Oct. 28, 1958 S. K. HARKRADER 2,858,054

DISPENSING DEVICE

Filed March 9, 1955

Fig. 1.

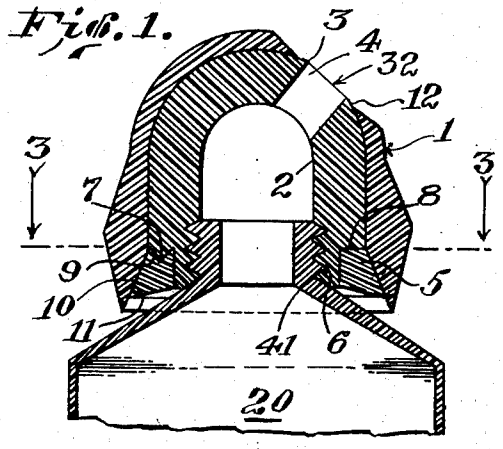


Fig. 2.

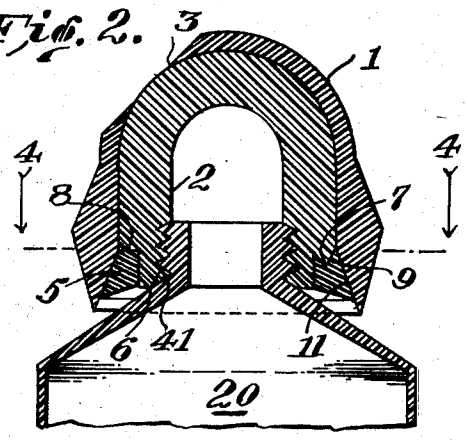


Fig. 5.

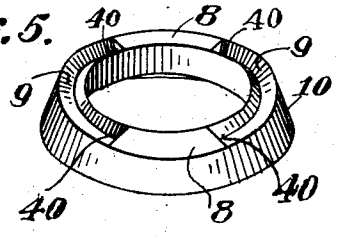


Fig. 4.

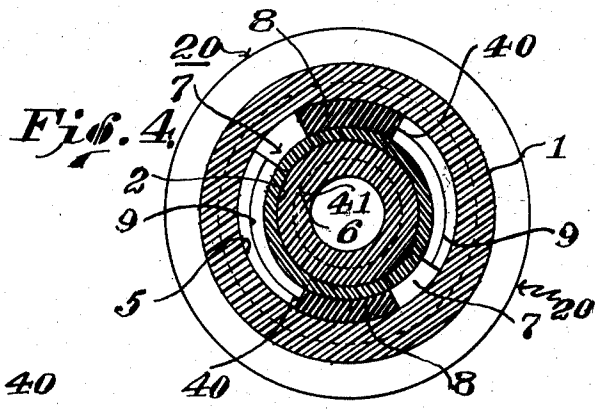


Fig. 3.

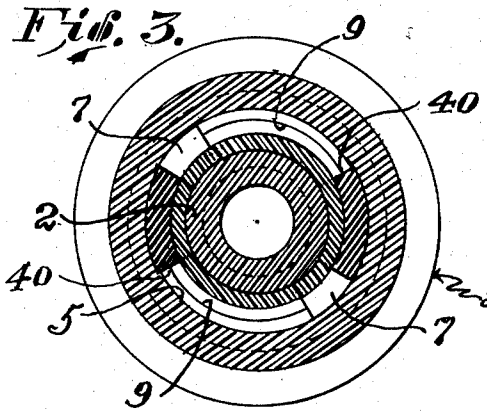


Fig. 6.

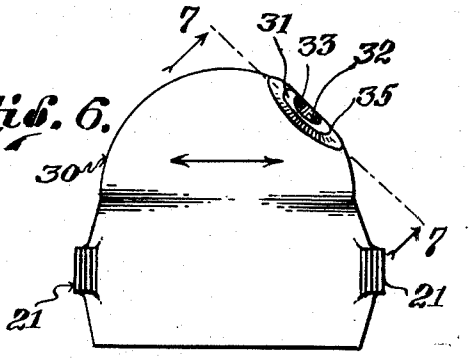
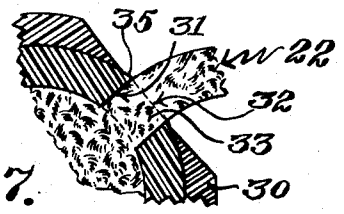


Fig. 7.



INVENTOR.

Stuard K. Harkrader.

BY

Attorney.

United States Patent Office 2,858,054
Patented Oct. 28, 1958

2,858,054

DISPENSING DEVICE

Stuard K. Harkrader, Seven Mile Ford, Va.

Application March 9, 1955, Serial No. 493,255

3 Claims. (Cl. 222—553)

The present invention relates to a dispensing device. It is particularly concerned with a closure head adapted to be used on tubes, cans, bottles, and the like which contain a liquid, powder, paste, etc. to be dispensed.

It is an object of the present invention to provide a device which may be easily opened when it is desired to dispense materials from the container to which it is attached.

It is another object of the present invention to provide a device which may be easily opened and closed by a single simple rotary motion.

Still another object of this invention is to provide a device which is adapted to be used on conventional containers and which may be readily attached thereto.

It is a further object of this invention to provide a positive open and shut dispensing head which is both pleasing to the eye and manufactured at a relatively small cost.

An additional object of this invention is to provide a dispensing device of such a construction that clogging or sticking of its movements is prevented.

It is another object of this invention to provide a closure for containers that is durable, easily and quickly assembled and highly efficient in use.

Additional objects of the present invention will appear throughout the following description and appended claims.

There are many dispensing devices on the market that bear outward similarities to the present invention. The common type of such devices is comprised of several shells each one of which has an aperture whereby rotation of the several parts serves to align the apertures so that the dispensing of the material, contained in the container to which the device is attached, is possible.

The chief difficulty with such devices is that they are frequently difficult to rotate due to the dispensing material clogging and adhering between the spherical surfaces. Further inconveniences arise in their use due to poor construction which results in the devices themselves being accidentally detached from the containers or otherwise rendered inoperative because of poor sealing and consequent accidental discharging of the paste, powder, liquid or other materials to be dispensed.

Other difficulties arise in that many of the devices on the present market are too complicated and require expensive apparatus to produce.

The present invention contemplates a simple, inexpensive device which is convenient in both manufacture and use and which effectively eliminates those difficulties inherent in those devices available on the present market.

A preferred embodiment of the invention has been chosen for illustrative purposes and is shown in the accompanying drawing and described in the specification and claims.

Referring to the figures shown in the drawing:

Figure 1 is a sectional view of the dispensing device in open position and attached to a container;

Figure 2 is a sectional view of the same device in

closed position but on a different vertical section than that of Figure 1;

Figure 3 is a cross-sectional view of Figure 1 taken along the lines 3—3 thereof;

Figure 4 is a cross-sectional view of Figure 2 taken along the lines 4—4 thereof;

Figure 5 is a perspective view of an annular ring which forms part of the present invention in its preferred embodiment;

Figure 6 is a side elevational view of a modified form of the dispensing device; and

Figure 7 is an exploded fragmentary cross-sectional view taken along the lines 7—7 of Figure 6.

The structure of the dispensing device seen in Figures 1 and 2 consists of an outer shell 1 superimposed over an inner shell 2. Figure 1 shows the outer opening or aperture 3 of the outer shell 1 in alignment with aperture 4 of inner shell 2 so that the material in tube 20 may be dispensed. The aperture 4 does not appear in Figure 2, as Figure 2 is a different vertical sectional view than that of Figure 1, and further, the shell openings are out of alignment in the Figure 2 illustration. While my dispensing device may be used in connection with various containers, such as tubes, bottles, cans, etc., I have shown, by way of example, a collapsible tube 20 such as is commonly employed in the dispensing of creams, paste and the like, in order that my invention may be more perfectly understood.

Most containers, whether they be tubes, bottles, or cans, have a threaded neck at their discharge ends. The present invention contemplates the provision of a conventional-sized thread 6 on the upper end of the tube so that the device of this invention may be screw threaded on those containers. Accordingly, the device may be secured to the tube by threading 6 on screw threads 41 of container 20.

The annular ring 5 and the inner shell 2 are provided with inclined interfitting conical walls 10 and 11 respectively, these parts being attached to each other by suitable means such as an adhesive. If ring 5 is formed from a rubber composition, a solvent might be employed. Thus, when shell 1 is rotated, ring 5 is also turned. Ring 5, however, is not secured to inner shell 2 at any point and may freely be turned, there being slight friction between the two so that inadvertent rotation of shell 1 and ring 5 is prevented.

The ring 5 is provided with a plurality of arc-shaped grooves 9 which extend partially circumferentially of the dome-shaped shells. For purposes of illustration, two grooves 9, each comprised of inclined surfaces terminating in a beveled edge, are shown in the drawing. Grooves 9 are similar to one another. The non-continuous portions of the grooves form stops as indicated at 8, and these are formed integrally with the upper periphery of the ring as shown in part in Figure 5. Cooperating with the grooves are arc-shaped tongues 7, each of which also only extends partly around the peripheries of the dome, and these tongues engage in the grooves. The ends of the tongues, when the shells are relatively rotated, engage the stops 8.

The numeral 40 indicates the ends of the groove which have been slightly narrowed so as to increase the friction when the tongues reach this portion of the grooves. This may occur in several ways, for instance by forming the grooves of slightly narrower width at the places indicated at 40 to thereby increase the friction against the tongues when the tongues are moved to the position to engage this end of the grooves.

Assuming that the device is closed, as shown in Figure 2, and it is desired to open the same, tube 20 may be held in the left hand, as is the usual custom, and the

outer shell is rotated clockwise by the right hand until the lugs 7 abut arcuate filler members 8. In this connection, should any sticking occur from disuse, the movement of rotation will be in the same direction, clockwise, as the device itself is screwed on the tube's neck and hence no loosening of the device will occur. Further, when the device is moved clockwise as far as possible, apertures 3 and 4 are in correct and registered alignment (although the inner aperture is smaller than the outer aperture), thus providing a device that is convenient, easy to handle and extremely practical.

It is to be noted that the aperture 3 of shell 1 is slightly larger than aperture 4 of shell 2. This provision has been made so that little or none of the dispensing material will be caught between shells 1 and 2. Cutting edge 12 of shell 1 is an additional feature added to insure that a complete severance of the material to be dispensed will be achieved.

The lower end of the shell 1, as shown in Figures 1 and 2, is slightly beveled inwardly, but this is considered to be an unimportant feature of the invention, merely to add attractiveness to the appearance of the outer shell. This provision also adds considerably to the pleasing appearance of the dispensing device. One lug 7 only shows in Figure 1 on the left side of the figure, the other lug 7 being hidden by arcuate filler member 8. Both lugs 7 abut arcuate filler members 8 in both open and closed positions as shown in Figures 3 and 4. The device in Figures 1 and 3 is in an open position, as previously mentioned. When the device is in closed position, as shown in Figures 2 and 4, the lugs 7 abut opposite arcuate filler members 8. It is to be noted that when the device is closed, as shown in Figure 2, part of inner shell 2 protrudes through the aperture 3 of outer shell 1 and a clean sweep of material is assured. Thus, when the device is closed, a clean sweep is assured and complete severance of the dispensed material is realized due to the shearing action. The parts are also fully sealed when the device is closed.

Figures 6 and 7 show a modified dispensing device, wherein finger grips 21 have been added to the outer shell 30 to facilitate the rotation of the device. Other than the addition of finger grips 21, which add to the attractive appearance of the device, all of the other elements shown in Figures 1–5 are present and are substantially identical with those seen in Figures 6 and 7. That is, outer shell 30 is superimposed over inner shell 31 and apertures 32 and 33 are positioned in shells 30 and 31, respectively, so that proper rotation will enable the apertures to be in substantial alignment and the material may be dispensed. In the present case, paste 22 is illustrated. As shown in Figure 6, shell 30 has a bevelled edge 35 at its aperture 32, which edge tapers to a knife-like edge that completely surrounds aperture 32. This edge 35, together with the provision of aperture 33 slightly smaller than aperture 32 so that the periphery of beveled edge 31 forms the aperture 33 which protrudes through aperture 32, insures a complete severance of the paste 22 so that not only is an effective seal achieved, but all traces of paste 22 are removed.

This feature is believed to be most important in preventing clogging and sticking of the device so that malfunctions will not occur and thus assure an effective seal, and to remove all traces of the paste at the aperture whereby to prevent clogging or sticking.

A further provision for convenience is contemplated in the case of shell 2 as seen in Figures 1 and 2. As previously stated, threads 6 of shell 2 are of such dimensions that they may be threaded on the conventional sized screw threads of those containers now commercially available. It may be desired to provide only a few screw threads on shell 2 so that only a few turns of shell 2 will be necessary. By properly designing the length of screw threads 6, the position of aperture 4 of shell 2 may be accurately calculated when shell 2 is tightened on a container and will be the same on all conventional containers. For instance, if it is desired to have aperture 4 on the narrow side of tube 20 when the device is tightly screwed to the tube, a screw thread of the proper length would place aperture 4 in the proper position.

Regarding the composition of shells 1 and 2, plastic compositions are favored since they are extremely durable when used in devices similar to the present one. They are also cheaply manufactured. However, the shells may be composed of various metals, woods, glass, etc., without departing from the spirit of my invention.

If the container itself is made of a plastic, screw threads need not be provided since the device may be properly secured to the container by means of a solvent so that the device will weld to the container.

The device may be fitted to containers by other means such as a simple frictional engagement or, where the container has a flange around the periphery of its opening, the device may have a similarly shaped periphery around the bottom of its inner shell instead of screw threads. The device is then secured to the container by a simple clamping engagement.

Annular ring 5 may be composed of rubber or compositions having similar properties, or the ring may be formed of a plastic composition, or various types of woods, metals, etc. may be used.

It will be noted that a plane intersecting the top surface of the inner opening 4 is outside of or above a plane intersecting the shear surface of the outer opening when the openings are aligned.

It will be seen that the present invention provides an inexpensive dispensing device for various liquids, powders, pastes and other pharmaceutical preparations. By virtue of its construction, a complete resealing of the material is realized after each use. Furthermore, the device itself cannot be lost or accidentally dropped as is the case with the conventional closures now seen on commercially available containers. In addition to the convenience of its manufacture and the resulting economy, the device may be re-used on various types of containers indefinitely.

As various modifications may be made both in form and construction without departing from the spirit of the present invention, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having described my invention, what is claimed is:

1. A dispensing device for a container, comprising a dome-shaped inner shell having an outer spherical surface and a dome-shaped outer shell having an inner spherical surface, apertures in the inner shell and outer shell extending through said spherical surfaces, said apertures being adapted to be brought into alignment upon rotation of the outer shell with relation to the inner shell, means on said inner shell for attaching the same to a container, said outer shell having an inwardly facing conical surface adjacent the lower end thereof, an annular ring having an outwardly facing conical surface and means attaching said conical surfaces to each other, said ring and said inner shell comprising a pair of members, one of said members having an arc-shaped tongue and the other an arc-shaped groove, said tongue extending into said groove, said tongue and groove extending partially around said shells, said groove having end portions forming stops for said tongue at each end of said groove whereby to limit the rotation of the outer shell on said inner shell, and to permit manual alignment or disalignment of said shell apertures, said conical surfaces being mating surfaces whereby said ring may be adjusted during assembly to cause contacting engagement between said tongue and groove.

2. The structure of claim 1 wherein the said tongue

comprises a pair of surfaces terminating in a beveled edge.

3. A dispensing device for a container, comprising a dome-shaped inner shell having an outer spherical surface and a dome-shaped outer shell having an inner spherical surface, apertures in the inner shell and outer shell extending through said spherical surfaces, said outer shell aperture having a beveled edge, the aperture of said inner shell being of slightly smaller diameter than that of said aperture of the outer shell, said apertures being adapted to be brought into central alignment upon rotation of the outer shell with relation to the inner shell, with the plane of the aperture at the outer surface of said inner shell and a portion of the outer surface periphery of said inner shell surrounding said aperture protruding above the plane of the aperture of the outer shell, means on said inner shell for attaching the same to a container, said outer shell having an inwardly facing conical surface adjacent the lower end thereof, an annular ring having an outwardly facing conical surface and means attaching said conical surfaces to each other, said ring and said inner shell comprising a pair of opposing members, one of said members having a contiguous arc-shaped tongue extending into a groove, said tongue and groove extending partially around said shells, said groove having end portions forming stops for said tongue at each end of said groove whereby to limit the rotation of the outer shell on said inner shell and to permit manual alignment or disalignment of said shell apertures, said conical surfaces being mating surfaces whereby said ring may be adjusted during assembly to cause contacting engagement between said tongue and groove and between said spherical surfaces of the inner and outer shell.

References Cited in the file of this patent

UNITED STATES PATENTS

1,615,127	McNaughton	Jan. 18, 1927
1,910,378	Burke	May 23, 1933
1,952,586	Cruze et al.	Mar. 27, 1934
2,041,351	Jones	May 19, 1936
2,056,005	Fleisch	Sept. 29, 1936
2,238,888	Kluth	Apr. 22, 1941