July 15, 1969 P. MESHBERG 3,455,489

DISPENSING TWO MATERIALS SIMULTANEOUSLY FROM DIFFERENT COMPARTMENTS

Filed Feb. 8, 1968 4 Sheets-Sheet 1

Fig. 1

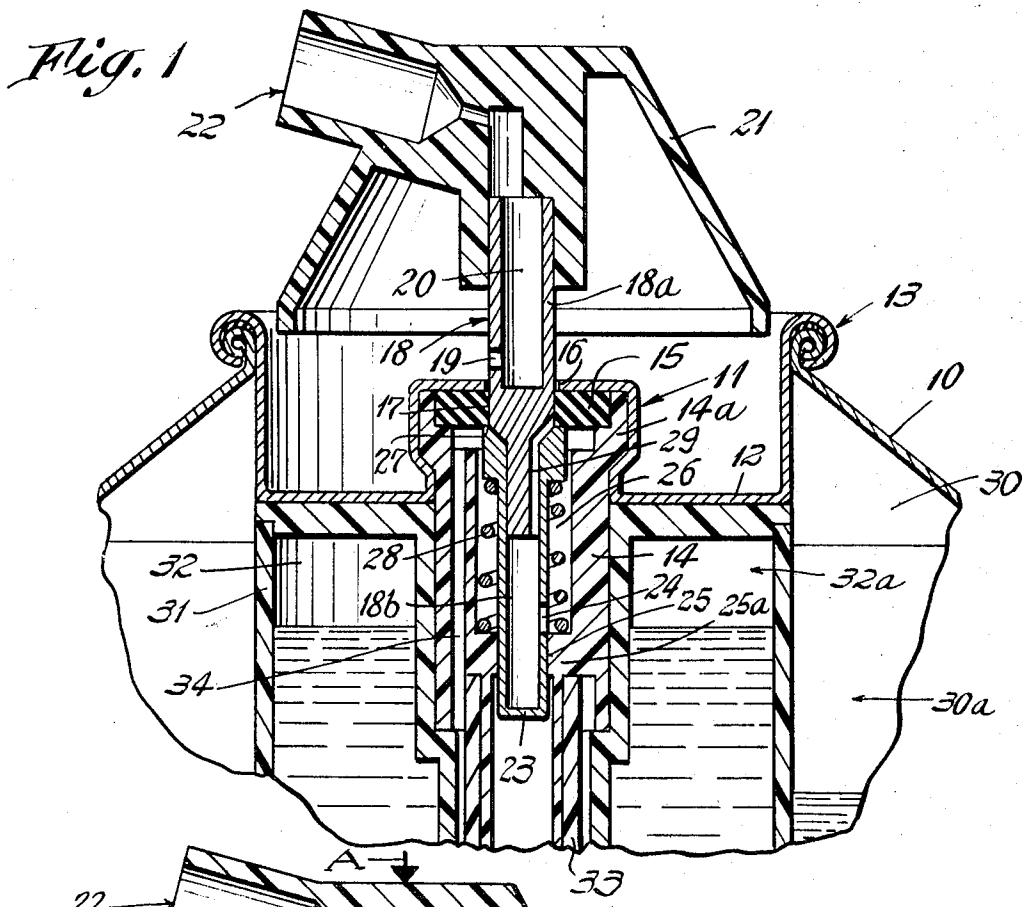
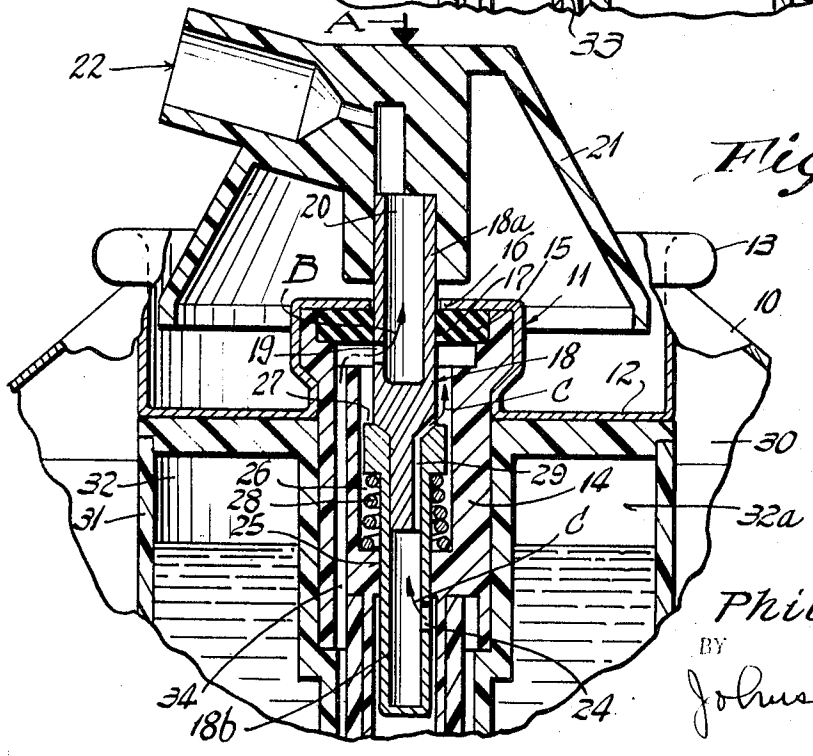


Fig. 2



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DISPENSING TWO MATERIALS SIMULTANEOUSLY FROM DIFFERENT COMPARTMENTS

Filed Feb. 6, 1968 4 Sheets-Sheet 2

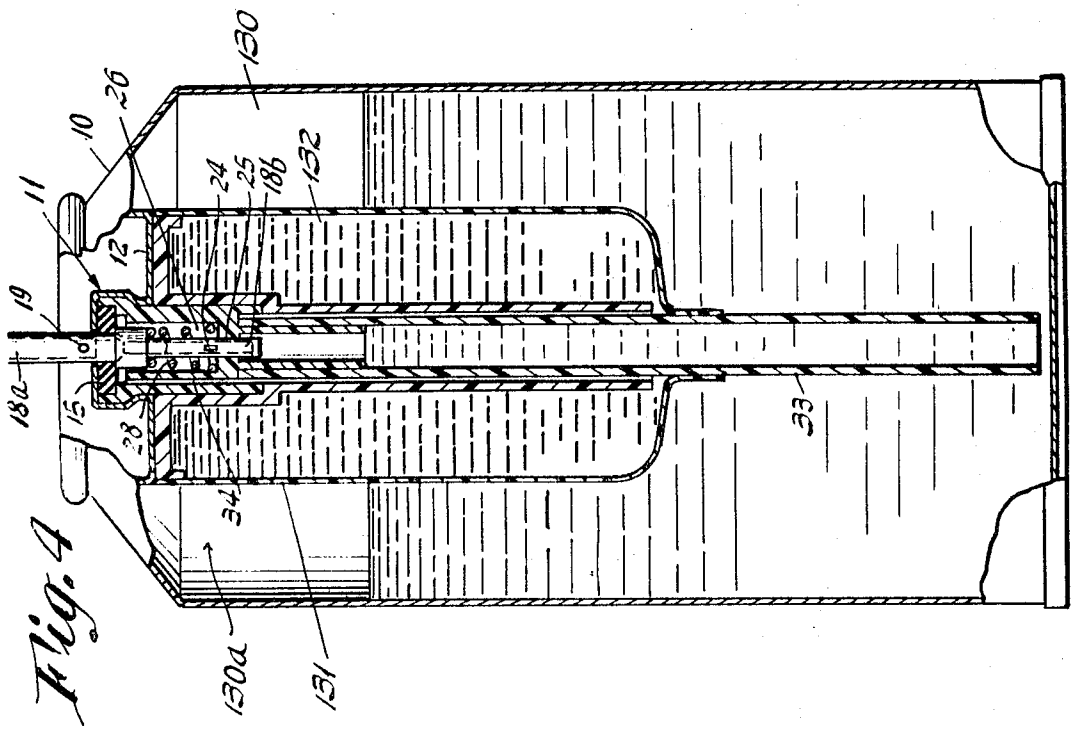

Fig. 4

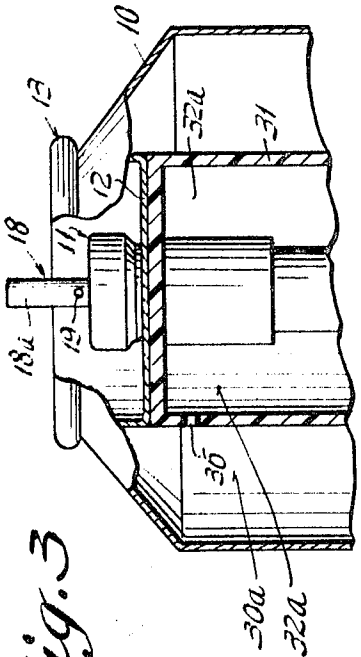

Fig. 3

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July 15, 1969 P. MESHBERG 3,455,489

DISPENSING TWO MATERIALS SIMULTANEOUSLY FROM DIFFERENT COMPARTMENTS

Filed Feb. 8, 1968 4 Sheets-Sheet 3

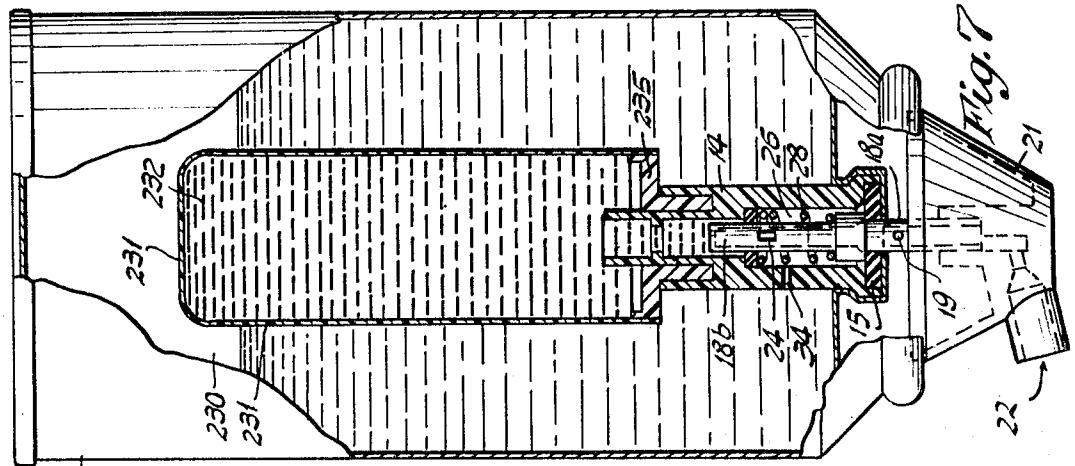

Fig. 7

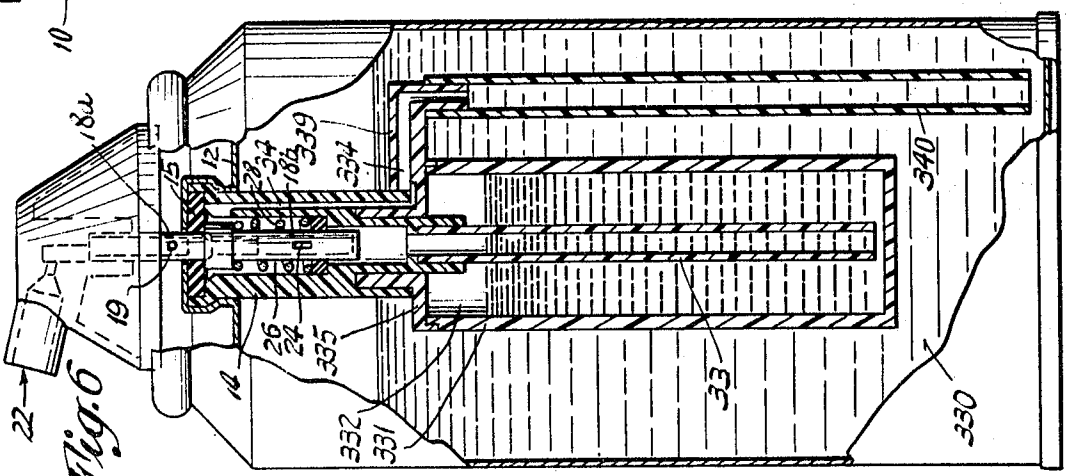

Fig. 6

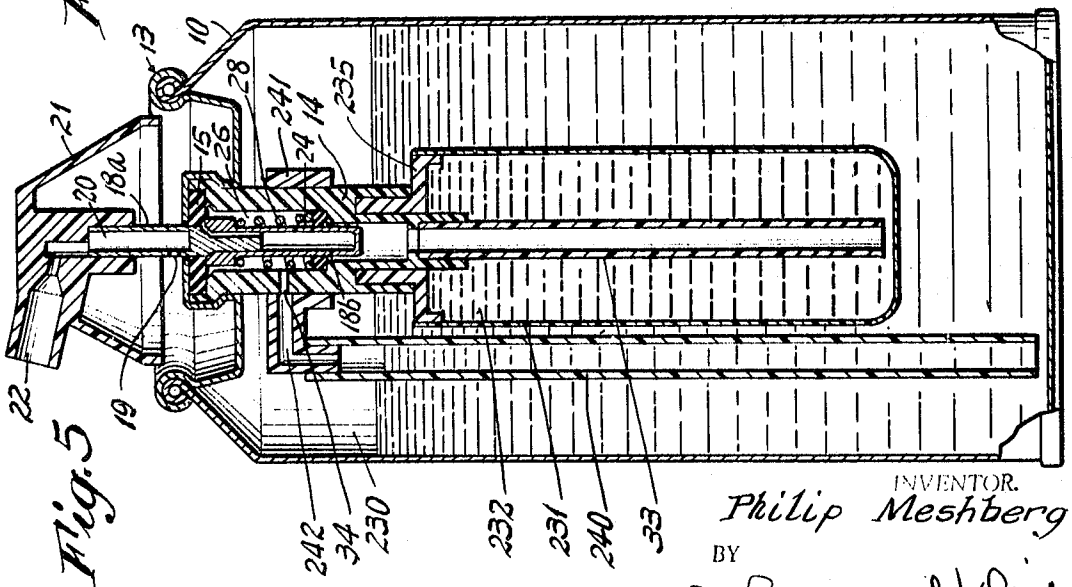

Fig. 5

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July 15, 1969 P. MESHBERG 3,455,489

DISPENSING TWO MATERIALS SIMULTANEOUSLY
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Filed Feb. 8, 1968 4 Sheets-Sheet 4

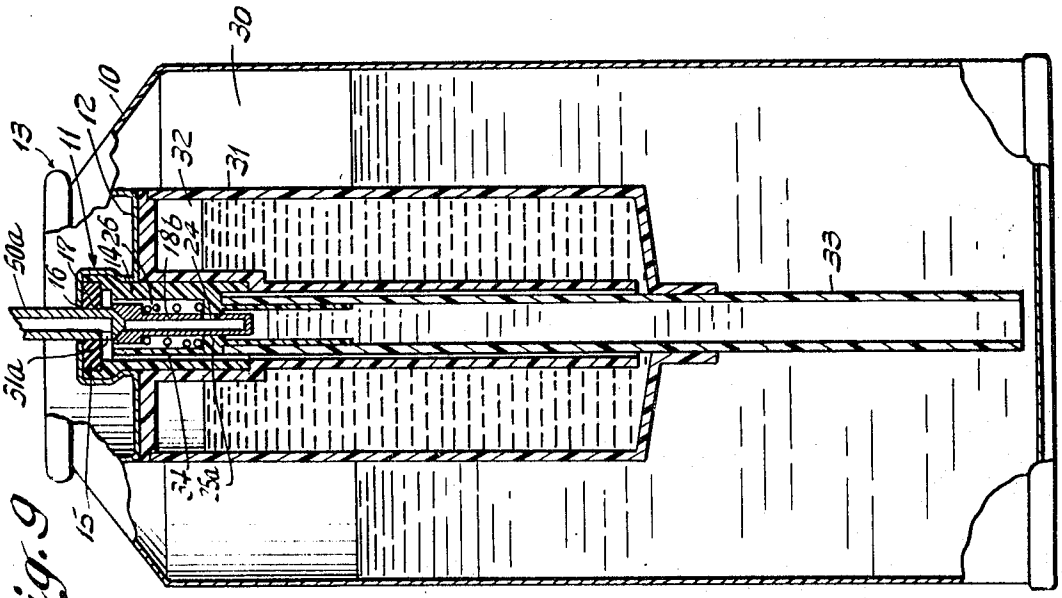

Fig. 9

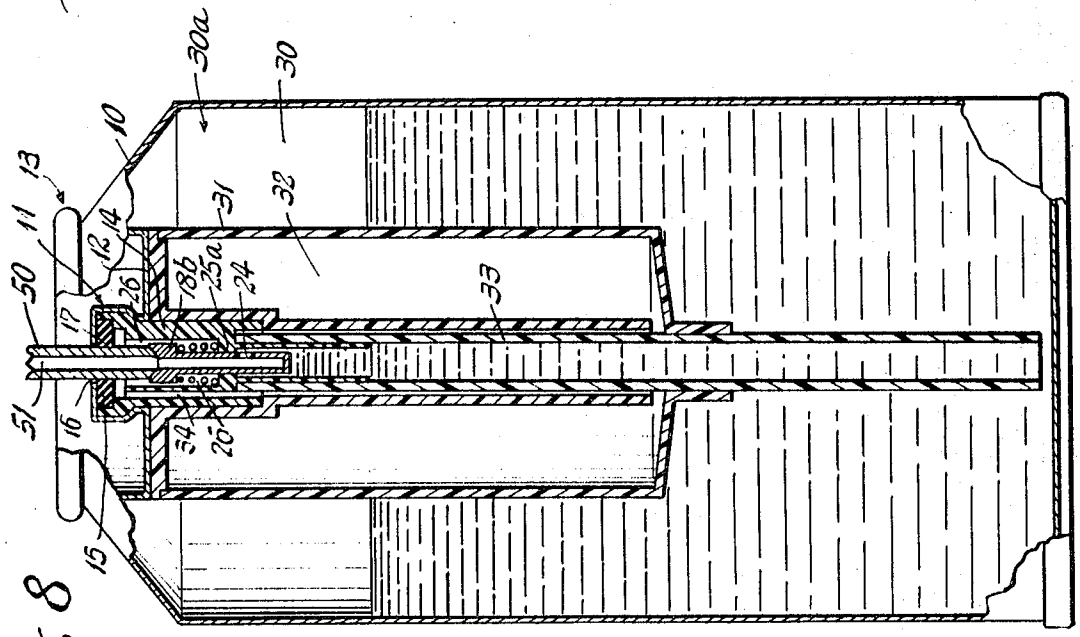

Fig. 8

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3,455,489

DISPENSING TWO MATERIALS SIMULTANEOUSLY FROM DIFFERENT COMPARTMENTS

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U.S. Cl. 222—94 14 Claims

ABSTRACT OF THE DISCLOSURE

The device has two compartments for storing different materials and a single valve means normally sealing each compartment in non-dispensing position i.e. sealing each compartment from a dispensing port or passage and also sealing said compartments from one another to avoid mixing until dispensed and for simultaneously opening said compartments to the dispensing passage and dispensing said materials to form a mixture or a chemical combination of said materials in dispensing position. The valve means also has separate valving constructions forming a part thereof which permits selective filling of said compartments during a filling operation.

The present invention provides a structure which is very versatile in use and one which can be filled in a simple, yet effective manner to provide for the storage of two different materials and the dispensing of said materials simultaneously. For example, the two compartments can independently receive and store different materials until they are simultaneously dispensed, all by the single valve means, to mix and/or combine chemically into a desired product. The materials for each compartment can be a concentrate or composition to be dispensed and a usual liquid propellent, such as Freon, or an immiscible gas under pressure, such as nitrogen, or the like propellent or one compartment may have flexible walls and so located that the concentrate or composition therein is propelled therefrom by the collapsing of the walls thereof by the pressure of the material in the other compartment.

If it is desired to dispense one composition and to provide additional booster pressure during the dispensing operation, one of the compartments can contain the concentrate or composition plus its propellent, and the other compartment can provide an additional propellent under pressure which, when the valve is operated, will supply the booster pressure to the dispensed material.

Another feature of the invention resides in the provision in the single valve means, of valving constructions which will enable the two compartments to be selectively and individually filled by means of the said valve means in a simple and expeditious manner.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the accompanying drawings in which:

FIGURE 1 is a enlarged longitudinal fragmentary sectional view of the valve means on the container having two compartments in non-dispensing position.

FIG. 2 is a view similar to FIG. 1 with the valve means in dispensing position.

FIG. 3 is a fragmentary view partly in section showing a port connecting the head spaces in the compartment.

FIG. 4 is a longitudinal view, partly in section, showing another form of the invention.

FIGS. 5, 6 and 7 are longitudinal views, partly in section showing other forms of the invention.

FIG. 8 is a longitudinal view, partly in section, showing the filling of the outer compartment through the valve means.

FIG. 9 is a longitudinal view, partly in section, showing the filling of the inner compartment through the valve means.

As shown in the drawings there is a canister or container **10** having an opening in one end in which a valve means **11** is mounted by means of a mounting cup **12** having its edges secured to the container as at **13** to close the same with said valve means providing the means for dispensing material from the container. The valve means includes a tubular housing **14**, the outer end of which is closed by a sealing washer **15** which is pressed against the undersurface of the mounting cup as the edge **14***a* of the housing is secured thereto by crimping of the cup **12** as shown in FIG. 1.

The mounting cup and sealing washer have apertures **16**, **17** through which an outer portion **18***a* of a reciprocating two-part valve stem **18** projects, as shown in FIG. 1, with the washer sealingly engaging the valve stem. The outer portion of the valve stem has a discharge port **19** which connects to a longitudinal passage **20** in the stem portion **18***a* which extends to the outer end of the stem. An actuating or dispensing button **21** is secured on stem portion **18***a* and has a nozzle means **22** connected to the passage **20**.

Th other or inner portion **18***b* of the valve stem is a hollow, tubular member having the inner end **23** closed and is sealingly slidable in an aperture **25** in a transverse wall **25***a* formed intermediate the ends of the housing. The washer **15** and wall **25***a* form a chamber **26** in the housing.

The stem portion **18***b* has a side port **24** which extends into the hollow interior thereof and is so located that it is above the traverse wall **25***a* in normal non-dispensing position, is moved below the sealing wall **25***a* in one filling and in the dispensing position and will be sealed by the wall in another filling position as will be explained.

The outer end of the inner stem portion **18***b* is open and the inner end of the stem portion **18***a* is inserted therein. As shown in FIG. 1, the stem portion **18***b* is provided with a sealing shoulder **27** which is pressed into engagement with the washer **15** by a spring **28** in the normal non-dispensing position and permits it to move inwardly to a dispensing position shown in FIG. 2. The portion of the stem portion **18***a* extending into the open outer end of the portion **18***b* has passages **29** formed therein extending from the interior of the hollow stem **18***b* to the chamber when the stem is in dispensing position.

According to the present invention the container has two separate compartments for storing and maintaining separate two different materails. While these may take various forms, such as side-by-side compartments or upper and lower compartments, in the form of the invention illustrated herein they are concentric with the interior of the container **10** forming an outer compartment **30**, and a hollow rigid unit **31** is disposed within the container **10** to surround the housing and is sealed from the first compartment **30** so as to form the second or inner compartment **32**. The inner end of the housing communicates, as by a dip tube **33**, with the inner part of the compartment **30** and the upper part of the chamber in the housing communicates by passage means **34**, illustrated as being formed in the walls of the housing, with the inner end of the compartment **32** so that both compartments can be connected to the chamber **26** in the housing during a dispensing operation and can be individually filled as will be explained.

With this construction the inner compartment **32** and outer compartment **30** can be filled with a material to be dispensed, usually comprising a concentrate or composition and a propellent, either a liquid propellent such as Freon, or a gaseous propellent such as nitrogen or the like gas. The two chambers **30**, **32**, as shown in the drawings, each have a head space **30***a*, **32***a* in which the gaseous phase of the liquid propellent or the gaseous propellent under pressure is disposed for forcing material through the

dip tube 33 or passage 34 to the chamber to be dispensed therefrom, in which chamber the concentrates are mixed and/or chemically combined into the desired product to be dispensed.

If it should be desired merely to dispense one material but provide a booster pressure during the dispensing operation, the concentrate, for example, can be omitted from the chamber 32 and it can be filled with a propellent, for example, a gaseous material under pressure which will be forced into the chamber and provide the necessary additional pressure to the dispensed composition to provide a booster pressure therefor.

In the non-dispensing position of the stem in FIG. 1 it will be noted that the shoulder 27 seals the compartment 32 from the discharge port and the end portion 18*b* of the stem cooperates with the sealing wall 25*a* to seal the compartment 30 both from the discharge port and also from the compartment 32 so that no mixture of the material in the two compartments can occur prior to the dispensing operation. When the stem is moved to the dispensing position of FIG. 2 by pressure applied in the direction of arrow A, the seals are broken and the discharge port 19 is rendered operative to receive material from the chamber 26 which includes material from compartment 32 through passage 34, as indicated by arrow B, and material from compartment 30 through dip tube 33, side port 24, hollow stem 18*b*, and passage 29 as indicated by arrows C. Thus the valve means seals both of the compartments from each other and from the dispensing port in non-dispensing position and opens both of the compartments to the dispensing port for simultaneous discharge in a dispensing position to automatically dispense a mixture or combination of the materials. By controlling the pressures and the location and size of the ports and passages through which the materials pass, an accurate control of the combination or mixture can be achieved.

If desired, a small venting orifice 36 can be provided, as shown in FIG. 3, which communicates the two head spaces 30*a*, 32*a* in the two compartments to regulate or equalize the pressure of the gases in the two compartments which pressures are utilized to force the concentrate or compositions into the chamber of the housing to be dispensed therefrom. This is to insure a uniform flow rate from each compartment during the entire dispensing operation.

In some circumstances it may be desired to have one of the materials dispensed without a propellent therein, in which case the unit 131 forming the inner compartment 132 is formed of flexible material which is capable of collapsing under the pressure of the material in the outer compartment 130. This is shown in FIG. 4 wherein the compartment 132 is completely filled with a concentrate or composition, whereas the compartment 130 has the material under pressure plus the gaseous phase in the head space 130*a*. The pressure in the surrounding outer compartment will tend to collapse the flexible walls of the unit 131 so as to cause the material to be forced from compartment 132 during the dispensing operation into the chamber 26 in the housing 14 to be mixed with, or chemically combined with, the material being propelled from the outer compartment 130 by the propellent therein to be dispensed from the chamber through the discharge port 19 and connected passages as previously described.

In the forms of the invention shown in FIGS. 5–7, the valve means is substantially the same as in the form illustrated in FIGS. 1 and 2; however, the compartments arrangement is different. In FIG. 5 a unit 231 which forms the inner compartment 232 is sealingly secured to a mounting member 235 connected to the inner end of the housing 14. The dip tube 33 extends from the inner end of the housing to a point adjacent the inner end of the compartment 232. The passage 34 in the housing 14 communicating with the chamber 26 connects with the outer compartment 230 formed by the interior of the container by means of a second dip tube 240. The tube is secured to a ring 241 carried on the housing 14, as shown, and has a bore 242 communicating with the passage 34 and with the dip tube, which tube extends to the bottom of the compartment 230. As illustrated, the unit 231 is flexible so that the material therein is forced therefrom as the walls thereof are collapsed by the pressure in the compartment 230.

In the form of the invention shown in FIG. 6, a unit 331, herein shown as a rigid unit, is sealingly connected to a mounting member 335 carried by the inner end of the housing 14 to form the inner compartment 332 and a dip tube 33 extends from the inner end of the housing 14 to the bottom of the compartment 332. The mounting member has an extension 339 having a passage 334 therein connecting with passage 34 in the housing. A dip tube 340 is carried on the extension 339 and connects passage 334 to the bottom of the outer compartment 330 formed by the interior of the container 10.

If the dispenser is to be used in the inverted position, as shown in FIG. 7, the structure is the same as shown in FIG. 5; however, the dip tubes 33 and 240 and ring 241 are removed so that the material in the compartment 232 will flow directly into the inner end of the housing 14 and the material in compartment 230 will flow directly through passage 34 to the chamber 26 in housing 14 to be dispensed therefrom through the port 19 and connected passages.

Thus it will be seen that the device of the present invention will store in separate compartments different materials and/or using different types of propellents and has valve means that will maintain the compartments sealed in non-dispening position and will simultaneously open both compartments so that the materials are mixed or chemically combined to produce the desired product.

Another important feature of my invention resides in the fact that the two compartments can be individually filled with material by means of the valve means after the valve means has been secured to the container. This is done by separate valving constructions forming a part of the valve means.

In the illustrated form of the invention, as shown in FIGS. 8 and 9, the outer end 18*a* of the stem is removed. A filling nozzle 50 having a through bore 51 is inserted through the apertures 16, 17 in the mounting cup 12 and sealing washer 15. The end sealingly engages the open end of the stem portion 18*b* and the stem portion is depressed so that it slides in the aperture 25 to the position shown in FIG. 8 wherein side port 24 is moved below the transverse sealing wall 25*a*, which wall seals the inner end of the chamber 26. Material is fed under pressure through the bore 51, interior of the stem portion 18*b* to the side port 24, to the dip tube 33 and into the compartment 30 to fill the same.

To fill the compartment 32 a second nozzle 50*a* having a side port 51*a* is inserted through the apertures 16, 17 in the mounting cup 12 and sealing washer 15 and into a closing relation with the end of the portion 18*b* of the stem. The stem portion is moved inwardly to the position shown in FIG. 9 wherein the port 24 is sealed by the transverse wall 25*a* and the side port 51*a* of the nozzle opens into the chamber 26 so that material which is fed through the nozzle passes into the chamber 26, through passage 34 to the compartment 32 to fill the same.

Thus the device of the present invention not only provides for effective storage and simultaneous discharge of two different materials but also provides a simple and effective means for selectively filling the two compartments by the single valve means.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. Means for simultaneously dispensing two different

materials under pressure from a container having two separate compartments, one for each of said materials, said means also including means for selectively filling said compartments, a dispensing valve means mounted on the container and including an element having a dispensing port and movable between dispensing and non-dispensing positions, and means normally urging said element to non-dispensing position, said first mentioned means having means for selective connection to said compartments to enable said compartments to be individually filled through said valve means with material during a filling operation, for sealing said compartments from each other and from the discharge port in the normal non-dispensing position of the element, and for connecting both compartments to the discharge port in dispensing position of the element.

2. Means for storing and simultaneously dispensing two different materials under pressure from a container having two separate compartments, one for each of said materials, said means also having means for selectively filling said compartments, a dispensing valve means mounted on the container and including a housing having a chamber and a valve stem disposed in said housing and having a dispensing port and being movable between dispensing and non-dispensing positions, and means normally urging said valve stem to non-dispensing position, said first named means having means for selective connection to said compartments to enable said compartments to be individually filled through said valve means with material under pressure during a filling operation, for sealing said compartments in the normal non-dispensing position of the valve stem, and for connecting both compartments to the discharge port in dispensing position of the valve stem.

3. The invention as defined in claim 2 wherein a unit is sealingly secured to the housing to form an inner compartment and the interior of the container forms an outer compartment and the housing has separate passages controlled by the valve stem for connecting said compartments to said chamber.

4. The invention as defined in claim 2 wherein the interior of the container forms one compartment and a unit surrounding the housing and sealed thereto forms the other compartment with the housing having separate passages connected to both compartments, said compartments each having a head space to receive a gas under pressure, and a small port connecting said head spaces to control the pressures therein.

5. The invention as defined in claim 2 wherein one compartment is an inner compartment formed by a unit sealingly secured to said housing and the other compartment is an outer compartment surrounding the inner compartment and formed by the interior of the container, said housing has separate passages communicating with both of said compartments, and said valve stem having a valving construction controlling said passages to individually open said passages during the filling of each compartment to seal both passages in non-dispensing position of the valve stem, and to simultaneously open both passages in dispensing position of said stem.

6. The invention as defined in claim 5 wherein said unit comprises a collapsible bag to receive the material to be forced therefrom by the pressure of the material in the surrounding compartment.

7. The invention as defined in claim 2 wherein the interior of the container forms one compartment and a unit sealed to a mounting member secured to the inner end of the housing forms the other compartment and wherein the housing has separate passages connected to both compartments.

8. The invention as defined in claim 2 wherein a mounting member is secured to the inner end of the housing and a unit forming one of the compartments is sealingly secured thereto and extends therefrom.

9. The invention as defined in claim 8 wherein the housing has a means at the inner end thereof communicating the chamber therein with the interior of said unit.

10. The invention as defined in claim 9 wherein the housing has passage means connecting the chamber in the housing to the interior of the container forming the other compartment.

11. The invention as defined in claim 10 wherein the passage means comprises a passage in the side wall of the housing, a ring surrounding the housing and provided with an extension having a bore, one end of which is connected to the passage and the other end of which is connected to a dip tube extending to the bottom of said other compartment.

12. The invention as defined in claim 9 wherein the mounting member has means communicating the chamber in the housing with said other compartment.

13. The invention as defined in claim 12 wherein the means communicating the chamber with the other compartment comprises an extension on the mounting member having a bore, one end of which connects to a passage in the housing communicating with said chamber and the other end of which connects to a dip tube extending to the bottom of the other compartment.

14. Means for simultaneously mixing and dispensing two different materials under pressure from a container having two separate compartments for receiving said materials, said means also having means for selectively filling said compartments, a valve means mounted on the container for dispensing material therefrom and having a housing and a single valve stem reciprocating in said housing, said housing having sealing means at an outer end thereof provided with an aperture through which the stem passes and an apertured transverse stem-receiving sealing wall intermediate the ends thereof forming a chamber in said housing, said stem being normally urged outwardly by an urging means to non-dispensing position and movable inwardly to a dispensing position and comprising an inner and outer portion, the outer portion projecting from the container and having a discharge port connected to a discharge passage and being normally inoperative to discharge material in non-dispensing position, with said portion being sealably slidable in said aperture in the sealing means and being removed during a filling operation and the inner portion being tubular, hollow, and closed at the inner end and having its outer end normally urged by resilient means into sealing relation with the sealing means, with the inner end of the stem sealingly engaging the transverse wall, said inner portion of the stem having a port in the side wall adapted to be sealed by the transverse wall or to bypass said wall, the outer portion having an inner end disposed in the outer end of said inner portion and provided with means to connect said inner portion to the chamber, said housing having a first means at the inner end communicating with one of said compartments and having a second means communicating the chamber with the other of said compartments, said stem, when moved to dispensing position, connecting the discharge port with the chamber in the housing and connecting both compartments to the chamber whereby material from the two compartments is simultaneously fed to said chamber and dispensed through said discharge port and discharge passage.

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U.S. Cl. X.R.

141—104; 222—136, 402.16