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[54] **FINGER PROTECTOR FOR USE IN THE OPENING OF AMPOULES**
11 Claims, 3 Drawing Figs.

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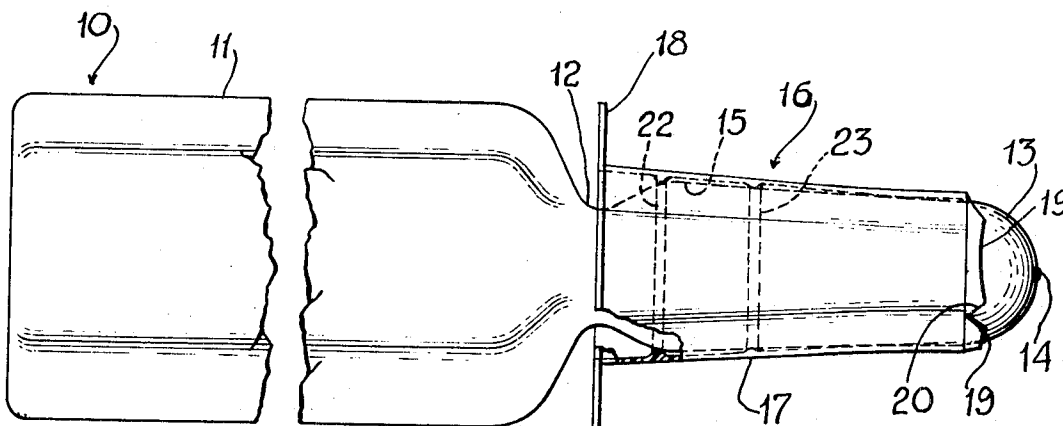
[50] Field of Search 215/11.3,
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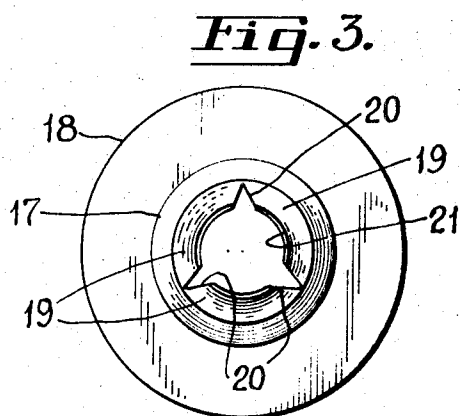
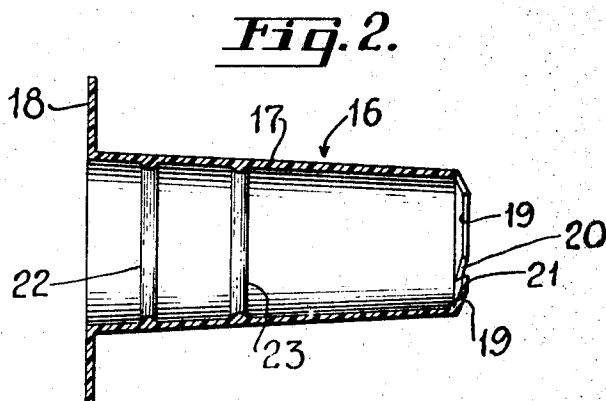
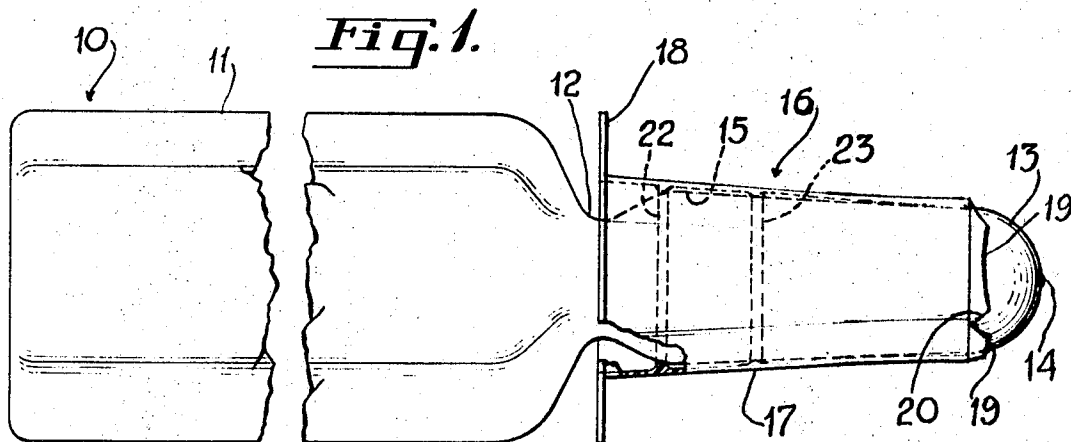
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ABSTRACT: Finger protector for grasping the removable end of flame-sealed ampoules and the like in the opening thereof comprising a tubular body of cylindrical to frustoconical contour having at one end thereof an outwardly extending circumferential flange, and at the other end portion thereof a plurality of circumferentially disposed inwardly extending flanges, said tubular body and flanges being integrally formed of yieldable material whereby said inwardly extending flanges can yieldably engage and center the removable end of an ampoule within the device. The device may also have inwardly extending circumferential means adjacent said outwardly extending flange for positioning said body on the removable end with said outwardly extending flange in substantial alignment with the point of severance of said end.





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FINGER PROTECTOR FOR USE IN THE OPENING OF AMPOULES

BACKGROUND OF THE INVENTION

Numerous drugs and medical supplies, particularly for injection purposes, are packaged in flame-sealed glass ampoules which characteristically have a cylindrical body part joined by a restricted neck to an elongated bulbous tip, the end of which is flame-sealed when the ampoule has been filled. This packaging assures sterility of the contents until the ampoule is opened by removal of the tip to gain access to the contents. With other type materials such as hairdressing supplies, deliquescent solids, and the like sealed containers with ends removable by rupture are employed to prevent alteration of the contents by the pickup or loss of vapors, or merely to preclude tampering with the contents.

The time-honored procedure when opening such flame-sealed ampoules is to scratch or nick the restricted neck with a small file or cutting tool and then in a quick movement to snap off the ampoule tip at the restricted neck. There is a knack, however, to scratching and breaking such ampoules, and unless properly done there is a danger of splintering the glass at the point of the break or even collapsing of the tip part with the possibility of thereby cutting the fingers of the operator. Even if these possibilities do not occur, there is always the chance of inadvertently sustaining a cut by brushing against the jagged edge of the ampoule as the tip is being severed.

Flame-sealed ampoules, of course, are made in many sizes, and while the danger of injury is relatively low with small one to two cc. ampoules, the possibility of injury increases rapidly with increase in the ampoule size. This is due in part to difficulty in controlling wall thickness when forming the ampoules and particularly the neck and tip portions thereof; and with larger ampoules the danger of the tip portion shattering as it is being broken from the ampoule body is a very real problem.

Sealed containers with removable ends are by no means limited to the conventional ampoule above described but can assume various shapes and sizes for decorative or utilitarian purposes. Furthermore, the separation of the removable end may be facilitated by a localized prestressing of the container at the intended point of severance by various known means such as that described in U.S. Pat. No. 2,517,604. With any such removable end, however, there is danger of injury due to collapse of the end or contact with sharp edges of the container as the end is being removed.

THE INVENTION

The finger projector for use in the opening of flame-sealed ampoules and the like in accordance with the present invention eliminates the danger of injury notwithstanding the problems above mentioned by providing a protective shield which prevents the fingers of the operator both from contacting the removable end or fragments thereof, and from inadvertently contacting sharp edges of the container body as the end is being removed.

The device can be inexpensively produced from various materials which have somewhat yieldable properties such as treated paper, rubber, molded plastics and the like. In fact, the device can be so inexpensively produced that it is intended that ampoules or other containers with removable ends be supplied with the device attached, and that the device and severed end be discarded as a unit when the container has been opened. Satisfactory results have been obtained when molding the device from polyethylene or polypropylene, and the use of clear plastic has the advantage of permitting the ampoule tip to be viewed through the device.

Details of the invention will readily be understood from a consideration of the following description taken together with the accompanying drawing illustrating a typical adaptation of the invention, in which the various parts thereof are identified by suitable reference characters in each of the views, and in which:

FIG. 1 is a shortened side elevation view of a typical ampoule having a finger-protecting device associated therewith, with part of said device broken away and in section;

FIG. 2 is a sectional view of the finger-protecting device as shown in FIG. 1, but separate from the ampoule, and;

FIG. 3 is an end view of the device as shown in FIG. 2.

In FIG. 1 of the drawing there is illustrated a typical ampoule 10, having a container or body part 11 of generally cylindrical contour which is joined by a restricted neck 12 to a tip or removable end 13, which is closed by flame-sealing at the end 14. The tip 13 is of elongated bulbous contour providing a rounded enlargement 15 adjacent the restricted neck 12. When the tip 13 is to be removed to gain access to the contents of the body part 11, a nick or scratch is made at the restricted neck 12, causing a weakness which normally permits the tip 13 to separate from the body 11 in a clean break. On the other hand, improper scratching or nicking of the neck 12 and irregularities in the wall thickness of the neck 12 or tip 13, and particularly in the enlarged portion 15 of the tip, can lead to irregular breaking of the neck and/or crushing of the tip with resulting injury to the fingers of the operator.

The finger protector or shield 16 has a cylindrical to frustoconical tubular body 17 terminating at one end in a circumferential outwardly extending radial flange 18 which, as shown in the drawing, is adapted to be positioned in substantial alignment with the neck 12 of the ampoule. The flange 18 should project outwardly from the tubular body a substantial distance to provide protection of the fingers from contact with broken edges of the ampoule or container body as the tip or removable end is being severed. When the ampoule body 11 is substantially larger than the removable end 13 as shown in the drawing, the flange 18 suitably has a diameter equal to or slightly less than the diameter of the ampoule body to facilitate packaging of ampoules with protectors attached.

The other end portion of the tubular body is provided with a plurality of inwardly extending flanges 19 separated by notches 20 which may be of generally V-shaped contour as shown, with the inner edges 21 of said flanges having a circular contour slightly smaller than the ampoule tip 13 which is intended to be associated therewith. Thus it will be noted that in mounting the device on an ampoule tip the flanges 19 are flexed outwardly as shown in FIG. 1 thereby gripping and positioning the ampoule tip in the protector. The walls of the tubular body 17 can, if desired, extend beyond the flanges 19 and even terminate as a closed end on the tubular body, but the flanges disposed at an open end of the tubular body as shown in the drawing represent the most economical construction for a one use disposable device.

As illustrated in the drawing, the tubular body 17 has been shown as having a frustoconical taper corresponding quite closely with the taper of the tip 13. While this is desirable, it is by no means essential; and the tubular body 17 can be of cylindrical contour, in which event the flanges 19 will have a somewhat greater radial dimension than shown in the drawing in providing the inner edge contour 21 which will yieldably grip the tip 13. It should also be understood that in adapting the invention to other types of containers with removable ends the size and cross section of the tubular body can be made to conform generally with the contour of such removable end.

As shown in FIGS. 1 and 2, the body 17 has inwardly extending circumferential ribs 22 and 23 which are inwardly spaced from the flange 18 to generally position the device with respect to the enlargement 15. Since the device with is fashioned from yieldable material, the rib 22 readily slides over the enlargement 15 as the device is slid onto the tip 13 or as it may be moved partially off the tip 13 to gain access to the ampoule neck 12 with a file for nicking or scratching the same prior to severance of the tip. After such scratching or nicking of the neck 12 the protector 16 is returned to substantially the position shown in FIG. 1 or even to direct engagement with the body 11 of the ampoule. Then as the tip is stressed in a manner to tilt it with respect to the axis of the ampoule, causing a break at the restricted neck 12, it will be apparent that

the fingers of the operator grasping the protector device 16 are protected against any inadvertent contact with glass fragments or jagged broken edges.

The inwardly extending ribs 22, 23 provide a sufficient frictional engagement with the tip 13 and the enlargement 15 thereof to retain the protector 16 against inadvertent displacement as during shipment and storage prior to use, and also to support the severed tip within the protector 16, permitting disposal thereof as a unit.

While the use of the protector device effectively protects the fingers of the operator from injury by glass fragments or jagged edges, it has been found that use of the protector 16 appears to reduce the frequency of improper breakage in the removal of ampoule tips. This is considered to be due in part to the spreading out of applied pressure, thereby minimizing the danger of crushing the tip, and in part to more positive or deliberate manipulation by the operator when breaking off the ampoule tip, realizing that an improper break of the tip will not cause injury. In other words, part of the knack of proper opening of flame-sealed ampoules is to apply ample breaking pressure in one quick movement; and by removing the threat of injury the operator is more likely to exert sufficient pressure to bring about a clean break.

Various changes and modifications in the finger protector for use in the opening of flame-sealed ampoules as herein disclosed may occur to those skilled in the art, and to the extent that such changes and modifications are embraced by the appended claims, it is to be understood that they constitute part of the present invention.

We claim:

1. Finger protector for grasping the removable end of a sealed ampoule in the opening thereof comprising a tubular body of cylindrical to frustoconical contour having at one end thereof an outwardly extending circumferential flange, and at the other end portion thereof a plurality of circumferentially disposed inwardly extending flanges, inner edges of said flanges being of arcuate contour collectively defining a substantially circular opening in the end of said body, the length of said tubular body being greater than the diameter thereof and shorter than the removable end of an associated ampoule, said tubular body and flanges being integrally formed of yieldable material whereby said inwardly extending flanges can yieldably engage and center the removable end of an ampoule within said device.

2. Finger protector as defined in claim 1 wherein said outwardly extending flange has a diameter substantially corresponding with the diameter of the associated ampoule.

3. Finger protector as defined in claim 1 wherein the yieldable material thereof is clear molded plastic, whereby an associated ampoule as it is at least partially visible therethrough.

4. Finger protector for grasping the removable end of a sealed ampoule in the opening thereof comprising a tubular body of cylindrical to frustoconical contour having at one end thereof an outwardly extending circumferential flange, and at the other end portion thereof a plurality of circumferentially disposed inwardly extending flanges, inner edges of said flanges being of arcuate contour collectively defining a substantially circular opening in the end of said body, the length of said tubular body being greater than the diameter thereof and shorter than the removable end of an associated ampoule, said tubular body and flanges being integrally formed of

yieldable material whereby said inwardly extending flanges can yieldably engage and center the removable end of an ampoule within said device, and inwardly extending circumferential means adjacent said outwardly extending flange for positioning said body on said removable end with said outwardly extending flange in substantial alignment with the juncture of said removable end and ampoule.

5. Finger protector as defined in claim 4 wherein said last-named means comprises a pair of inwardly extending circumferential beads closely spaced longitudinally of said tubular body and adapted to receive therebetween the characteristic enlargement of an elongated bulbous removable end of an ampoule.

6. Finger protector as defined in claim 4 wherein said last-named means comprises a pair of inwardly extending circumferential beads closely spaced longitudinally of said tubular body and adapted to receive therebetween the characteristic enlargement of an elongated bulbous removable end of an ampoule, and said tubular body being sufficiently yieldable to permit forcible movement of both of said circumferential beads over said enlargement.

7. The combination with a sealed ampoule having an essentially cylindrical body joined by a restricted neck to an elongated bulbous tip of smaller diameter than said body and adapted to be removed from the body by severance at said restricted neck, of a finger protector comprising an essentially tubular body of cylindrical to frustoconical contour slidably engaging said ampoule body having an outwardly extending flange with a diameter approximately the same as that of the ampoule body, and the other end portion of said finger protector having a plurality of inwardly extending flexible flanges engaging the protruding end of the ampoule tip.

8. The combination as defined in claim 7 wherein said finger protector is a unitary body of molded plastic material.

9. The combination as defined in claim 7 wherein said finger protector is a unitary body of colorless molded plastic material whereby the associated ampoule tip is at least partially visible therethrough.

10. The combination with a sealed ampoule having an essentially cylindrical body joined by a restricted neck to an elongated bulbous tip of smaller diameter than said body and adapted to be removed from the body by severance at said restricted neck, of a finger protector comprising an essentially tubular body of cylindrical to frustoconical contour slidably engaging said ampoule tip, the end of said finger protector adjacent the ampoule body having an outwardly extending flange with a diameter approximately the same as that of the ampoule body, the other end portion of said finger protector having a plurality of inwardly extending flexible flanges engaging the protruding end of the ampoule tip, and means internally of said tubular body yieldably engaging said ampoule tip at the enlarged portion of its bulbous contour preventing inadvertent removal of said finger protector from said ampoule tip, both while on said ampoule and when severed therefrom in the opening of said ampoule.

11. The combination as defined in claim 10 wherein said inwardly extending means comprises a pair of inwardly extending circumferential beads spaced longitudinally of said tubular body a distance to substantially accommodate said enlarged portion of the ampoule tip.