Sept. 13, 1966 J. P. RAFFE 3,271,810

DISPENSERS FOR LIQUID, POWDER OR THE LIKE MATERIALS

Filed July 6, 1964

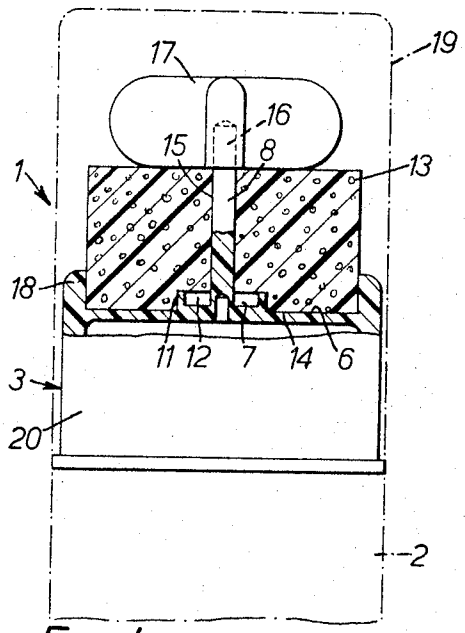

FIG. 1.

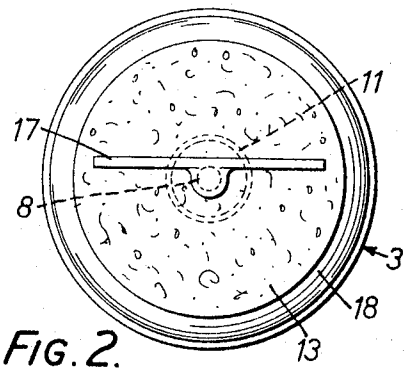

FIG. 2.

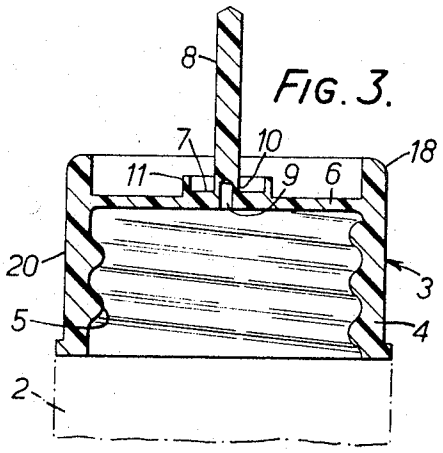

FIG. 3.

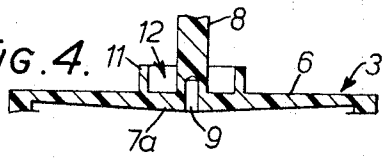

FIG. 4.

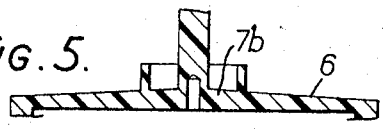

FIG. 5.

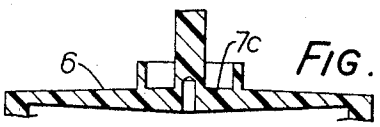

FIG. 6.

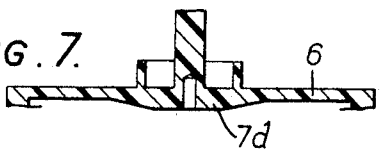

FIG. 7.

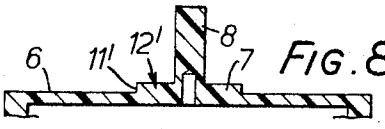

FIG. 8.

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DISPENSERS FOR LIQUID, POWDER OR THE LIKE MATERIALS

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12 Claims. (Cl. 15—539)

The invention concerns improvements relating to dispensers and in particular dispenser heads for liquid, powder or like flowable materials which are to be applied by a sponge-like applicator.

An object of the invention is to provide such a head wherein an initially sealed dispensing hole concealed beneath the applicator is readily unsealed, and obstruction of the hole by the broken sealing means is avoided. Obstruction of the unsealing operation or of the unsealed hole by adhesive used to secure the applicator may also be avoided by the invention.

According to the invention a dispenser head comprises a closure element for a container of liquid, powder or like flowable material, a rod-like member integral with the closure element and upstanding therefrom to project outwardly of the container, a sealed dispensing hole extending through the closure element and part way into the rod-like member to define a thin-walled region of weakness which enables the rod-like member to be readily broken off from the closure element to unseal the dispensing hole, and a sponge-form applicator secured on the closure element to apply the material, the rod-like member passing completely through the applicator to present an end thereof whereby the member can be broken off and withdrawn.

Advantageously the closure element includes an integral diaphragm, the rod-like member upstands from the diaphragm, and the diaphragm presents a wall formation defining a region around the rod-like member separate from the remainder of the diaphragm.

The applicator may have an end which is secured to the diaphragm by adhesive and the wall formation prevents such adhesive from penetrating to said region.

Embodiments of a dispenser head according to the invention are hereinafter described by way of example only with reference to the accompanying drawings in which:

FIG. 1 is an elevation of one embodiment of the head partly in section,

FIG. 2 is a plan view of such head,

FIG. 3 is a longitudinal section of the closure element of such head, and

FIGS. 4 to 8 illustrate alternative forms of the closure element.

Referring to FIGS. 1 to 3, the dispenser head **1** is to be fitted to a container indicated diagrammatically at **2** for the liquid, powder or like flowable material to be dispensed. Thus the head comprises a closure element **3** which includes a cylindrical portion **4** which is adapted to be fitted to the container **2** e.g. by means of an internal screw thread formation **5**. Any other suitable form of fitting could be used, e.g. an external screw thread formation or a snap closure.

The closure element also includes an integral diaphragm **6** of disc form having a central thickened portion or boss **7**. Any equivalent central strengthening formation may alternatively be provided at either face of the diaphragm. A rod or rod-like member **8** is integral with the diaphragm and upstands centrally of the diaphragm and boss **7** to project outwardly of the container. A sealed dispensing hole **9** extends axially through the

diaphragm and boss **7** and for a short distance into the rod **8**. The wall of the rod in the region **10** around the hole **9** therein is sufficiently thin and weak in relation to the material of the rod that the latter can be readily broken off from the diaphragm, being either forced sideways or twisted for this purpose.

The boss **7** or equivalent strengthening assists in ensuring that the rod breaks as required, without fracturing the diaphragm. A cylindrical wall formation in the form of a lip **11** upstands from the diaphragm co-axially around the rod **8** to define an annular region or space **12** around the rod **8** separate from the remainder of the diaphragm and between the diaphragm and an applicator **13**.

The applicator **13** is constituted by a cylindrical plug of sponge-form material (e.g. of cellular rubber or plastic) which has a substantially flat end **14** secured to the corresponding face of the diaphragm by adhesive which is prevented by the lip **11** from penetrating to said region **12** around the rod **8**. The plug has a central axial hole **15** to permit the rod **8** to pass completely through the plug and present an end **16** projecting from the plug. This end **16** may carry means such as the wing **17** to facilitate the required breakage of the rod. The cylindrical portion **4** of the closure element may also present a cylindrical shoulder formation **18** upstanding from the diaphragm **6** to assist in locating the plug.

A cap as indicated diagrammatically at **19** is removably fitted onto the closure element **3** to enclose the applicator and the projecting rod end **16** with the wing **17**, for example by a friction fit over the cylindrical radially outer surface **20** of the element which may be slightly tapered for this purpose.

In use: the cap is removed to expose the wing **17**. This is twisted or pushed sideways and the force is applied to the rod **8**—this movement is not impeded by the applicator plug **13** which is relatively soft and has considerable "give"—with the result that the rod is broken off immediately next to the boss **7**. The rod is then withdrawn from the plug by pulling on the wing in a direction lengthwise of the rod. The rod and wing when completely withdrawn may be thrown away. The contents can then readily escape from the container through the unsealed dispensing hole **9** into the plug for application thereby. The hole **9** is made of a size suited to the flow characteristics of the material to be dispensed. The contents pass rapidly into the sponge of the plug through the axial hole **15** therein, though of course this will partly close on withdrawal of the rod.

As indicated above, it is ensured that during assembly and usage of the head, adhesive is not present in and does not penetrate to the region in the immediate vicinity of the dispensing hole **9**, which adhesive might otherwise hinder breakage of the rod and also provide a partial obstruction to the ready flow of the liquid or powder to be applied.

The closure element **3** integral with the rod **8** is preferably made from a synthetic resin material, e.g. high impact polystyrene. After securing the plug **13** with adhesive, the wing **17** is fixed to the rod, the wing being made for example of polythene.

The head may be fitted to various forms of dispenser container which may have rigid walls or a pliable wall to assist dispensing.

FIG. 4 shows an alternative form of the closure element **3** wherein the diaphragm **6** has a shallow conical strengthening formation at the face to the container side presenting a central thickened portion **7***a*. Also, the cylindrical shoulder formation **18** of FIGS. 1 to 3 is omitted.

FIG. 5 shows an arrangement similar to FIG. 4 but with the conical formation at the outer face of the

diaphragm **6**, to present a central thickened portion **7***b*.

In FIG. 6 both faces of the diaphragm **6** have such a shallow conical formation to present a central thickened portion **7***c*.

In FIG. 7 the face to the container side of the diaphragm **6** presents the central thickened boss **7***d*.

FIG. 8 shows an arrangement similar to that of FIGS. 1 to 3, but the cylindrical wall formation **11'** is not continued upward as a lip above the boss **7**, and in this case the separate region **12'** around the rod **8** is defined solely by the boss **7**. Again the cylindrical shoulder formation **18** is omitted.

I claim:

1. A dispenser head comprising a closure element for a container of flowable material, a rod member integral with said closure element and upstanding therefrom to project outwardly of the container, a sealed dispensing hole extending through said closure element and part way into said rod member, a thin-walled region of weakness defined in said rod member by said hole which enables said rod member to be readily broken off from said closure element to unseal said hole, a sponge-form applicator secured on said closure element to apply the material and through which said rod passes completely, and an end of said rod thus projecting from said applicator whereby the said rod can be broken off and withdrawn.

2. A dispenser head according to claim **1** wherein the closure element includes an integral diaphragm, the rod member upstands from the diaphragm, and the diaphragm presents a wall formation defining a region around the rod member separate from the remainder of the diaphragm.

3. A dispenser head according to claim **2** wherein an end of the applicator is secured to the diaphragm by adhesive and the wall formation prevents said adhesive from penetrating to said region.

4. A dispenser head according to claim **2** wherein the rod member upstands centrally from the diaphragm and the wall formation is in the form of a lip upstanding cylindrically from the diaphragm co-axially around said member.

5. A dispenser head according to claim **2** wherein the diaphragm has a strengthening formation from which the rod member upstands.

6. A dispenser head according to claim **1** wherein means to facilitate the required breakage of said rod

member is carried by said end of said rod member which projects from said applicator.

7. A dispenser head according to claim **1** wherein the closure element includes a cylindrical portion which is adapted to be fitted to the container.

8. A dispenser head according to claim **7** wherein the cylindrical portion further presents a shoulder formation assisting to locate the applicator.

9. A dispenser head according to claim **1** further comprising a cap removably fitting onto the closure element to enclose the applicator.

10. A dispenser comprising a container for flowable material, a closure element fitted to said container, a rod member integral with said closure element and upstanding therefrom to project outwardly of the container, a sealed dispensing hole extending through said closure element and part way into said rod member, a thin-walled region of weakness defined in said rod member by said hole which enables said rod member to be readily broken off from said closure element to unseal said hole, a sponge-form applicator secured on said closure element to apply the material and through which said rod passes completely, and an end of said rod thus projecting from said applicator whereby said rod can be broken off and withdrawn.

11. A dispenser according to claim **10** wherein said closure element includes an integral diaphragm, said rod member upstands centrally from said diaphragm, a cylindrical lip upstands from said diaphragm co-axially around said rod member to define a region around such member separate from the remainder of said diaphragm.

12. A dispenser according to claim **11** wherein an end of said applicator is secured to said diaphragm by adhesive and said lip prevents such adhesive from penetrating to said region around said rod member.

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