United States Patent

[11] **3,608,782**

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[33] **France**
[31] **172,606**

[54] **DEVICE FOR HOLDING TWO PRODUCTS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY**
9 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **222/94,** 222/136, 222/145
[51] **Int. Cl.** **B65d 35/24**
[50] **Field of Search** 222/82, 83, 85, 94, 95, 135, 136, 144, 145, 400.7, 402.16, 402.17, 402.18

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Primary Examiner—Robert B. Reeves
Assistant Examiner—David A. Scherbel
Attorney—Holcombe, Wetherill & Brisebois

ABSTRACT: Two products are stored in separate tubes, each in a separate container compartment, with one of said tubes under external pressure. Means are provided for connecting the tubes together so that the contents of the tube under pressure will be forced into the other tube, and for then dispensing the contents of the second tube.

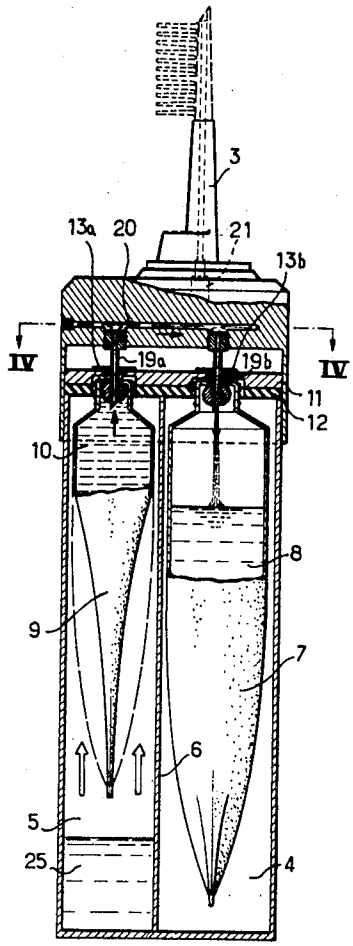


FIG. 1

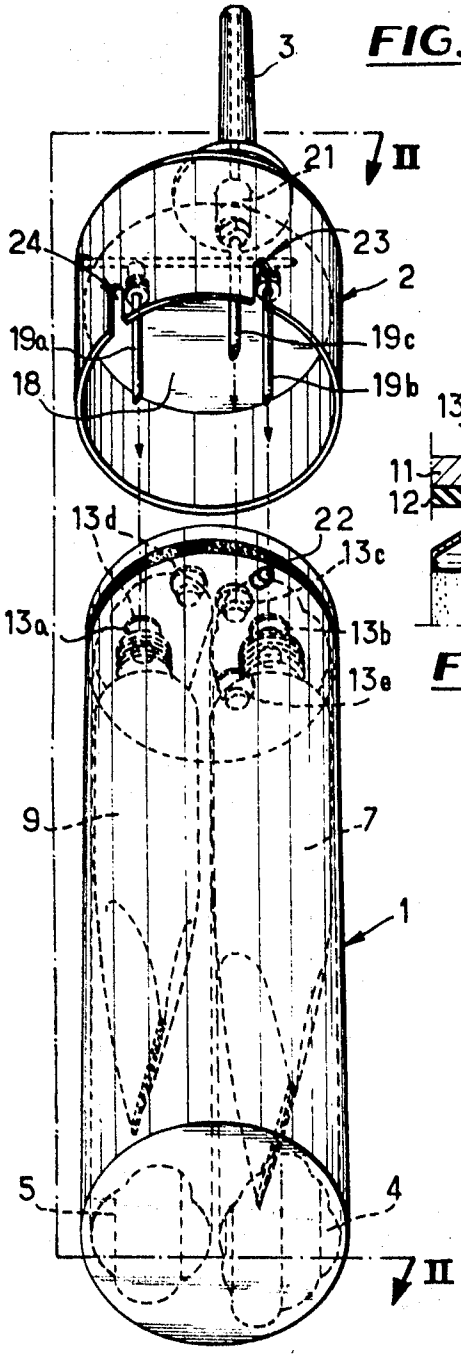


FIG. 3

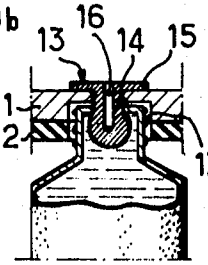


FIG. 2

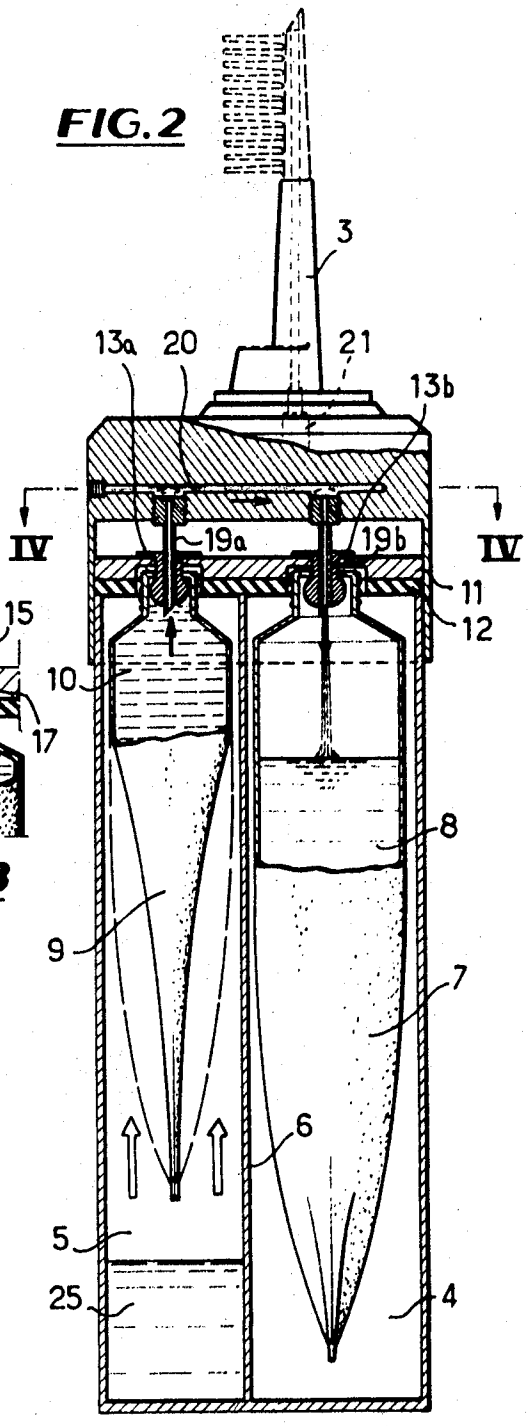


FIG. 4

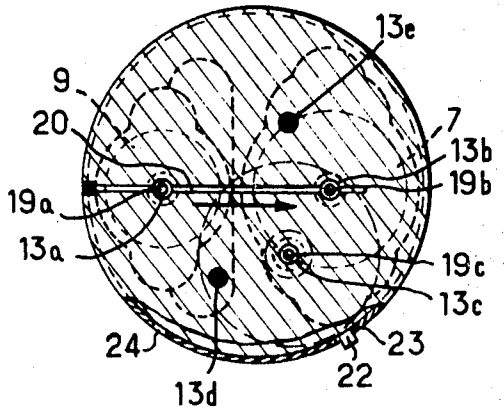
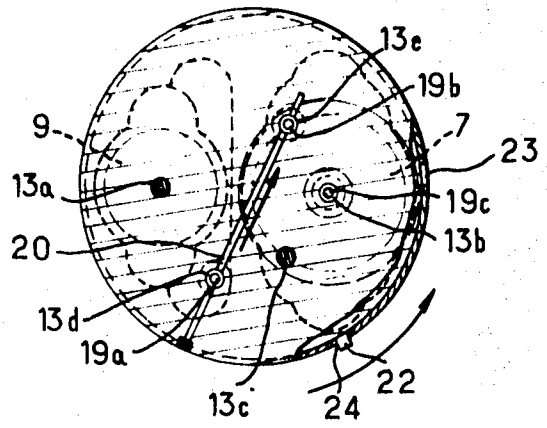

13e
9
20
7
13b
19b
19a
13a
19c
13c
24
23
22
13d

FIG. 5


13e
19b
9
7
23
13a
19c
20
13b
13d
19a
22
13c
24

DEVICE FOR HOLDING TWO PRODUCTS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY

SUMMARY OF THE INVENTION

It is often necessary, for one purpose or another, to mix together two fluids, each of which contains a certain number of chemical compounds, when the compounds in one of these fluids are capable of reacting with the compounds in the other fluid. It is then necessary to store the two fluids separately and mix them together just before they are to be used. This problem occurs with particular frequency in the cosmetic industry, for example, when employing a hair dye of the oxidation type which requires the use of a mixture of dyes and oxidizing agents.

The present invention, therefore, relates to a device which makes it possible to package the two fluids separately within a single container. This package makes it possible to mix the two fluids together just before use and also to dispense them under pressure after they have been mixed.

It is the object of the present invention to provide a new article of manufacture which consists of a dispenser capable of dispensing simultaneously under pressure two fluids which have been separately stored, which device is essentially characterized by the fact that it comprises:

Firstly, a container having two closed compartments, each of which contains a jacket inside which a fluid is stored. Each of these jackets opens into one of the end walls of the container through a valve made of elastic material. One of the compartments contains a liquified pressurizing gas and also opens into the end wall of the container through a valve made of an elastic material. The other compartment is not pressurized and opens into the same end wall through two valves made of an elastic material. The triangle formed by the single valve of the first compartment, the valve of the jacket in the second compartment and one of the two valves of this second compartment has the same dimensions as the triangle formed by the two valves of the two jackets of the two compartments and the other valve of the second compartment.

Secondly, a dispensing cover which is adjustably mounted on end wall of the container into which the jackets open and carries three pointed tubes or trocars adapted to penetrate into the elastic valves which close the jackets and the compartments of the containers. These three trocars form a triangle which may be brought into registration with the triangle formed by the two valves of the jacket and one of the valves of the second compartment. When this is done the two trocars corresponding to the two jacket valves are in communication with each other through a passageway in the end wall and the third trocar is in communication with the outlet of the device which is equipped with a dispensing valve.

In a preferred embodiment of the invention the five valves which close the jackets and the compartments are conventional closures of a rubberlike material which are substantially cylindrical in shape. They have an enlarged base, an upper collar, and an axial opening which is closed at its bottom. The bottom of the axial opening of these valves is adapted to be pierced by a trocar which results in the opening of the valve. When the trocar is withdrawn the material forming the bottom of the opening closes as a consequence of its own elasticity and the valve is then closed.

The shape of the compartments and of the jackets in the container and the length of the trocars in the cover are such that, when one or two of the trocars of the cover pierce the valves of the compartments these trocars do not reach the walls of the jackets inside the compartments. The jackets may consist of tubes of a flexible material, and are put in place by simply snapping their outlets onto the corresponding valves in one of the bases of the container. In an advantageous embodiment, the container is a circular cylinder and the cover is also cylindrical and fits over the upper part of the container. The outlet for the entire device is at the top of the cover and equipped with a dispensing nozzle of a conventional type. The container carries on its lateral surface a stationary projection adapted to cooperate with two slots in the lateral surface of the cover parallel to its axis. This arrangement makes it possible to predetermine two specific angular positions of the cover with respect to the container. The pressurizing gas used, consisting essentially of trichloromonofluoromethane and dichlorodifluoromethane, is a mixture of the products sold under the trade names Freon-11 and Freon-12 respectively, which provides a relative pressure of 1–2 kg./cm.^{2} at 20° C.

The fluids to be distributed are packaged in the device according to the invention in the following manner:

Each of the two fluids to be dispensed is inserted into one of the jackets, consisting for example of tubes of a flexible plastic material, and these tubes are attached to rubber valves mounted in the upper end member of the container according to the invention. It should be noted that the tube designed for the unpressurized compartment is not completely filled and that the volume thereof which remains empty after filling is equal to or greater than the volume of the other tube when full. The two tubes are then slid into the corresponding compartments of the container and the end is attached to the container itself in a fluidtight manner. A certain quantity of liquefied pressurizing gas is then introduced through the appropriate valve into the compartment of the container which is provided with only one valve. This may be accomplished by piercing said valve by means of a trocar. When the trocar is withdrawn, the filling is completed and the valve closes in response to the vapor tension remaining in the compartment. The cover is then mounted on top of the containers at a sufficient distance to prevent the trocars of the cover from coming into contact with the valves carried by the upper part of the base carried by the container.

The container according to the invention is used in the following manner:

The user brings the cover toward the body of the container, the angular position of the cover with respect to the container being determined by the projection on the container as it slides in one of the slots in the cover. The position of this first slot is such that two of the trocars on the cover are in alignment with the two valves of the jackets, the third trocar being in alignment with one of the valves of the unpressurized compartment. In a first step, the user presses the cover down on the container to cause the three trocars to penetrate into the three corresponding valves. In this manner, thanks to the passageway between the two trocars which penetrate into the valves of the jackets, the interiors of the two jackets are brought into connection and the fluid in the flexible tube of the pressurized compartment is expelled to the interior of the tube in the nonpressurized compartment by the vapor tension of the pressuring gas. The two fluids initially contained in the two separate tubes are thus mixed together. The user then remounts the cover and rotates it about the container so as to bring the projection on the container opposite the second slot in the cover. In this position, the two trocars which have initially penetrated the valves of the jackets are each brought into alignment with a valve leading to one of the compartments of the container. The third trocar is in alignment with the valve of the jacket which contains the mixture produced in the first step. Finally, the user depresses the cover to force the three trocars into the valves in alignment therewith. Because of the connection between the trocars penetrating the two valves of the compartments, the compartment which was initially not pressurized is now pressurized and this results in the expulsion through the third trocar of the mixture contained in the jacket of the compartment which was initially not pressurized. This third trocar is in communication with the dispensing valve and nozzle.

In order that the invention may be better understood, one embodiment thereof will now be described, purely by way of example, with reference to the accompanying drawings, on which:

FIG. 1 is a perspective view showing the container having two compartments according to the invention, together with its associated cover;

FIG. 2 is an axial section taken along the line II—II of FIG. 1 with the cover shown in position to carry out the step in which two fluids contained in the two tubes are mixed together;

FIG. 3 is a detail view showing how each tube is attached to the valve of the corresponding jacket;

FIG. 4 is a sectional view taken along the line IV—IV of FIG. 2; and

FIG. 5 is a sectional view similar to FIG. 4 showing the position of the cover during the last step, after rotation of the cover.

Referring now to the drawings, it will be seen that reference numeral 1 indicates the container according to the invention as a whole and reference numeral 2 indicates the cover adapted to cooperate with this container. The cover 2 is equipped with a dispensing spout 3. This spout may be of any suitable shape and terminate in a comb, the teeth of which are provided with distributing holes. It is provided at its base with a distribution valve operated by the user.

The container 1 has a generally cylindrical shape. Its upper end member 11 is removable and may be mounted on the remainder of the container in a fluidtight manner by means of the sealing member 12. The container 1 comprises two compartments 4 and 5 separated by a wall 6. The compartment 4 has a larger volume than compartment 5 and contains a tube made of plastic material which is partially filled with a fluid 8 which is to be dispensed. The compartment 5 contains a tube of flexible plastic material 9 which is completely filled with a fluid 10 which is to be dispensed. The volume of tube 9 is less than the empty volume in tube 7.

The end member 11 comprises five valves 13. Each valve 13 comprises a rubber cylinder 14 having a collar 15 at its top and slightly enlarged at its bottom. A blind hole 16 extends along the axis of this cylinder. The end member 11 of the container comprises openings in which the valves 13 may be mounted. The lower parts of these valves are located in a recess 17 in the lower surface of the upper end member 11. The five valves 13 in the end member 11 carry reference numerals 13*a*, 13*b*, 13*c*, 13*d*, and 13*e*, respectively. Valve 13*a* is for tube 9, valve 13*b* for tube 7, valve 13*d* is for compartment 5 and valves 13*c* and 13*e* are for compartment 4. The triangle formed by the valves 13*a*, 13*b* and 13*c* is equal in size to the triangle formed by the valves 13*d*, 13*e* and 13*b*, and these two sets of valves would register with each other if they could be rotated in a suitable manner about the axis of the container. The cover 2 is generally cylindrical in shape and has an inner diameter substantially equal to the outer diameter of the container 1. The upper end 10 of the cover carries on its lower surface three trocars 19*a*, 19*b* and 19*c* parallel to the axis of the cover. The trocars 19*a*, 19*b* are connected together by the passageway 20. The trocar 19*c* is connected to the outlet port 21 leading to the dispensing spout 3 through a suitable dispensing valve. The bases of the trocars 19*a*, 19*b* and 19*c* define a triangle which can be superposed on the triangle formed by the valves 13*a*, 13*b* and 13*c*. When the trocar 19*a* is in alignment with the valve 13*a* the trocars 19*b* and 19*c* are in alignment with the valves 13*b* and 13*c*. This arrangement of the cover 2 with respect to the container 1 occurs when the projection 22 on the lateral surface of the container 1 is seated in a slot 23 in the lateral surface of the cover 2. The cover 2 carries a second slot 24 similar to the slot 23 and spaced from this slot by an angle exactly equal to the angle through which the cover must be rotated in order for the trocars to be shifted from a position in alignment with the valves 13*d*, 13*e* and 13*b* to one in alignment with the valves 13*a*, 13*b*, and 13*c*.

This apparatus is filled in the following manner:

The five valves 13*a*, 13*b*, 13*c*, 13*d* and 13*e* are mounted in the end member 11 of the container. The fluids 8 and 10 are then introduced into the flexible tubes 7 and 9 and these tubes are attached to the valves 13*b* and 13*a* respectively. The tubes 7 and 9 are then slid into the compartments 4 and 5 of the container 1 and the base 11 is mounted on the container by any suitable means. A certain quantity of pressurizing fluid 25 is then introduced into compartment 5 through the valve 13*d*. This pressurizing fluid is a liquid mixture containing 70 percent Freon-11 and 30 percent Freon-12 having a vapor tension of 1.54 kg./cm.² at 20° C. The trocar through which this pressurizing fluid is introduced is then withdrawn and the valve closes itself in response to the vapor pressure. The cover is then mounted on top of the container 1 by sliding the slot 23 over the projection 22. A safety strip prevents the cover from being pushed downwardly toward the container during storage.

When the apparatus according to the invention is to be used, the safety strip is removed and pressure is exerted on the container cover. The trocars 19*a*, 19*b* and 19*c* then enter the valves 13*a*, 13*b* and 13*c*. The pressure exerted by the pressurizing fluid 25 then expels the fluid 10 from the tube 7 through the trocar 19*a*, the passage 20, and the trocar 19*b*. The fluids 10 and 8 are accordingly mixed together. After a time sufficient to permit all of the contents of the tube 9 to be evacuated, the user pulls up the cover, turns it through a certain angle about the axis of the container so as to bring the slot 24 in alignment with the projection 22 and presses the cover down again. The trocars 19*a*, 19*b* and 19*c* are then introduced, as shown in FIG. 5, into the valves 13*d*, 13*e* and 13*b* respectively. The compartments 4 and 5 are thus brought into communication through the trocar 19*a*, the passageway 20, and the trocar 19*b*. As a consequence, a pressure is developed in the compartment 4 which is equal to the vapor tension of the pressurizing fluid 25. The tube 7, which is in communication with the ambient air through the trocar 19*c*, the orifice 21 and the distribution spout 3 may be emptied in response to this pressure if the user turns the distribution valve associated with the spout. The user may thus dispense at will, under pressure, the mixture of fluids 8 and 10.

This device is particularly valuable for use in connection with oxidation dyes for the hair. By way of example, 40 cm.² of 6 percent hydrogen peroxide may be introduced into a tube 9 having a capacity of 40 cubic centimeters and 40 cubic centimeters of a composition having the following constituents may be introduced into a tube 7 having a volume of 100 cubic centimeters:

Nonylphenol condensed with four molecules of ethylene oxide per molecule of nonylphenol	23 g
Nonylphenol condensed with nine molecules of ethylene oxide per molecule of nonylphenol	25 g
Copra diethanolamide	6 g
Butylglycol	2 g
Propylene glycol	16 g
20% ammonia	12 ml
Paratolylene diamine	09 g
Para-aminophenol	0.9 g
m.diamino-anisol sulfate	0.06 g
m.aminophenol	0.2 g
Resorcinol	0.5 g
Nitroparaphenylene diamine	0.002 g
Hydroquinone	0.10 g
Sodium salt of diethylene-triamino-penta-acetic acid	1.5 g
Sodium bisulfite	1.2 ml
Water, q.s.p.	100 g

A suitable mixture of dye and oxidizing agent may be applied to the hair by using the container hereinbefore described. In this example its application to 70 percent white hair results in a chestnut color.

It is of course obvious that the embodiment hereinbefore described may be modified as to detail without thereby departing from the basic principles of the invention. In particular the container may be spherical or even prismatic in shape having a regular polygon as its base and the angle of rotation of the cover may in the later case be a multiple of the corresponding angle between two adjacent sides of the polygonal base.

What is claimed is:

1. Device for dispensing simultaneously under pressure two fluids which are separately packaged, said device comprising a container having two closed compartments, a fluid-containing jacket in each compartment, each of said jackets opening into a valve made of a flexible material at one end of said con-

tainer, one of said compartments containing a liquefied pressurizing gas and opening into a valve made of a flexible material in said container end and the other compartment being unpressurized and opening into two valves made of a flexible material in the same end of the container, the single valve of said one compartment, the valve of the jacket in said other compartment, and one of the two valves of said other compartment forming a triangle congruent to a triangle formed by the valves of the two jackets the other valve of the other compartment, a dispensing cover adapted to be mounted on the base of the container and carrying three trocars adapted to enter and open said valves, said trocars forming a congruent triangle which may be brought into register with either of the triangles hereinbefore mentioned, a passageway in said cover connecting two of said trocars and an outlet for said cover connected to the other trocar.

2. Device as claimed in claim 1 in which the five valves are made of a rubberlike material, are substantially cylindrical in form with enlarged bases, are provided at their tops with a small collar, and are pierced by an axial hole.

3. Device as claimed in claim 1 in which the jackets are tubes of a flexible plastic material.

4. Device as claimed in claim 3 in which the tubes are snapped onto the corresponding valves.

5. Device as claimed in claim 1 in which the container is a circular cylinder and the cover is cylindrical and adapted to fit over the container.

6. Device as claimed in claim 1 in which the outlet is in the top of the cover and leads to a conventional dispensing spout.

7. Device as claimed in claim 1 in which the container carries a lateral projection and the cover is provided with two slots in its lateral surface parallel to the axis thereof which adapted to cooperate with said projection.

8. Device as claimed in claim 1 in which the liquefied pressurizing gas is a mixture of trichloromonofluoromethane and dichlorodifluoromethane yielding a relative pressure of about 1 to 2 kg./cm.^{2} at 20° C.

9. Device for simultaneously dispensing two fluids, which device comprises:

a container having two closed compartments,

first and second compressible fluid-holding tubes, one in each compartment, said first tube being partly empty;

a pressurizing fluid in the compartment containing said second tube;

outlet means for said container; and

means for first connecting said tubes together so that the pressure in the compartment containing said pressurizing fluid will force fluid from said first tube in said pressurized compartment into said second tube in the other compartment, and for subsequently connecting said pressurized compartment to said other compartment and said second tube to said container outlet, so that the contents of said second tube are urged through said container outlet by said pressurizing fluid.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,608,782 Dated September 28, 1971

Inventor(s) Robert Sathicq

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

[31] 172,506

Signed and sealed this 7th day of March 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

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