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3,002,658

NOZZLE FOR APPLYING COLORS

Filed July 6, 1959

Fig.1

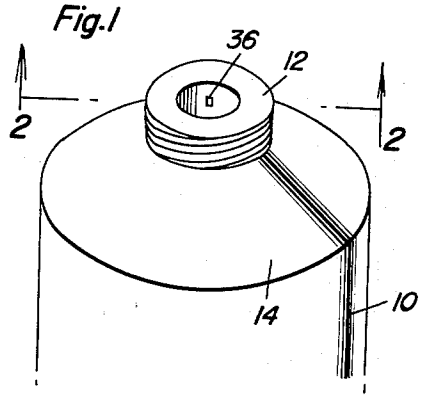


Fig.5

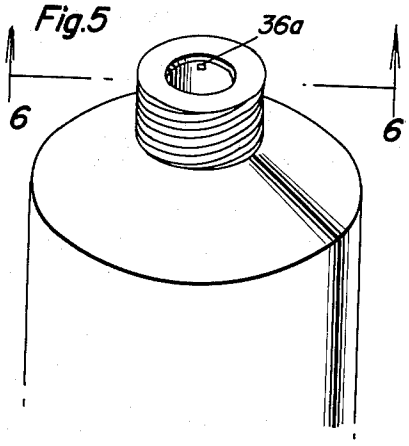


Fig.2

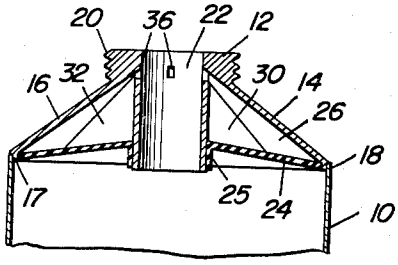


Fig.6

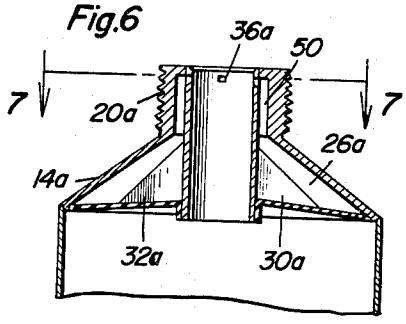


Fig.3

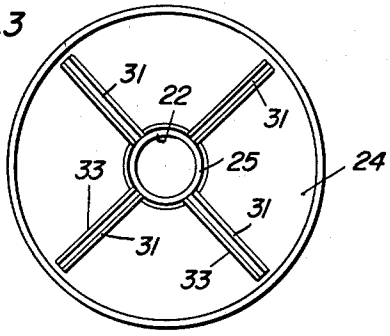


Fig.7

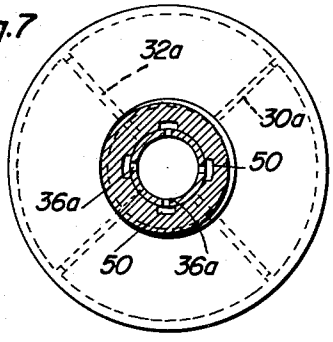
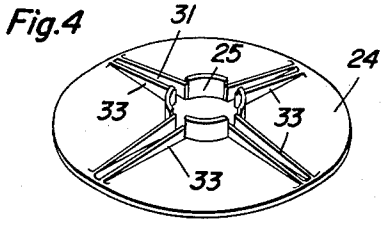


Fig.4



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NOZZLE FOR APPLYING COLORS

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This invention relates to nozzles designed to extrude various colors to be added to a fluent substance discharged from a container at the time that the substance is being discharged.

An object of the invention is to provide a nozzle construction of improved design for applying colored substance to a stream of fluent substance which is being discharged from a container. A typical embodiment of the invention entails a very simple organization of a diaphragm which functions as a baffle holding the colored material separate from the contents of a container but capable of transmitting pressure to the colored substance so that a small quantity thereof may issue through one or more orifices opening laterally into a discharge tube at the discharge end of the container.

The invention is further characterized by a compartmented, diaphragm separated chamber within the container so that a plurality of colored substances may be issued into the stream of fluent substance which is expelled from the container. This enables a selection of different colors in the main stream of fluent substance that is being discharged from the container. For example, a manufacturer's product may be associated with a particular color or color pattern, either or both of which may be obtained by use of a nozzle constructed in accordance with the invention.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to be accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary perspective view of a container equipped with a nozzle of this invention;

FIGURE 2 is a sectional view taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a plan view of the diaphragm baffle in accordance with the invention;

FIGURE 4 is a perspective view of the baffle;

FIGURE 5 is a fragmentary perspective view of a modification of the invention;

FIGURE 6 is a sectional view taken on the line 6—6 of FIGURE 5; and,

FIGURE 7 is a sectional view taken approximately on the line 7—7 of FIGURE 6.

In the accompanying drawings reference in first made to FIGURES 1–4. Container **10** diagrammatically represents any type of container with which nozzle **12** may be used. Ordinarily container **10** will be a collapsible tube or squeeze-bottle, both of which have at least one wall of pliant material, either metallic or non-metallic, so that the contents of the container **10** may be subjected to pressure.

Nozzle **12** is made of a nozzle body **14** including an essentially truncated conical wall **16** attached to the upper open end **18** of the container. The shape of wall **16** can, of course, be varied. However, the upper end of wall **16** has an external thread **20** by which to engage a cap and separably hold it in place. The cap covers tube **22** which is attached to the smaller diameter part of wall **16** and projects downwardly along a central axis of the body **14**. Both ends of tube **22** are open, and one end is covered by the cap (not shown) and the other end is in registry with the interior of container **10**. Tube **22** defines a passageway through which fluent substance from tube **10** is adapted to issue.

A combined baffle and diaphragm **24** extends transversely across the lower part of body **14**, thereby separating cavity **22** from the interior of the container.

There are a plurality of partitions, for instance, partitions **30** and **32** fixed to the outer surface of the tube **22** and occupying cavity **26**, subdividing it into a plurality of small chambers. The number of walls **30** and **32** may be increased or decreased, the illustrated form of the invention in FIGS. 1–4 having four such walls thereby subdividing chamber **26** into four compartments.

Baffle **24** is made of flexible material, for instance rubber, plastic or an equivalent material, and its peripheral edge is joined to the edge **18** of container **10** or to the edge **17** of wall **16** which is engaged with the edge **18** of tube **10**. A short neck **25** is at the center of the baffle **24**, and it has tube **22** extended therethrough so that a sliding connection between neck **25** and the outer surface of tube **22** is established.

Each of the compartments defined by walls **30** and **32** has at least a single orifice **36** in registry therewith. Orifice **36** (FIG. 2) is in the wall of tube **22** and is in communication with one of the compartments. Accordingly, each compartment may contain a different color substance to be issued through the particular orifice associated therewith, while the main supply of fluent substance is maintained within container **10**.

In use and operation thereof, pressure is applied to the container **10** thereby causing the fluent substance therein to issue through tube **22**. At the same time pressure is applied to the four chambers divided from cavity **26**, by means of the diaphragm **24**, which flexes causing it to move in a direction that walls **30** and **32** enter slots **31** between ribs **33** of the diaphragm **24**. As fluent substance issues through tube **22**, the coloring material issues through the various orifices **36** and is applied to the outer surface of the ribbon or charge of fluent substance passing through tube **22**. This applies streaks of colored substance on the main fluent substance as it issues through the tube **22**.

Reference is now made to FIGURES 5–7. This form of the invention distinguishes from the form of the invention shown in FIGURES 1–3 principally in dimensions and in a slightly different arrangement of the cavity **26***a*. Cavity **26***a* is provided at the upper end thereof with passages **50** formed lengthwise on the interior of the threaded portion **20***a* of body **14***a*. The threaded portion **20***a* is made considerably longer than the corresponding threaded portion **20** thereby permitting passages **50** to register orifices **36***a* with the chambers or compartments of cavity **26***a* divided from each other by means of walls **30***a* and **32***a*.

Functionally and operationally, the embodiments of FIGURES 1–4 and 5–7, inclusive, are identical.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A nozzle structure for a container provided with a fluent substance, said nozzle structure comprising a wall adapted to be attached to the end of the container, a diaphragm baffle connected to said wall and isolating the wall into a cavity which is separated by said diaphragm from the interior of the container, a tube connected to said wall and in registry with the interior of the container, a plurality of partition walls provided in said cavity and separating the same into a plurality of compartments, said tube having a plurality of orifices in the side wall

thereof in communication with the respective compartments so that upon application of force and pressure to the contents of the container, pressure is transmitted by means of said diaphragm to said compartments thereby issuing substances from said compartments through said orifices into said tube to be applied to the main stream of fluent substance passing therethrough, said baffle having a plurality of slots in which the lower edges of said partition walls are disposed so that said baffle may deflect into said cavity with portions of said baffle moving alongside of said partition walls.

2. The combination of claim 1 wherein there is a neck attached to said baffle and embracing said tube to guide the baffle in its movement as said diaphragm is deflected.

3. In a nozzle construction for a collapsible tube, a nozzle body having an outer wall defining a cavity, a fluent substance conductor tube connected to said body and having one end in registry with said tube and having an opposite open end through which fluent substance is adapted to be discharged, a baffle of flexible material in said body and separating the cavity in said body from the contents of said tube, a plurality of partition walls in said cavity separating said cavity into a plurality of individual compartments adapted to contain different colored substances, orifice means establishing registry between the interior of said tube and the respective compartments so that colored substances may be issued from said compartments in response to application of pressure on the tube which is transmitted to the cavity by means of said baffle, and a neck on said baffle slidably engaging the exterior surface of said tube to guide said baffle as said baffle is deflected.

4. In a nozzle construction for a collapsible tube, a nozzle body having an outer wall defining a cavity, a fluent substance conductor tube connected to said body and having one end in registry with said tube and having an opposite open end through which fluent substance is adapted to be discharged, a baffle of flexible material in said body and separating the cavity in said body from the contents of said tube, a plurality of partition walls in said cavity separating said cavity into a plurality of individual compartments adapted to contain different colored substances, orifice means establishing registry between the interior of said tube and the respective compartments so that colored substances may be issued from said compartments in response to application of pressure on the tube which is transmitted to the cavity by means of said baffle, and a neck on said baffle slidably engaging the exterior surface of said tube to guide said baffle as said baffle is deflected, said baffle having a plurality of slots therein, and said partition walls being disposed in said slots so that said baffle is capable of moving inwardly of said cavity to positions alongside of said partition walls.

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