

[54] ADAPTER SHIM DEVICE

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|-----------|---------|-------------|-----------|
| 3,292,954 | 12/1966 | Corey ..... | 285/420 X |
| 3,370,752 | 2/1968  | Abler ..... | 222/83.5  |

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[51] **Int. Cl.**..... **B23b 41/08, F16e 41/04**

[58] **Field of Search**..... 137/315, 317, 318;  
222/83.5; 285/178, 197, 317, 420

[56] **References Cited**

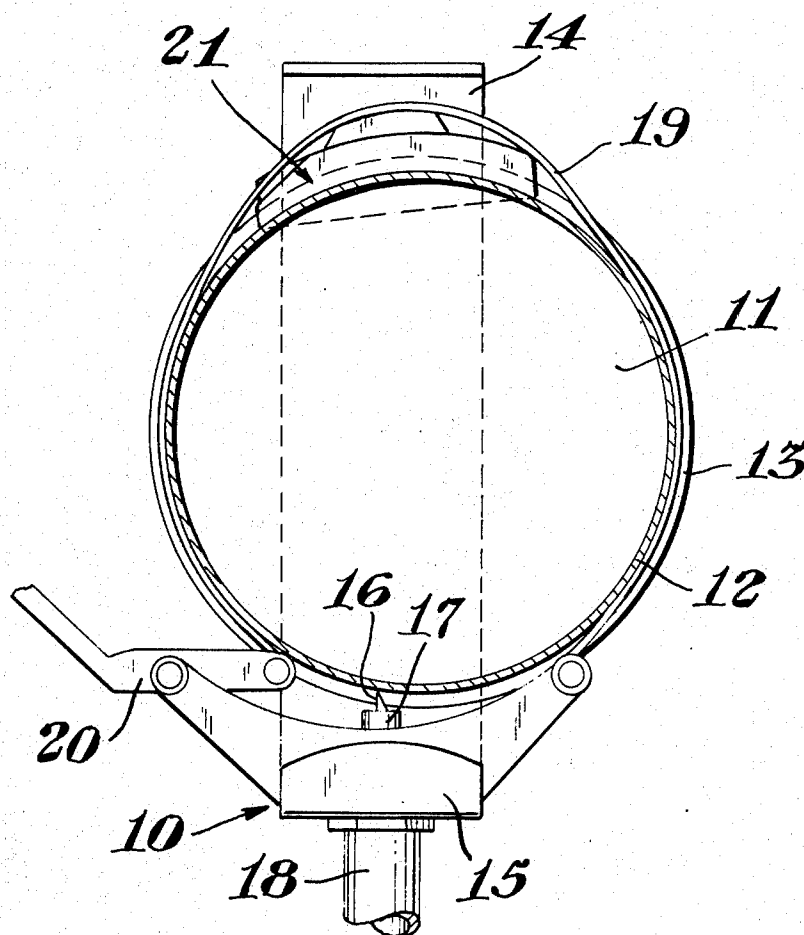
UNITED STATES PATENTS

3,147,887 9/1964 Brooks..... 222/83.5

[57] **ABSTRACT**

An adapter shim to be used with an opening and dispensing device which is utilized with containers that do not have integral dispensing means. The adapter shim provides for safe opening and dispensing of containers of different sizes with a dispensing device designed for a container of a specific size.

### 6 Claims, 7 Drawing Figures



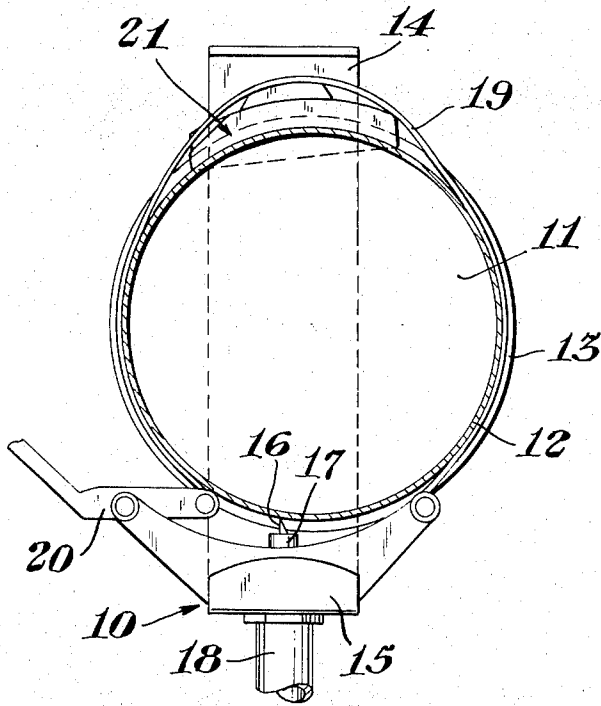


Fig. 1

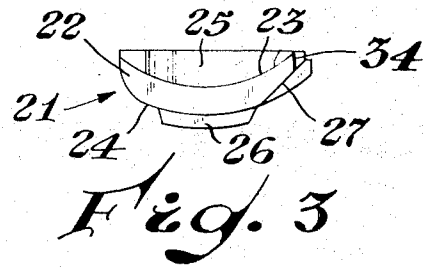


Fig. 3

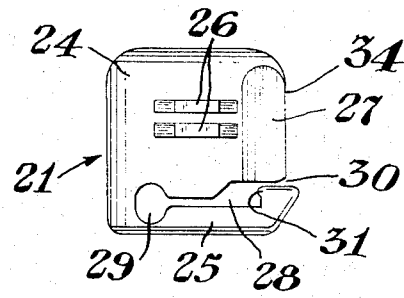


Fig. 2

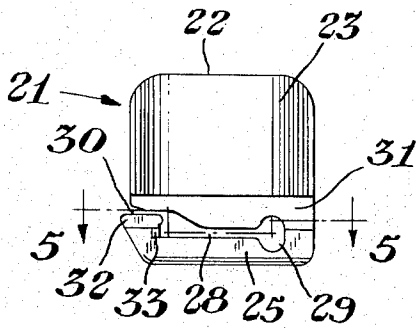


Fig. 4

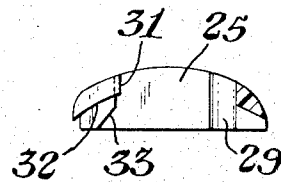


Fig. 5

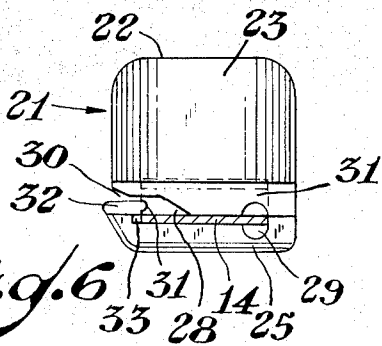


Fig. 6

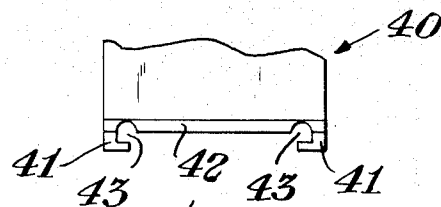


Fig. 7

## ADAPTER SHIM DEVICE

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to devices used to open and dispense the contents of containers, with particular reference to adapter shims used with the same to provide the necessary adjustment required for containers having different sizes.

## 2. Description of the Prior Art

There are numerous combinations of commercially beneficial products and containers used to package the same. Many of the containers utilized are of the rigid or semi-rigid type which may or may not include integral dispensing means. For those which do not include integral dispensing means, a separate device for opening and dispensing their contents is often required.

For example, where hazardous chemical materials, such as methyl bromide beneficially used as an agricultural fumigant to treat soil, are packaged, it is essential that specialized containers and use procedures be adopted because of their dangerous and/or poisonous characteristics. Externely hazardous chemicals of this type are generally packaged in small rigid cylindrical containers having specially designed end portions which preclude any possibility of the hazardous materials leaking from the same. To further insure against leaks during shipment and storage, the containers are normally formed without any integral dispensing means. Therefore, use of the containers requires a separate opening and dispensing device.

A typical dispensing device utilized with containers of this type is illustrated in U.S. Pat. No. 3,147,887 by T. W. Brooks. Another similar dispensing device commonly used is illustrated in FIG. 1 of the present disclosure. Both devices illustrate the general manner of opening cylindrical containers by penetration and exterior sealing of a hollow needle through the side wall of the containers near their base. These devices utilize a clamping and retaining band means such as a flexible metal strap disposed around the outer circumference of the containers which is tightened to cause puncture of the needle through the side wall of the containers. The band means thereafter retains the containers in a sealed relationship with the needle. Since exterior sealing around the needle can be critical in the view of the type of material disposed in the container, it has heretofore been necessary to maintain a close tolerance between the size of the container and dispensing device with respect to diameter in order to insure a safe seal during use. Therefore, different size dispensing devices have generally been required for containers having different diameters.

## SUMMARY

In general, the present invention provides an adapter shim used with opening and dispensing devices for generally cylindrical containers which do not incorporate integral dispensing means. The adapter shim insures a safe seal of the dispensing device on containers during use when the containers have smaller diameters than that for which the dispensing device was originally designed. The shim can be formed from a variety of materials, such as wood, metals, plastics or the like, and is preferably molded in one piece from a thermoplastic resinous material such as polyolefin, polystyrene, acryl-

onitrile-butadiene-styrene, acetal resins or copolymers of the same.

There are two elements of the present invention which provide for its safe satisfactory use with clamp type opening and dispensing devices of the type discussed in the description of the prior art. First it has been found that the shim should be securely attached to the dispensing device to insure easy handling and safe exterior sealing during use. To achieve this end, the present invention provides attachment means which secures the shim to a common radial rather than circumferential feature found on most dispensing devices as, for example, the base plate which is common to both dispensing devices previously discussed. More specifically, the attachment means is movably mounted on the radial feature of the dispensing device. Attaching the shim to the circumferential clamping band means would provide a fairly secure attachment to the dispensing device, but does not provide a feature common to most dispensing devices and does not allow for relatively free movement of the shim in the radial direction of the container which, as will be illustrated more clearly later, is an important characteristic of the present invention.

The second element of the present invention provides means for reducing the drag or friction caused by the location of the adapter shim between the container side wall and the clamping and retaining band. This is an important feature since excessive friction can cause the shim to stick to the clamping and retaining band rather than the band sliding over the shim as it is tightened during the opening of a container. If this occurs the shim may twist or rotate out of position which, in turn, can cause the container to twist in the dispensing device resulting in a leak due to an incomplete exterior seal of the needle protruding through the side wall of the container.

## BRIEF DESCRIPTION OF THE DRAWINGS

The objects and advantages of the present invention are even more apparent when taken in conjunction with the accompanying drawings in which like characters of reference designate corresponding materials and parts throughout the several views thereof, in which:

FIG. 1 is a plan view of an opening and dispensing device illustrating the position of a container (shown in cross-section) and an adapter shim just prior to opening of said container;

FIG. 2 is a back elevational view showing an adapter shim made according to the principles of the present invention;

FIG. 3 is a plan view of the adapter shim;

FIG. 4 is a front elevational view of the adapter shim;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is a front elevational view of the adapter shim illustrating the manner in which it is secured to the opening and dispensing device of FIG. 1; and

FIG. 7 is a partial front elevational view illustrating a modified adapter shim.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following description illustrates the manner in which the principles of the invention are applied but are not to be construed as limiting the scope of the invention.

More specifically referring to FIG. 1, an opening and dispensing device 10 with a cylindrical container 11, shown in section, positioned therein and an adapter shim 21 is shown as it would appear just prior to container 11 being opened. Container 11 has a side wall 12 and a curled bottom wall bead 13. Dispensing device 10 comprises a head portion 15 which includes an exterior rubber sealing gasket 17 and a hollow needle 16 that is in open communication with an exterior transfer pipe 18, a radially directed base plate 14, a flexible clamping and retaining band 19 disposed circumferentially around container 11, and a pivoting lever arm assembly 20 used to tighten band 19. Shim 21 positioned between band 19 and side wall 12 of container 11 will be described in more detail by reference to FIGS. 2-7.

Referring now to FIGS. 2-6, a shim 21 molded as a single piece and having an upper body portion 22 and a lower body portion 25 for attaching the same to base plate 14 is illustrated. The upper body portion 22 has opposing arcuate front and back surfaces 23 and 24, respectively, designed to generally conform to the contour of side wall 12 of container 11 and the retaining band 19 of device 10. The thickness of upper body portion 22 between surfaces 23 and 24 can be varied along with the radius of curvature of surfaces 23 and 24 to provide shims 21 of a variety of sizes.

Referring now to FIGS. 2 and 3, means for reducing the frictional drag that can cause shim 21 to twist out of position as band 19 is tightened and slides over upper body portion 22 are illustrated. Ribs 26 integrally formed on surface 24 substantially reduce the contact surface area with band 19 thereby reducing the frictional drag on shim 21. Ribs 26 are centrally positioned to provide maximum effect when utilizing a device like dispensing device 10 having a band 19 and so that they will not interfere with the function of the clamping member on devices like those illustrated in U.S. Pat. No. 3,147,887.

In addition, it has been found that a substantial reduction in frictional drag can be achieved by providing a flat surface 27 which relieves the contact between band 19 and surface 24 at a point where a major portion of the frictional drag causing twisting of shim 21 is produced. Surface 27 is located adjacent the trailing side 34 of body portion 22 in the direction band 19 slides as it is tightened to relieve contact and frictional drag on shim 21 since a force applied to tighten band 19 results in major stress contact at this point between shim 21 and band 19. Surface 27 is a flat cordial surface of arcuate surface 24 positioned essentially parallel and axial to the radius of arcuate surface 24. Ribs 26 and surface 27 may be used in combination, as shown in FIGS. 2 and 3, or may be used separately to reduce frictional drag on shim 21.

Referring again to FIGS. 2-6, shim 21 is attached to dispensing device 10 by sliding base plate 14 through opening 30 into slot 28. Lug 31 holds base plate 14 securely in slot 28. Although shim 21 is firmly held in place on base plate 14, it can easily slide radially on base plate 14 during tightening of band 19. Diverging surface 33 and hole 29 located at the ends of slot 28 provide stress relief to help prevent lower body portion 25 from being broken off of upper body portion 22 and to allow for smooth sliding of base plate 14 in slot 28. Groove 31 is provided in shim 21 to receive bead 13 of

container 11 thereby insuring a positive register of container 11 in dispensing device 10 when shim 21 is utilized therewith. Surface 32 is formed in lower body portion 25 to complete groove 31 across the entire width of shim 21.

Referring to FIG. 7, a modified shim 40 is illustrated. The upper body portion of shim 40 is the same as shown for shim 21. However, attachment of shim 40 to base plate 14 is achieved by base legs 41. Holes 43 provide stress relief for legs 41 in the same manner as hole 29 for lower body portion 25. A groove 42 is also provided for receiving bead 13 of container 11.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination with a device of the type used to open and dispense the contents of a generally cylindrical container which does not incorporate integral dispensing means wherein said device utilizes penetration and exterior sealing of a hollow needle through the side wall of said container which is achieved by tightening a clamping and retaining band means disposed around the outer circumference of said containers, wherein the improvement comprises: an adapter shim mounted on said device to allow use of said device on containers having cylindrical diameters smaller than that for which said device was originally designed, said adapter shim comprising an axially disposed upper body portion being of an arcuate shape similar to the cylindrical side wall of the container and positioned between the side wall of said container and said clamping and retaining band means, integral attachment means for securing said adapter shim in a movable relationship to a radially directed element of said device, and means for reducing the frictional drag caused by tightening and sliding of said clamping and retaining band means over said upper body portion of said shim.

2. The adapter shim of claim 1 wherein said radially directed element of said device is a base plate.

3. The adapter shim of claim 2 wherein said integral attachment means is a slot in said adapter shim having an open end, said base plate being secured within said slot.

4. The adapter shim of claim 2 wherein said integral attachment means are base legs formed on said arcuate upper body portion, said legs secured around each side of said base plate.

5. The adapter shim of claim 1 wherein said means for reducing frictional drag is at least one protruding rib integrally formed on the surface of said arcuate upper body portion which contacts said clamping and retaining band means.

6. The adapter shim of claim 5 wherein said means for reducing frictional drag includes an essentially axially directed flat cordial surface on said arcuate upper body portion formed with the surface which contacts said clamping and retaining band means and disposed adjacent the trailing side of said upper body portion in the direction said clamping and retaining band means slides as it is tightened.

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