United States Patent

[11] **3,550,649**

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[45] Patented **Dec. 29, 1970**

[54] **METHOD OF FILLING TWO COMPARTMENT CONTAINER**
1 Claim, 4 Drawing Figs.

[52] **U.S. Cl.** **141/3,** 53/36, 141/9, 141/20, 141/103
[51] **Int. Cl.** **B65b 31/00**
[50] **Field of Search** ..... 53/36; 141/3, 9, 20, 100, 103, 104; 222/136(Cursory), 402.16

[56] **References Cited**

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ABSTRACT: The method of filling two different compartments of an aerosol container selectively through a single-dispensing valve to produce a device for storing the two materials and for simultaneously dispensing the same.

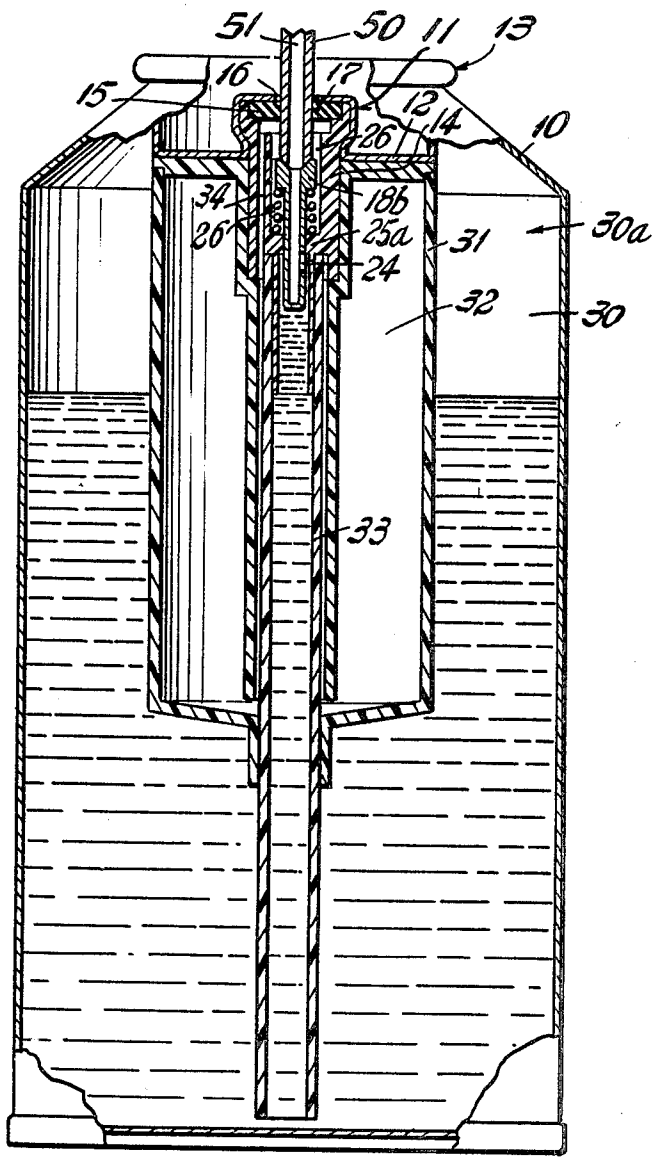


Fig. 1

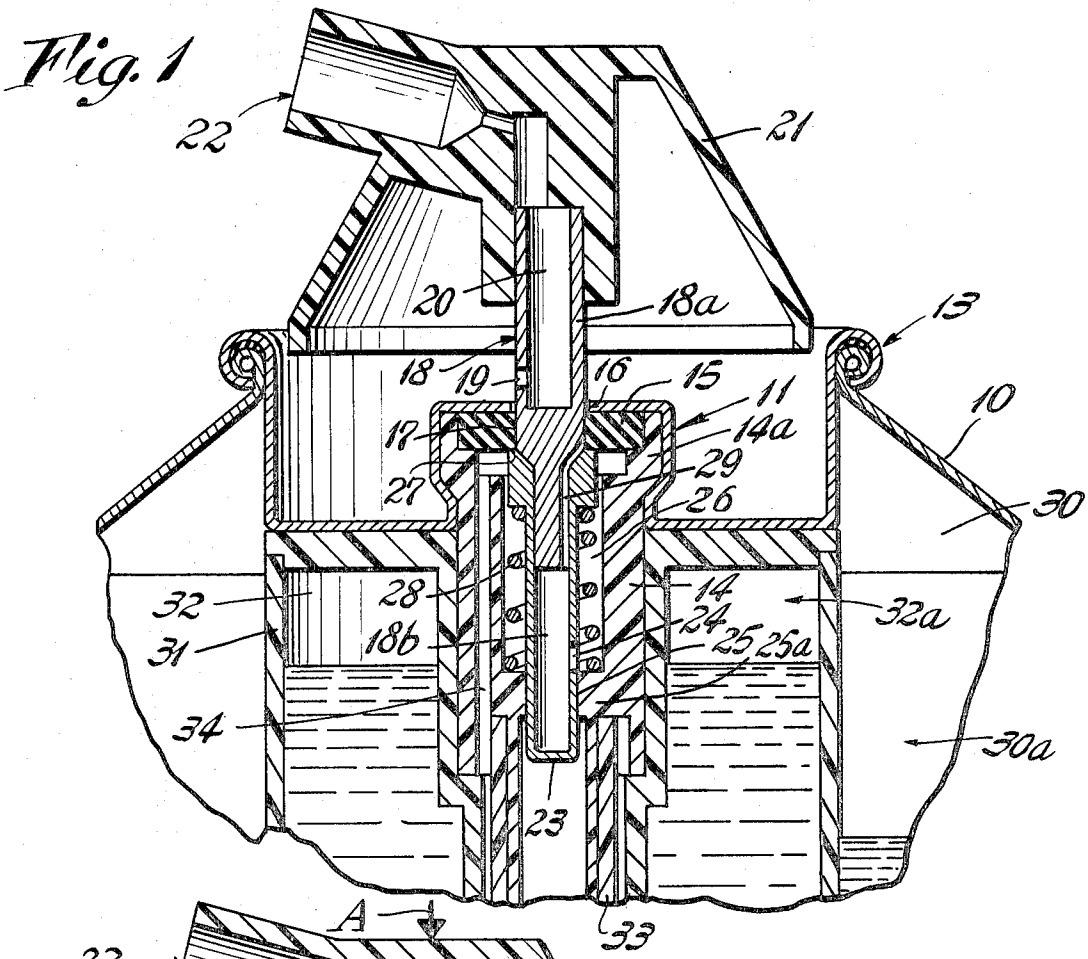
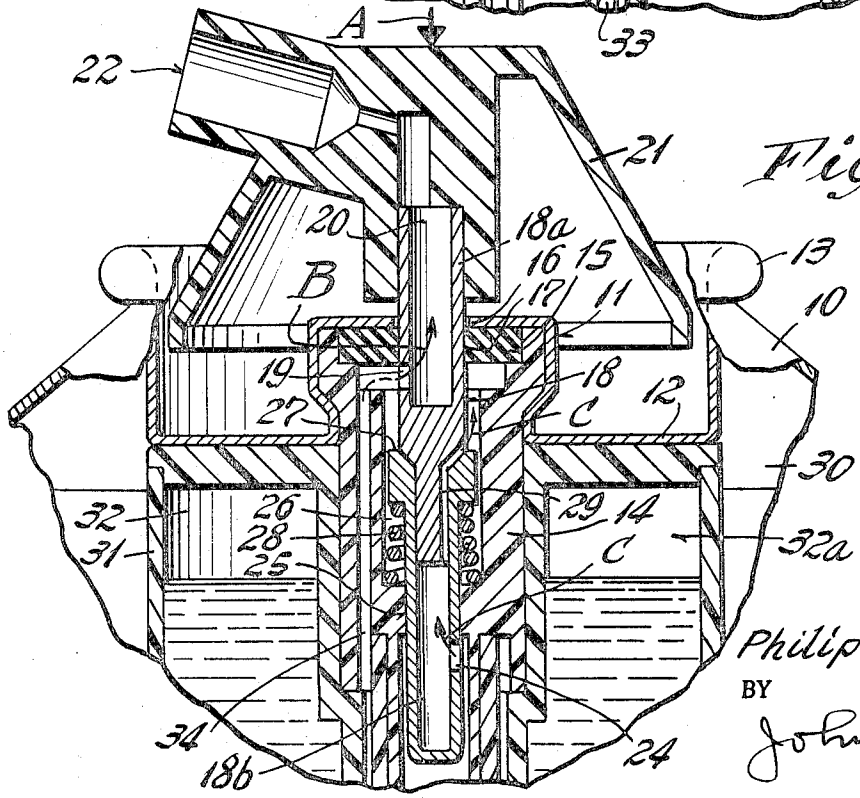


Fig. 2



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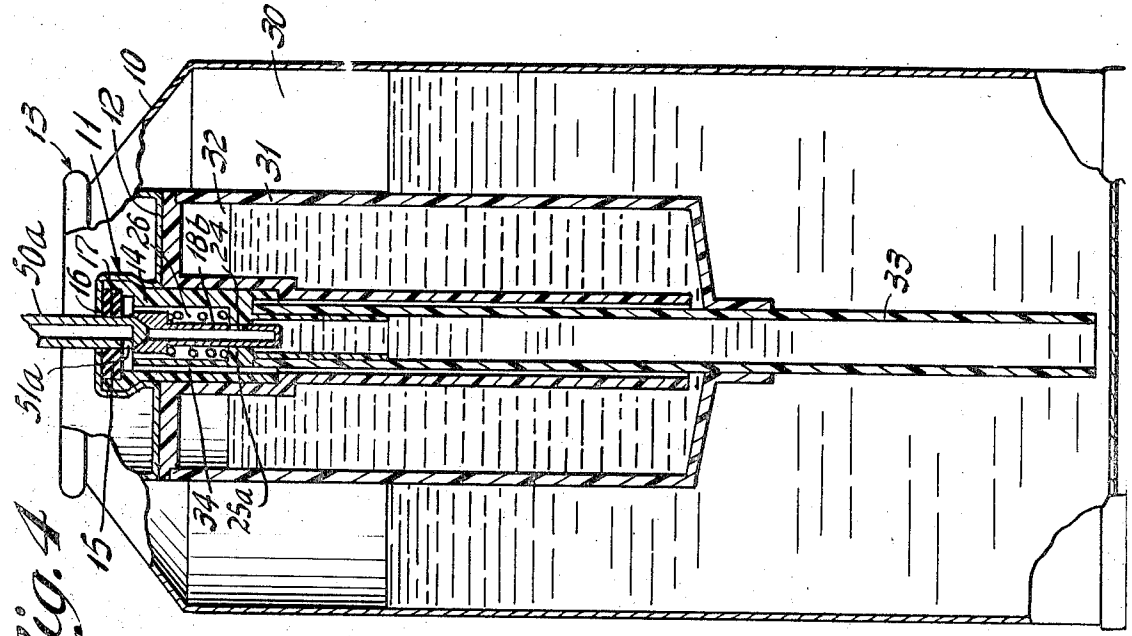


Fig. 4

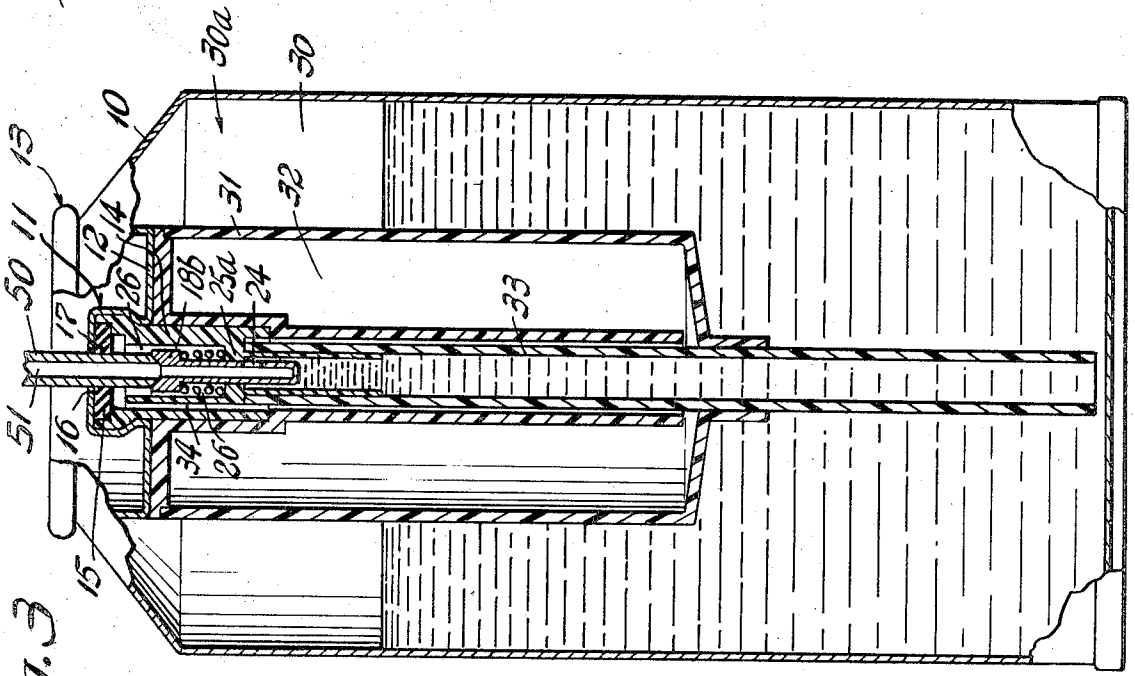


Fig. 3

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METHOD OF FILLING TWO COMPARTMENT CONTAINER

This application is a division of my copending application Ser. No. 704,028, filed Feb. 8, 1968 now Pat. No. 3,455,489.

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.

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:

FIG. 1 is an enlarged longitudinal fragmentary sectional view of the valve means on the container having two compartments in nondispensing position.

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

FIG. 3 is a longitudinal view, partly in section, showing the filling of the outer compartment through the valve means.

FIG. 4 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 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**.

The 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 housings. 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 transverse wall **25***a* in normal nondispensing 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 nondispensing 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 materials. 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 the 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 nondispensing 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 nondispensing position and opens both of the compartments to the dispensing portion 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.

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 nondispensing position 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. **3** and **4**, 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. **3** wherein the 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. **4** wherein the port **24** is sealed by the transverse wall **25***a* and the side port **51***a* of the nozzle means 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 invention and portions of the improvements may be used without others.

I claim:

1. The method of filling a two-compartment container through a valve means mounted on the container and having a single valve stem reciprocating in a housing, said housing having sealing means at an outer end thereof provided with an aperture through which the stem passes and a transverse sealing wall intermediate the ends thereof forming a chamber, said stem comprising an inner and outer portion, the outer portion being sealably slidable in said aperture in the sealing means and being removed during the filling and the inner portion being tubular, hollow, and closed at the inner end and having its outer end normally urged 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 sidewall adapted to be sealed by the transverse wall or to bypass said wall, said housing having a first means at the inner end forming a passage communicating with the bottom one of said compartments and having a second means adjacent the outer end thereof forming a passage communicating the chamber with the bottom of said other compartment, the steps of inserting a filling nozzle having a through bore into sealing relation with the end of said inner stem portion and moving the inner portion inwardly until the port in the side of the stem bypasses the transverse sealing wall, feeding material through the stem, through the port to the inner end of the housing and through said passage into said one compartment to fill the same, terminating the feeding of the material after said one compartment has received a predetermined charge, removing said filling nozzle thereby allowing said stem to move into sealing relation with the sealing means, inserting a second filling nozzle having a closed end and side filling port into engagement with the end of said inner stem portion to seal the same, and pushing the stem inwardly to move the filling port into the chamber of the housing and the side port of the stem in sealing relation with said transverse wall, and feeding a different material through the filling port to the chamber of the housing through said passage and into the other compartment communicating therewith to fill the same with material.