Feb. 17, 1959 J. J. SPERO 2,873,887

DEVICE FOR DISPENSING STRIPED MATERIALS

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FIG. 1

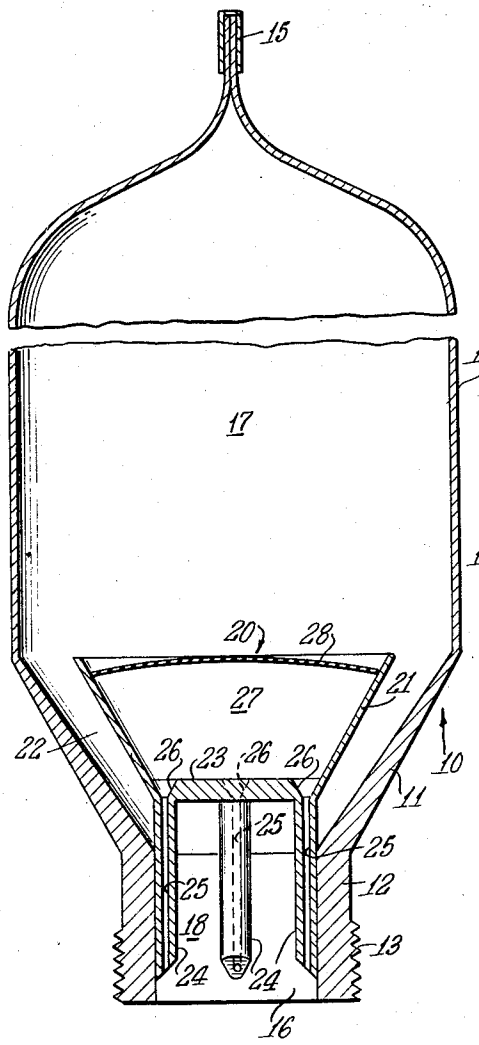
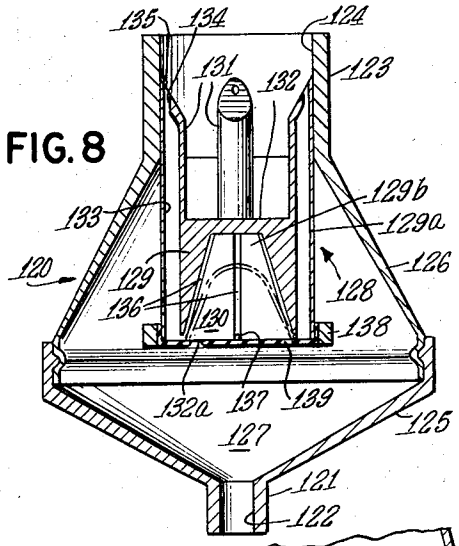


FIG. 8



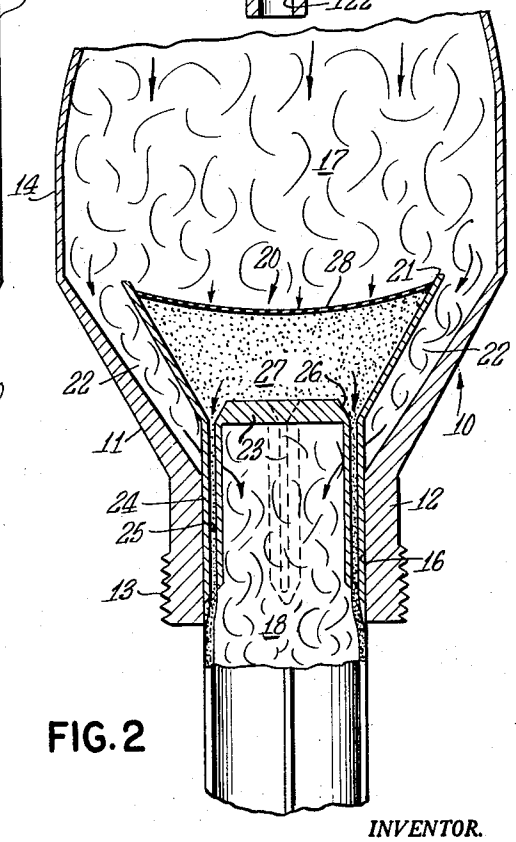


FIG. 2

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FIG. 5

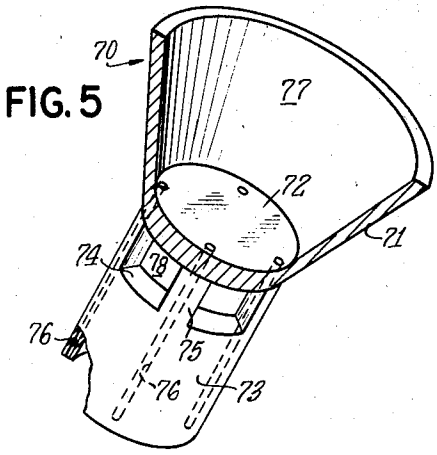


FIG. 3

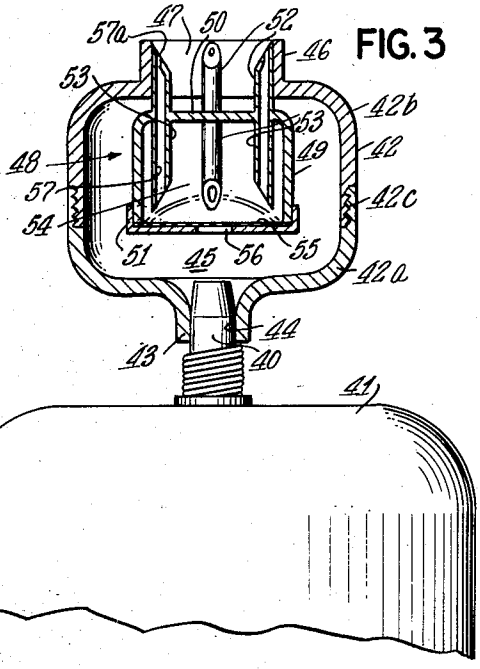
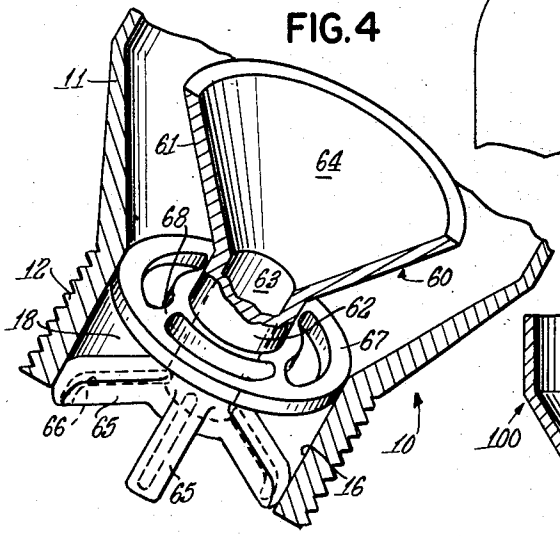


FIG. 4



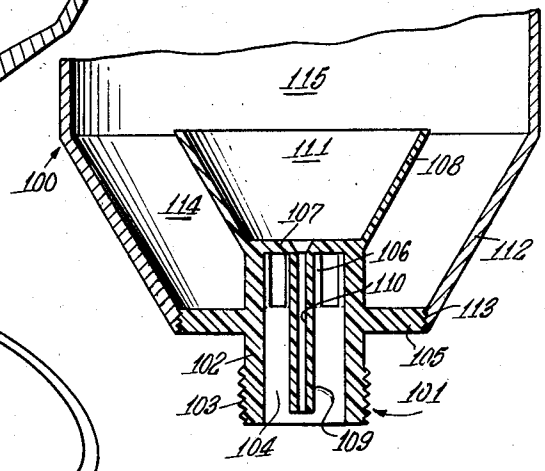
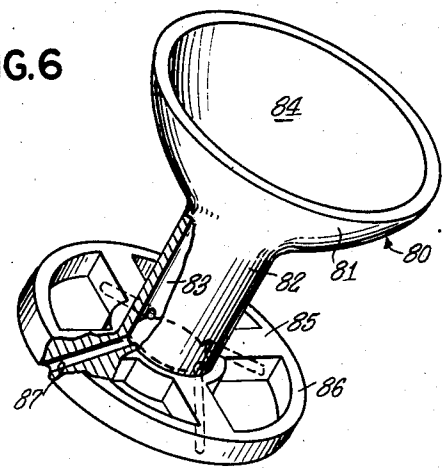


FIG. 7

FIG. 6



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2,873,887

DEVICE FOR DISPENSING STRIPED MATERIALS

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Application April 24, 1957, Serial No. 654,689

14 Claims. (Cl. 222—94)

My invention relates to dispensing fluent materials, such as pastes and the like, and in particular provides a device for dispensing two or more such materials simultaneously.

Thus it is a principal object of my invention to provide a device for dispensing two or more materials of different color as a color striped stream for the purpose of presenting the dispensed materials in attractive product form. In this aspect of my invention, I particularly contemplate providing a color striped tooth paste product for the purpose of encouraging children to clean their teeth. In addition the device is useful in cake decorating, candy manufacture and in the manufacture of other food products, cosmetics and the like where a color stripe effect is desirable for ornamental purposes. Generally in forming color striped products with the device of my invention coloring materials, such as food dyes, are added to different portions of the same base material to achieve the color effect desired.

It is also a principal object of my invention to provide a device for dispensing a striped stream of two or more materials which differ in some other characteristic in addition to color or which differ in some characteristic other than color. In this aspect of my invention, I particularly contemplate dispensing materials simultaneously which, because they tend to degrade upon contact with each other, must be separately stored prior to dispensing. Thus, for example, it is frequently desirable to add to cosmetics, dentifrices and similar materials active ingredients, such as certain vitamins, which rapidly deteriorate upon dilution in the particular base material. My invention permits such base materials and additives to be stored separately in a single container and dispensed simultaneously.

In addition to these general objects of my invention it is a further object of my invention to provide a device of the general character described which is simply fabricated, filled and assembled and which assures dispensing of the several materials in constant proportion one to the other.

It is still another object of my invention to provide a dispensing device of the general character described which can be constructed to dispense two or more materials simultaneously as a single stream in which the striping of one material in the other can be located in the stream at a single or plurality of positions either at the surface of the stream or within the stream, or both.

It is yet a further purpose of my invention to provide a device of the general character described which can usefully be employed in dispensing of materials from collapsible containers or from rigid containers assisted by an impeller, such as a piston, or which can be employed to add a stripe of a different material or color, or both, to a stream of material dispensed from an entirely separate container.

It is still a further object of my invention to provide a device of the general character described which is capable of simultaneously dispensing materials of different

consistency, for example, in striping a paste-like material with a thin liquid.

These and other objects of my invention are generally obtained utilizing the arrangement which is the subject matter of United States Patent 2,789,731 to Leonard L. Marraffino, by which pressure applied to a fluent material retained in a chamber is transmitted by the material to at least a second fluent material which is retained in the same chamber as the first to dispense each material through separate discharge passageways which eventually lead to the same outlet orifice. The devices constructed in accordance with my invention, however, differ from those specifically described in the aforenoted patent in that the present devices do not pass the stream of the first material through the center of the second material as in the specific devices of the patent. Specifically I contemplate storing the second material or materials in a vessel which is supported in a main chamber adjacent to and spaced from the inner end of a main discharge passageway such that movement of the first body of material from the main chamber passes around the outside of the vessel and then into the main discharge passageway. Discharge of material from the small vessel, which is open to the interior of the main chamber at a point remote from the discharge passageway is accomplished by providing one or more legs, each having a conduit which communicates with the interior of the vessel and leads through the legs or legs into the main discharge passageway. As pressure is applied to the body of material in the main chamber it is thus transmitted by the material to the contents of the vessel and as the body of material is dispensed from the main chamber around the vessel and into the discharge passageway the contents of the vessel are forced to flow out through the leg or legs forming a stripe in the dispensed stream of the material wherever a leg terminates. Simply by proper positioning of the leg or legs the material from the vessel can be introduced into the dispensed stream at any desired location.

For a more complete understanding of the practical application of the principles of my invention reference is made to the appended drawings in which:

Figure 1 is a longitudinal section through a collapsible container provided with a dispensing device in accordance with my invention;

Figure 2 is a similar view of the same devices shown in Figure 1, illustrating the manner by which two materials are dispensed in the form of a surface striped stream;

Figure 3 is a partially sectioned, elevational view illustrating a device similar to that of Figures 1 and 2 employed in connection with striping a stream of aerosol product;

Figure 4 is a partially sectioned, fragmentary isometric view of a modification of the device shown in Figures 1 and 2;

Figure 5 is a partially sectioned, isometric view of a modification of a portion of the device shown in Figure 4;

Figure 6 is a partially sectioned isometric view of still another modification of a portion of the device shown in Figure 4;

Figure 7 is a fragmentary, longitudinal section of yet another device constructed in accordance with my invention; and

Figure 8 is a fragmentary, longitudinal section of still another device constructed in accordance with my invention.

Referring to Figure 1 the reference numeral 10 designates a collapsible container of conventional construction. Container 10 includes a tapered neck end 11 having cylindrical nozzle 12 at its apex suitably provided with external threads 13 for receiving a cap. The main body of container 10 is formed by a cylindrical side wall 14 attached at one end to neck 11 and closed together at

its other end as indicated by the reference numeral 15. Suitably container 10 is fabricated in one piece of a flexible material, such as lead, and is formed more thickly at neck 11 and nozzle 12 than at side wall 14 to impart a greater degree of rigidity to neck 11 and nozzle 12. Nozzle 12 is provided with a wide axial bore 16 forming a discharge passageway 18 leading into a main chamber 17 confined by neck 11 and side walls 14.

Positioned within neck 11 is a vessel 20 having a conical side wall 21 which is spaced from the inner wall of neck 11 forming a passageway 22 of annular cross-section leading from chamber 17 to discharge passageway 18. The bottom 23 of vessel 20 is entirely closed except as otherwise noted below and is located adjacent to and spaced a short distance from discharge passageway 18. Thus passageway 22 freely communicates with discharge passageway 18.

Four legs 24 are attached to bottom 23 of vessel 20 spaced at equal arcuate intervals about its edge and extend parallel to each other into discharge passageway 18. Legs 24 are arranged to fit tightly within bore 16 and thus support vessel 20 in the position described above.

Each of legs 24 is provided with a bore 25 extending through the entire length of its respective leg 24 and extending through bottom 23 at one end, as indicated by the reference numeral 26, thus communicating the interior 27 of vessel 20 with discharge passageway 18. Preferably the end faces of legs 24 remote from vessel 20, through which bores 25 open into discharge passageway 18, are faced inwardly on a slant and are set back a short distance from the outer end of bore 16.

A flexible, non-porous diaphragm, constructed of rubber or similar material, is placed inside the wide end of side walls 21 to cover the interior 27 of vessel 20.

Referring to Figure 2 which shows the same device as Figure 1, the interior 27 of vessel 20 is filled with a material, such as red tooth paste, and chamber 17 is filled with another material, such as white tooth paste. It will be noted that the wide end of vessel 20, that is, the end which is remote from discharge passageway 18, is freely open to the interior of chamber 17. Ordinarily where the materials in chambers 17 and 27 do not tend to degrade upon contact diaphragm 28 can be omitted. If, however, there is a tendency of deterioration of one material upon contact with the other, for example, if the red dye employed in coloring the tooth paste in chamber 27 tends to bleed into the white material, it is preferable to separate the two materials using flexible diaphragm 28. Alternatively a layer of flexible wax can be sprayed on the exposed surface of the material in vessel 20, or the same surface can be covered by a layer of inert fluent material, such as petroleum jelly.

When it is desired to employ container 10 side walls 14 are squeezed in the conventional manner. This forces the body of white material contained in chamber 17 to move toward discharge passageway 18. Most of the material so moved will flow through passageway 22 between legs 24 into passageway 18 causing a rod of material to stream forth from nozzle 12. Some of the white material will be displaced, however, into the open end of vessel 20 forcing the red material retained in chamber 27 through openings 26 into bores 25 eventually forming stripes on the surface of the rod of material streaming from nozzle 12. If a flexible covering, such as diaphragm 28, is employed it will flex toward the bottom 23 of vessel 20 as the contents of container 10 are thus dispensed.

It will be noted that the inwardly slanted end faces of legs 24 facilitate movement of the stream of stripe material to the outer surface of the main rod issuing from discharge nozzle 12. If the end faces had been terminated without this slant there would be a tendency for the striped stream to penetrate more deeply into the rod. This result can, of course, be also avoided where it is not desired by providing an inwardly extending flange at the outer end of bore 12.

Figure 3 illustrates a device similar to that shown in Figures 1 and 2 for attachment to the discharge nozzle 40 of a typical aerosol container 41 employed, for example, for containing cream and a suitable pressurizing and expanding agent. Typically slight lateral pressure against discharge nozzle 40 opens a valve in container 41 releasing a foamy cream product from discharge nozzle 40.

In this arrangement of my invention I utilize a rigid two piece receiver 42 which is provided at one end with a fitting 43 having a bore 44 which can be wedged on the exterior of discharge nozzle 40 such that the product discharged from container 41 will pass into the interior chamber 45 of receiver 42. At its end opposite inlet 43 receiver 42 is provided with a cylindrical discharge nozzle 46 having a bore 47 leading to the interior 45 of receiver 42. It will be noted as shown in the drawings receiver 42 comprises a lower shell 42*a* which carries inlet fitting 43 and an upper shell 42*b* which carries discharge nozzle 46. These two pieces are held together normally by a threaded joint 42*c*.

A small vessel 48 is provided with an integral cylindrical side wall 49 and upper end closure 50, and a snap fit cap 51 over its lower end. Four legs 52 extend upwardly from end 50 and are spaced parallel to each other at arcuate intervals about the periphery of end 50. Vessel 48 is positioned in receiver 42 with its end 50 adjacent to and spaced inwardly from the lower, inner end of bore 47 of discharge nozzle 46. Legs 52 thus extend into bore 47 frictionally engaging the wall of bore 47 to hold vessel 48 in position. Legs 52 also extend downwardly from end 50, as indicated by the reference numbers 53, into the space 54 enclosed by side wall 49.

A flexible, non-porous, thin diaphragm 55 resting at its periphery in the corner formed between side wall 49 and cap 51 extends across the open bottom of vessel 48 above cap 51, and a small aperture 56 is formed at the center of cap 51. Legs 52 and their lower extensions 53 are provided with bores 57 extending therethrough which communicate the space 54 in vessel 48 with the interior of bore 47. Bores 57 as they enter bore 47 are restricted in diameter as indicated at 57*a*.

To assemble the device shown in Figure 3, for example, to dispense a color and flavor striped whipped cream product, space 54 of vessel 48, held in inverted position, is charged with a thin sugar syrup, suitably peppermint flavored and colored with a pink dye. Diaphragm 55 is then positioned across the open end of vessel 48, and cap 51 is snapped on over the edges of side wall 49 to retain diaphragm 51. Vessel 48 is then positioned in upper shell 42*b* by forcing the end portions of legs 52 into bore 47 from within upper shell 42*b*. Shells 42*a* and 42*b* are threaded together, and receiver 42 is then inverted and affixed to aerosol can 41 by wedging nozzle 40 of can 41 into bore 44 of inlet fitting 43, as shown in Figure 3.

It will be evident that the device shown in Figure 3 is particularly suitable for striping aerosol products which are dispensed from the conventional upright can, because of the extension of leg portions 53 into the interior 54 of vessel 48. Also because of such extension, liquid striping materials can be handled, even when receiver 48 is inverted. It will also be noted that the lower ends of leg portions 53 are inclined inwardly and upwardly to permit diaphragm 55 to stretch into space 54. The principal purpose of aperture 56 is to reduce the impact of aerosol product against diaphragm 55 where the striping material is a thin liquid. Accordingly more than one such aperture can be employed, where desired, cap 51 can be omitted and replaced simply by a retaining ring.

When the striped aerosol product is to be dispensed, lateral force is applied to receiver 42 causing nozzle 40 to bend thus opening the valve in can 41 in the conventional manner. Whipped cream product is thereupon dispensed under the internal pressure of can 41 through nozzle 40 into interior 45 of receiver 42. As the

whipped cream product fills interior 45, it flows past the space between side wall 49 of vessel 48 and the inner wall of shell 42*b*, between legs 52 and out through bore 47 of discharge nozzle 46. At the same time a small amount of whipped cream enters aperture 56 causing the center of diaphragm 55 to flex upwardly (see dashed lines in Figure 3) displacing the colored and flavored material in space 54 of vessel 48 to flow out through bores 57 of legs 52—53 into bore 47 of discharge nozzle 46 in four distinct streams. Hence, as the whipped cream product is dispensed from discharge nozzle 46, the surface of the discharged product carries four distinct pink stripes having a peppermint flavor. Diaphragm 55 returns to its original shape upon release of pressure. When pressure again is introduced diaphragm 55 acts as a piston and pushes out more stripe material.

It will also be evident that the structure of vessel 20 in Figures 1 and 2 and of vessel 48 in Figure 3 can be varied substantially to provide alternate modes of supporting the vessel. Thus in Figure 4, which shows a fragmentary view of container 10 shown in Figures 1 and 2, a vessel 60 is shown in place of vessel 20. Vessel 60 has a conical side wall 61 and is provided with a leg 62 attached at the apex end of side wall 61 extending centrally into discharge passageway 18 formed in bore 16 of discharge nozzle 12 of container 10. Leg 62 is hollow and opens at its end attached to vessel 60 to communicate its interior 63 with the interior 64 of vessel 60.

The end of leg 62 adjacent to the outlet end of discharge nozzle 12 is closed and carries four angularly disposed feet 65 which are attached to leg 62 at equal arcuate intervals about its closed end and which lead at their outer ends to the inner wall of discharge nozzle 12 which defines bore 16. Each foot 65 is bored, as indicated by the reference numeral 66, to communicate at its inner end with interior 63 of leg 62. Each of bores 66 at the outer end of its respective foot 65 is turned toward the orifice end of discharge nozzle 12 and opens into bore 16.

A ring 67 supported by spaced spokes 68 is traversely mounted on leg 62 as hub end is frictionally received in bore 16 at its periphery thus supporting vessel 60 in neck 11 of container 10.

The functioning of the device shown in Figure 4 is substantially that described above with respect to vessel 20.

Figure 5 shows another modification of vessel 20 in which the leg structure is formed from a tube in order to give superior support for the vessel in the bore of the discharge nozzle of a suitable container or other receiver.

In Figure 5 a vessel 70 is provided having a conical side wall 71 closed across its bottom 72 and carrying a tube 73 on its bottom 72 suitably formed as an integral piece with side wall 71 and bottom 72. Tube 73 has an outside diameter which will be tightly received in a discharge nozzle such as nozzle 12 of Figure 1. Tube 73, adjacent to bottom 72, is provided with four windows 74 spaced at arcuate intervals about tube 73 defining four legs 75 extending from the bottom 72 of vessel 70. Each of legs 75 is provided with a bore 76 which communicates at one end with the interior 77 of vessel 70 enclosed by side walls 71, and each bore 76 extends at its other end lengthwise through tube 73 opening in the edge of tube 73 remote from bottom 72 of vessel 70.

Vessel 70 is employed in a manner identical to vessel 20, for example, but the rigid tubular construction permits a tighter force fit within bore 16 for securing vessel 70 in position in the neck 11 of container 10. The interior 78 of tube 73 thus defines the discharge passageway for the main body of material from container 10 which is accessible through windows 74 which in assembled position lie within tapered neck 11 of container 10.

Figure 6 shows still another modification of the construction of vessel 20. In Figure 6 the vessel for receiving the striped material is designated by the reference numeral 80 and includes a hemispherical side wall 81 from the center of which extends a tubular leg 82. The open interior 83 of leg 82 communicates with the interior 84 of vessel 80 enclosed by side wall 81. The lower end of leg 82 is closed and carries four radial spokes 85 which support at their outer ends a ring 86. Vessel 80 is supported in container 10, for example, by wedging the rim of ring 86 in bore 16 such that leg 82 is centrally positioned in discharge passageway 18 and side wall 81 lies in neck 11 spaced a short distance therefrom. The structure of Figure 6 is completed by four passageways 87 each of which extends through a spoke 85 and communicates at its inner end with interior 83 of leg 82 and at its outer end exits from the under surface of ring 86.

When the device of Figure 6 is employed the flow of base material through discharge passageway 18 is about leg 82 and through the spaces between spokes 85, whereas the flow of striping material runs from interior 84 of vessel 80 through the interior 83 of leg 82 and then out through passageways 87.

Figure 7 shows yet another construction in accordance with my invention. The vessel for receiving the striping material is formed of molded plastic integrally with the discharge end 101 of a container 100. Discharge end 101 includes a tubular discharge nozzle 102, having external threads 103 at one end for receiving a cap. Nozzle 102 encloses a discharge passageway 104 and is centrally provided with an outwardly extending radial flange 105. On the opposite end of discharge end piece 101 from threaded end 103, tube 102 is longitudinally slotted to form four equally spaced struts 106 which are attached at their ends to the disk bottom 107 of a conical vessel 108 which is open at its upper, wide end.

Bottom 107 of vessel 108 centrally carries a leg 109 which is provided with a longitudinal bore 110 opening at one end through bottom 107 to communicate with the interior 111 of vessel 108 and opening at its other end in discharge passageway 104.

The body of container 100 is formed of tubular flexible metal stock and is normally assembled by bending in one end to form a neck 112 which is crimped upon the outer edge of flange 105 as indicated by the reference numeral 113 forming a passageway 114 of annular transverse section between neck 112 and vessel 108 which communicates between the interior 115 of container 100 and discharge passageway 104 through the spaces in tube 102 between struts 106.

From the preceding description of the device shown in Figure 7, it will be apparent that its functioning is identical to that, for example, of the devices shown in Figures 1 and 2 except that material retained in the interior 111 of vessel 108 will be extruded as a centered stripe or core and the base material in chamber 115 will form the surface layer of the dispensed product.

Figure 8 illustrates another modification for striping a product dispensed from an aerosol container. The device shown in Figure 8, like that in Figure 3 is particularly suited to liquid striping materials, but unlike that of Figure 3 can be employed in any position, and hence can be employed with the type of conventional aerosol containers which are designed to be employed in inverted position.

In the modification of Figure 8 I utilize a two piece receiver 120 which is provided at one end with a fitting 121 having a bore 122 which receives the discharge nozzle of a conventional aerosol container. At its other end receiver 120 has a cylindrical discharge nozzle 123 provided with a bore 124. The shell of receiver 120 includes a base cap 125 on which inlet fitting 121 is formed and a housing 126 from which discharge nozzle 123 extends. Base cap 125 snap fits over housing 126 to enclose an interior space 127 between them which communicates

at one end with bore **122** of fitting **121** and at the other end with bore **124** of nozzle **123**.

A small vessel **128** in the form of a cylindrical block **129** having a deep conical end depression **130** in its lower end and four upright, parallel legs **131** extending above its top end surface **132** is positioned in receiver **120** with the upper portions of legs **131** cemented to the sides of bore **124** of discharge nozzle **123**. An annular lower edge **132** is formed on the bottom end of block **129** between its cylindrical outer side wall **129***a* and its conical inner wall **129***b*. Four bores **133** each extend from an opening in edge **132** upwardly through a leg **131** and terminate in a restricted opening **134** in the inwardly and downwardly inclined upper end face **135** of the associated leg **131**. Four channels, i. e., grooves, **136** each extend from the bottom to the top of the inner wall **129***b* adjacent to a bore **133**, and a small slot **137** is cut in annular edge **132** connecting each bore **133** with one such channel **136**.

Receiver **120** is charged and assembled by first filling depression **136** with the liquid striping material while the assembled housing **126** and vessel **128** are held in inverted position from that shown in Figure 8. A thin, elastic piece of material, such as rubber, is then placed over depression **130** with the edges of the material extending beyond annular edge **132**. A ring **138** is then placed over the end of vessel **128** to wedge the edges of the rubber or other material between ring **138** and cylindrical outer wall **129***a*, stretching the material over depression **130** as a diaphragm **139**. Base cap **125** is then snapped onto housing **126** and the device is ready for employment in the same manner as receiver **42** in Figure 3.

Pressure of an aerosol product introduced through fitting **121** causes diaphragm **139** to flex inwardly forcing the contents of depression **130** out through slots **137** and up through bores **133** to stripe the acrosol product as it issues from discharge nozzle **123**. Even when receiver **120** is held in inverted position, as diaphragm **139** flexes inwardly to fill depression **130**, the striping material rides up channels **136** to enter slots **137** and bores **133**, since diaphragm **139**, as it flexes inwardly, rides against the inner wall **129***b* of block **129** closing the sides of channels **136** to make suitable conduits of channels **136**.

From a review of the preceding description it will be evident that the device of my invention is capable of modification in many ways and is generally applicable to dispensing two or more materials simultaneously in any desired transverse pattern. Dispensing of more than two materials can be accomplished, for example, by compartmenting the inner vessel to permit storage of separate striping materials associated with separate feed legs or by nesting several vessels coaxially and spaced from each other.

I claim:

1. A device for dispensing a plurality of materials simultaneously which includes means defining a chamber, a discharge passageway communicating with said chamber, a vessel supported in said chamber adjacent to and spaced from the inner end of said discharge passageway, a leg on said vessel extending into said discharge passageway and having a conduit therethrough communicating between said discharge passageway and the interior of said vessel, and means communicating the interior of said vessel with the interior of said chamber.

2. A device according to claim 1 in which said means defining a chamber is a collapsible container.

3. A device according to claim 1 in which said means defining a chamber includes means for introducing a fluent material into said chamber.

4. A device according to claim 1 which includes a plurality of said legs spaced from each other extended into said discharge passageway adjacent to the sides thereof.

5. A device according to claim 1 in which said leg extends centrally into said discharge passageway.

6. A device according to claim 1 in which said leg extends centrally into said discharge passageway and includes an outwardly extending foot through which said conduit passes.

7. A device according to claim 1 which further includes a flexible diaphragm positioned across the said vessel.

8. A device according to claim 1 which further includes a flexible diaphragm positioned across said vessel and in which said conduit communicates with the interior of said vessel at a location remote from said discharge passageway.

9. A device for dispensing a plurality of materials simultaneously which includes means defining a chamber, a discharge passageway communicating with said chamber, a vessel supported in said chamber adjacent to and spaced from the inner end of said discharge passageway, a leg on said vessel extending into said discharge passageway and having a conduit therethrough communicating between said discharge passageway and the interior of said vessel, and means defining an opening in said vessel remote from said discharge passageway thereby communicating the interior of said vessel with the interior of said chamber.

10. A device according to claim 9 which further includes a flexible diaphragm positioned across said opening in said vessel.

11. A device according to claim 9 which further includes a flexible diaphragm positioned across said opening in said vessel and in which said conduit communicates with the interior of said vessel at a location remote from said discharge passageway.

12. A device according to claim 9 which further includes a flexible diaphragm positioned across said opening in said vessel, in which said conduit communicates with the interior of said vessel at a location remote from said discharge passageway, and in which said means defining a chamber includes means for introducing fluent material into said chamber.

13. A device according to claim 12 in which said vessel includes a hollow body which is closed at one end and which is open at the other end thereby defining said opening in said vessel, said leg being on the closed end of said body and said diaphragm being positioned across the open end of said body, said conduit extending from said leg through the side wall portion of said body and terminating at the open end of body, and a channel formed lengthwise along the inside of said side wall portion of said body communicating at the open end of said body with said conduit.

14. A device for containing and dispensing a fluent material which includes a hollow body which is closed at one end and open at the other end, a leg on the closed end of said body having a conduit therethrough, said conduit extending from said leg through the side wall portion of said body terminating and communicating with the interior of said body at the open end thereof, a flexible diaphragm positioned across the open end of said body, and a channel formed lengthwise along the inside of said side wall portion of said body communicating at the open end of said body with said conduit.

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