

FIG. 16

FIG. 15

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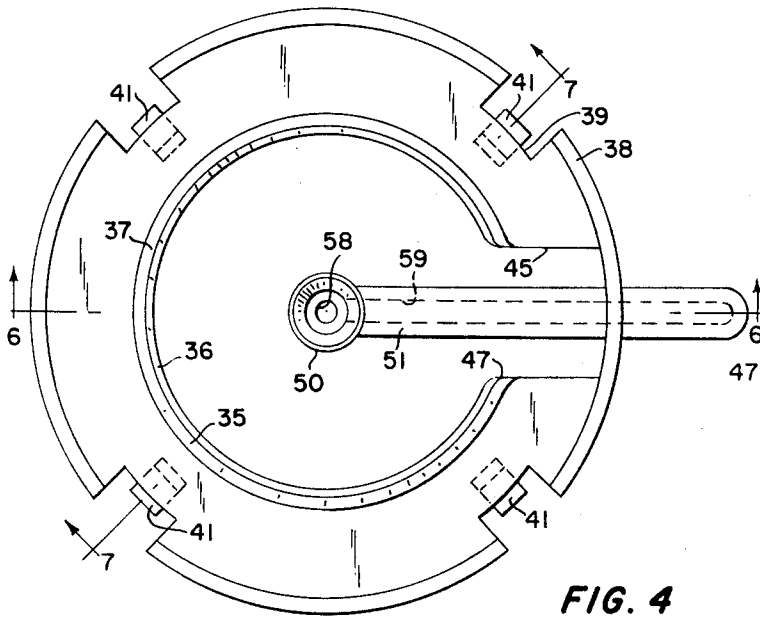


FIG. 4

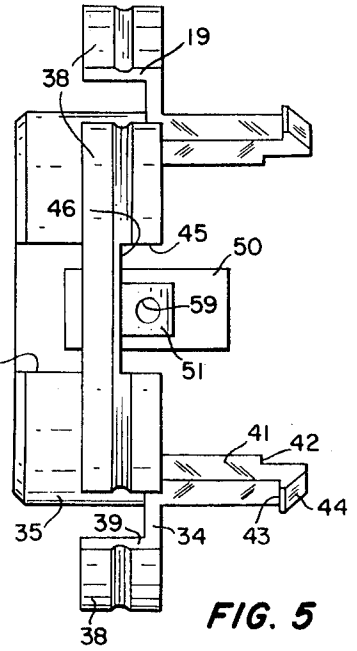


FIG. 5

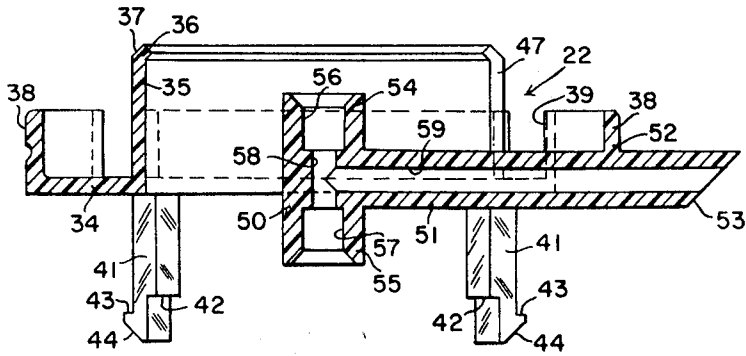


FIG. 6

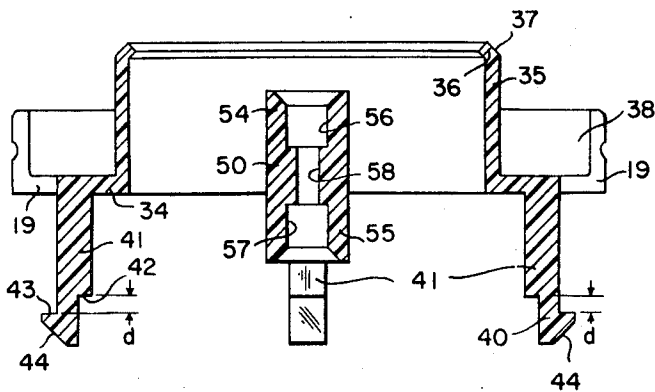


FIG. 7

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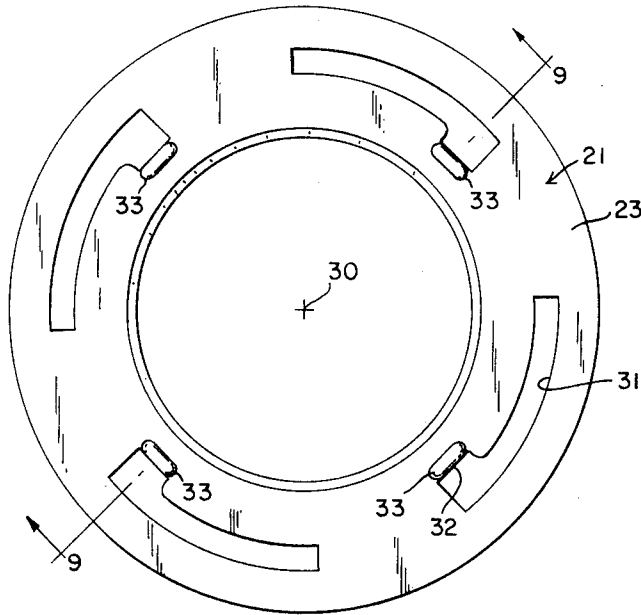


FIG. 8

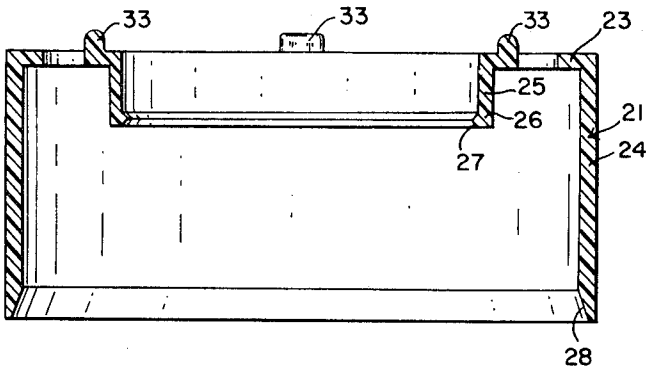


FIG. 9

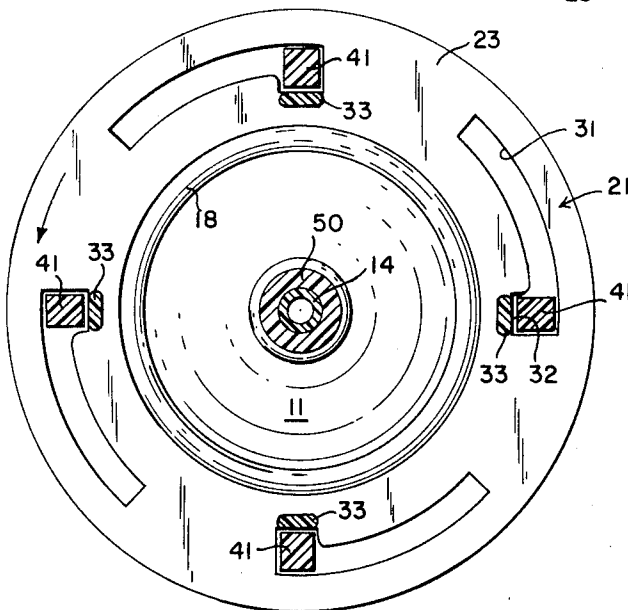


FIG. 10

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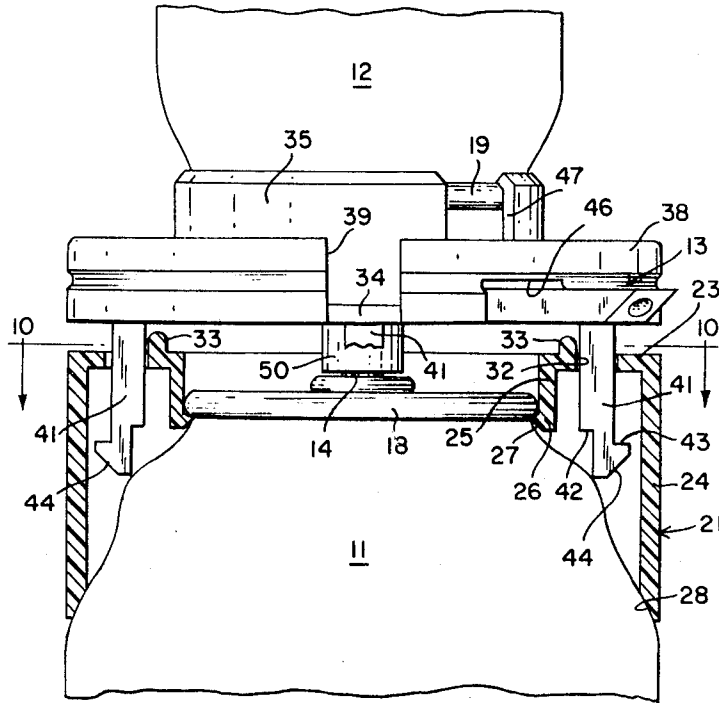


FIG. 3

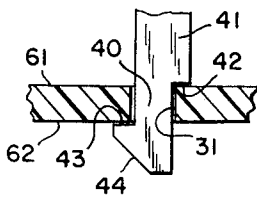


FIG. 11

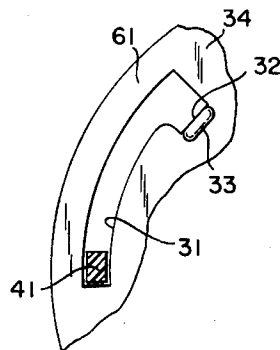


FIG. 13

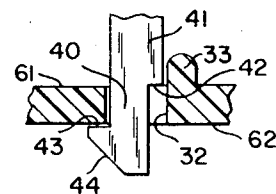


FIG. 12

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DISPENSING PACKAGE AND CONNECTING DEVICE

BACKGROUND AND SUMMARY OF INVENTION

The invention relates primarily to a package including a special connecting device for the simultaneous dispensing and mixing of ingredients from two aerosol-type containers. A particular application is the production of warm shave cream lather by the exothermic interaction of a shave cream containing a sulfite dispensed from one container and an oxidizing agent such as hydrogen peroxide dispensed from another container into a mixing chamber section of a common discharge member.

Devices for the general purpose have been proposed as in Friedenbergs U.S. Pat. No. 3,240,396. The present invention distinguishes mainly over earlier proposals in that it contemplates a novel reliable connecting device for mounting conventional containers in operative relation and providing for their simultaneous discharge into the mixing chamber section of a common discharge spout, and this is the major object of the invention.

Other cosmetic fluid and related ingredient mixing and dispensing devices have been proposed as disclosed in Marafino U.S. Pat. Nos. 3,300,095 and 3,338,479. Also, generally in other fields devices have been proposed for simultaneously dispensing and mixing various materials maintained isolated in separate containers until the time of use. For example, see the U.S. patents to Kennedy et al No. 3,236,457; Boe et al. No. 3,096,001 and Lewis, No. 3,325,056.

The present invention provides a connecting device that may be used for the same purposes as any hitherto proposed. It is of novel construction consisting essentially of two relatively movable members each adapted for releasable connection to a discharge valve stem of a disposable aerosol container of conventional construction. The valve stems are automatically connected to a mixing chamber section of a discharge spout unit and they remain so connected as the members and respective associated containers undergo relative movement during dispensing. These and other more specific structural features are further objects of the invention as will appear from the following description of preferred embodiments.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a side elevation showing the invention in a preferred embodiment;

FIG. 2 is an enlarged fragmentary elevation partly broken away and partly in section showing the connecting device operatively associated with two aerosol-type containers for concurrent discharge, the parts being shown in nondispensing position;

FIG. 3 is an enlarged elevation partly in section and viewing the connecting device of FIG. 2 from a different direction, the parts being shown in dispensing position;

FIG. 4 is a top plan view of one member of the two part connecting device;

FIG. 5 is a side elevation of the connecting member of FIG. 4;

FIG. 6 is a section through the connecting member on line 6-6 of FIG. 4;

FIG. 7 is a section through the connecting member on line 7-7 of FIG. 4;

FIG. 8 is a plan view showing the other member of the connecting device;

FIG. 9 is a section substantially on line 9-9 of FIG. 8;

FIG. 10 is a section substantially on line 10-10 of FIG. 3;

FIG. 11 is an enlarged fragmentary view mainly in section showing the structural association of the members of the connecting device in nondispensing position with the legs of the upper member disposed in the narrow portions of the slots in the lower member;

FIG. 12 is a fragmentary plan view further illustrating the parts with the legs of the upper member disposed in the wide portions of the slots in the lower member; and

FIG. 13 is an enlarged fragmentary view mainly in section showing the structural association of the members of the connecting device in dispensing position.

FIG. 14 is a fragmentary section showing a further embodiment of the invention;

FIG. 15 is a fragmentary view showing the check valve chamber; and

FIG. 16 is a fragmentary plan view showing a modified slot-shape.

PREFERRED EMBODIMENTS OF THE INVENTION

The invention comprises a novel assembly wherein opposed containers 11 and 12 of the aerosol-type are interconnected through a connecting device indicated at 13 to provide for comingled discharge of their contents.

Container 11 is of the usual type having an axially projecting depressible hollow discharge stem 14 which when depressed into the container actuates an internal valve to discharge the container contents through bore 15. Similarly container 12 is of the usual type having an axially depressible hollow discharge stem 16 which when depressed into the container actuates an internal valve to discharge the container contents through bore 17. Valve stems 14 and 16 are associated within their respective containers with suitable discharge valves (not shown) that are preferably of the type disclosed in Ablaplanalp U.S. Pat. No. 2,631,812 dated Mar. 17, 1953.

Containers 11 and 12 are formed adjacent their discharge ends with rounded annular beads 18 and 19 respectively, such being conventional structure.

Connecting device 13 is preferably a two part assembly consisting of integral molded plastic members 21 and 22.

Member 21 comprises a transverse annular top wall 23 from the outer periphery of which depends at right angles a cylindrical outer skirt 24. At the inner periphery of wall 23 depends at right angles an inner cylindrical skirt 25 that is inturned at its lower end to form a continuous flange 26 adapted to fit under container bead 18. The material of skirt 25 is of such inherent resiliency and the inclined lower edge 27 of flange 26 is such that, when member 21 is forced axially onto the top of container 11, flange 26 will resiliently cam over and slip under bead 18 to retain member 21 on container 11. The outer skirt 24 is preferably of such axial length that its tapered lower edge 28 fits snugly with the container wall as shown in FIG. 2. Thus member 21 is axially releasably attached to container 11.

As shown in FIGS. 8 and 10 the top wall 23 is formed with a plurality of identical parallel edge arcuate slots 31. Four equally circumferentially spaced slots 31 are shown, and the radially inner edge of each slot at a corresponding end is recessed inwardly at 32 to define a region of enlarged width.

The arcuate edges of slots 31, which are of uniform width except at region 32; are preferably concentric with the centers of skirts 24 and 25 indicated at 30 in FIG. 8. A relatively short lug 33 projects upwardly from wall 23 at the inner edge of each enlarged slot region at 32.

Preferably slots 31 are about 45° in arcuate extent, although this is not critical.

Member 22 comprises an annular transverse wall 34 that has around its inner periphery an upstanding right-angle cylindrical inner skirt 35 that is inturned along its upper edge to define a flange 36 having an inclined camming surface 37. As shown in FIG. 2, when container 12 is thrust axially into member 22 flange 36 cams over the rounded bead 19 to snap fit under bead 19 and thereby axially releasably attach member 22 to container 12. The diameter of inner skirt 35 is preferably about the same as that of inner skirt 25 of member 21. The inner and outer skirts of each member are concentric.

At its outer periphery wall 34 is formed with an upstanding cylindrical outer skirt 38 preferably having about the same diameter as outer skirt 24 of member 21. As shown in FIG. 4, wall 34 and skirt 38 are cut out to form a series of equally circumferentially spaced edge recesses 39, and depending from the inner edge of each recess 39 is a rectangular cross section

leg 41. There are four legs 41, one for each slot 31 in the lower element.

Legs 41 are parallel to each other and extend at right angles to wall 34. The lower end of each leg 41, see FIG. 7, is formed on its inner side with a downwardly facing flat ledge 42. Each leg is formed on its outer side a small distance below ledge 42 with an upwardly facing flat ledge 43. Preferably the lower end of each leg is beveled inwardly from just below ledge 43 as shown at 44.

As will appear for a purpose the distance d between flat parallel ledges 42 and 43 is about equal to or preferably slightly greater than the thickness of wall 34. Each leg between ledges 42 and 43 has a reduced section 40 sized to the radial width of slot 31. The legs above ledge 42 have a radial width equal to the enlarged slot sections 32.

Referring to FIGS. 3, 4 and 5 it will be seen that wall 34 is formed with a relatively wide radial edge slot 45 (FIG. 5) which at its outer end (FIG. 3) extends up into skirt 38 to form a downwardly open recess 46 therein. At its inner end slot 45 extends up into inner skirt 35 to form the axially slotted region 47 therein.

A hollow discharge spout unit 51 having a rigid inlet structure 50 centrally within member 22 projects from the interior of element 22 radially outwardly through the space provided by slot 45 and, as shown in FIG. 5 its upper edge is integrally joined to skirt 38 at the upper edge of recess 46, the juncture being indicated at 52 in FIG. 6. The outer end of spout 51 is beveled at 53 for flow direction control.

At the inner end of spout 51 the inlet 50 is formed with upwardly and downwardly extending hollow bosses 54 and 55 provided with oppositely open bores 56 and 57 that are interconnected by a common coaxial passage 58 that is intersected at right angles by the discharge passage 59 through the spout. Passage 58 is effectively a mixing chamber wherein the ingredients of the respective containers intermix turbulently. As shown in FIG. 2, valve stems 14 and 16 respectively fit snugly into adapter bores 57 and 56 for end abutment with the bottom of these bores in the assembly, with their open ends aligned with passage 58.

The common axis of passage 58 and bores 56 and 57 coincides with the common axis of skirts 35 and 38, and in the assembly of FIG. 1 as will appear this axis coincides with axis 30 of FIG. 8.

The containers 11 and 12 are placed in assembly interconnected by device 13 by pushing them axially into the releasable retainer sockets provided by skirts 25 and 35 as shown in FIG. 2. As illustrated, by the time flanges 26 and 36 grip the container beads the valve stems 14 and 16 respectively will be bottomed in bores 57 and 56. As yet there is no discharge from either container since the valve stems have not been depressed. As will appear the flexible pivotal connection between the spout 51 and member 22 will permit the inlet end of the spout to shift to compensate for dimensional differences in the valve stems and bores.

At this time of assembly the two members 21 and 22 are in their axially separate positions shown in FIG. 2, wherein members 21 and 22 are so relatively rotated that legs 41 are all disposed at the smaller ends of slots 31 (see FIG. 13) and movement of members 21 and 22 toward each other is prevented by engagement of ledges 42 with the smooth planar upper surface 61 of wall 34, as shown in FIG. 11. At the same time ledges 43 all extend under the smooth planar parallel lower surface 62 of wall 34 in slidable relation thereto.

The foregoing represents the normal inactive condition of the assembly, during storage and when not dispensing.

In order to effect discharge of the contents of the containers, the operator merely rotates the containers relatively on their common axis (as by rotating lower container 11 counterclockwise as shown by the arrow in FIG. 10) as permitted by slots 31 and then pushes them toward each other when the legs 41 reach the wide regions 32 of the slots. During this turning movement ledges 42 and 43 slide along the opposite surfaces of wall 34 and prevent relative tilting of the members while retaining them in axial assembly.

FIGS. 10 and 12 show the relationship of parts when the legs have been disposed in the wide parts of the slots. While ledges 43 remain in slidable contact with undersurface 62 of wall 34, to prevent axial separation of members 21 and 22, ledges 42 are now clear of surface 61 and disposed above the wide region of the slot. It will be noted that lugs 33 abut the rear sides of legs 41 to prevent legs 41 from moving radially inwardly when the legs reach the FIG. 10 position, which insures that ledges 42 will be maintained clear of the top surface of wall 34.

At this point, when containers 11 and 12 are pushed toward each other, members 21 and 22 attached to each other will move along with them to the position shown in FIG. 3 and both valve stems 14 and 16 which have opposite end abutment with the rigid spout inlet 50 will be thereby depressed relative to their containers to discharge the same time into mixing passage 58 and out through the spout.

When the upper portions of legs 41 enter the wide slot regions 32 they effectively occupy those regions and relative rotation of members 21 and 22 is prevented, as shown in FIG. 10.

As the respective container contents meet and move together in passage 58 and through the spout, they intermix and may react chemically if so constituted. For example, when the contents of container 11 are a shave cream composition containing a sulfite and propelled by gas under compression, container 12 may contain an oxidizing fluid such as hydrogen peroxide under pressure which will admix with the composition in an exothermic interaction which will not change the effective properties of the shave cream but will result in discharge of warm lather from the outer end of the spout.

Referring to FIG. 6, it will be noted that the juncture 52 constitutes the sole point of attachment of spout 51 to member 22, and this juncture because of the inherent flexibility of the plastic from which element 22 is molded comprises an effective resilient pivot connection between the spout 51 and member 22. This pivotal connection enables the inlet end of spout 51 to accommodate and reposition itself to suit varying lengths of valve stems and eliminates the need for accurate determination of the lengths of bores 56 and 57. Spout 51 will merely tilt slightly about pivot 52 to suit the interfit of the valve stems with bores 56 and 57.

The invention therefore provides a novel package wherein the containers are conventional and disposable and one or both may be replaced when exhausted. Assembly requires only axial thrust of the containers into the connecting device, and operation for dispensing requires only simple sequential rotary and axial movements of small extent. When the manual pressure urging the containers toward each other for dispensing is relaxed, the internal resilient means in the containers urges them apart toward nondispensing position where the device may be locked by a simple rotary movement.

In assembly as shown in FIG. 1, a removable housing structure indicated at 61 in FIG. 1 is mounted to enclose upper container 12, the connecting device 13 and at least the upper part of lower container 11. This housing may be of two axially separable parts 62 and 63 one of which has a slot to pass spout 51 in assembly and in operation, and the housing inner diameter indicated at 64 is sized to a sliding friction slip fit over skirts 38 and 24 and the body container 11, all of which are substantially the same diameter.

With housing 61 in place the assembly may be operated for dispensing simply by pushing down on the housing which slides upon the skirts and lower container. The peripheral friction fit between container 12 and the reduced upper diameter 65 of the housing is such that rotation of the housing about axis 30 rotates container 12 along with it. An axially separable sliding circular joint 66 is provided between parts 62 and 63.

FIGS. 14-16 illustrate a further embodiment wherein there are some differences in structure and a safety device is incorporated to prevent the contents of one container from undesirably entering the other container under certain conditions such as when outlet spout 51 is blocked. It will be noted that normally no dip tube is used for container 12 since it is inverted.

In this embodiment, it will be noted that the spout inlet structure on lower member 21 is formed above the intersection of passages 58 and 59 with a check valve to prevent undesired discharge of fluid into the interior of container 12. As shown in FIG. 14 this check valve may comprise a light weight spherical ball 71 disposed in a chamber 70 and adapted to engage an annular seat 72 to block fluid from entering the upper passage section 73. Normally ball 71 rests on ribs 74 in the lower part of chamber 70 so that the chamber is always open to passage 58.

For purposes of assembly seat 72 and passage portion 73 may be formed on the lower end of a hollow plug 75 press fitted into the inlet structure into a shoulder in alignment with passage 58. Plug 75 has an internal shoulder 76 against which abuts the upper valve stem 16.

Thus, should passage 59 become blocked, internal build up of pressure in the spout inlet will force ball 71 onto seat 72 and prevent the possibility of discharge of material from container 11 into container 12. In normal operation with the spout clear, the relative pressures are such that ball 71 floats in chamber 70 permitting discharge from both containers into passage 59. Floating ball 71 help mix the discharged materials.

In this embodiment an outer cylindrical skirt 80 extends up from transverse wall 23 and upper member 22 is formed with an annular transverse flange 82 that is adapted to longitudinally slidably fit within the guide provided by the inner periphery 76 of skirt 74. This helps prevent relative tilting of the containers during operation.

Legs 41 here integrally depend from flange 82 and their lower ends are formed as in the FIG. 1-13 embodiment to project into and coast with slots 77 in wall 23. As shown in FIG. 16, slots 77 are the same as slots 31 illustrated for example in FIG. 13 except that the outer arcuate edge 78 has a shoulder 79 which the leg encounters just before entering the wide region 81, so that a positive force is necessary to move the leg past shoulder 79. This prevents unintentional relative displacement of the parts to discharge position.

The foregoing structure shown in FIGS. 14-16 could be used in the embodiment of FIGS. 1-13.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What I claim and desire to be secured by Letters Patent is:

1. A dispensing package comprising opposed containers each having movable discharge means for discharging the contents thereof, connector means mounting said containers in assembly, said connector means comprising first and second members mounted on the respective containers and connected for relative rotation, cooperating means on said members effective in a first position of relative rotation for preventing relative axial movement between said containers and effective in a second position of relative rotation for permitting relative axial movement between said containers and toward each other, and a discharge spout on said connector means for receiving both said container discharge means and for simultaneously dispensing and mixing the contents of said containers, whereby said contents are dischargeable from said containers through said spout only when said cooperating means is in said second position and said first and said second members and their respective containers are moved toward each other.

2. The dispensing package defined in claim 1, wherein said cooperating means comprises means providing only limited relative rotation of said members between said first and second positions.

3. The dispensing package defined in claim 1, wherein said members are provided with aligned opposed resilient sockets for mounting said containers on said connector means.

4. A connecting device adapted to dispense simultaneously the contents from opposed aligned containers each having a discharge means, said device comprising first and second members respectively adapted to be operatively connected to said containers, said members being connected for relative rotation and having cooperating means which in a first position of said relative rotation is effective and in a second position of said relative rotation is effective to permit axial movement between said members and toward each other, and a discharge spout on one of said members adapted to receive both said container discharge means and to dispense simultaneously the contents of both containers, whereby said contents are dischargeable from said containers when said cooperating means is in said second position and said first and second members and their respective containers have been moved toward each other.

5. In the connecting device defined in claim 4, said cooperating means comprising means connecting said members for only limited relative rotation between said first and second positions.

6. In the connecting device defined in claim 4, each of said members having a resilient socket for releasably mounting a container.

7. In the connecting device defined in claim 4, said spout being flexibly connected to said one member.

8. In the connecting device defined in claim 4, each of said members being an integral molded plastic structure.

9. In the connecting device defined in claim 4, one of said members comprising means defining a guide slot having a uniform width section and a wider section and the other of said members comprising a projection extending slidably into said slot, said projection being slidable along said slot between said sections, cooperating means on said projection and adjacent said slot for limiting axial separation of said members, and cooperating means on said projection and adjacent said slot for preventing movement of said members toward each other except when the projection is in the wider section of the slot.

10. In the connecting device defined in claim 9, said slot being formed in a transverse wall of said one member and said cooperating means comprising opposed ledges on said projection adapted for sliding engagement with opposed surfaces of said wall.

11. In the connecting device defined in claim 10, a second projection on said wall at said wider slot section for preventing one of said ledges from extending over said wall at said wider slot section.

12. In the connecting device defined in claim 9, there being a plurality of cooperating slots and projections, spaced equally circumferentially around said device.

13. In the connecting device defined in claim 4, said discharge spout comprising a transverse tube having an inlet end axially centered in said device and formed with opposed bores for receiving respective valve stems of the containers, said bores being connected by a passage defining a mixing chamber laterally intersected by the passage defined by said tube, and said spout being integrally flexibly mounted on one of said members radially outwardly of said inlet member.

14. In the connecting device defined in claim 4, said members respectively having coaxial opposed inner skirts formed with container attaching end flanges.

15. In the connecting device defined in claim 4, check valve means in said discharge spout for preventing the contents of one container from passing into the other container.

16. In the connecting device defined in claim 4, means in said discharge spout for promoting admixture of said discharging container contents.

17. In the connecting device defined in claim 4, means in said cooperating means for preventing unintentional relative movement of said members into said second position.

18. A connecting device adapted to dispense simultaneously the contents from opposed aligned containers each having a depressible discharge valve stem projecting therefrom, said

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device comprising a transversely extending hollow spout formed at its inner end and centrally of said device with an inlet structure adapted to receive the contents discharged from said valve stems and containing a passage intermediately intersected by the opening through the spout and terminating at opposite ends in enlarged bores within which said valve stems are adapted to bottom when the device is assembled with said containers, and means flexibly mounting said spout on said device at a location disposed laterally outwardly of said inlet whereby said spout may displace to accommodate during assembly with said containers.

19. A connecting device adapted to dispense simultaneously the contents from opposed aligned containers each having a depressible discharge valve stem projecting therefrom, said device comprising a transversely extending hollow spout formed at its inner end and centrally of said device with an inlet structure adapted to receive the contents discharged

from said valve stems and containing a passage intermediately intersected by the opening through the spout and terminating at opposite ends in enlarged bores within which said valve stems are adapted to bottom when the device is assembled with said containers, and check valve means in said inlet for preventing discharge of the contents of one container through said passage into said other container.

20. In the connecting device defined in claim 19, said check valve comprising an annular seat within that portion of the passage that extends between its intersection with the spout and the bore for receiving the other container, and a ball mounted for limited free float in said passage, said ball being pressure balanced and free of said seat when said containers are discharging in normal operation, but being forced onto said seat by predetermined excess pressure in the other portion of said passage.

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