

[54] **PRESSURIZED DISPENSING PACKAGE**

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[51] Int. Cl. **B65b 1/04, B65b 3/04**

[58] Field of Search **222/402, 16, 182; 141/3, 20, 348, 349, 18, 84, 98, 351-354; 285/130, 361, 376, 396, 402; 220/38.5, 85 P**

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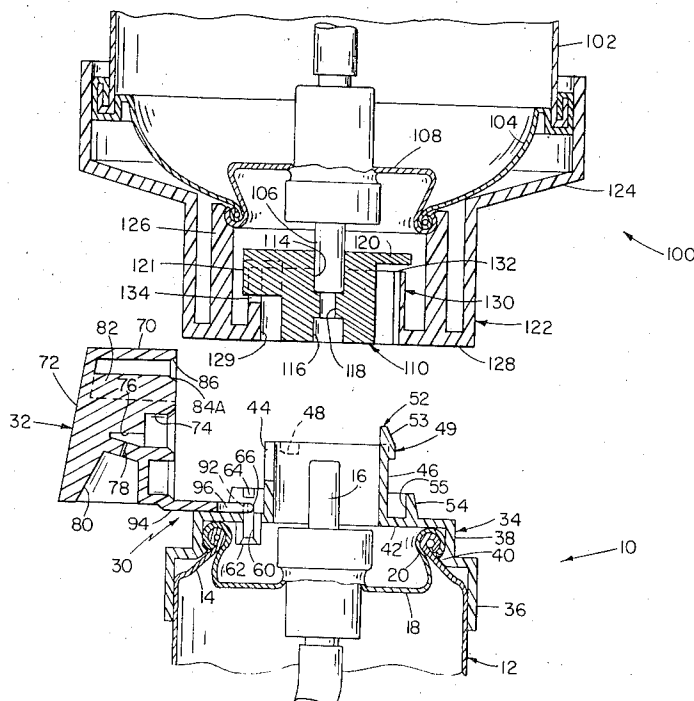
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[57] **ABSTRACT**

A pressurized dispensing package system includes two dispensing packages, each package including a projecting discharge passage structure. Transfer structure defines a closed passage that provides communication between the two discharge passage structures and interconnecting structure includes indexing means that permits the passage structures to be brought into communication only when the contents of the two packages are such that mixing of the contents is desirable, and latching structure for maintaining the transfer structure and the packages in proper position relative to each other for transfer of material from one package to another in a refilling operation.

23 Claims, 9 Drawing Figures



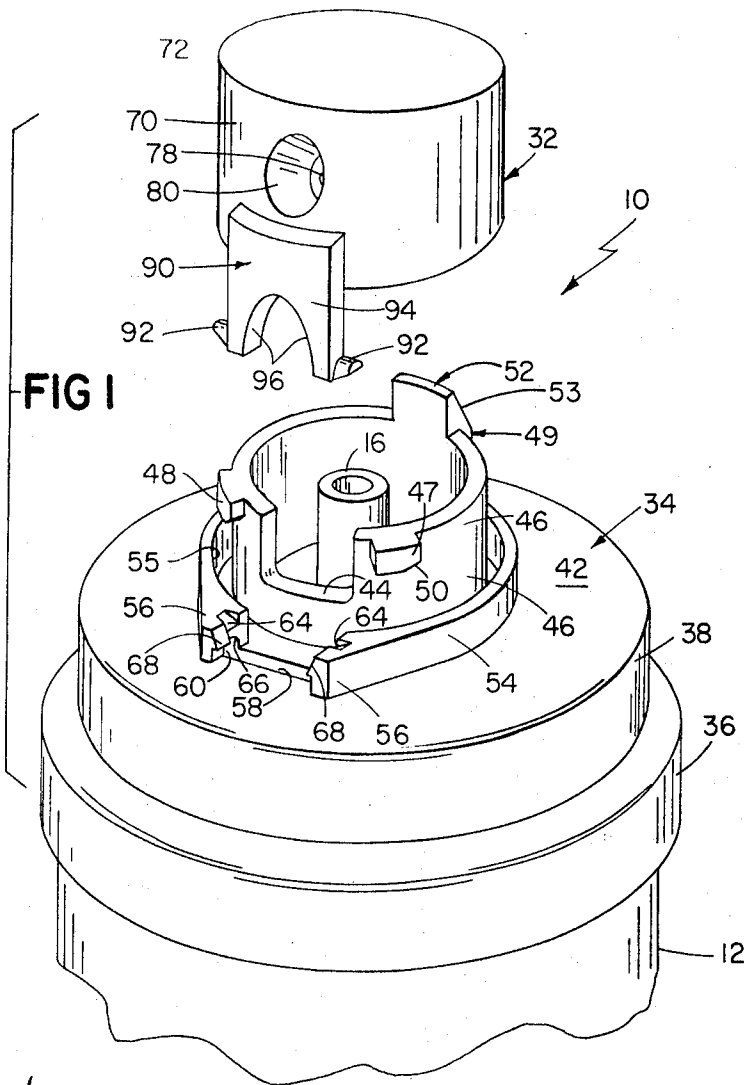


FIG 2

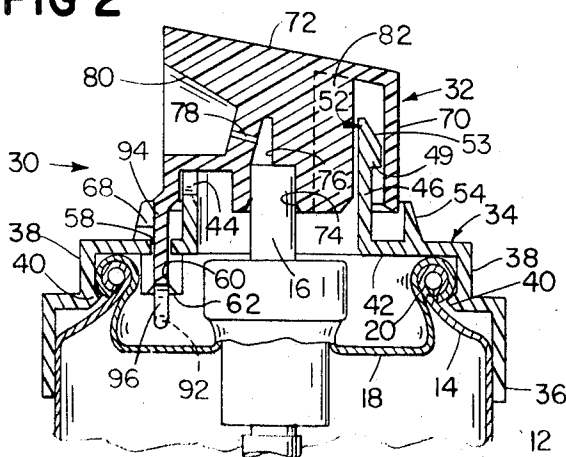


FIG 3

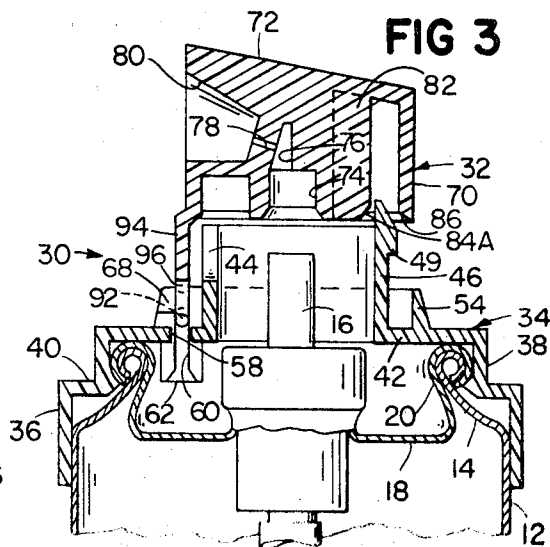


FIG 5

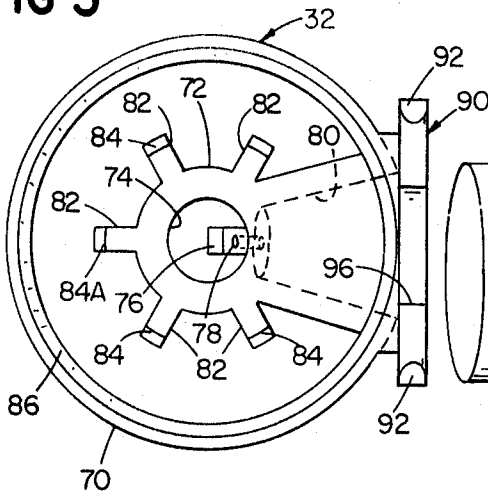


FIG 4

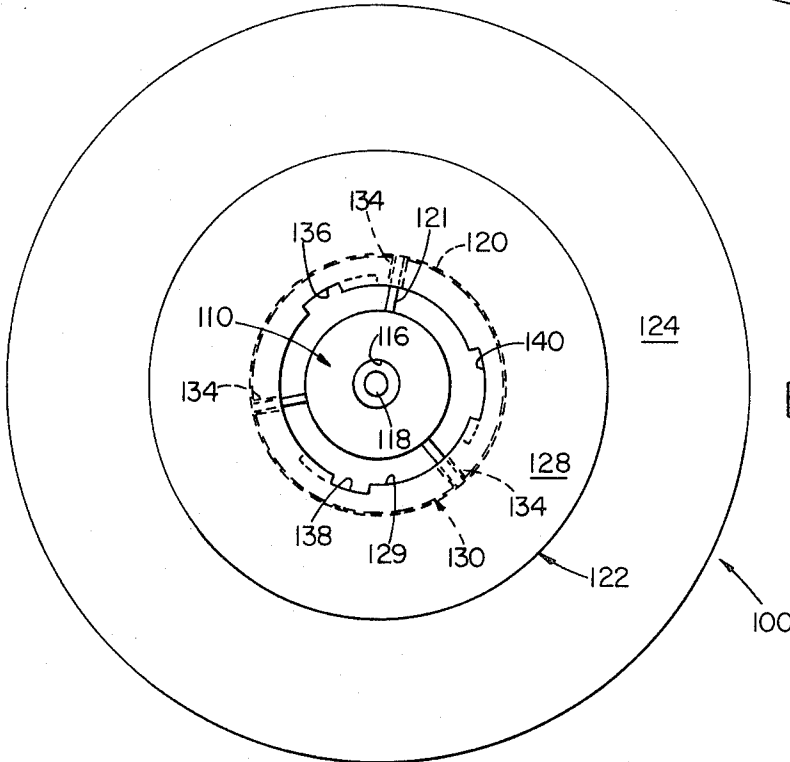
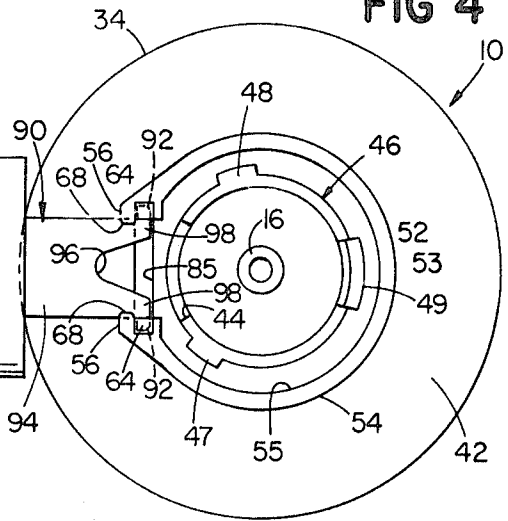


FIG 7

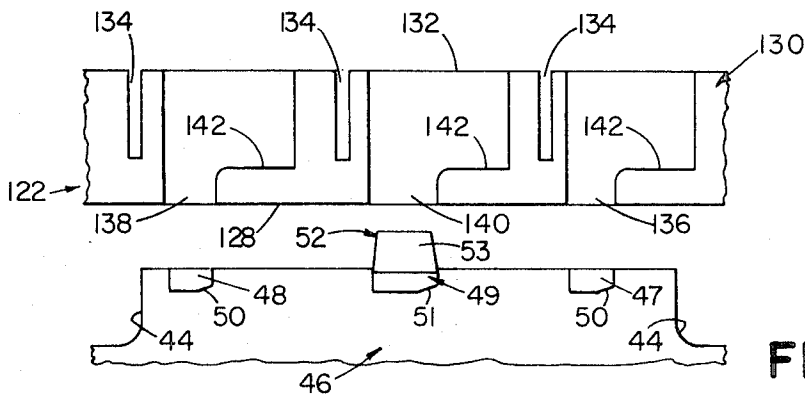
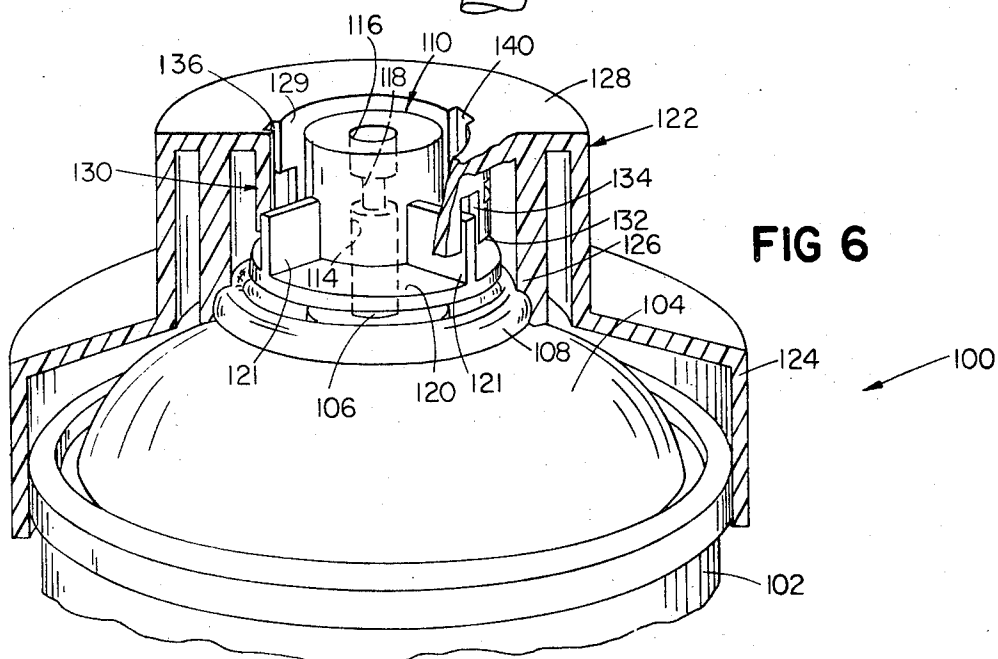
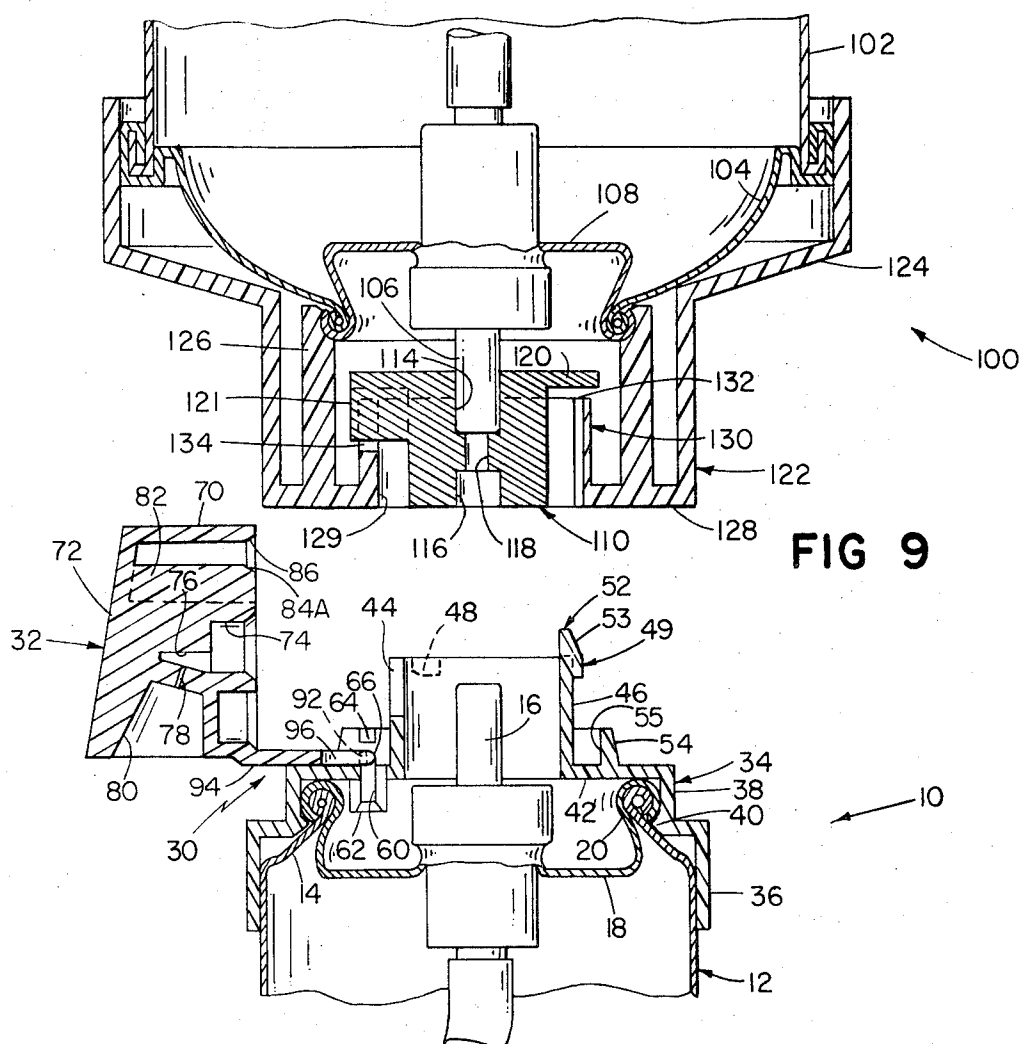


FIG 8

SHEET 3 OF 3



PRESSURIZED DISPENSING PACKAGE

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 the present invention to provide a pressurized dispensing package system including at least two dispensing packages that may be brought together for transfer of material to one from the other, the system insuring that the contents of the two packages are proper for such transfer refilling and, when proper, allowing the packages to be locked together during transfer. Other objects include, in systems in which the packages are indexed and interlocked, providing for at least one of the packages a simple actuator that is movable in engagement with the one dispensing package between a dispensing configuration in which the dispenser valve is in communication with the actuator and a transfer configuration in which the actuator is pivotally spaced from the valve and the valve is exposed so that it can be connected to the other dispensing package for refilling.

The invention features, in a first aspect thereof, a pressurized dispensing package system comprising, in combination, at least two pressurized dispensing packages, each of which includes a projecting discharge passage structure, a transfer structure for sealingly connecting the two discharge passage structures, and interconnecting structure for maintaining the transfer structure and the packages in position relative to each other with the passages in communication for transfer of material from one package to the other in a refilling operation. In a second aspect the invention features interconnecting structure which includes indexing means, such as cooperating stops and guides, for permitting the passages to be brought into communication only when the contents of the dispensing packages are such as to make refilling desirable. In a preferred embodiment, which includes both aspects, one of the dispensing packages includes an upstanding tubular valve stem, a support cap, and an actuator having a recess for receiving the stem, features that improvement wherein the cap and actuator include engaged cooperating portions which permit movement of the actuator relative to the

cap in a direction parallel to the stem axis between a first position wherein the stem is seated within the recess and a second position wherein the actuator is spaced from the stem with the recess aligned with the stem, and permit relative pivotal movement of the cap and actuator about an axis generally perpendicular to the stem axis from the second position to a third position wherein the actuator is spaced from the stem with the recess out of alignment with the stem, the cooperating portions including stop means for preventing movement of the actuator away from the cap in the direction parallel to the stem axis beyond the second position. A preferred embodiment also provides a system in which one of the actuator and cap defines a projecting support having lugs extending outwardly from opposite sides thereof, the other of the cap and actuator includes a socket having spaced parallel guideways for receiving the sockets, the lugs are snap-fitted within the guideways, and detent means are provided for locking the cap and actuator in the third position. In that embodiment, the two packages have cooperating cylindrical guide walls which carry the indexing and latching structure.

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 component from dispensing position to refill position and latching the appropriate mother package to the daughter package, thus concurrently actuating the valve assemblies of both mother and daughter packages.

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

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

FIGS. 2 and 3 are sectional views of the package of FIG. 1 in different configurations;

FIG. 4 is a top view of the package of FIG. 1 in the transfer configuration;

FIG. 5 is a bottom view of the actuator employed in the package of FIG. 1;

FIG. 6 is a perspective view, partially in section, of a pressurized dispensing supply package useful with the user package shown in FIGS. 1-3;

FIG. 7 is a top view of the pressurized dispensing supply package shown in FIG. 6;

FIG. 8 is a developed view of cooperating portions of the pressurized dispensing user package of FIG. 1 and the pressurized dispensing supply package of FIG. 6; and

FIG. 9 is a sectional view of a system including the user package of FIG. 1 in its transfer configuration and the supply package of FIG. 6 in juxtaposed spaced relation.

DESCRIPTION OF PARTICULAR EMBODIMENT

Referring now to the drawings, there is shown in FIGS. 1-4 a pressurized dispensing package, generally

designated 10, comprising a one and one-half inch diameter cylindrical container 12 having a reduced neck portion 14, the central opening of which is closed by a valve assembly including a tubular valve stem 16 extending upwardly from a closure 18 whose annular rim 20 is crimped over the bead edge of the container opening. Circumferentially spaced serrations (not shown) project radially outwardly from rim 20.

An actuator assembly, generally designated 30 and including an actuator 32 and support collar or cap 34, is mounted on container 10 with cap 34 engaging valve closure 18 and container 12. As shown, cap 34 is of generally stepped-cylindrical configuration and includes a lower wall 36 which engages the outer periphery of container 12, an intermediate wall 38 engaging the periphery serrations of rim 20 and a radially inwardly extending ridge 40 intermediate walls 36 and 38 snapped under the lower edge of rim 20. A horizontal wall 42 extends inwardly from wall 38 and defines a circular opening surrounded by an upwardly extending cylindrical guide wall 46. Wall 46 includes, at its upper edge, three circumferentially spaced, radially outwardly projecting key lugs, designated 47, 48 and 49, respectively. As shown best in FIG. 8, lugs 47 and 48 are substantially identical in configuration, each having a length of 0.120 inch, a height of 0.070 inch and a thickness of 0.050 inch. The top of each lug 47, 48 is flush with the top of wall 46 and the bottom of each includes a cam surface 50 that is 0.060 inch in length and inclined at an angle of 15°. Guide lug 49 is of greater width (0.180 inch) than lugs 47 and 48 and includes a bayonet-like guide projection 52 that extends upwardly 0.100 inch above the top of wall 46. Surface 53 of guide projection 52 is inclined at an angle of 30°. A cam surface 51, similar to cam surfaces 50, is provided at the base of lug 49.

The portion of wall 46 diametrically opposite lug 49, and midway between lugs 47, 48, is relieved through the thickness thereof to provide an opening 44 extending downwardly from the top of the wall.

Generally surrounding wall 46 on top wall 42 is a horseshoe shaped collar 54 defining an inwardly facing surface portion 55 coaxial with and spaced from the outer surface of wall 46, and two foot portions 56. A rectangular opening 58 extends through top wall 42 between foot portions 56. A pair of opposed slotted guideways 60, defined at opposite ends of opening 58, extend vertically downwardly from the foot portions 56. As shown each guideway 60 opens outwardly at its base 62. A latch structure that includes an inclined planar cam surface 64 is provided adjacent each end of opening 58 in the respective foot portion 56. Each cam surface 64 extends upwardly and away from the opening, at 45°, and is aligned with the adjacent guideway 60. The bottom surface 66 of each latch structure is curved and provides a journal surface. Opposed detents 68 are provided on foot portions 56, on the side of opening 58 farther from guide wall 46.

Actuator 32 is of molded organic plastic (high density polyethylene) and includes a cylindrical outer wall 70, an inner hub 72 defining a socket 74 to receive valve stem 16 with a close slip fit, a dispersing chamber 76, and an 0.016 inch diameter orifice 78 extending through the wall of hub 72 from chamber 76. A nozzle passage 80 in the form of a truncated conical frustum, extends from orifice 78 to the outer surface of wall 70. Radially extending from hub 72 as shown in FIG. 5 are

five guide ribs 82. The guide rib 82A opposite orifice 78 has a chamfer surface 84 at its bottom edge and a similar chamfer surface 86 is formed in wall 70 opposite surface 84.

A supporting structure 90, including a pair of oppositely extending stub shafts 92 connected at their adjacent ends to the bottom of a support portion 94, extends generally downwardly from wall 70 below passage 80. A slot 96 extends through the thickness of support portion 76 between shafts 92 and provides increased flexibility for the arms 98 that support shafts 92.

Actuator 32 and cap 34 are assembled by placing one of shafts 92 on each of cam surfaces 64 and then forcing the actuator and cap towards each other, thereby forcing shafts 92 downwardly through opening 58 so that each shaft will snap into one of guideways 60. In the dispensing configuration (FIG. 2), valve stem 16 is slip-fitted within socket 74, and button outer wall 70 is located intermediate cap wall 46 and collar 54. The contents of container 12 are dispensed through orifice 78 and nozzle passage 80 by pressing down on the top of actuator 32, thereby depressing valve stem 16 and opening the dispensing valve.

Referring now to FIGS. 6-9, there is shown a refill or supply dispenser 100 comprising a three inch diameter cylindrical container 102 having a reduced neck portion 104, the central opening of which is closed by a valve assembly including a tubular valve stem 106 extending upwardly from a valve cap 108. A transfer button 110, circular in cross section, is mounted on stem 106 with the interior passage 112 of button 110 coaxial with the stem. Passage 112 includes a lower socket portion 114 in which stem 106 is tightly fitted, an upper socket portion 116 for receiving stem 16 of dispenser 10 in a tight slip fit, and a passage portion 118, 0.09375 inch in diameter, intermediate socket portions 114 and 116. A locating flange 120 carrying three angularly spaced, radially and upwardly extending ribs 121 extends outwardly from the base of button 110.

A support cap 122 is mounted on dispenser 100 with the base of cylindrical cap outer wall 124 engaging container 100 and the latch surface at the base of cylindrical intermediate wall 126 engaged over the rib of valve cap 108. As shown, the horizontal top wall 128 of cap 122 defines a central opening 129. A cylindrical wall 130, 0.718 inch in diameter, defining a recess for button 110, extends downwardly from opening 129. Wall 130 terminates in an annular end surface 132 adjacent and facing flange 120. Radial slots 134 extend upwardly from surface 132 into wall 130 and receive ribs 121.

Also defined, at the inner circumferential surface of wall 130, are three circumferentially spaced keyways 136, 138, 140, which extend downwardly from top wall 128 and are sized and adapted for receiving lugs 47, 48, 49, respectively. As shown in FIGS. 7 and 8 keyway 140, which is for receiving lug 49, is of greater width (0.196 inch) than are keyways 136 and 138 (0.136 inch). The lower portion of each keyway is of increased width (60° in annular length) and includes a circumferentially offset locking surface 142 which cooperates with cam surface 50.

When it is desired to refill container 10, actuator 32 is first moved from the position shown in FIG. 2 upwardly relative to cap 34 and valve stem 16 until shafts 92 engage the journal surfaces 66, thereby withdrawing

the stem from socket 74 and moving the bottom of button 34 to above or closely adjacent the top of wall 46 (as shown in FIG. 3). The actuator is then pivoted 90° about the axis of shafts 84 until support portion 94 is snapped under detents 68 and the front of the support portion engages top wall 42 (FIG. 9). Stem 14 and wall 46 are now fully exposed and accessible, permitting containers 10 and 100 to be locked together with their respective valve stems 16, 106 in communication.

Projecting guide key 49 provides ready identification and facilitates proper alignment of the user and supply containers 10, 100. Coordinated keys 47 and 48 are correlated in angular position with guide key 49 so that only the proper supply and auxiliary packages may be coupled together. In a transfer operation, as indicated in FIG. 9, the packages 10, 100 are axially aligned and then moved relatively together snugly slip-fitting wall 46 and stem 16 into, respectively, the recess defined by wall 130 and upper socket portion 116. With particular reference to FIG. 8, lugs 47, 48, 49 fit within, respectively, keyways 136, 138, and 140. With the top of stem 16 fitted in socket 116 and guide key 49 aligned with keyway 140, the containers are pushed manually together. The two containers may now be relatively rotated, and the interaction between the cam surfaces 50 and 51 of the lugs of container 10 and locking surfaces 142 of the keyways of container 100 will secure the containers together. In this position valve stems 16 and 106 are depressed and the respective valves of the two containers are open, permitting material from supply container 100 (which is at higher pressure) to flow into user container 10.

After refilling, the supply and user containers are disconnected by relative rotation to release the latches. The valves close and the containers are separated. The actuator button 32 is then pivoted up to the position shown in FIG. 3 and slid down onto stem 16 to the dispensing position shown in FIG. 2. Guide ribs 82 assist in the proper alignment of actuator 32 on stem 16, the chamfer surface 84 of rib 82A receiving indexing projection 49 for initial guidance. In this position, user container 10 is again ready for conventional use by the consumer.

A typical consumer may have several different pressurized dispensing user packages, each of which contains a different substance. It is important to insure that, for example, a container of shaving cream is not refilled with mosquito repellant. The supply and user containers 10 and 100 are coordinated so that only properly correlated containers may be fitted together. In the disclosed system, guide projection 49 will fit only within keyway 140, it being too wide for keyways 136 and 138. Lug 49 and keyway 140 thus serve as an indexing function, facilitating the proper relative rotational orientation of the two containers.

The angular position of identification projections 47 and 48, and of keyways 136 and 138, is a function of the contents of the particular container so that two containers, when properly rotationally oriented by the indexing system, may be interlocked only if the identification keys and keyways are also properly aligned. For example, the identification projections or keyways of a user container of shaving cream are located in positions that are angularly (relative to indexing key or keyway) different from the positions of the identification keys of a user container of mosquito repellant, so that it is

physically impossible to connect an incompatible supply container.

For further safety and convenience, it may be further desirable to color code or otherwise optically identify the keys and/or other portions of the packages.

Other embodiments within the scope of the appended claims will occur to those skilled in the art.

What is claimed is:

1. In combination:

a first pressurized dispensing package of the type including discharge control valve structure;
a second pressurized dispensing package of the type including discharge control valve structure;
and transfer structure including structure for defining a closed duct for communication between said discharge control valve structures, each said package further including

interconnecting structure including a latch surface for engagement with the latch surface of the interconnecting of the other package, said interconnecting structures, in latched engagement, maintaining said transfer structure and said packages in fixed position relative to each other and in communication with each other through said control valve structures for transfer of material from one package to the other in a refilling operation.

2. The combination of claim 1 wherein one of said interconnecting structures includes a recess and the other of said interconnecting structures includes a projecting lug, said recess and lug being arranged so that relative engagement of cooperating surfaces of said recess and said lug latch said interconnecting structures together and prevent movement of said packages relatively apart.

3. The combination of claim 1 wherein said transfer structure comprises a member having a pair of recesses and an internal duct portion connecting said recesses, each of said recesses being arranged for receiving at least a portion of one of said discharge passage structure.

4. The combination of claim 1 wherein one of said interconnecting structures includes a first wall member having a plurality of projecting members and the other of said interconnecting structures includes a second wall member having cooperating recesses for engaging said projecting members.

5. The combination of claim 4 wherein said wall members are cylindrical.

6. The combination of claim 5 wherein said interconnecting structures includes means for permitting said communication only when said wall members are in one predetermined position of angular orientation.

7. The combination of claim 4 wherein said wall members are arranged to mate in sliding relation and one of said projecting members is of size different from the size of another of said projecting members permitting said packages to be brought into communication only when said contents are such that the mixing of said contents is desirable.

8. In combination:

a first pressurized dispensing package of the type including discharge control valve structure;
a second pressurized dispensing package of the type including discharge control valve structure;
and transfer structure including structure for defining a closed duct for communication between said dis-

charge control valve structures, each said package further including

interconnecting structure including indexing means having a predetermined relationship to the contents of its package, said indexing means being arranged to engage one another and permitting said packages to be brought into communication only when said contents are such that the mixing of said contents is desirable.

9. The combination of claim 8 wherein each said interconnecting structure includes a guide wall for in part locating its package relative to a cooperating package, an indexing portion, and a second portion, the position of said second portion relative to said guide wall and said indexing portion being predetermined with relation to the contents of its package.

10. The combination of claim 9 wherein each said guide wall is cylindrical and said indexing portions permit engagement of said guide walls in only one position of angular orientation of said packages.

11. A pressurized dispensing package of the type including a valve assembly having a valve stem with a passage therethrough extending upwardly from a container closure, a support cap mounted on said container, and an actuator including a recess for receiving at least a portion of said stem,

said actuator and said cap including cooperating portions permitting movement of said actuator relative to said cap in a direction generally parallel to the axis of said stem between a first position wherein said stem is seated within said recess and a second position wherein said actuator is spaced from said stem with said recess generally aligned with said stem, said cooperating portions including stop means for preventing movement of said actuator relatively away from said cap in said direction beyond said second position,

said cooperating portions providing for pivotal movement of said actuator relative to said cap about an axis generally perpendicular to said direction from said second position to a third position wherein said actuator is spaced to one side of and said recess is out of alignment with said stem, said cooperating portions of said cap include an upstanding guide wall extending generally parallel to the axis of said stem, said wall being arranged for guiding said actuator during said movement between said first and second positions, and at least one indexing portion for engagement with a cooperating portion of a second pressurized dispensing package when said cap and actuator are in said third position.

12. The package of claim 11 and further including a second cooperating portion, the position of said second portion relative to said guide wall and said indexing portion being predetermined with respect to the contents of said package and said second package.

13. The package of claim 12 wherein said guide wall is cylindrical and further including latching structure for maintaining said package in position relative to said second package during a material transfer operation.

14. The package of claim 11 and further including a second pressurized dispensing package having an upstanding tubular valve stem; and transfer structure for engaging both of said stems for providing communication between said stem when said actuator and said cap are in said third position.

15. The combination of claim 14 wherein said transfer structure includes adjacent the end thereof nearer said second package a radially outwardly extending flange, said second package includes a support cap mounted thereon, and said transfer structure and said second package support cap include cooperating portions for permitting limited movement of said transfer structure relative to said second package in a direction substantially parallel to the axis of said transfer structure and for preventing relative rotational movement of said transfer structure and said second package.

16. The combination of claim 14 and further including interconnecting structure engaging and secured to each of said packages for maintaining said packages in position relative to each other with said stems in communication.

17. The combination of claim 16 wherein one of said interconnecting structures includes a plurality of lugs and the other of said interconnecting structures includes a plurality of guides associated with the other of said packages, each of said guides being arranged for engaging a corresponding one of said lugs.

18. The combination of claim 17 wherein a lug and a cooperating guide include camming surfaces, the camming surface of the lug engaging the camming surface of the guide and relative rotation of said packages with said camming surfaces in engagement causing said packages to be drawn together.

19. The combination of claim 18 wherein said interconnecting structures includes indexing means, each said indexing means having a predetermined relationship to the contents of its package and said indexing means permitting said stems to be brought into communication only when said contents are such as that mixing of said contents is desirable.

20. A pressurized dispensing package system comprising

a first pressurized dispensing package having projecting discharge passage structure and interconnecting structure,

a second pressurized dispensing package having projecting discharge passage structure and interconnecting structure,

said interconnecting structures of said packages being arranged for cooperating engagement for maintaining said packages in fixed position relative to each other, and transfer structure including structure defining a closed passage providing communication between the discharge passage structures of said first and second packages when said packages are maintained in said fixed position by the engaged interconnecting structures to permit transfer of material from one package to the other through said discharge passage structures and said transfer structure in a refilling operation.

21. The system of claim 20 wherein one of said interconnecting structures includes a plurality of lugs and the other of said interconnecting structures includes a plurality of guides associated with the other of said packages, each of said guides being arranged for engaging a corresponding one of said lugs.

22. The system of claim 21 wherein each of said lugs and guides include camming surfaces, a camming surface of each lug engaging a camming surface of a guide and relative rotation of said packages with said camming surfaces in engagement causing said packages to be drawn together.

23. The system of claim 22 wherein said interconnecting structures include indexing means having a predetermined relationship to the contents of each of said packages for permitting said discharge passage struc-

tures to be brought into communication only when said contents are such as that mixing of said contents is desirable.

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