

- [54] **PRESSURIZED DISPENSING PACKAGE SYSTEM**  
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[51] Int. Cl. ....B65b 3/04, B65b 31/00, B67c 3/00  
[58] Field of Search .....222/402.16, 182; 141/3, 20, 141/348, 349, 18, 84, 98, 351-354; 285/130

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[57]

**ABSTRACT**

A pressurized dispensing package system includes two dispensing packages, each package including a projecting discharge passage structure. An actuator assembly maintained on one of the discharge passage structures includes an inner member having a cylindrical surface and an outer member having a mating inner cylindrical surface. The outer member also defines a discharge conduit and a refilling conduit, the refilling conduit extending in a direction generally parallel to the axis of the discharge passage structure and including a configured valving surface adapted to mate with a correspondingly configured complementary surface of the other package. The outer structure is rotatable on the inner structure between a dispensing position in which the discharge conduit is aligned with a transfer passage in the inner structure and a refilling position in which the refilling conduit is aligned with the transfer passage.

16 Claims, 8 Drawing Figures

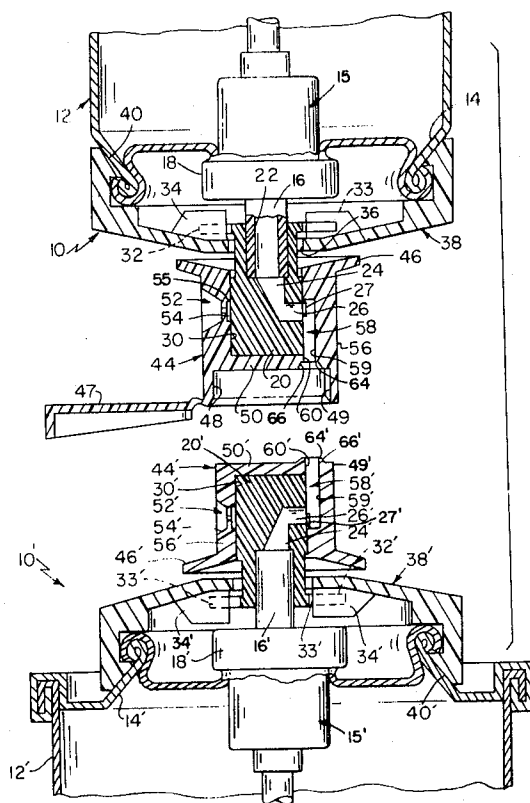


FIG 1

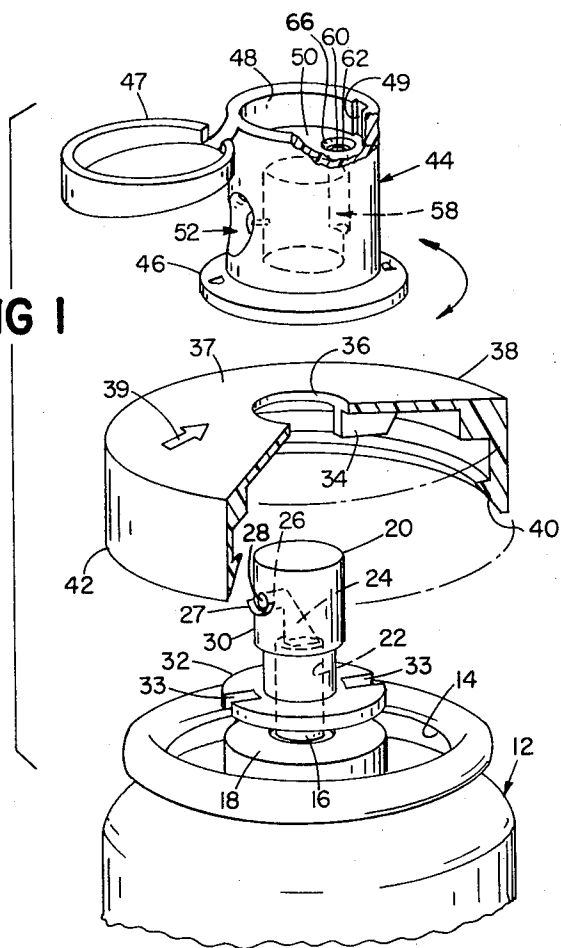


FIG 2

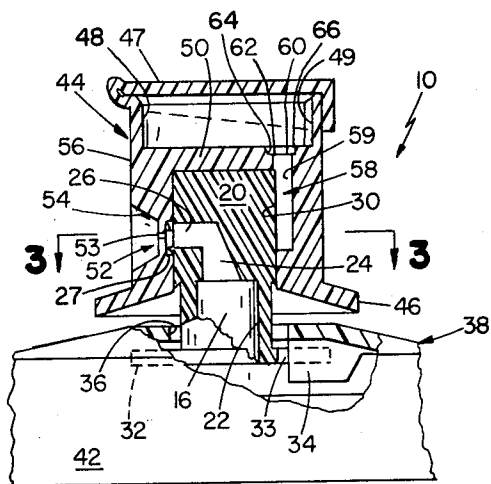


FIG 3

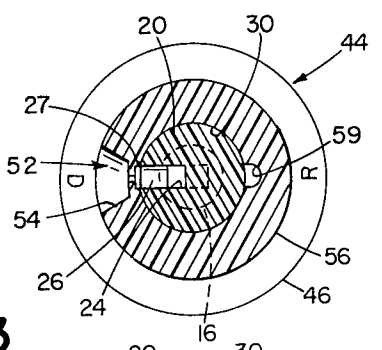


FIG 4

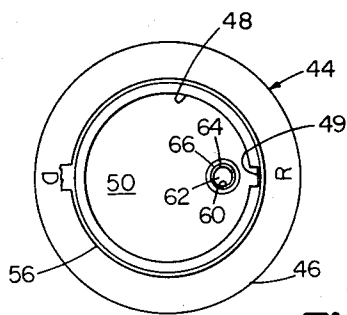


FIG 7

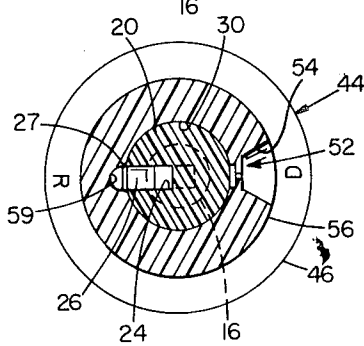
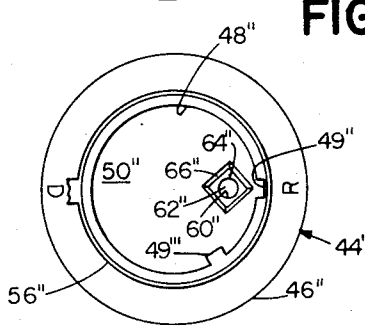


FIG 8



SHEET 2 OF 2

FIG 5

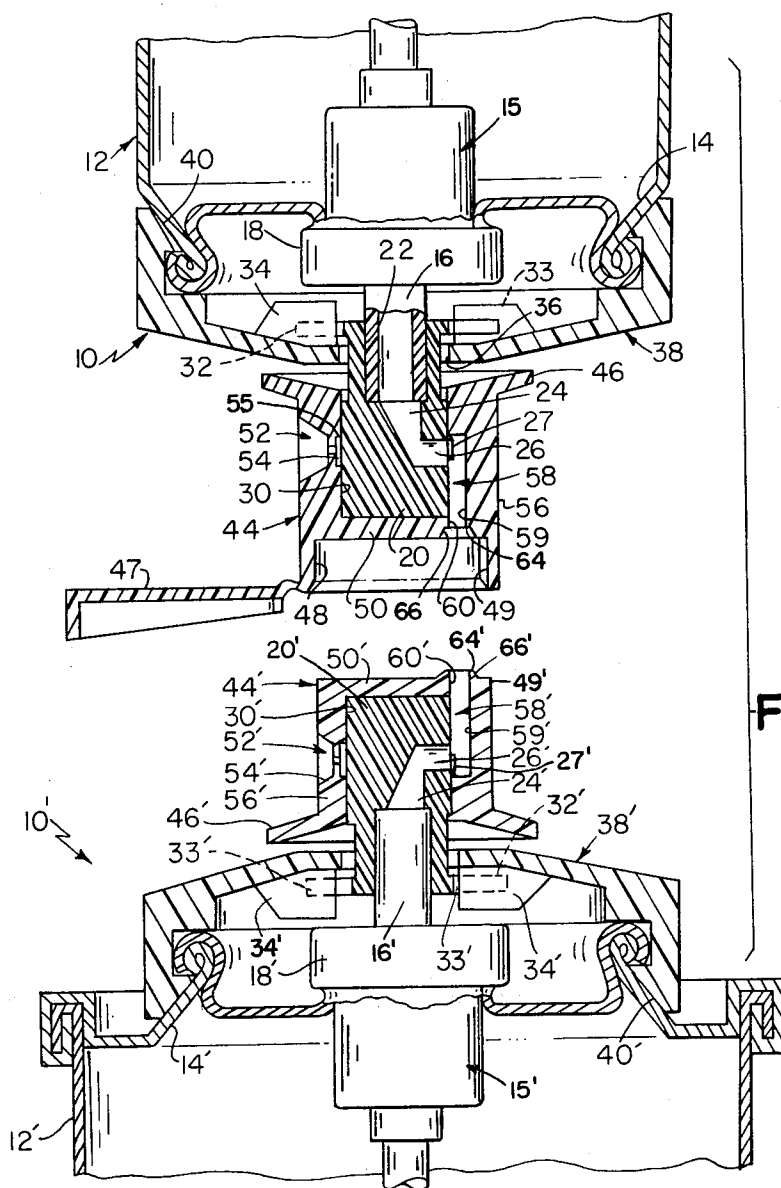
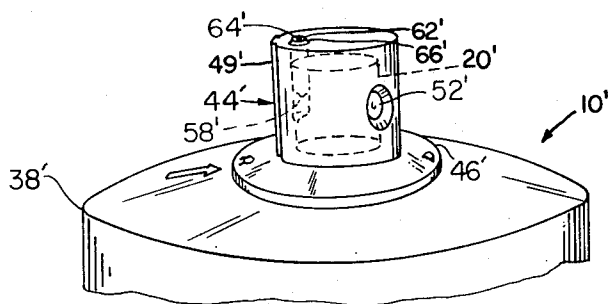


FIG 6

## PRESSURIZED DISPENSING PACKAGE SYSTEM

### SUMMARY OF INVENTION

This invention relates to pressurized dispensing packages and more particularly to systems that permit the refilling of such pressurized dispensing packages.

Pressurized containers are used for dispensing a wide variety of products including insecticides, deodorants, antiperspirants, shaving preparations, dessert toppings, etc. Conventional pressurized dispensing packages are filled by the manufacturer and are discarded by the consumer after those contents have been dispensed. A relatively large size pressurized dispensing package reduces the cost to the user but such large containers are cumbersome and inconvenient and small size pressurized dispensing packages, while convenient to store and use, are relatively expensive in terms of material dispensed. It has been proposed that the use of pressurized dispensing packages of relatively small size might be extended by arrangements that permit the user to easily and safely refill one relatively small container refilled from a larger sized pressurized dispensing package, thus providing the consumer with greater convenience and reducing his overall cost. Such a system, in addition to making more economical the use of small pressurized dispensing packages, would also increase the flexibility and convenience with which various products packaged in this manner can be used.

It is a principal object of one aspect of the present invention to provide a system including at least two pressurized dispensing packages that may be brought together for refilling of one from the other and in which at least one of the dispensers is manually adjustable by the consumer between clearly indicated dispensing and refilling configurations and prevents accidental discharge when in neither its dispensing and refilling configuration. Other objects include providing simple and inexpensive pressurized dispensing package refilling systems which employ transfer structures which are rotatably adjustable between the two configurations.

The invention features, in a pressurized dispensing package system including at least two pressurized dispensing packages, each of which includes a projecting discharge passage structure, and a transfer structure for sealingly connecting the passages of the two packages, that improvement wherein the discharge passage of at least one of the packages terminates at an outlet port and the transfer structure defines a discharge conduit and a refilling conduit mounted on the one package for movement relative to the outlet port between a first position wherein the discharge conduit communicates with the port and a second position wherein the refilling conduit communicates with the port, the conduit not in communication with the port being sealed therefrom. In preferred embodiments in which the outlet port of each device is at a cylindrical, outwardly-facing valving surface, the transfer structure of each device includes a sleeve member defining an inwardly-facing cylindrical valving surface mounted a cooperating button member with the valving surfaces in face-to-face relationship, the sleeve also defining a radially-extending discharge passage and an axially-extending refilling passage. In such preferred embodiments, the refilling passages terminate at ports in axially-facing surfaces of the respective sleeves, that are

adapted to mate with one another in sealing relation. At least one sleeve may include a hinged cover overlying the refilling passage port.

The invention thus provides a convenient, reliable and economical system enabling the user to refill a small (daughter) pressurized dispensing package from a larger (mother) dispensing package. The daughter package may be of a size suitable for carrying in a purse, for example, and need not be discarded when the material initially loaded into it has been dispensed. Rather, the daughter container may be readily refilled from the mother package simply through moving the actuator components from dispensing position to refill position and urging the two packages together, thus concurrently actuating the valve assemblies of both mother and daughter packages.

Other objects, features and advantages will appear from the following detailed description of particular embodiments of the invention, taken together with the attached drawings in which:

FIG. 1 is an exploded perspective view, partially in section, of components of a pressurized dispensing package constructed in accordance with the invention;

FIG. 2 is an elevational view, partially in section, of the assembly of FIG. 1;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2 illustrating the assembly in its dispensing configuration;

FIG. 4 is a top view of the assembly of FIG. 1 with the cover open;

FIG. 5 is a perspective view of a complementary assembly of a complementary pressurized dispensing package constructed in accordance with the invention;

FIG. 6 is a sectional view of the assembly of FIG. 1 and the complementary refilling assembly in juxtaposed, spaced relation;

FIG. 7 is a sectional view similar to FIG. 3 illustrating the assembly in its refill configuration; and

FIG. 8 is a plan view, similar to FIG. 4 of a modified embodiment of the invention.

### DESCRIPTION OF PARTICULAR EMBODIMENTS

Referring now to the drawings, there is shown in FIGS. 1-4, a pressurized dispensing package of the user or daughter type generally designated 10, comprising a cylindrical container 12 having a reduced neck portion 14 at its upper end, the central opening of which is closed by a valve assembly 15 including a tubular valve stem 16 extending upwardly from valve cup 18. Stem 16 defines a passage for a discharge of material from container 12.

An actuator assembly including a transfer button 20 is mounted on stem 16. Button 20 includes an axial socket 22, a mixing chamber portion 24, and a transfer passage 26 which extends radially from chamber 24 to the outer surface of button 20. The upper end of stem 16 is received in socket 22. A latch ridge 27 projects outwardly from surface 30 immediately below and in alignment with the outlet port 28 of passage 26. At the lower end of button 20 there is provided a radially extending flange 32 with three circumferentially spaced radial orientation slots disposed therein.

A collar structure 38 is mounted on package 10, inwardly facing annular rib 40 at the base of the skirt wall 42 of collar 38 being snapped over the rim of valve cup

18. Three depending webs 34 extend downwardly from the top wall 37 of collar 38, and in assembled relation with button 20 projecting through central opening 36 in the top wall of collar 38, webs 34 are disposed in cooperating slots 33 in flange 32 of button 20. In this position, an indicator, in the form of arrow 39, molded in the surface of top wall 37, is aligned with outlet port 28 of transfer passage 26.

Cylindrical sleeve 44 has a radially extending flange at its base and defines a socket which receives the upper end of button 20, with the top of button 20 abutting intermediate transverse wall 50 of sleeve 44. Formed in sleeve 44 is a dispensing passage structure 52 which includes a discharge orifice 53 and a coaxial frusto-conical nozzle surface 54, extending radially through the cylindrical wall 56 of the sleeve below transverse wall 50 in position for alignment with transfer passage 26. On the interior surface of the socket in sleeve 44 is a recess 55 which receives ridge 27. A refill passage 58 extends axially from socket in sleeve 44 through transverse wall 50. The lower end of refill passage 58 is a channel in the inner wall of the socket and extends to a point opposite orifice 53 of the dispensing passage structure. Groove 59 cooperates with the outer surface 30 of button 20 to define a lower portion of the refill passage.

The portion of sleeve 44 above wall 50 defines a cylindrical recess 48, the top of which is closed by a hinged cover 47. A vertical keyway 49, extending parallel to the axis of sleeve 44, is provided in the inner cylindrical wall of recess 48, as shown in FIG. 4. Passage 60 opens into a port 62 which is located below the upper surface of wall 50. Surrounding port 62 is a radially extending annular land surface 64 and surrounding land surface 64 is a frusto-conical guide surface 66.

Indicating markings D (for dispensing) and R (for refilling) are provided on top of flange 46 in radial alignment with dispensing passage 52 and refilling passage 58, respectively.

For normal dispensing operation, sleeve 44 is positioned so that the letter D is aligned with the arrow 39. In that position, dispensing port 52 is in line with transfer passage 26. On depression of the sleeve and button assembly, valve stem 16 is moved axially to open the valve and contents of container 12 are dispensed through stem 16, chamber 24, passage 26 and orifice 53 in conventional manner.

When the contents of container 12 have been dispensed, the daughter package may be refilled from a larger mother package having a cooperating actuator assembly as shown in FIGS. 5 and 6. The mother package is generally designated 10' and includes a transfer button structure 20' mounted on stem 16', as shown in FIGS. 5 and 6. The mother container is substantially larger than the daughter container, a typical container having a height of about eight inches and a diameter of about 2 1/2 inches, in contrast with a daughter container which may have a height of 2 inches and a diameter of one inch, for example. The mother actuator assembly includes a collar 38' and a control sleeve 44'. The sleeve 44' of package 10' differs from the sleeve 44 of daughter package 10, principally in the configuration structure above the transverse wall 50'. It includes a similar dispensing passage structure 52' and

a similar refill passage structure 58'. However, the surface above transverse wall 50 is open and an annular ridge surrounds port 62' of the refill passage 58'. The protruding portion includes a flat surface 64' and a frustoconical surface 66' of similar dimensions to corresponding surfaces 64 and 66 of the daughter package. Also, a key 49' projects from the outer cylindrical wall of the sleeve 44'. In this embodiment key 49' extends substantially the entire height of sleeve 44' and is in radial alignment with opening 62'. The outside diameter of sleeve 44' is slightly less than the inner diameter of recess 48 of sleeve 44 so that the upper surface or outer surfaces of walls 50 and 50' may be brought together in juxtaposed relation in a close slip fit with surfaces 64 and 66 engaging corresponding surfaces 64' and 66' in sealing relation.

For refilling, sleeve 44 is rotated 180° relative to button 20 respectively until ridge 27 snaps into groove 59. In this position, transfer passage 26 is in communication with groove 59 and dispensing orifice structure 52 is located 180° away from the outlet of passage 26 and thus sealed therefrom by the abutting cylindrical surfaces of sleeve 44 and button 20, as shown in FIG. 7. Sleeve 44' of the mother container is similarly rotated. When both sleeves have been so positioned and cover 47 opened, the daughter container is inverted and sleeve 44' is inserted into recess 48 at the top of sleeve 44 with key 49' in keyway 49. The recess surfaces 64 and 66 engage corresponding surfaces 64' and 66'. As the daughter container is pushed down on the mother container 10', the mating surfaces provide a seal of the two dispensing refill passages 58, 58'. As the containers are pressed further together, the two valves are opened permitting flow from mother container 10' into daughter container 10 along the path through stem 16', chamber 24', transfer passage 26', refill passage 58', refill passage 58, transfer passage 26, chamber 24, and stem 16 to the interior of daughter container package 10 in a material transfer operation. The two containers then may be separated and each sleeve rotated 180° to the dispensing position where the respective ridges 27, 27' latch, and cover 47 is closed.

Other embodiments of the invention will be obvious to those skilled in the art. For example, as shown in FIG. 8, two or more keys or keyways 49'' may be provided in the wall of recess 48 and the configuration of sealing surfaces 64 and 66 may be changed, both in shape and in orientation with respect to the keyway or keyways. Also color coding may be employed. Thus ready discrimination between different products as afforded so that the user may easily and safely refill a relatively small daughter package from a larger mother package. As still other embodiments will be apparent to those skilled in the art, it is not intended that the invention be limited to the disclosed embodiments or to details thereof and departures may be made therefrom within the spirit and scope of the invention as defined in the claims.

What is claimed is:

1. In combination:

a first pressurized dispensing package having a projecting discharge passage structure terminating in a discharge port;

a second pressurized dispensing package having a projecting discharge passage structure terminating in a discharge port; and

two transfer structures adapted to be connected together for providing communication between said discharge ports, each said transfer structure being mounted on the discharge passage structure of its corresponding package and including a discharge port coupling portion and means defining a discharge conduit and a refill conduit with said discharge port coupling portion being mounted on the discharge passage structure of its corresponding package, each said transfer structure being movable between a first position wherein its discharge conduit communicates with the coupled discharge port of its package and a second position wherein its refill conduit communicates with the coupled discharge port of its package,

each said transfer structure further including sealing means for sealing the one of said conduits not in communication with its discharge port, and a mating surface for mating engagement with the cooperating mating surface of the other transfer structure, each said refill conduit terminating in a refill port and said refill ports being in sealed alignment when said mating surfaces are in mating engagement with one another so that material may be transferred from one package to the other through said discharge passage structures and said refill conduits.

2. The combination of claim 1 wherein said sealing means include first and second valving surfaces defined by said transfer structure, said surfaces being relatively movable in face-to-face engagement.

3. The combination of claim 2 wherein said valving surfaces are at least in part cylindrical and said transfer structure is rotatable relative to said one package between said positions.

4. The combination of claim 1 wherein one of said transfer structures includes an upstanding wall portion disposed about its mating surface, said upstanding wall portion defining a recess for receiving the mating surface of the other transfer structure, and interlock means on each of said transfer structures for engagement with one another as said mating surfaces are moved into engagement for limiting the transfer structures permitted to be coupled together.

5. The combination of claim 1 wherein each said transfer structure comprises a sleeve that has a cylindrical wall and said discharge and refill conduits are circumferentially spaced about said cylindrical wall, each said discharge conduit extending generally radially and each said refill conduit extending generally axially of said cylindrical wall.

6. The combination of claim 2 wherein each said transfer structure includes a button mounted on said discharge passage structure and said refill conduit is defined in part by said button.

7. The combination of claim 4 wherein said interlock means coordinate the positioning of said refill conduit of said transfer structure on said first package in communication with said refill conduit of said transfer structure on said second package.

8. In combination with a pressurized dispensing package of the type including a container, and a projecting discharge passage structure and terminating in a discharge port at an outwardly-facing cylindrical surface, that improvement comprising a cylindrical button member mounted on said discharge passage structure,

a sleeve including an inwardly-facing cylindrical valving surface rotatably mounted on said button member with said valving surface of said sleeve in face-to-face engagement with the cylindrical surface of said button member,

said sleeve including a dispensing conduit extending through the wall of said sleeve from said sleeve valving surface to a radially-outwardly facing surface of said sleeve, and a refilling conduit extending axially of said sleeve from said sleeve valving surface to an axially-outwardly facing surface of said sleeve, each of said conduits being arranged for selective alignment with said port, and latching means for latching said conduits in alignment with said port.

9. The improvement of claim 8 wherein said refilling conduit is defined at least in part by a radially-inwardly facing groove in said sleeve valving surface and a cooperating portion of said button member.

10. The improvement of claim 8 wherein said sleeve includes an transverse wall abutting an end surface of said button member and said refilling conduit extends through said transverse wall.

11. The improvement of claim 10 wherein said sleeve includes an upwardly-facing recess on the side of said transverse wall opposite said button member, said transverse wall defining the base of said recess and said refilling conduit terminating in a port at said base.

12. The improvement of claim 11 wherein said recess is adapted to receive the end surface of a cooperating transfer structure and includes interlock means for engaging a cooperating interlock surface of structure inserted in said recess.

13. The device of claim 11 including a cover hingedly secured to the upper portion of said sleeve and arranged for closing said recess.

14. The device of claim 8 including a support cap mounted on said container, cooperating portions of said cap and button member preventing relative rotation of said button member and said cap, and cooperating portions of said cap and said sleeve including indicia for indicating the position of said sleeve relative to said button member.

15. A pressurized dispensing package adapted to be refilled from a second pressurized dispensing package comprising:

a container adapted to hold material to be dispensed under pressure,

structure defining a discharge passage for material from said container,

a valve assembly for controlling the flow of material through said discharge passage,

and an actuator assembly mounted on said container in communication with said discharge passage structure, said actuator assembly including a button member having structure defining a transfer passage extending through said button with a port at each end, said button member being mounted on said discharge passage structure with said one port in communication with said discharge passage structure,

and transfer structure mounted on said button member, said transfer structure including means defining a discharge conduit and a refill conduit separate from said discharge conduit, said refill conduit having a transfer port, a transverse surface

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at the outlet end of said refill conduit, a seal surface surrounding said transfer port, offset from the surface of said transverse surface and uniquely configured to provide a surface for cooperation with the correspondingly configured complementary surface of said second package,

said transfer structure being movable between a first position wherein said discharge conduit communicates with said transfer passage and a second position in which said refill conduit communicates

with said transfer passage, said button structure and said transfer structure including sealing means for sealing the one of said discharge and refill conduits not in communication with said transfer passage from said transfer passage.

16. The combination of claim 4 and further including a cover hingedly secured to the upper portion of said one transfer structure and arranged for closing said recess.

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