

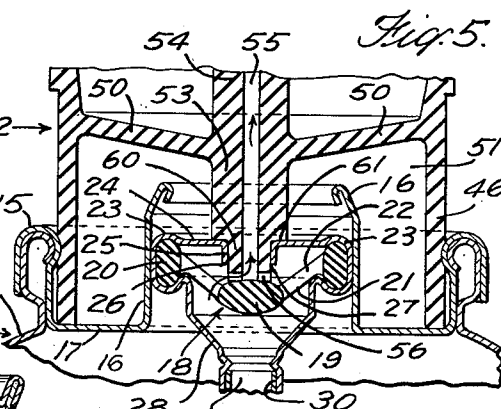
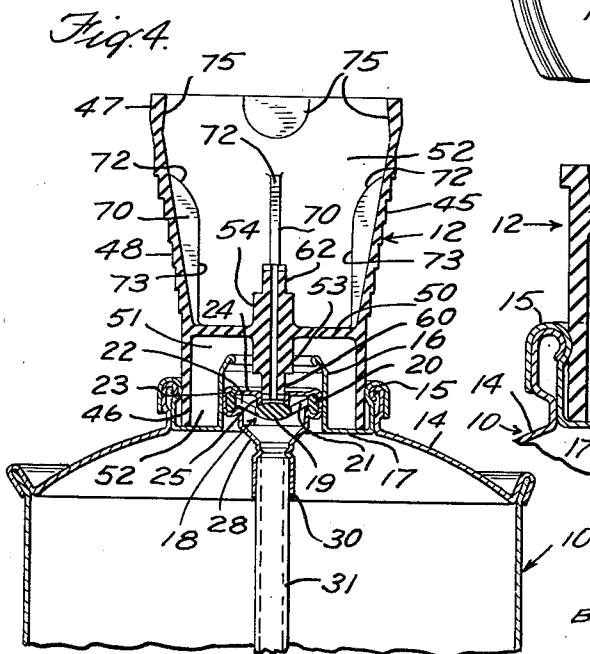
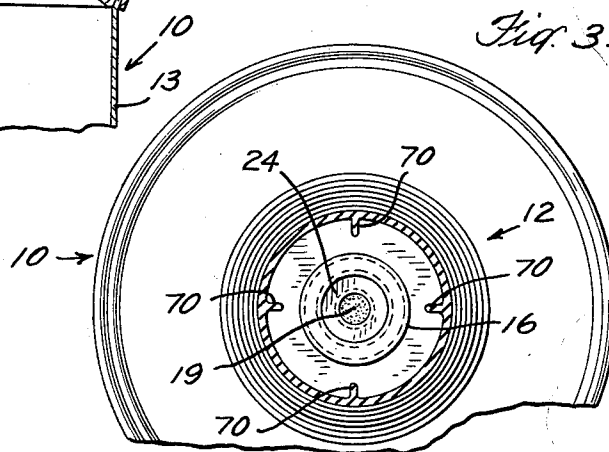
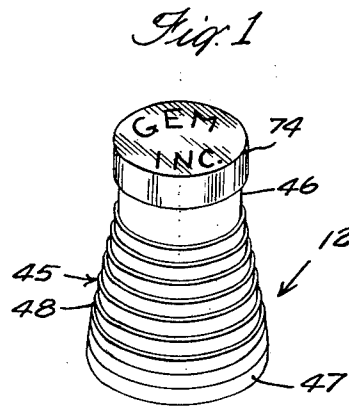
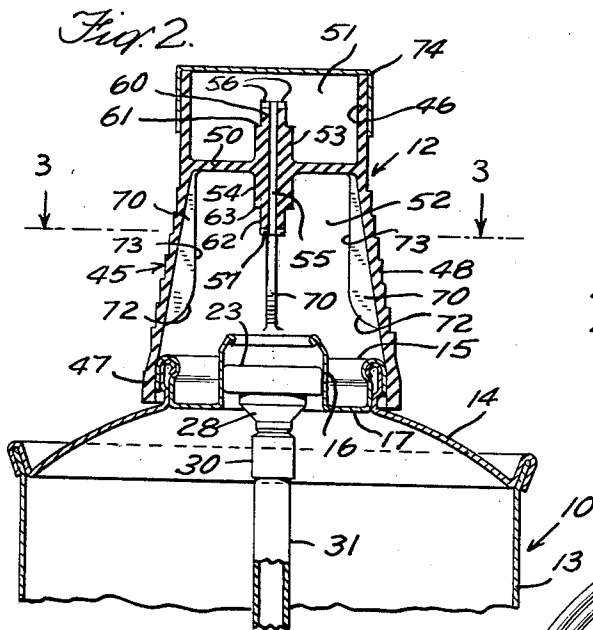
May 5, 1964

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DEVICES FOR TRANSFERRING PRESSURIZED
LIQUID BETWEEN CONTAINERS

3,131,733

Filed Jan. 27, 1961

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

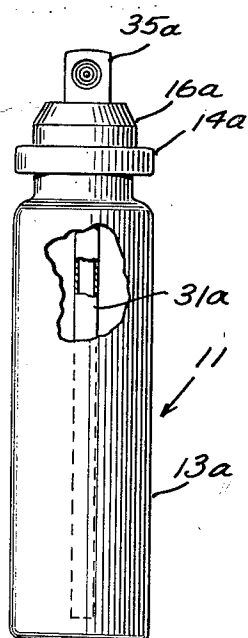


Fig. 7.

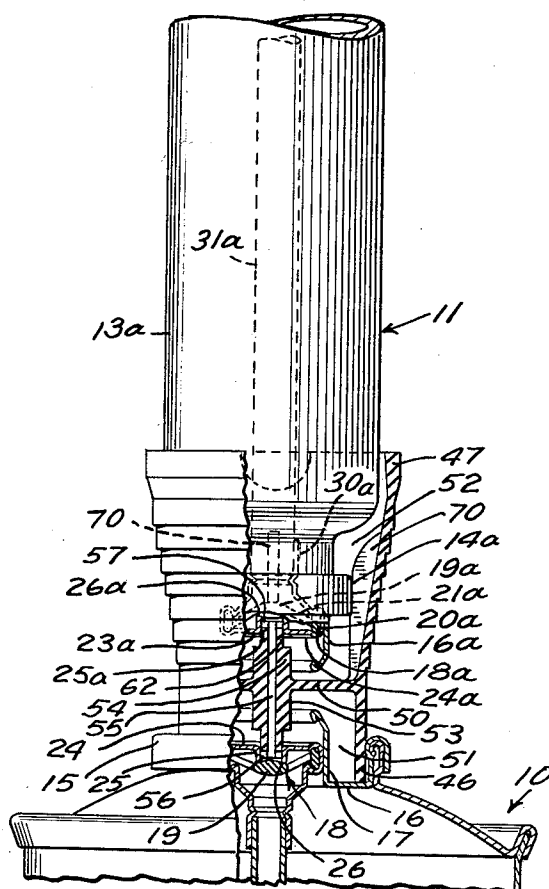
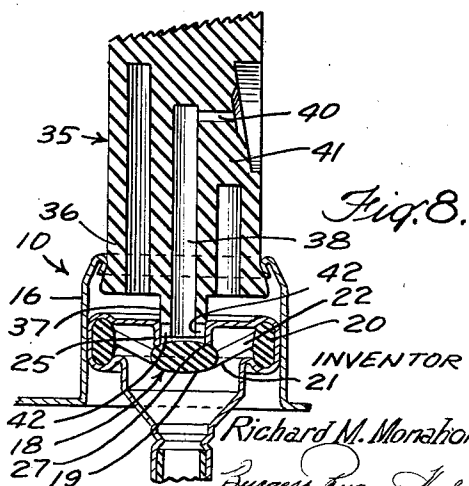
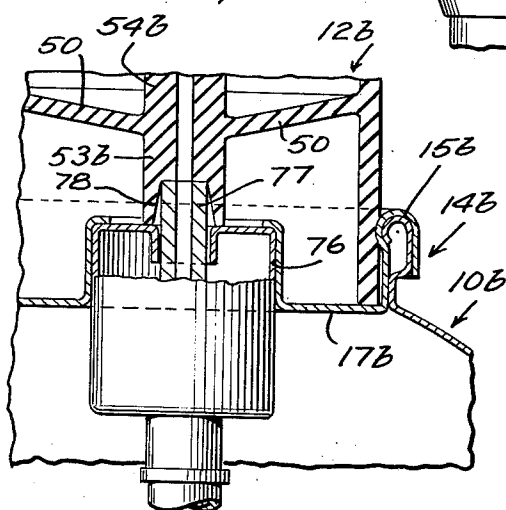


Fig. 9.



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3,131,733

DEVICES FOR TRANSFERRING PRESSURIZED
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8 Claims. (Cl. 141-349)

The present invention relates to a device for transferring liquid from a pressurized storage refill container to a refillable dispenser container.

It is desirable to have a pressurized or aerosol container whose contents may be renewed when emptied. This may be especially the case where the container is of small contents, such as that adapted for carriage in a purse or pocket for such cosmetic preparations as hair setting lotion, cologne and perfume and is expensive enough to make its discard after its contents have been spent costly. Also, it would be advantageous in certain cases to provide a cosmetic container set-up comprising a pressurized storage refill dispenser container and a smaller pressurized refillable dispenser container which are similar in appearance except as to size, and which by their kinship may serve together as a dainty and pleasurable mother and daughter cosmetic community unit.

One object of the present invention is to provide a new and improved pressurized liquid transfer device for the purpose described.

Another object of the present invention is to provide a new and improved pressurized liquid transfer device which can be operated in conjunction with and between containers having standard pressure discharge dispenser valves.

A further object of the present invention is to provide a new and improved pressurized liquid transfer device which can be employed as a protective overcap for the storage or refill container when not used for refilling purposes, thus eliminating the need of a standard overcap.

Another object of the present invention is to provide a new and improved pressurized liquid transfer device which serves to collect any liquid which may have escaped as the containers are separated after refill, thereby permitting refill operations to be carried out in a neat orderly manner.

A further object of the present invention is to provide a new and improved pressurized liquid transfer device, which can be easily applied to the containers between which transfer is to take place, and which is constructed to easily and automatically center the container to be refilled in proper refillable position as it is inserted into liquid transfer position.

Another object of the present invention is to provide a new and improved pressurized liquid transfer device which is comparatively inexpensive, and which can be made of one piece of plastic material.

Another object of the present invention is to provide a pressurized liquid transfer device constructed to receive a removable attachment, which may serve as a dust cap for the device when applied as an overcap for the storage container, and which may carry printed matter.

Various other objects, features and advantages of the present invention are apparent from the following description and from the accompanying drawings, in which—

FIG. 1 is a perspective of the transfer device embodying the present invention and shown in connection with an attached dust cap;

FIG. 2 is a vertical section through a transfer device constituting one embodiment of the present invention and shown attached upside down to a refill storage container in inactive position with a dust cap to serve as a protec-

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tive overcap for said container, the container being shown with a standard discharge valve of the stemless type;

FIG. 3 is a transverse section of the transfer device taken on line 3-3 of FIG. 2;

FIG. 4 is a vertical section through the transfer device shown in upright position attached to the refill storage container and shown with the discharge valve of the container closed;

FIG. 5 is an enlarged vertical section through the transfer device shown in conjunction with the valved parts of one of the two containers between which transfer is to take place and shown in stressed position to open both container valves for liquid transfer operation;

FIG. 6 is a side elevation of the smaller refillable dispensing container prior to being refilled and shown with the valve operating finger piece for spray dispensing therefrom still attached thereto, part of the wall of said dispenser being shown broken away to reveal the interior structure of said container;

FIG. 7 shows a view partly in vertical section and partly in side elevation of the two containers with the transfer device in position therebetween for liquid transfer but with the container valves closed and just prior to being opened by the application of downward pressure on the smaller refillable container;

FIG. 8 shows in vertical section part of the larger storage refill container with attached valve operating finger piece attached for dispensing therefrom; and

FIG. 9 is a vertical section of a part of a refill container shown with a standard valve of the stemmed type and shown in conjunction with a transfer device which constitutes another embodiment of the present invention, and which is shown stressed into position to open said valve for liquid transfer operation.

Referring to FIGS. 1-8 of the drawings, the container kit of the present invention comprises a pressurized storage refill container 10, which may be of standard construction with a standard stemless pressure discharge valve, a similar but smaller refillable dispenser container 11, which may also be of standard construction with a standard stemless discharge valve, and a transfer device 12 for filling the smaller container 11 from the larger container 10. The container 10 is shown comprising a cylindrical shell body 13, a cover 14 at the upper end of said shell body with an annular flange 15 and a tubular cylindrical head 16 centered with respect to said flange and separated therefrom by a wall 17. The discharge valve for the container 10 comprises a valve body 18 inside the tubular head 16 made of resilient material, such as rubber, and comprising a circular bulbous gate 19 connected to an encircling support ring 20, by a series of radial bars 21 defining therebetween ports 22. The support ring 20 is retained in a metal clip 23 secured in any suitable manner to the inside of the cylindrical wall of the head 16, and having an upper wall extension 24 forming a round socket 25 terminating in a circular rim seat 26 defining a valve opening 27. The valve gate 19 is normally sealably pressed by the inherent resiliency of the valve body 18 against the rim seat 26 to block flow through the valve opening 27.

The clip 23 also has a wall extension 28 forming a nipple 30 for a syphon tube 31 extending to the end of the container 10.

The storage container 10 may be employed as a spray dispensing container when not used for refilling purposes. For that purpose, the container 10 may be provided with an operating member 35 (FIG. 8) shown in the form of a finger button made of a suitable plastic such as polyethylene and having a body 36 adapted to removably and slidably fit snugly in the container head 16 and having a stem 37 fitting snugly but slidably in the socket 25 and

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against the valve gate 19. This stem 37 has a passageway 38 therealong communicating with a fine hole spray hole 40 in a side wall 41 of the operating member 35 and diametrically split at its inner end to form radial openings 42. Finger pressure on the operating member 35 pushes the valve gate 19 inwardly towards open position against the action of the inherent resiliency of the valve body 18, thereby permitting discharge through the ports 22, valve opening 27, stem openings 42, stem passageway 38 and spray hole 40.

The operating member 35 may be removed from the container 10, when the container is to be employed as a refill reservoir for the smaller container 11, and may be discarded entirely, if the container 10 is not to be used as a dispenser but merely as a refill container. In that case, the transfer member 12 may serve as an overcap, as will be more fully described.

The refillable container 11 (FIGS. 6 and 7) is shown similar to the container 10 except that it is smaller, does not have an outer flange corresponding to the flange 15 in the container 10 and is in the form of a glass bottle with a separate metal cover 14a, while the container 10 including its cover 14 is shown in the form of a metal can. In the drawings, the parts of this container 11 corresponding to those of the container 10 are designated with numbers corresponding to those of the container 11, except that the members for the smaller container are followed by the subscript *a*.

The container 11 has a cylindrical shell body 13a, a cover 14a with a tubular head 16a enclosing and supporting a valve body 18a similar to the valve body 18. This valve body 18a has a valve gate 19a connected to an encircling support ring 20a by spaced radial bars 21a defining therebetween valve ports. The support ring 20a is retained in a metal clip 23a inside the head 16a having an upper wall extension 24a forming a round socket 25a terminating in a circular rim seat 26a defining a valve opening. The valve gate 19a is normally sealably pressed by the inherent resiliency of the valve body 18a against the rim seat 26a to block flow through the valve opening defined by the rim seat 26a.

The clip 23a also has a wall extension forming a nipple 30a for a syphon tube 31a extending to the end of the container 11.

A removable operating member 35a (FIG. 6), similar to the member 35 for the container 10 is employed in connection with the container 11 and operates in a similar way.

Although specific containers 10 and 11 for use in conjunction with the transfer device 12 of the present invention have been described, it must be understood that these may be of any suitable pressure dispenser type, as long as they have the necessary conformation and design to cooperate with the transfer device in the manner to be described.

The transfer device 12 is desirably constructed of one-piece in the form of a tube and is made of material having a certain degree of resiliency, such as polyethylene. This device 12 has an annular flaring wall 45 with a cylindrical section 46 at its smaller end, a cylindrical section 47 at its larger end and a frusto-conical section 48 in between. Intermediate the ends of the transfer device 12 and on the inside thereof is a transverse wall 50 separating the inside of the device into two chambers 51 and 52. This transverse wall 50 is integral with the outer wall 45 and is thin enough to serve as a resilient diaphragm. For opening the valves in the containers 10 and 11 for pressurized liquid transfer operations, there extend from opposite faces of the diaphragm 50 along the longitudinal axis of the transfer device 12 a pair of stems 53 and 54 integral with said diaphragm and having a bore 55 extending along the full lengths thereof.

The outer end of the stem 53 is diametrically split to provide two radial openings 56 in the wall of the stem and the outer end of the stem 54 is similarly split to provide two radial openings 57 in the wall of the stem

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54. These stem openings 56 and 57 provide flow communication between the inside and outside of the stems 53 and 54, even though their ends are blocked by engagement with the valve gates 19 and 19a respectively, as will be described.

The outer end section 60 of the stem 53 is reduced in diameter to fit snugly and slidably in the valve socket 25 of the container 10 and to form a limiting shoulder 61 and the outer end section 62 of the stem 54 is similarly reduced in diameter to fit snugly and slidably in the valve socket 25a of the container 11 and to form a limiting shoulder 63.

In liquid transfer position, the transfer device 12 is adapted to be set upright on the container 10 with the smaller cylindrical end section 46 extending inside the cover flange 15 of the container 10 in contact therewith, and seated against the wall 17 of the container cover 14, as shown in FIG. 4, and the stem 53 is long enough, so that when the transfer device is in this position, the reduced end section 60 of the stem extending in the valve socket 25 of said container, just reaches the valve gate 19 in closed position as shown.

For liquid transfer operation, the smaller container 11 with its operating member 35a removed, is inverted and inserted into the flaring chamber 52 of the transfer device 12 attached to the container 10 to cause the reduced end section 62 of the stem 54 to extend into the valve socket 25a of said container 11 and almost into contact with the valve gate 19a in closed position, while the reduced end section 60 of the stem 53 is almost in contact with the closed valve gate 19 of the container 10, as shown in FIG. 7. To center the container 11 with respect to the transfer device 12 as it is slipped into this position, there are provided inside the compartment 52 of said transfer device a series of guide vanes 70, four being shown quadrantly arranged. These guide vanes 70 are integral with the annular wall 45 of the transfer device 12 and extend therealong. The inner edges of the vanes 70 at their entry end sections 72 are convexly curved to conjointly encompass a flaring contour and at their other sections 73 extend parallel to the longitudinal axis of the transfer device to conjointly encompass a cylindrical contour having a diameter corresponding substantially to the outside diameter of the cover 14a of the smaller container 11. With the vanes 70 so constructed, the inverted container 11 can enter easily into the transfer device and is guided by said vanes centrally into position to cause the stem 54 in said device to enter into the valve socket 25a of said container and to cause said container to be held centrally in this position while said container is being pushed into valve opening position, as will be more fully described.

A cylindrical dust cap 74 fits snugly and removably over the smaller end section 46 of the transfer device 12 when said device is not in operation. The dust cap 74 is desirably of transparent plastic material and the transfer device 12 desirably will be colored, such as white, so that the separability of the cap from the transfer device becomes apparent and the necessity of detaching the cap from the transfer device for transfer operation becomes obvious. This dust cap 74 may contain printed matter, such as the trade mark of the products dispensed from the containers 10 and 11.

The two containers 10 and 11 with their respective operating members 35 and 35a can be used independently as dispensers of pressurized liquid in spray form. This independent dispensing relationship may be desirable, when for example, the two containers 10 and 11 form a mother and daughter kit, in which case the containers would be almost duplicates except for size, and each person would employ her own container. However, if desired, the large container 10 may be sold merely as a refill container for the smaller container 11, in which case it need not be provided with an operating member and need not be similar in shape to the container 10.

With the container 10 free from an operating member, the transfer member 12 when not being used for liquid transfer operations, is inverted and slipped over the end of the container to serve as an overcap for this container, as shown in FIG. 2. The larger cylindrical end section of the transfer device 12 is just large enough to fit snugly over the annular cover flange 15 of the larger container 10 with enough embracing pressure to be frictionally retained thereon in any position of the container and may have slight bosses 75 on its inner surface to afford a tighter friction grip with said cover flange. In this position of the transfer device 12, the dust cap 74 may be fitted in position over the smaller end section 46 of the device to keep the inside of the smaller compartment 51 and the stem 53 therein free from dust. The larger compartment 52 being slipped over the cover 14 of the container 10 is closed off from any dirt collection.

When the contents of the smaller container 11 have been spent, the dust cap 74 is removed from the transfer device 12 and the device is set up in upright position on the container 10, with the smaller end cylindrical section 46 inside the cover flange 15 of the container 10 and seated on the wall 17 of the cover 14 of said container 10, as shown in FIG. 4. In this position of the transfer device 12, the outer reduced end section 60 of the stem 53 extends through the valve socket 25 of the container 10 and contacts or is at least very close to the valve gate 19 of said container in closed position of the valve.

With the transfer device 12 so set up on the container 10, the smaller container 11 in inverted position and with its operating member 35a removed, is lowered into the transfer device until the reduced end section 62 of the stem 54 passing upwardly through the valve socket 25a of the container 11 engages the valve gate 19a of the container 11 as shown in FIG. 7. Downward pressure of the smaller container 11 in this position, causes the valve gate 19a of the container 11 to be pushed off its seat 26a into open position and at the same time, the stems 53 and 54 to be pushed downwardly, and since the transfer member 12 is seated on the cover wall 17 of the container 10, this action causes the resilient diaphragm 50 to flex and the stems to move downwardly relative to the annular wall 45 of said transfer device, as shown in FIG. 5. This causes the reduced end section 60 of the stem 53 to push the valve gate 19 of the container 10 off its seat 26 into open position, so that the valves of both containers 10 and 11 will be open against the inherent resiliency of the valve bodies 18 and 18a, as shown in FIG. 5. The shoulders 61 and 63 on the stems 53 and 54 engaging the wall extensions 24 and 24a of the container valves limit the extent to which the valve gates 19 and 19a are moved into open position.

With both container valves open as described, the liquid under pressure will flow from container 10, through the syphon 31, the radial stem openings 56, the valve opening 27, the bore 55 of the valve stems 53 and 54, the valve opening defined by the rim seat 26a, the stem openings 57, the syphon 31a and the container 11.

When the container 11 has a transparent body, the contents can be observed, so that the amount of liquid therein can be determined. When the container 11 has been filled to the desired extent in the manner described, downward pressure on the container 11 is released, thereby causing the valve gates 19 and 19a to be returned under the action of their inherent resiliency into closed position and the diaphragm 50 to be restored into unstressed unflexed position. As the container 11 is lifted out of the transfer device 12, any liquid which leaks out of the containers 10 and 11 is collected in the chamber 52 of the transfer device.

With the container 11 filled and removed from the transfer device 12, the transfer device can again be inverted over the container 11 in the position shown in FIG. 1 to serve as an overcap and the dust cap 74 restored until the next liquid transfer operation is in order.

For the purpose of illustration, the transfer device of the present invention has been shown in FIGS. 1-8 in connection with containers having valves of the stemless type. However, the transfer device, with slight changes, can be operated in connection with valves of the stemmed type, as shown in FIG. 9. Since the construction of the valves of this stemmed type are well-known, the valve construction in FIG. 9 is shown only diagrammatically.

In FIG. 9, the larger container 10b has a cover 14b with a flange 15b and a wall 17b to which is connected a valve housing 75 enclosing a valve with an upstanding spring-pressed tubular valve stem 77. The transfer device 12b for this type of container valve is similar to that described in connection with the construction of FIGS. 1-8, except that the stem 53b corresponding to the stem 53 in the construction of FIGS. 1-8 is large enough in diameter to receive the valve stem 77 and for that purpose is provided at its lower end with an outwardly flaring recess 78.

FIG. 9 shows the transfer device 12b attached in upright position to the larger container 10b and stressed by the downward pressure on the smaller container (not shown) to open the valves of the containers. In initial position of the transfer device before being so stressed, the lower end of the stem 53b is spaced above the valve housing 75 to afford the necessary clearance for operation of the stem into valve opening position. The top of the valve housing 75 limits the extent of valve opening movement of the stem 53b, as shown in FIG. 9.

The transfer device 12b is similarly provided with a stem 54b corresponding to the stem 54 in the construction of FIGS. 1-8, but shaped similarly to the stem 53b and the refillable smaller container (not shown) would have a valve of the stemmed type similar to that of the container 10b. In all other respects, the transfer device 12b is similar to the transfer device 12 and is manipulated and operated for liquid transfer in the manner described in connection with FIGS. 1-8.

While the invention has been described with particular reference to specific embodiments, it is to be understood that it is not to be limited thereto but is to be construed broadly and restricted by the scope of the appended claims.

What is claimed is:

1. A device for transferring pressurized liquid from one valved container to another, comprising an annular peripheral wall, the opposite ends of which are adapted to engage the heads of the containers respectively for liquid transfer operation, a transverse wall inside the space encompassed by said annular wall and peripherally secured to said annular wall, and a pair of stems secured to and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore, said transverse wall having sufficient resiliency to serve as a diaphragm, said annular wall being adapted to seat in limiting position on one of the containers in transfer position while the valves of the containers are closed and being substantially rigid against endwise compressive stress applied during liquid transfer operation, whereby upon application of pressure to one of the containers tending to bring them together, corresponding compressive stress on the stems lengthwise thereof causes said diaphragm to flex and said stems to move lengthwise relative to the annular wall sufficiently to open the container valves.

2. A device for transferring pressurized liquid from one valved container to another, made of one piece of plastic material, comprising a peripheral continuous annular wall of circular cross-section, one end of said wall being adapted to be attached to one of the containers for liquid transfer operation, a transverse circular wall inside said annular wall peripherally integral with said annular

wall intermediate the ends of said annular wall to define two chambers inside said annular wall on opposite sides of the transverse wall for receiving the heads of the containers respectively in liquid transfer position of the transfer device, a pair of stems integral with and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being centrally spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore, the section of the annular wall on one side of said transverse wall flaring away from said transverse wall towards the outer end of the annular wall on the latter side of said transverse wall, whereby the chamber encompassed by said wall section flares towards the latter end, said flaring chamber serving to receive the escaped liquid from the container head in said flaring chamber as the containers are separated after liquid transfer operation, the opposite end sections of the annular wall on opposite ends of said flaring annular wall section being cylindrical in shape, the smaller end section of the annular wall being adapted to engage with a friction fit the inner periphery of a cover flange on the refill container from which transfer is to be effected in transfer position of the transfer device and the larger end section of the annular wall being adapted to engage with a friction fit the outer periphery of said cover flange to serve as an overcap for the refill container when said transfer device is not in transfer position, said transverse wall having sufficient resiliency to serve as a diaphragm, said annular wall being adapted to seat in limiting position on one of the containers in transfer position while the valves of the containers are closed and being substantially rigid against endwise compressive stress applied during liquid transfer operations, whereby upon application of pressure to one of the containers tending to bring them together, corresponding compressive stress on the stems lengthwise thereof causes said diaphragm to flex and said stems to move lengthwise relative to the peripheral wall sufficiently to open the container valves.

3. In combination with a pair of valved containers, one of which is filled and serves as a refill container, the other container serving as a refillable container, said refill container having a cap with a circular flange and a valve in the center of said flange, a device for transferring pressurized liquid from the refill container to the refillable container, comprising an annular tubular wall of circular cross-section, a circular transverse wall inside the space encompassed by said tubular wall and peripherally secured to said tubular wall, and a pair of aligned stems secured to opposite sides of said transverse wall and extending axially along the length of said tubular wall, said stems having a bore and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their lengths to establish communication between the containers through said bore, one end of said annular wall on one side of said transverse wall being sized and shaped to frictionally engage said flange for removable attachment thereto, the section of said tubular wall on the other side of said transverse wall defining a chamber with an internal minimum conformation sufficiently to snugly engage the valved end of the refillable container with the valve at the end of the refillable container engaging the corresponding stem when said valved end of the refillable container is inserted in said chamber, said transverse wall having sufficient resiliency to serve as a diaphragm and said tubular wall being adapted to seat in limiting position on the refill container while the valves of the containers are closed, and said tubular wall being substantially rigid against endwise compressive stress applied during liquid transfer operations, whereby upon application of pressure to one of the containers tending to bring them together, corresponding compressive stress on the stems lengthwise

thereof causes said diaphragm to flex and said stems to move lengthwise relative to the annular wall sufficiently to open the container valves.

4. A device for transferring pressurized liquid from one valved container to another made of one piece of plastic material and comprising a peripheral continuous annular wall of circular cross-section, one end of said wall being adapted to be attached to one of the containers for liquid transfer operation, a transverse circular wall inside said annular wall integral at the periphery of said transverse wall with said annular wall and located intermediate the ends of said annular wall to define two chambers on opposite sides of the transverse wall for receiving the heads of the containers respectively in liquid transfer position of the transfer device, the section of the annular wall on one side of said transverse wall flaring away from said transverse wall towards the outer end of the annular wall on the latter side of said transverse wall, whereby the chamber encompassed by said wall section flares towards the latter end, said flaring chamber serving to receive the escaped liquid from the container head in said flaring chamber as the containers are separated after liquid transfer operation, the opposite end sections of the annular wall on opposite ends of said flaring annular wall section being cylindrical in shape, the smaller end section of the annular wall being adapted to engage with a friction fit the inner periphery of a cover flange on the refill container from which transfer is to be effected in transfer position of the transfer device and the larger end section of the annular wall being adapted to engage with a friction fit the outer periphery of said cover flange to serve as an overcap for the refill container when said transfer device is not in transfer position, and a pair of stems secured to and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being centrally spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore.

5. A device for transferring pressurized liquid from one valved container to another made of one piece of plastic material and comprising a peripheral continuous annular wall of circular cross-section, one end of said wall being adapted to be attached to one of the containers for liquid transfer operation, a transverse circular wall inside said annular wall integral at the periphery of said transverse wall with said annular wall and located intermediate the ends of said annular wall to define two chambers on opposite sides of the transverse wall for receiving the heads of the containers respectively in liquid transfer position of the transfer device, the section of the annular wall on one side of said transverse wall flaring away from said transverse wall towards the outer end of the annular wall on the latter side of said transverse wall, whereby the chamber encompassed by said wall section flares towards the latter end, said flaring chamber serving to receive the escaped liquid from the container head in said flaring chamber as the containers are separated after liquid transfer operation, a pair of stems secured to and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being centrally spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore, and a series of guide vanes integral with and extending along the inside of the flaring section of said annular wall for centering one of said containers with respect to the corresponding stem as the latter container is inserted into said flaring wall section for liquid transfer operations.

6. A device for transferring pressurized liquid from one valved container to another, comprising a peripheral continuous annular wall of circular cross-section, one

end of said wall being adapted to be attached to one of the containers for liquid transfer operation, a transverse circular wall inside said annular wall peripherally secured to said annular wall intermediate the ends of said annular wall to define two chambers on opposite sides of the transverse wall for receiving the heads of the containers respectively in liquid transfer position of the transfer device, the section of the annular wall on one side of said transverse wall flaring away from said transverse wall towards the outer ends of the annular wall on the latter side of said transverse wall, whereby the chamber encompassed by said wall section flares towards the latter end, said flaring chamber serving to receive the escaped liquid from the container head in said flaring chamber as the containers are separated after liquid transfer operation, the opposite end sections of the annular wall on opposite ends of said flaring annular wall section being cylindrical in shape, the smaller end section of the annular wall being adapted to engage with a friction fit the inner periphery of a cover flange on the refill container from which transfer is to be effected in transfer position of the transfer device and the larger end section of the annular wall being adapted to engage with a friction fit the outer periphery of said cover flange to serve as an overcap for the refill container when said transfer device is not in transfer position, a dust cap adapted to frictionally and removably fit over the smaller end of said annular wall when said transfer device is not in use for liquid transfer operation, and a pair of stems secured to and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being centrally spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore.

7. A device for transferring pressurized liquid from one valved container to another, comprising a peripheral continuous annular wall of circular cross-section, one end of said wall being adapted to be attached to one of the containers for liquid transfer operation, a transverse

circular wall inside said annular wall peripherally secured to said annular wall intermediate the ends of said annular wall to define two chambers on opposite sides of the transverse wall for receiving the heads of the containers respectively in liquid transfer position of the transfer device, the end of said annular wall which is adapted to be attached to one of the containers being adapted to seat in limiting position on the latter container in transfer position while the valves of the containers are closed, and a pair of stems secured to and extending from opposite faces of said transverse wall and having a bore therethrough, said stems being centrally spaced from said annular wall and being adapted to open the valves of the containers respectively upon application of compressive pressure to said stems along their length to establish flow communication between the containers through said bore, said transverse wall having sufficient resiliency to serve as a diaphragm, and said annular wall being substantially rigid against endwise compressive stress applied during liquid transfer operations, whereby upon application of pressure to the containers tending to bring them together, corresponding compressive pressure on the stems lengthwise thereof causes said diaphragm to flex and said stems to move lengthwise relative to the annular wall sufficiently to open the container valves.

8. A device for transferring pressurized liquid from one valved container to another as described in claim 1, wherein said device is made of one piece of plastic material, and said annular wall is substantially cylindrical at its opposite ends.

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