening and/or the nozzle, in particular the connector insert inside the first and/or second opening and/or the nozzle.

[0012] According to a more preferred embodiment of the invention, the canister comprises a handle, wherein the handle comprises at least a part of the suction lance. The suction lance may extend along the top part of the body of the canister, allowing the suction lance with its upper end to be connected to the first opening within the nozzle. The handle may be arranged at the top of the body and may be formed at least partially hollow, in order to accommodate at least partially the suction lance. Integrating the suction lance at least partially in to the handle of the canister may reduce the weight of the canister, increase the stability of the handle and avoid increased costs for extending the suction lance along the top part of the body of the canister.

[0013] According to a preferred embodiment of the invention, the nozzle, the connector insert and/or the connector cover comprises a profiling, matching the profiling of an allocated flange of a suction machine connectable to the nozzle and/or connector closure. The connector insert and/or connector cover may be connectable to the flange of a suction machine. The connector insert and/or connector cover may provide a female coupling element matching a male coupling element of the flange of the suction machine, in order to connect to the flange of the suction machine, and in particular allow for a recloseable opening of the first and/or second opening. As the upper end of the suction lance is connected to the first opening inside the nozzle of the suction system, attaching the flange of the suction machine directly to the nozzle, in particular to the connector insert and/or connector cover, improves the handling of the suction system, in particular of the canister, when the substance is to be extracted as no further handling, for example of an adapter or a separate suction lance, is required. Thus a closed suction system is provided, and the risk of contaminating a person handling the canister with the substance is avoided. Further, a cap may be provided to seal the nozzle, in particular the connector insert and/or connector cover, for example for transportation in order to protect the nozzle from dirt, which may hinder the forming of an underpressure when attaching the nozzle to a suction machine.

[0014] The profiling may be an external profiling arranged on the outside of the connector closure, in particular to the outside of the connector cover, or to the outside of the first and/or second opening and/or the nozzle. The profiling may be an internal profiling arranged on the inside of the connector closure, in particular to the inside of the connector cover, or to the inside of the first and/or second opening. The external profiling of the connector closure, opening or nozzle matches a corresponding internal profiling of the allocated flange of the suction machine, and an internal profiling of the connector closure, opening or nozzle matches a corresponding exter-

nal profiling of an allocated flange of the suction machine. The profiling, in particular the matching profilings, may comprise several tongue-and-groove like arranged forms arranged around the circumference of the connector closure, opening or nozzle, running in particular in a direction essentially parallel to an axis of the connector closure, opening or nozzle. The profiling of the connector closure, opening or nozzle may be different in form and/or size to a profiling of a second connector closure or opening for example of a different suction system or for different substances. The profiling, in particular the matching profiling, may be designed in form of a key-and-lock profiling

[0015] According to an embodiment of the invention, the canister comprises a third opening, in particular a rinsing opening for rinsing the canister with a fluid, in particular water. The third opening may be located at the top part of the canister. The third opening may be designed to be recloseable connected to a water supply in order to allow water to flow into the canister in order to rinse the inside of the canister. The water for rinsing the canister may be sucked out of the canister via the suction lance after rinsing. The third opening may be arranged in the connector closure, in particular inside the connector cover. The third opening may be arranged next to, or inside, the second opening and/or the first opening. The connector closure, in particular the connector cover, may comprise the third opening for rinsing the canister. By providing a third opening, the suction system may be connected to a water supply in order to rinse the canister and remove essentially all of the substance out of the canister, thus avoiding any harm to a person handling the suction system, in particular the canister.

[0016] According to a preferred embodiment of the invention, the third opening is located in the nozzle, in particular in the connector insert and/or connector cover. The third opening may be located within the nozzle adjacent to, or inside, the first and/or second opening. This may enable the connection of the third opening to a water supply for example to be integrated into the flange of the suction machine. Thus, the additional rinse function may be provided without further handling steps.

[0017] According to an embodiment of the invention, a fitment is provided in the first, second and/or third opening. The suction system, in particular the first and/or second connector element, may comprise a fitment, wherein the fitment may operate like a recloseable valve with or without a spring. The fitment may be arranged in the first, second and/or third opening, in order to recloseably seal the first, second and/or third opening. The fitment may comprise a first fitment part and an allocated second fitment part, wherein for example the first fitment part receives the second fitment part in order to recloseably open the fitment, and wherein removing the second fitment part from the first fitment part may close the recloseable fitment. The first and/or second fitment part may be arranged at the connector closure and/or the flange of the suction system. The first fitment part may for example be arranged at the connector insert and the

second fitment part may be arranged at the connector cover or the flange of the suction machine. The fitment may be designed in form of a recloseable connector, for example a hose coupling, a plug-in connector, or a quick coupling, for establishing a recloseable fluid permeable connection of the first, second and/or third opening with a suction machine. The recloseable fitment has the advantage, that the suction system, in particular the canister, may be connected and removed without the risk of substance leaving the canister, thus providing a closed suction system.

[0018] According to an embodiment of the invention, the venting means is arranged in the connector insert and/or connector cover. Arranging the venting means in the connector insert and/or connector cover allows for a cost efficient design of the suction system. The venting means may be integrated into the connector insert and/or connector cover, for example by partially using the second opening for venting the canister, which may be sealed after filling the canister by the connector insert, thus efficiently using the available space. Therefore, this may allow for a reduction of the manufacturing costs.

[0019] According to a preferred embodiment of the invention, the venting means is designed in form of a venting membrane and/or a venting valve. The venting means may for example be designed in form of a venting valve or a venting membrane, allowing a gas, e.g. air, to flow into the canister whilst stopping the substance from leaving the canister via the venting means. The venting valve may be a spring loaded valve. The venting membrane may be a membrane allowing the gaseous substance to pass but not the fluid. This enables a pressure compensation of the suction system, for example air flowing into the canister, when the canister is attached to a suction machine, extracting the substance out of the canister by means of an underpressure, a vacuum for example.

[0020] According to a preferred embodiment of the invention, the connector closure, in particular the connector cover, comprises an indicator switch. The indicator switch may for example comprise a metal stripe and a pin, wherein the pin is arranged in such a way, that when the flange of the suction machine is mounted properly to the suction system, in particular the connector closure, the pin contacts the connector closure and pushes the metal stripe into contact with a metal contact for example, closing an electric circuit, thus indicating the proper mounting of the flange in order to start sucking the substance out of the canister. The metal stripe moved by the pin may also activate a switch, indicating the proper mounting of the flange. Thus, the operating of a securely closed suction system may be provided.

[0021] According to a preferred embodiment of the invention, the suction system comprises an empty alarm. The empty alarm is to indicate that the substance in the canister is used up, for example to the suction machine in order to stop a pump or indicate the need for changing the canister to a person. The empty alarm may comprise a detector element connected to the first opening and/or

the suction lance, for example in the connector closure, in order to monitor the presence and/or lack of the substance. The empty alarm may be based on an induction based detector element. The detector element may be designed in form of an electromagnetic coil or an electro magnet and a float, in particular an at least partially metallic float, arranged for example in the first opening next to the electromagnetic coil, which may be arranged around the first opening. If a pump is not operating and drawing the substance from the canister, the electromagnet may attract the float, sealing for example the first opening. If the pump is switched on and working, the electromagnet may reverse its polarity or exert a lower force of attraction onto the float, allowing the float to move away from the electromagnet and the electromagnetic field. A flowing substance may move the float, in particular in a downstream direction, away from the electro magnet, thus indicating the flow and the presence of the substance, for example by altering the magnetic field of the electromagnet. If the substance runs out, the float drops towards the electro magnet, indicating the lack of substance, for example by altering the magnetic field of the electromagnet, by reducing the distance towards it. On triggering the empty alarm, the electro magnet may reverse its polarity again to attracting the float towards the electro magnet, hence sealing the opening. Thus, the suction machine may be stopped and an alarm be sounded.

[0022] According to an embodiment of the invention the connector closure (36) is designed as a snap-on connector closure (36). The connector closure may comprise positive locking means matching positive locking means arranged at the nozzle. The connector closure may also be designed as a screw-on connector closure. This allows for a time saving fitting of the connector closure without use of tool.

[0023] In an exemplary embodiment, the bottom part of the body is sloped at the inside, preferably sloped towards the lower end of the suction lance. By forming the inside of the bottom part in such a way that it is sloped and/or inclined, it is possible to guide the remaining substance in a defined direction, when extracting the substance out of the canister and when the level of substance is lowered. Thus, a last remaining amount of substance can be guided towards the lower end of the suction lance in order to further improve the residue free extraction of the substance out of the canister.

[0024] In a further exemplary embodiment, the canister is designed to be stackable with at least a second canister of the same design. This enables canisters of the same design to be stacked on top of each other in order to save space which for example allows for an efficient transportation and/or storing of such canisters. The bottom part of the body of the canister may be designed in such a way as to match the profile of the top part of a canister of the same design. Further, the top part of the body may comprise stacking means in order to accept the bottom part of a canister of the same design. This enables the

received canister to be centred by the stacking means and to avoid a relative movement between the canisters. The stacking means may be formed like side walls, protruding from the upper part of the body of the canister above the nozzle of the canister. The stacking elements at the upper part of the body may be designed to interlock with fitting stacking elements at the bottom part of the canister.

[0025] In a further exemplary embodiment, the nozzle is designed to be attachable to flange of a suction machine for extracting the substance out of the body of the canister. As the upper end of the suction lance is connected to the first opening inside the nozzle, attaching the flange of the suction machine directly to the nozzle improves the handling of the canister when the substance is to be extracted as no further handling, for example of an adapter or a separate suction lance, is required. Thus the risk of contaminating a person handling the canister with the substance is avoided. Further, a cap may be provided to seal the nozzle, for example for transportation in order to protect the nozzle from dirt, which may hinder the forming of an underpressure when attaching the nozzle to a suction machine.

[0026] In a further exemplary embodiment, the canister further comprises a connector closure to seal the first opening and/or the second opening. The connector closure may be fitted inside the nozzle. The connector closure may be designed to match and/or contact the flange of a suction machine attached to the nozzle of the canister, thus enabling a continuous, air and/or fluid tight, pressure-resistant connection of the flange of the suction machine with the suction lance, via the nozzle and the first opening in the nozzle. The connector closure may seal both, the first opening and the second opening simultaneously, for example after the canister is filled with the substance and prepared for transport. Further, the connector closure may seal one opening and leave the other opening open and/or unsealed, for example the second opening, e.g. used for filling the substance in to the canister, may be closed and/or sealed by the connector closure while the first opening, which is connected to the suction lance, may be left open and/or unsealed. Sealing is meant in a way of an air tight and/or fluid tight closure of an opening.

[0027] In a further exemplary embodiment, the connector closure is designed as a snap-on connector closure. The connector closure may comprise positive locking means matching positive locking means arranged at the nozzle. The connector closure may also be designed as a screw-on connector closure. This allows for a time saving fitting of the connector closure without use of tool.

[0028] In a further exemplary embodiment, the connector closure is designed to selectively seal and/or open the first opening and/or the second opening separately. This allows for the first opening and/or the second opening to be closed and/or sealed by the connector closure, and if needed to be opened or re-opened the first opening and the second opening separately and independently

of each other, if desired. For example when extracting the substance out of a canister with both openings sealed, the second opening may be kept closed and/or sealed, while the first opening is opened or re-opened in order to allow a suction machine to connect to the first opening for extracting the substance through the suction lance which is connected to the first opening.

[0029] In a further exemplary embodiment, the connector closure comprises a venting means for venting the inside of the body of the canister. The venting means may for example be designed in form of a venting valve or a venting membrane, allowing a gas, e.g. air, to flow into the canister whilst stopping the substance from leaving the canister via the venting means. This enables pressure compensation when the canister is attached to a suction machine, extracting the substance out of the canister by means of an underpressure, a vacuum for example.

[0030] The afore mentioned components, as well as the claimed components and the components to be used in accordance with the invention in the described embodiments, are not subject to any special exceptions with respect to their size, shape, material selection and technical concept such that the selection criteria known in the pursuant field can be applied without a limitation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Additional details, features, characteristics and advantages of the object of the invention are disclosed in the subclaims, the figures and the following description of the respective figures and examples, which - in exemplary fashion - show several embodiments and examples of a canister and a connector closure according to the invention. In the drawings:

- Fig. 1 is an illustration of a canister constructed in accordance with the invention;
- Fig. 2 is a sectional drawing of a first and second opening of a canister constructed in accordance with the invention;
- Fig. 3 is a sectional drawing of another arrangement of the first and second opening of the canister constructed in accordance with the invention;
- Fig. 4 is a schematic top view of the first and second opening illustrated in Fig. 3 ;
- Fig. 5 is a sectional drawing of a first and second opening with a connector insert and connector cover;
- Fig. 6 is a schematic top view of the connector insert illustrated in Fig. 5;
- Fig. 7 is a sectional drawing of a connector cover

comprising a profiling in accordance with the invention;

- Fig. 8 is a schematic top view of the connector cover shown in Fig. 7 in accordance with the invention;
- Fig. 9 a profiling is shown comprising six different forms from a) to f) constructed in accordance with the invention;
- Fig. 10 is a schematic perspective of an indicator switch constructed in accordance with the invention;
- Fig. 11 is a similar view to Fig. 1, but with a different design;
- Fig. 12 is an illustration of a canister constructed similar to Fig. 11;
- Fig. 13 is a schematic drawing of a canister similar view to Fig. 11, but from a side view;
- Fig. 14 is a similar view to Fig. 12, but showing the canister from a front perspective;
- Fig. 15 is a drawing of a nozzle design constructed in accordance with the invention ;
- Fig. 16 is a similar view to Fig. 15, but with a differently designed suction lance;
- Fig. 17 is a schematic top view of a nozzle constructed according to the invention;
- Fig. 18 is a similar view to Fig. 17, but with a differently designed nozzle;
- Fig. 19 is a schematic illustration of a nozzle with a connector closure constructed in accordance with the invention ; and
- Fig. 20 is an illustration of a connector closure.

[0032] The illustration in Fig. 1 shows a canister 10 for holding a substance, for example a liquid or fluid, comprising a body 12, wherein the body 12 has a top part 14, a side part 16, which may consist one or more side elements, and a bottom part 18 (not shown). The canister 10 further comprises a nozzle 20, which is located at the top part 14 of the body 12 of the canister 10. The canister 10 comprises a first opening 22 and a second opening 30, wherein the first opening 22 and the second opening 30 are both arranged within the nozzle 20, wherein both the first opening 22 and the second opening 30 are located horizontally adjacent to each other. The diameter and/or cross-sectional area of the first opening 22 and

the second opening 30 are different, wherein the second opening 30 shows the larger diameter and/or cross-sectional diameter, e.g. for filling the substance into the canister 10. The first opening 22 in the nozzle 20 of the canister 20 is connected to a suction lance 24. The suction lance 24 is formed as an integral part of the body 12, wherein the suction lance 24 is formed at the inside of the body 12. The suction lance 24 is connected to the first opening 22 in the nozzle 20 with an upper end 26 and reaches down the bottom part 18 of the body 12 of the canister 10 with a lower end 28. The suction lance 24 is formed as one-piece with the body 12 of the canister 10. As illustrated, the suction lance 24 may be formed as an integral part of the top part 14 and the side part 16 of the body 12. The suction lance 24 may be designed to protrude at least partially towards the outside of the body 12, forming for example a bulge at the outside of the body 12. The suction lance 24 may also be designed in such a way that the suction lance 24 protrudes at least partially towards the inside of the body 12, forming for example a bulge at the inside of the body 12. The suction lance 24 provides a continuous, air and fluid tight, pressure-resistant connection from the bottom part 18 of the body 12 to the nozzle 20, thus enabling the extraction of the substance for example by applying an underpressure or a vacuum. The second opening 30, has a larger diameter than the first opening 22 and may for example be used for filling a substance into the body 12 of the canister 10. For handling, the canister 10 is provided with a handle 32 at the top part 14.

[0033] Fig. 2 illustrates a sectional drawing of a canister 10 with a nozzle 20. The first opening 22 and the second opening 30 are arranged inside the nozzle 20, wherein the first opening 22 opens sideways into the second opening 30. The first opening 22 is connected to the upper end 26 of the suction lance 24. The suction lance 24 is partially integrated into a handle 32 of the canister 10, arranged at the top part 14 of the body 12.

[0034] In fig. 3 the first opening 22 and the second opening 30 are arranged adjacent to one another inside the nozzle 20 of the canister 10. The first opening 22 is connected to the suction lance 24. The suction lance extends along the top part 14 of the body 14 and is partially integrated into the handle 32. A top view of the nozzle 20 in fig. 3 is illustrated in fig. 4. The first and second opening 22,30 are arranged next to each other, wherein the second opening 30 comprises a larger, non-circular cross sectional area than the round first opening 22 within the circular nozzle 20.

[0035] In fig. 5 a canister 10 with a first opening 22 and a second opening 30 is illustrated, wherein the first opening 22 opens into the second opening 30 sideways within the nozzle 20. Inside the nozzle 20 essentially in the second opening 30 a connector insert 46 is arranged. The connector insert 46 essentially seals the second opening 30 off towards the inside of the canister, while connecting, in particular sideways, fluid permeable to the first opening 22, in order to allow the substance to be sucked through

the first opening 22 and the connector insert 46 by a suction machine (not shown) for example. The connector insert 46 and the nozzle 20 may be covered by a connector cover 48, shown slightly lifted off the nozzle for a better illustrating the parts. The connector insert 46 comprises a venting membrane 50, which is arranged at the inside of the connector insert 46 and connected by a small channel to the inside of the canister 10 in order to allow a ventilation of the canister 10. A gas passing the venting membrane 50 may exit through the not airtight fitted connector cover 48. The venting membrane 50 is arranged in a small tube which is open towards the inside of the canister 10, protecting the venting membrane 50 from the substance hitting the venting membrane 50 directly in case the canister 10 is dropped, for example. The connector insert 46 also comprises a venting valve 52 with a connection (not shown) to the inside of the canister 10 for allowing air to enter the canister 10 when the substance is sucked from the canister 10. The venting valve 52 may be designed as a one-way valve and may be opened by a spike 54 arranged at the connector cover 48 in order to open the venting valve 52 when the connector cover 48 is fitted. The connector cover 48 may be connected to a flange (not shown) of a suction machine. The connector insert 46 may comprise a female first part of a fitment 56 and the connector cover 48 may comprise a fitting male second part of the fitment 56 in order to open the fitment 56 and allow a suction machine (not shown) to suck the substance from the canister 10 through the suction lance 24, the first opening 22, through the connector insert 46.

[0036] A top view of the connector insert 46 shown in fig. 5 is illustrated in fig. 6. The connector insert 46 comprises a centrally arranged first part of the recloseable fitment 56. On either side of the fitment 56 the venting membrane 50 and the venting valve 52 are arranged. Additionally the connector insert 46 comprises a third opening 58 for example for connecting the suction system to a water supply in order to supply the canister 10 with water for rinsing the inside of the canister 10.

[0037] A sectional drawing of a connector cover 48 is shown in fig. 7. The connector cover 48 comprises an opening 60 to provide access for example to the first and/or second opening 22,30. The connector cover 48 comprises on the outside a profiling 62, matching the profiling (not shown) of a flange allocated to the connector cover 48. A top view of the connector cover 48 in fig. 7 is illustrated in fig. 8. The profiling 62 of the connector cover 48 is circumferentially arranged, providing an irregular pattern of a tongue and groove connection for connecting a flange to an allocated connector cover 48.

[0038] In fig. 9 six different profilings 62, a), b), c), d), e) and f), are illustrated. The profiling 62 on the outside of the connector cover 48 are arranged in different patterns, comprising smaller and larger circumferential tongue-like sections of the tongue and groove connection for connecting the flange to the allocated connector cover 48. The patterns of the profiling 62 may be arranged in

such a way, that in several sections of 45° each, none, one, two or two and a half patterns may be arranged. The tongue-like patterns extend along the outside of the connector cover 48 essentially in parallel to a symmetrical axis of the connector cover 48 and/or opening 22, 30 or nozzle 20.

[0039] In fig. 10, for example, the nozzle 20 is shown, comprising a first connector insert 46 with the connector cover 48 shown above the nozzle 20, for example prior to being mounted on to the nozzle 20. The connector cover 48 comprises an indicator switch 64 with a stripe 66 and a pin 68, wherein the pin 68 may push the stripe 66 towards a contact (not shown) when the connector cover 48 is mounted properly. The pin 68 may extend out of the connector cover 48 towards the canister 10 and/or towards a flange of the suction machine. The pin 68 arranged at the for example connector cover 48 may be moved by a flange of a suction system when the flange is connected to the connector cover 48. By moving the pin 68 the stripe 66 may be moved in order to indicate a properly attached flange, thus providing an indication for a properly closed suction system.

[0040] Fig. 11 illustrates a canister 10 of a similar design to the canister 10 shown in Fig. 1, but provides a different design of the suction lance 24 and the arrangement of the first opening 22 and the second opening 30. The suction lance 24 is formed at the outside of the body 12 mainly in a straight line, as an integral part of the body 12. The nozzle 20 is located at the edge of the top part 14 of the body 12. The second opening 30 comprises a larger diameter than the first opening 22, which is located adjacent to the circular second opening 30. The nozzle 20 has an oval outer circumference.

[0041] The canister 10 shown in Fig. 12 comprises a suction lance 24 that is formed as an integral part of the body 12 of the canister 10, wherein the suction lance 24 protrudes or bulges towards the outside of the body 12. The upper end 26 of the suction lance 24 which is connected to the first opening 22 is arranged inside the nozzle, wherein the nozzle 20 has a circular outer contour.

[0042] Fig. 13 shows a canister 10, similar to the one illustrated in Fig. 12, from a side view. The suction lance 24 is formed as one-piece with the side part 16 of the body 12. The suction lance 24 reaches from the bottom part 18 to the first opening 22, located inside the nozzle 20, which has a circular outer contour. The canister 10 also comprises stacking means 34, which are formed as side walls, rising up to the height of the nozzle 20, in order to enable a stacking of canisters 10 of the same design.

[0043] In Fig. 14 a canister 10, similar to the one depicted in Fig. 13, is shown in a frontal view. The suction lance 24 is formed towards the outside of the body 12. Stacking elements 34 are formed as side walls, that rise up to the upper level of the nozzle 20, in order to enable stacking canisters 10 of the same design on top of each other.

[0044] Illustrated in Fig. 15 is a nozzle 20, which is arranged centrally on the top part 16 of the body 12 of

the canister 10. The first opening 22 and the second opening 30 are both arranged horizontally adjacent to each other within the nozzle 20. The suction lance 24 is formed at the inside of the body 12. The arrow indicates the filling of the substance into the canister 10 via the second opening 30.

[0045] Fig. 16 depicts a canister 10 with a centrally at the top part 14 of the body 12 arranged nozzle 20, wherein the suction lance 24 is formed at the outside of the body 12 as one-piece with the body 12.

[0046] The first opening 22 and the second opening 24 shown in Fig. 17 are both arranged inside the nozzle 20 horizontally adjacent to each other. The nozzle 20 has an oval outer contour. The first opening 22 and the second opening 30 both comprise a circular cross-sectional area, wherein the second opening 30 is has a larger cross-sectional area than the first opening 22.

[0047] The nozzle 20 in Fig. 18 has a circular outer contour, with both the first opening 22 and the second opening 30 arranged within the nozzle 20. The first opening 22 and the second opening 30 disembody into the nozzle 20 with a circular cross-sectional area. At the inside, the nozzle 20 comprises two areas of different shape into which each of the two openings disembody. These areas may be contacted by a seal of a flange 38 of a suction machine (not shown), in order to enable the build up of a vacuum for extracting the substance out of the canister.

[0048] In Fig. 19 a cross-sectional view of a canister 10 with a nozzle 22 is shown. The first opening 22 and the second opening 30 are both arranged inside the nozzle 20. Inside the nozzle 20, covering both the first opening 22 and the second opening 30, a connector closure 36 is arranged. The connector closure 36 may receive a flange 38 of a suction machine (not shown), in order to extract the substance out of the canister 10. The flange 38 may be screwed onto the nozzle 20. With the flange 38 fitted to the nozzle 20, the suction machine is connected to the first opening 22 and the suction lance 24 and may built up a vacuum allowing the substance to flow upwards through the suction lance 24, the first opening 22, the connector closure 36, the flange 38, towards the suction machine.

[0049] Fig. 20 shows a connector closure 36 suitable for sealing for example the second opening 30, after the canister 20 has been filled with the substance. The connector closure 36 may be pressed-on, snapped-on or screwed on the canister 10 in order to seal the opening. The connector closure 36 may only be removable with a tool, not by hand. The connector closure 36 comprises a spring 40, which applies a pressure in a movable lid of the connector closure 36. The spring 40 may be made of plastic and is supported by a spring holder 42. The movable lid comprises a sealing 44 in order to avoid any leakage of the substance.

[0050] The particular combinations of elements and features in the above detailed embodiments are exemplary only; the interchanging and substitution of these

teachings may be contemplated. However, the inventions scope is defined in the following claims, whereby, reference signs used in the description and claims do not limit the scope of the invention as claimed.

List of reference numerals

[0051]

10	canister
12	body
14	top part
16	side part
18	bottom part
20	nozzle
22	first opening
24	suction lance
26	upper end
28	lower end
30	second opening
32	handle
34	stacking means
36	connector closure
38	flange
40	spring
42	spring holder
44	sealing
46	connector insert
48	connector cover
50	venting membrane
52	venting valve
54	spike
56	fitment
58	third opening
60	access opening
62	profiling
64	indicator switch
66	stripe
68	pin

Claims

1. A suction system for sucking a substance, preferably a fluid, comprising
a canister (10) for holding a substance, preferably a fluid, wherein the canister (10) comprises a body (12), wherein the body (12) comprises a top part (14), a side part (16) and a bottom part (18),
at least one nozzle (20), preferably located at the top part (14) of the body (12), wherein the nozzle (20) comprises a first opening (22) and a second opening (30) suitable for filling the substance into the body (12), wherein the first opening (22) and the second opening (30) are both arranged in the nozzle (20),
a suction lance (24) for sucking the substance out of the body (12) of the canister (10), wherein the suction lance (24) comprises an upper end (26) and

a lower end (28), wherein the upper end (26) is connected to the first opening (22) and the lower end (28) is located next to the bottom part (18) of the canister (10), and

5 a connector closure (36) for sealing the canister (10), wherein the connector closure (36) is designed to seal and/or open the first opening (22) and/or the second opening (30) separately at the same time, wherein the connector closure (36) further comprises a venting means (52,54) for venting the inside of the body (12) of the canister (10), wherein the suction lance (24) is formed integrally as part of the body (12) of the canister (10).

10 2. A suction system according to claim 1, **characterised in that** the first opening (22) opens out into the second opening (30), in particular sideways, within the nozzle (20).

15 3. A suction system according to claim 1 or 2, **characterised in that** the connector closure (36) comprises a connector insert (46) and/or a connector cover (48).

20 4. A suction system according to any of the claims 1 to 3, **characterised in that** the canister (10) comprises a handle (32), wherein the handle (32) comprises at least a part of the suction lance (24).

25 5. A suction system according to any of the claims 1 to 4, **characterised in that** the nozzle (20), the connector insert (46) and/or the connector cover (48) comprises a profiling (62), matching the profiling of an allocated flange of a suction machine connectable to the nozzle (20) and/or connector closure (36).

30 6. A suction system according to any of the claims 1 to 5, **characterised in that** the canister (10) comprises a third opening (58), in particular a rinsing opening for rinsing the canister (10) with a fluid, in particular water.

35 7. A suction system according to claim 6, **characterised in that** the third opening (58) is located in the nozzle (20), in particular in the connector insert (46) and/or connector cover (48).

40 8. A suction system according to any of the claims 1 to 7, **characterised in that** a fitment (56) is provided in the first, second and/or third opening (22,30,58).

45 9. A suction system according to any of the claims 1 to 8, **characterised in that** the venting means (50,52) is arranged in the connector insert (46) and/or connector cover (48).

50 10. A suction system according to any of the claims 1 to 9, **characterised in that** the venting means (50,52)

is designed in form of a venting membrane (50) and/or a venting valve (52).

11. A suction system according to any of the claims 1 to 10, **characterised in that** the connector closure (36), in particular the connector cover (48), comprises an indicator switch (64). 5
12. A suction system according to any of the claims 1 to 11, **characterised in that** the suction system comprises an empty alarm. 10
13. A suction system according to any of the claims 1 to 12, **characterised in that** the connector closure (36) is designed as a snap-on connector closure (36). 15

Patentansprüche

1. Ein Ansaugsystem zum Ansaugen eines Stoffes, vorzugsweise eines Fluids, umfassend einen Kanister (10) zur Aufnahme einer Substanz, vorzugsweise eines Fluids, wobei der Kanister (10) einen Körper (12) umfasst, wobei der Körper (12) einen oberen Teil (14), einen seitlichen Teil (16) und einen unteren Teil (18) umfasst, mindestens einen Anschlussstutzen (20), vorzugsweise am oberen Teil (14) des Körpers (12) angeordnet, wobei der Anschlussstutzen (20) eine erste Öffnung (22) und eine zweite Öffnung (30) aufweist geeignet zum Einfüllen der Substanz in den Körper (12), wobei die erste Öffnung (22) und die zweite Öffnung (30) beide in dem Anschlussstutzen (20) angeordnet sind, eine Sauglanze (24) zum Ansaugen der Substanz aus dem Körper (12) des Kanisters (10), wobei die Sauglanze (24) ein oberes Ende (26) und ein unteres Ende (28) umfasst, wobei das obere Ende (26) mit der ersten Öffnung (22) verbunden ist und das untere Ende (28) neben dem unteren Teil (18) des Kanisters (10) angeordnet ist, und einen Anschlussstück-Verschluss (36) zum Verschließen des Behälters (10), wobei der Anschlussstück-Verschluss (36) ausgebildet ist, die erste Öffnung (22) und/oder die zweite Öffnung (30) getrennt voneinander zur gleichen Zeit zu verschließen und/oder zu öffnen, wobei der Anschlussstück-Verschluss (36) ferner ein Belüftungsmittel (52, 54) zum Belüften des Inneren des Körpers (12) des Kanisters (10) aufweist, wobei die Sauglanze (24) einstückig als Teil des Körpers (12) des Kanisters (10) ausgebildet ist. 20 25 30 35 40 45 50
2. Ein Ansaugsystem gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die erste Öffnung (22) innerhalb des Anschlussstutzens (20), insbesondere seitlich, in die zweite Öffnung (30) mündet. 55
3. Ein Ansaugsystem gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Anschlussstück-Verschluss (36) einen Anschlusseinsatz (46) und/oder einen Anschlussdeckel (48) aufweist.
4. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der Kanister (10) einen Handgriff (32) aufweist, wobei der Handgriff (32) zumindest einen Teil der Sauglanze (24) umfasst.
5. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** der Anschlussstutzen (20), der Anschlusseinsatz (46) und/oder der Anschlussdeckel (48) eine Formgebung (62) aufweist, die passend zu der Formgebung eines zugeordneten Flansches einer Saugmaschine ist, die mit dem Anschlussstutzen (20) und/oder mit dem Anschlussstück-Verschluss (36) verbindbar ist.
6. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** der Kanister (10) eine dritte Öffnung (58) aufweist, insbesondere eine Spülöffnung zum Spülen des Kanisters (10) mit einem Fluid, insbesondere Wasser.
7. Ein Ansaugsystem gemäß Anspruch 6, **dadurch gekennzeichnet, dass** die dritte Öffnung (58) in dem Anschlussstutzen (20) angeordnet ist, insbesondere in dem Anschlusseinsatz (46) und/oder dem Anschlussdeckel (48).
8. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** ein Anschlussstück (56) in der ersten, zweiten und/oder dritten Öffnung (22, 30, 58) vorgesehen ist.
9. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** das Belüftungsmittel (50, 52) in dem Anschlusseinsatz (46) und/oder in dem Anschlussdeckel (48) angeordnet ist.
10. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** das Belüftungsmittel (50, 52) in Form einer Entlüftungsmembran (50) und/oder eines Entlüftungsventils (52) ausgebildet ist.
11. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 10, **dadurch gekennzeichnet, dass** der Anschlussstück-Verschluss (36), insbesondere der Anschlussdeckel (48) einen Anzeigeschalter (64) umfasst.
12. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, dass** das Saugsystem ein Signal für den Entleerungszustand

aufweist.

13. Ein Ansaugsystem gemäß irgendeinem der Ansprüche 1 bis 12, **dadurch gekennzeichnet, dass** der Anschlussstück-Verschluss (36) als Schnappverbindungsanschluss (36) ausgebildet ist.

Revendications

1. Système d'aspiration pour l'aspiration d'une substance, de préférence un fluide, comprenant :

une boîte (10) pour contenir une substance, de préférence un fluide, dans lequel la boîte (10) comprend un corps (12), dans lequel le corps (12) comprend une partie supérieure (14), une partie latérale (16) et une partie inférieure (18), au moins une buse (20), de préférence située au niveau de la partie supérieure (14) du corps (12), dans lequel la buse (20) comprend une première ouverture (22) et une seconde ouverture (30) adaptée pour remplir la substance dans le corps (12), dans lequel la première ouverture (22) et la seconde ouverture (30) sont toutes les deux agencées dans la buse (20), une lance d'aspiration (24) pour l'aspiration de la substance hors du corps (12) de la boîte (10), dans lequel la lance d'aspiration (24) comprend une extrémité supérieure (26) et une extrémité inférieure (28), dans lequel l'extrémité supérieure (26) est reliée à la première ouverture (22) et l'extrémité inférieure (28) est située près de la partie inférieure (18) de la boîte (10) et une fermeture à connecteur (36) pour rendre étanche la boîte (10), dans lequel la fermeture à connecteur (36) est conçue pour rendre étanche et/ou ouvrir en même temps la première ouverture (22) et/ou la seconde ouverture (30) séparément, dans lequel la fermeture à connecteur (36) comprend en outre un moyen de ventilation (52, 54) pour la ventilation de l'intérieur du corps (12) de la boîte (10), dans lequel la lance d'aspiration (24) est formée intégralement comme partie du corps (12) de la boîte (10).

2. Système d'aspiration selon la revendication 1, **caractérisé en ce que** la première ouverture (22) s'ouvre dans la seconde ouverture (30), en particulier latéralement, dans la buse (20).
3. Système d'aspiration selon la revendication 1 ou 2, **caractérisé en ce que** la fermeture à connecteur (36) comprend un insert de connecteur (46) et/ou un couvercle de connecteur (48).
4. Système d'aspiration selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la boîte

(10) comprend un manche (32), dans lequel le manche (32) comprend au moins une partie de la lance d'aspiration (24).

5. Système d'aspiration selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** la buse (20), l'insert de connecteur (46) et/ou le couvercle de connecteur (48) comprend un profilage (62) correspondant au profilage d'une bride attribuée d'une machine d'aspiration pouvant être reliée à la buse (20) et/ou à la fermeture à connecteur (36).
6. Système d'aspiration selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** la boîte (10) comprend une troisième ouverture (58), en particulier une ouverture de rinçage pour le rinçage de la boîte (10) avec un fluide, en particulier de l'eau.
7. Système d'aspiration selon la revendication 6, **caractérisé en ce que** la troisième ouverture (58) est située dans la buse (20), en particulier dans l'insert de connecteur (46) et/ou le couvercle de connecteur (48).
8. Système d'aspiration selon l'une quelconque des revendications 1 à 7, **caractérisé en ce qu'un** équipement (56) est prévu dans la première, deuxième et/ou troisième ouverture (22, 30, 58).
9. Système d'aspiration selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** le moyen de ventilation (50, 52) est agencé dans l'insert de connecteur (46) et/ou le couvercle de connecteur (48).
10. Système d'aspiration selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** le moyen de ventilation (50, 52) est conçu sous la forme d'une membrane de ventilation (50) et/ou d'une valve de ventilation (52).
11. Système d'aspiration selon l'une quelconque des revendications 1 à 10, **caractérisé en ce que** la fermeture à connecteur (36), en particulier le couvercle de connecteur (48), comprend un commutateur indicateur (64).
12. Système d'aspiration selon l'une quelconque des revendications 1 à 11, **caractérisé en ce que** le système d'aspiration comprend une alarme vide.
13. Système d'aspiration selon l'une quelconque des revendications 1 à 12, **caractérisé en ce que** la fermeture à connecteur (36) est conçue comme une fermeture à connecteur encliquetable (36).

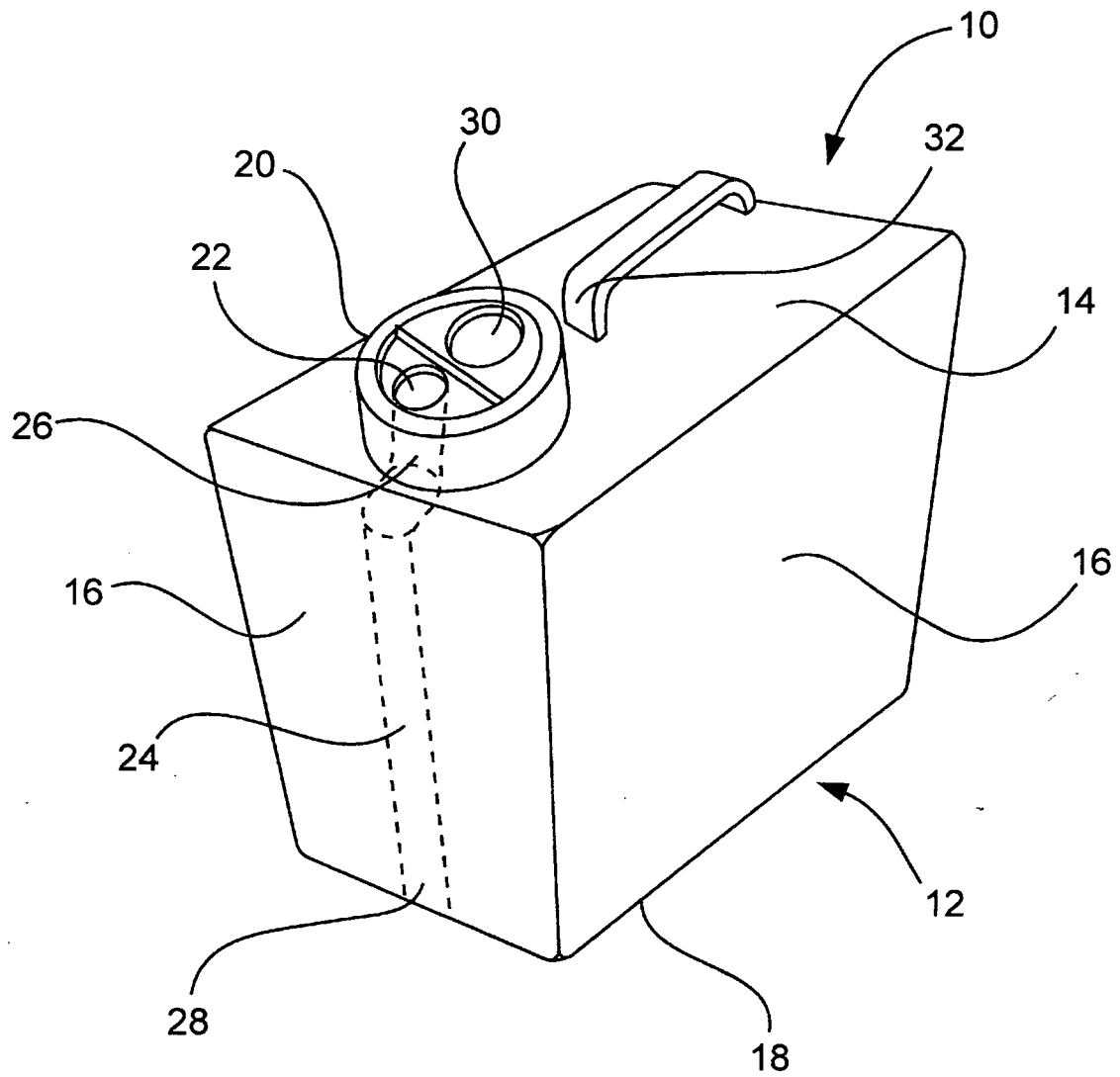
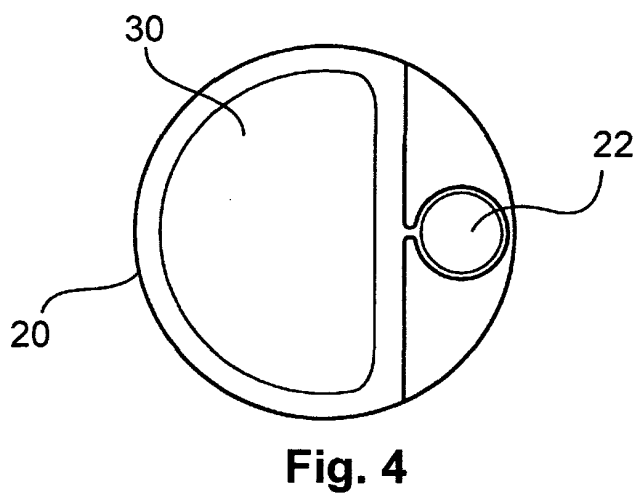
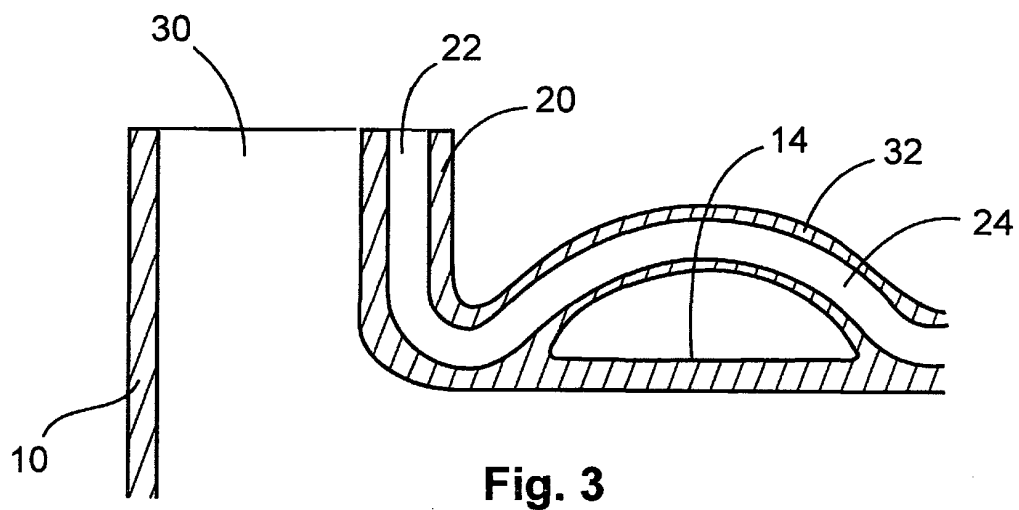
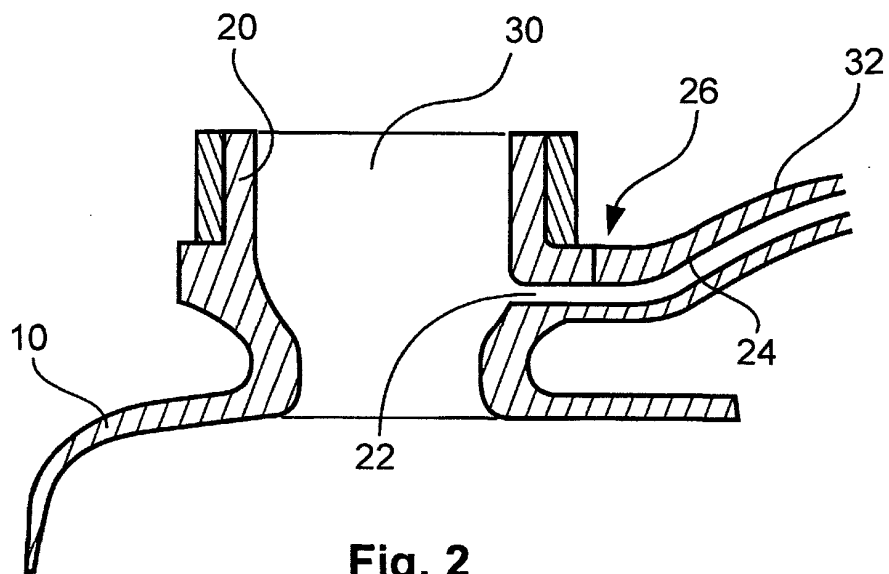
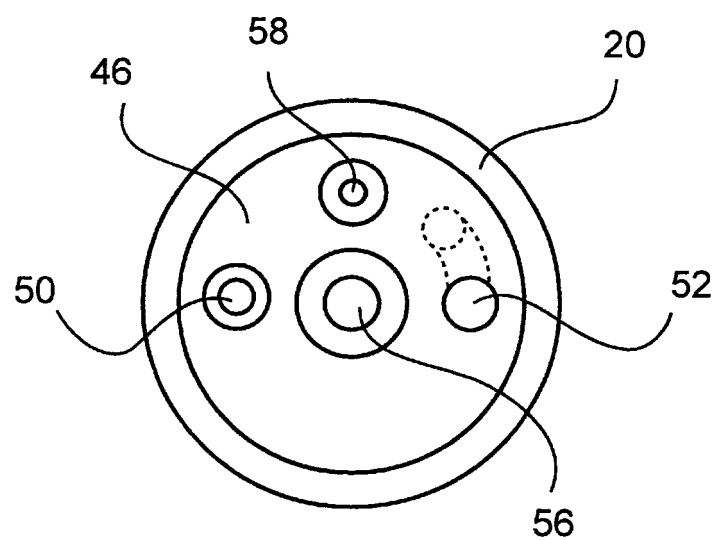
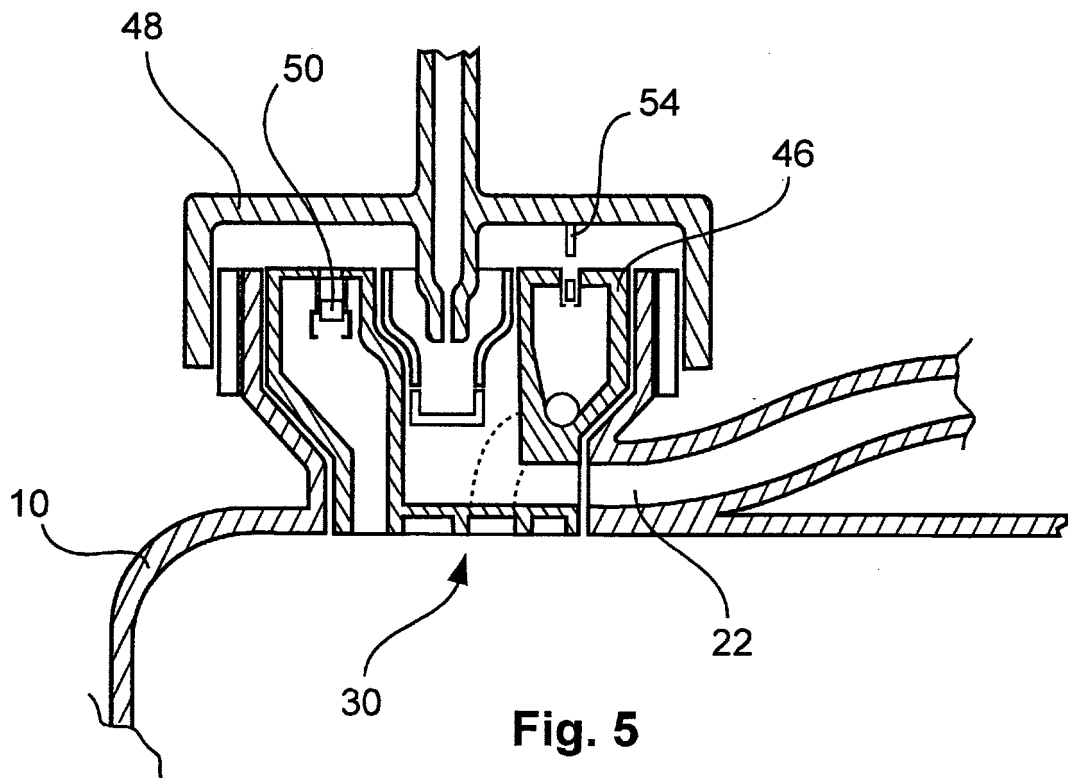


Fig. 1





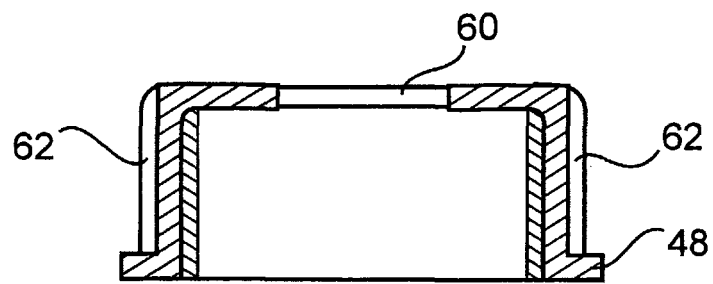


Fig. 7

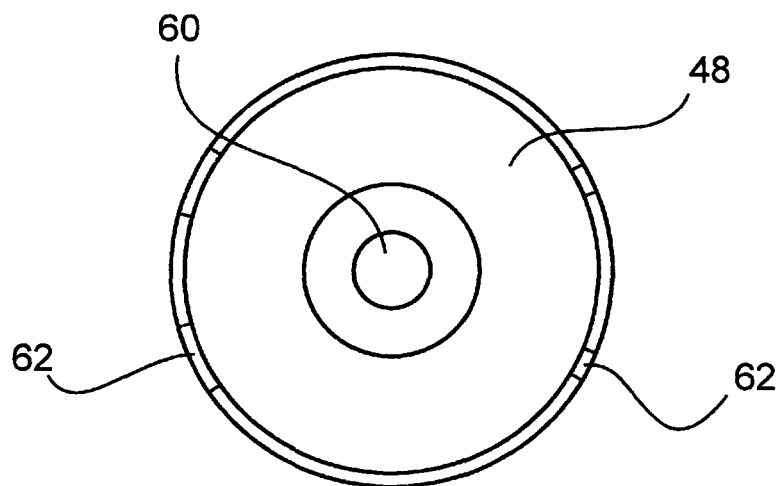


Fig. 8

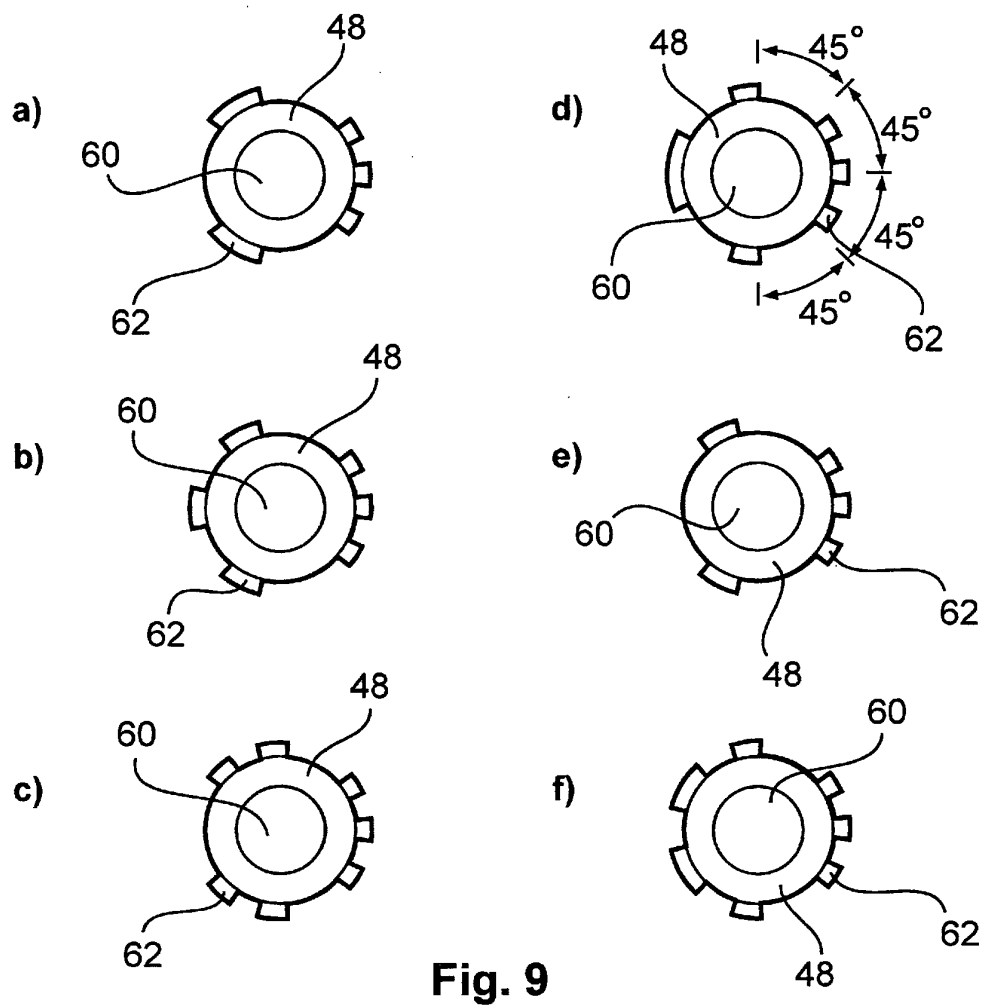


Fig. 9

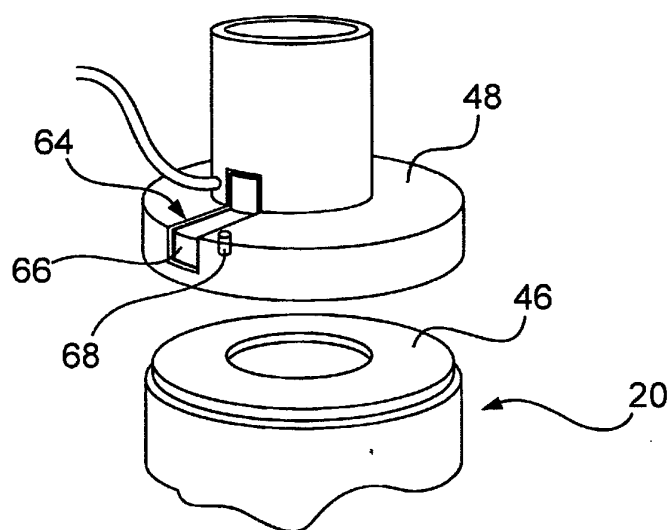


Fig. 10

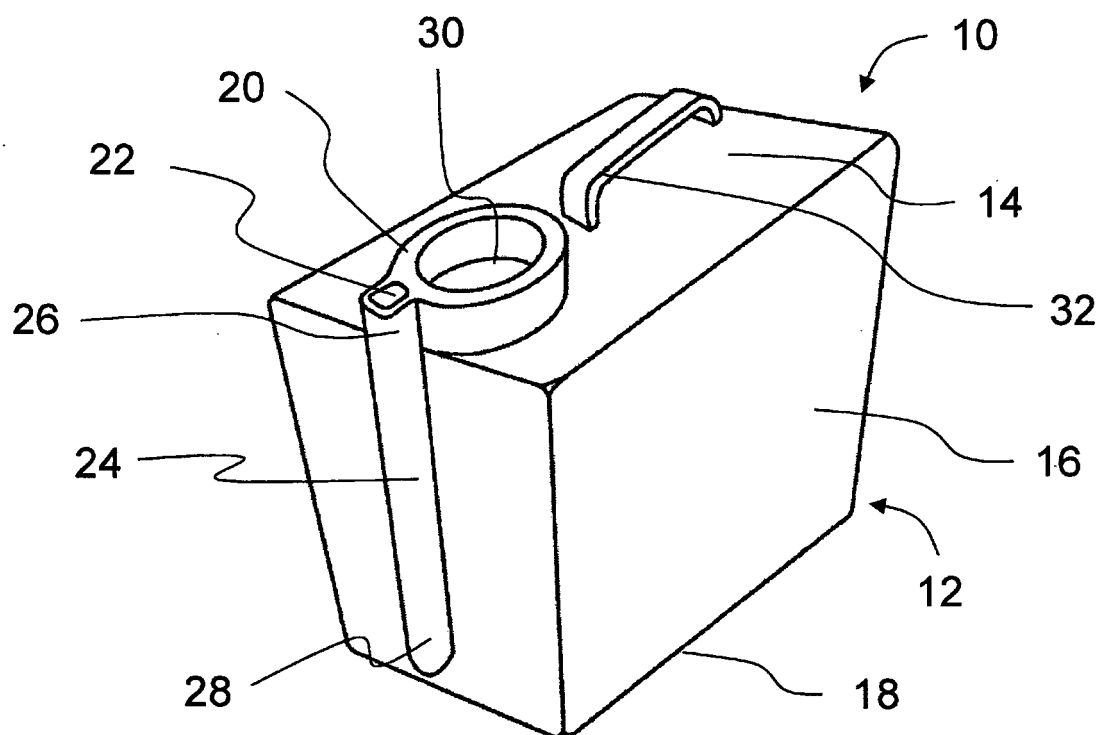


Fig. 11

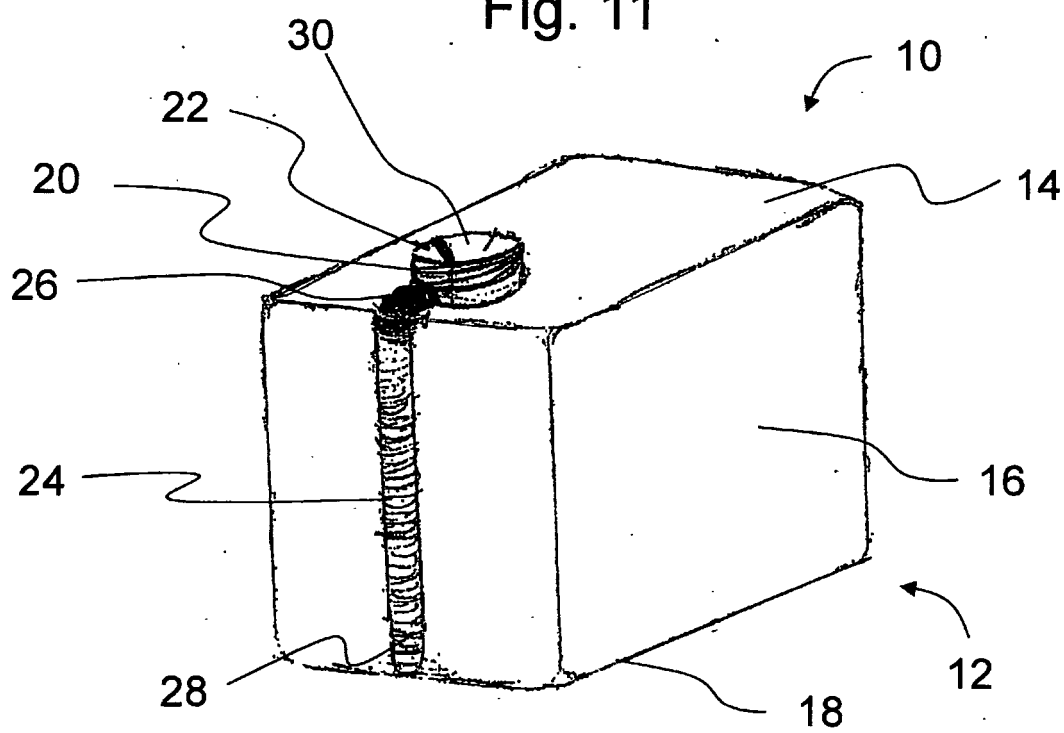


Fig. 12

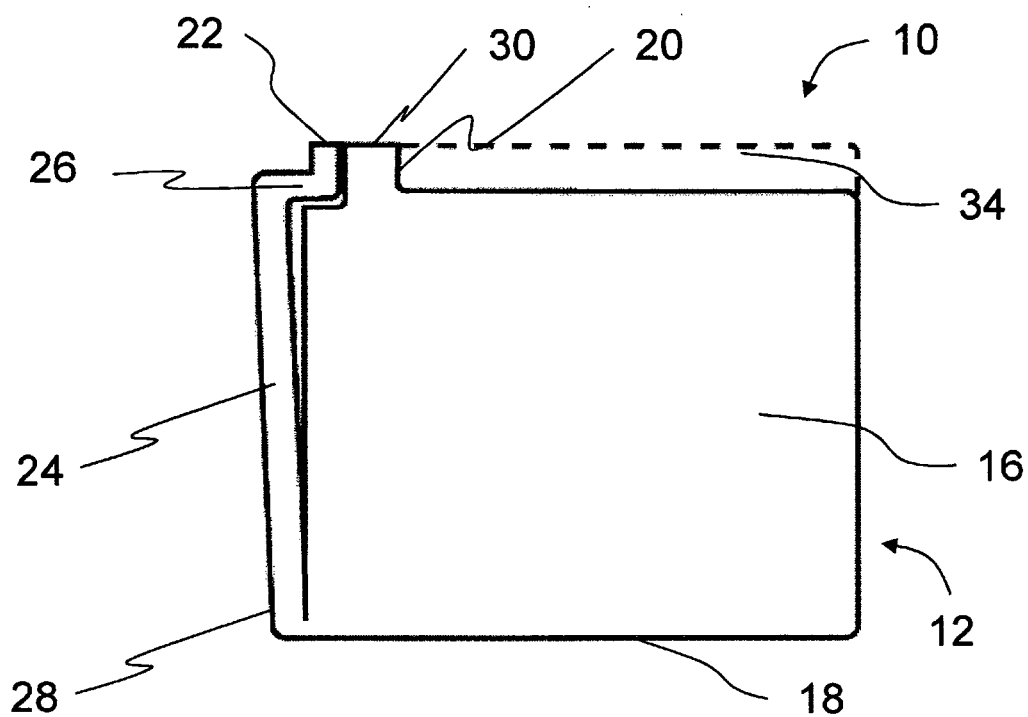


Fig. 13

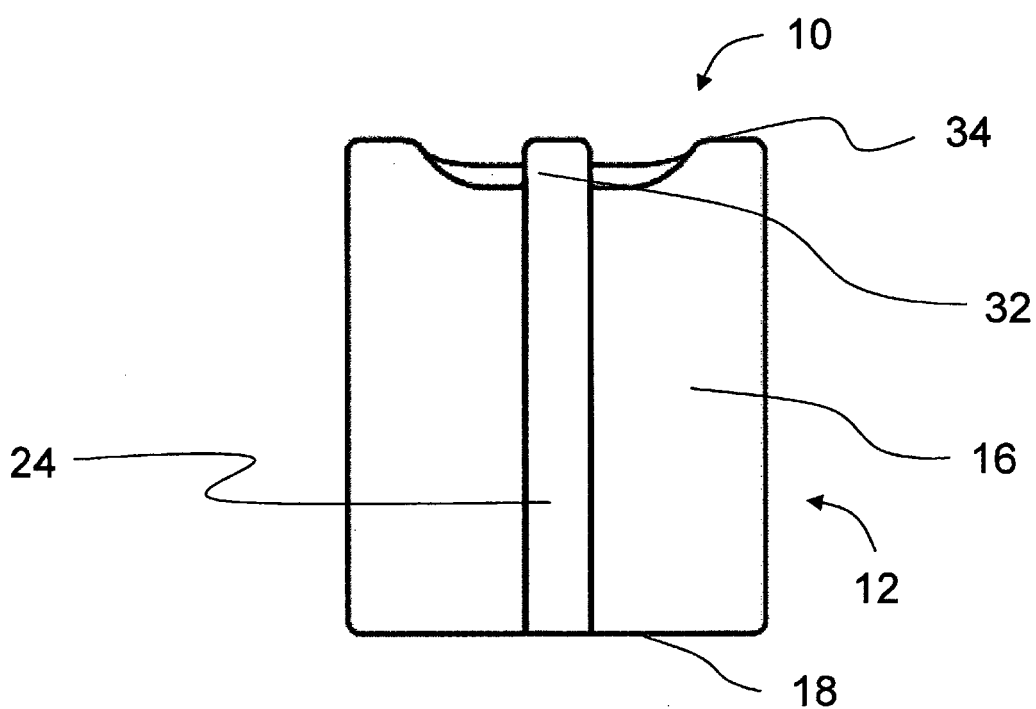


Fig. 14

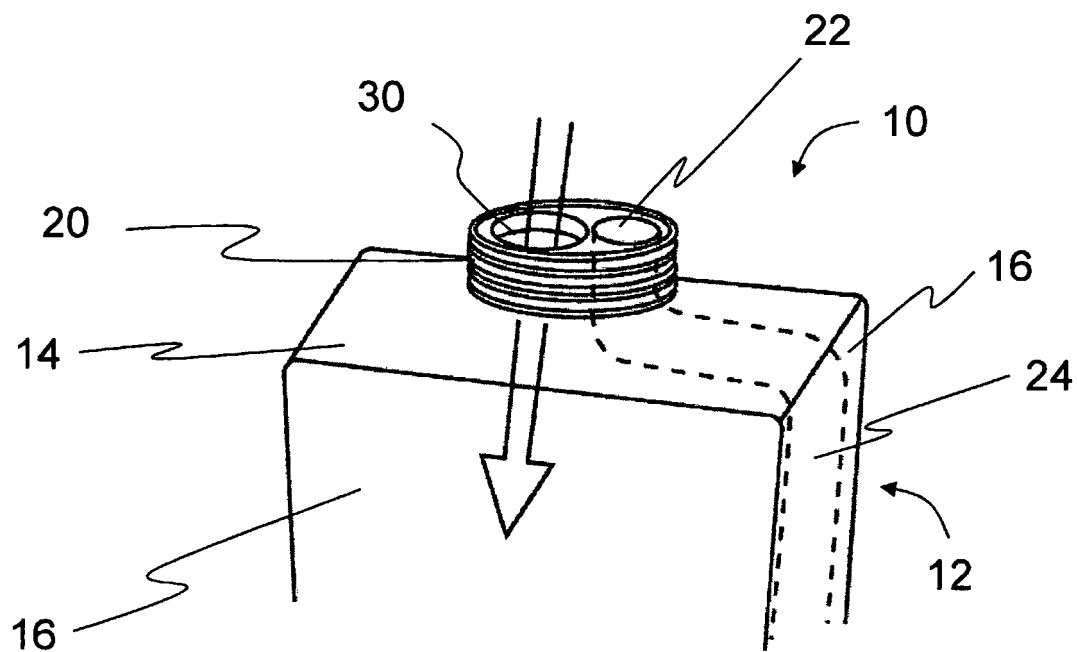


Fig. 15

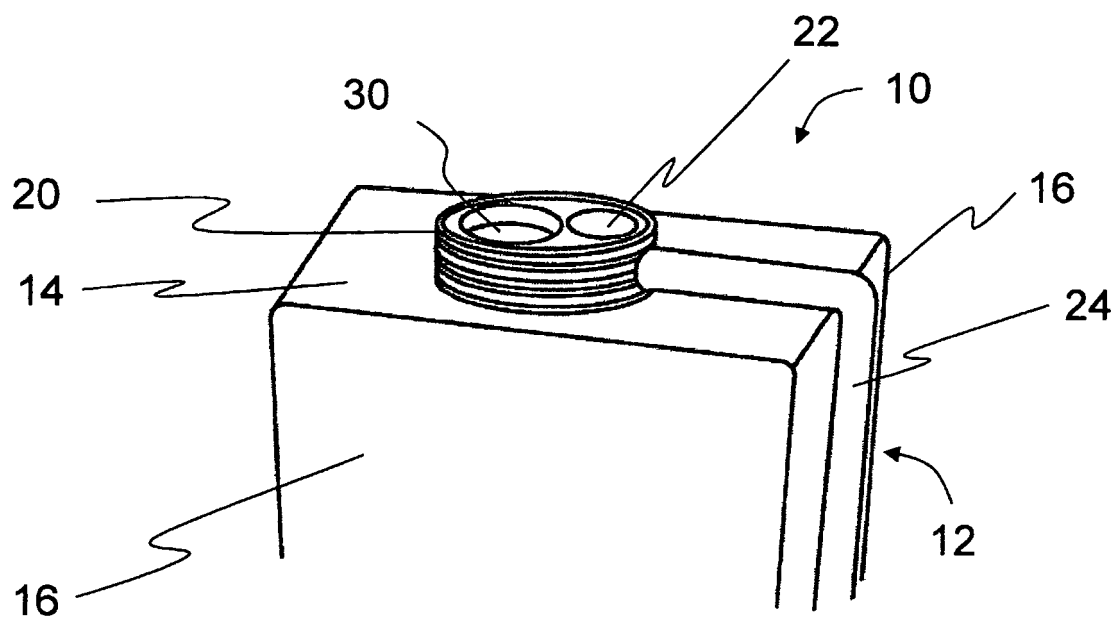


Fig. 16

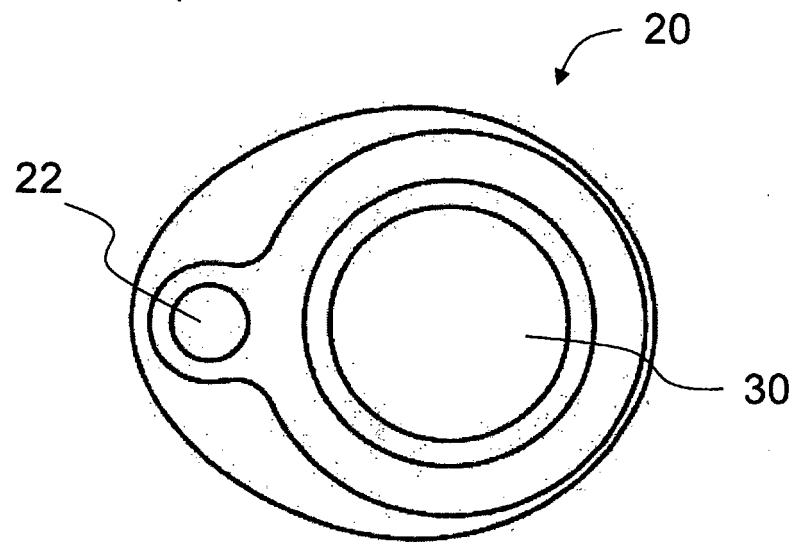


Fig. 17

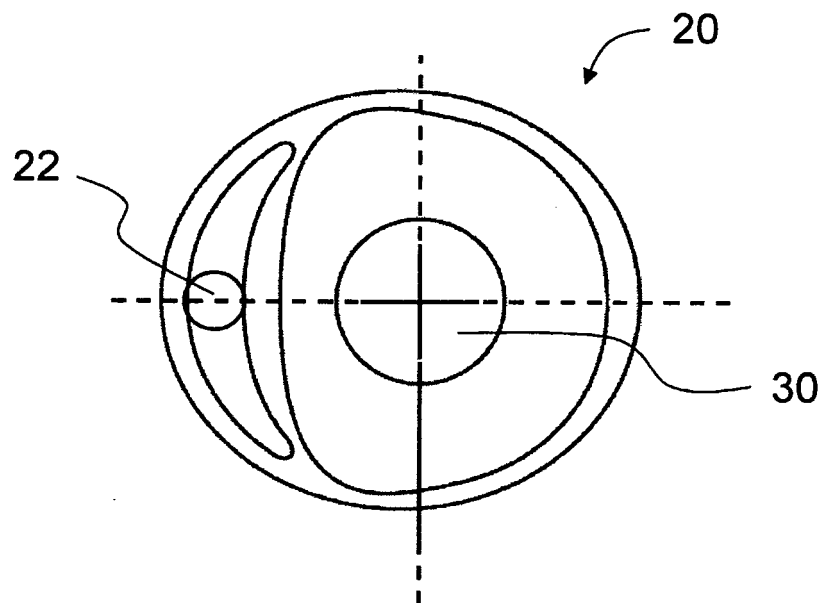


Fig. 18

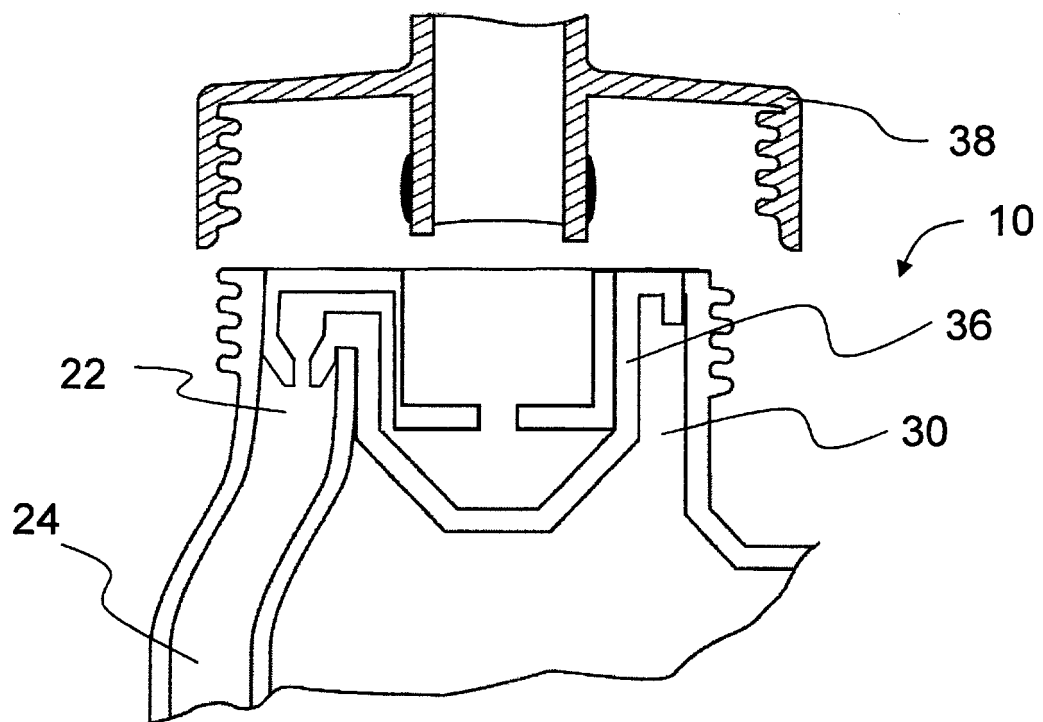


Fig. 19

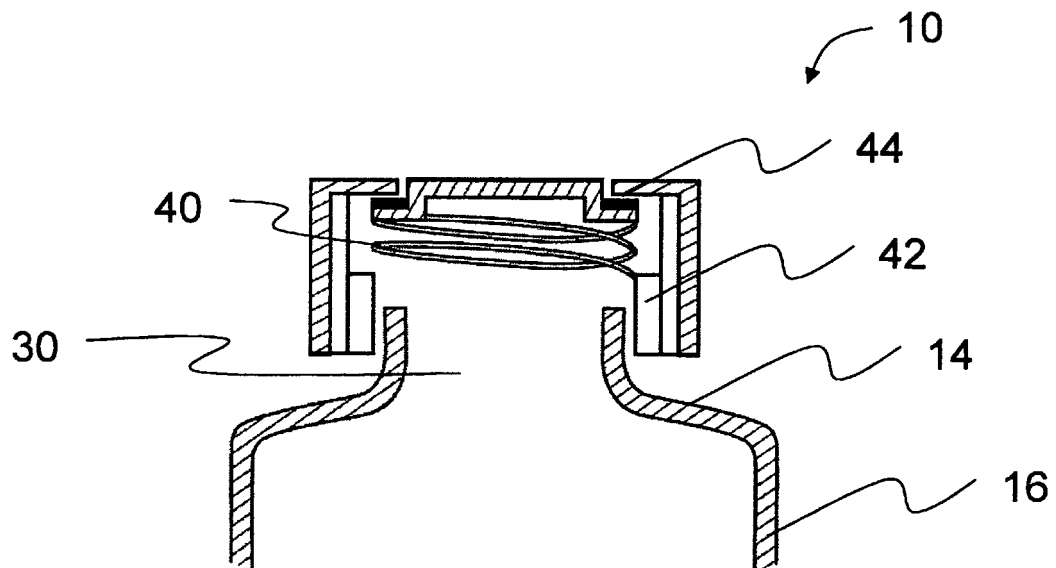


Fig. 20

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1510462 A1 [0002]