

[54] **DISPOSABLE HYPODERMIC NEEDLE DESTROYER**

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[51] Int. Cl. **B26f 3/00**

[58] Field of Search 225/103, 104, 93, 94, 102; 81/3 R; 83/167, 925 R; 241/99; 206/43; 128/218 R, 218 S, 218 D, 218 DA, 219, 220, 215

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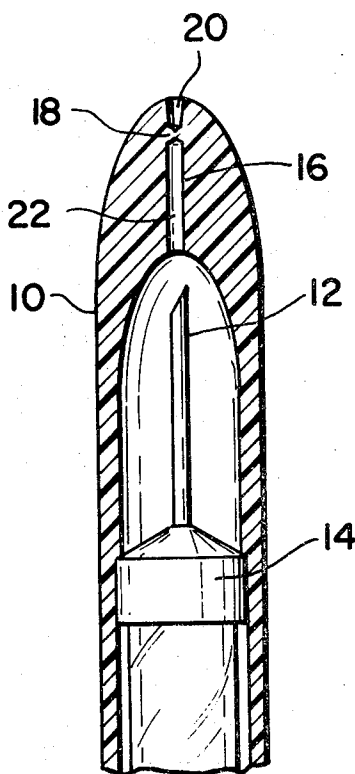
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[57] **ABSTRACT**

A portable hypodermic needle destroyer is provided having an axial opening to receive the needle and allow the user to safely grip the needle and snap it off from the syringe and provide a safe holder for the needle. In one form of the invention the opening is provided in the sheath having a diaphragm to maintain the sterility of the syringe allowing the needle and destroyer to be disposed as a unit. In another form the jaws of the destroyer are adjustable having separate jaw closing fingers and the needle is safely disposed within a container.

4 Claims, 6 Drawing Figures



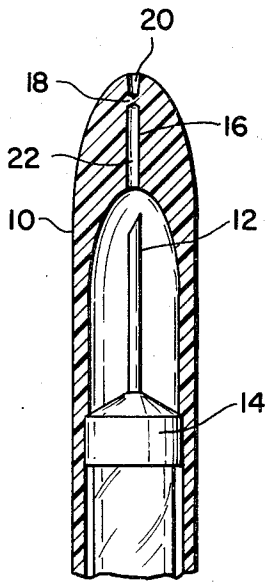


Fig. 1.

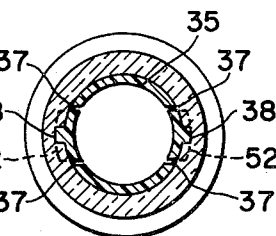
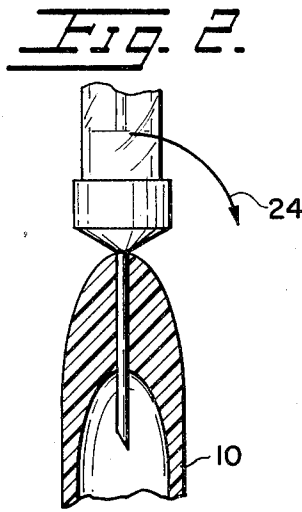


Fig. 5.

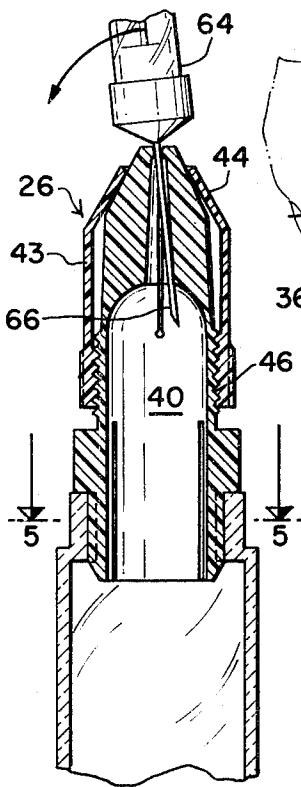


Fig. 4.

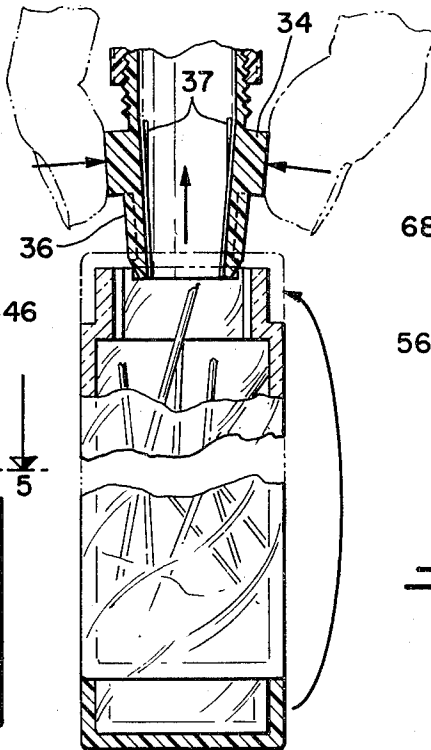


Fig. 6.

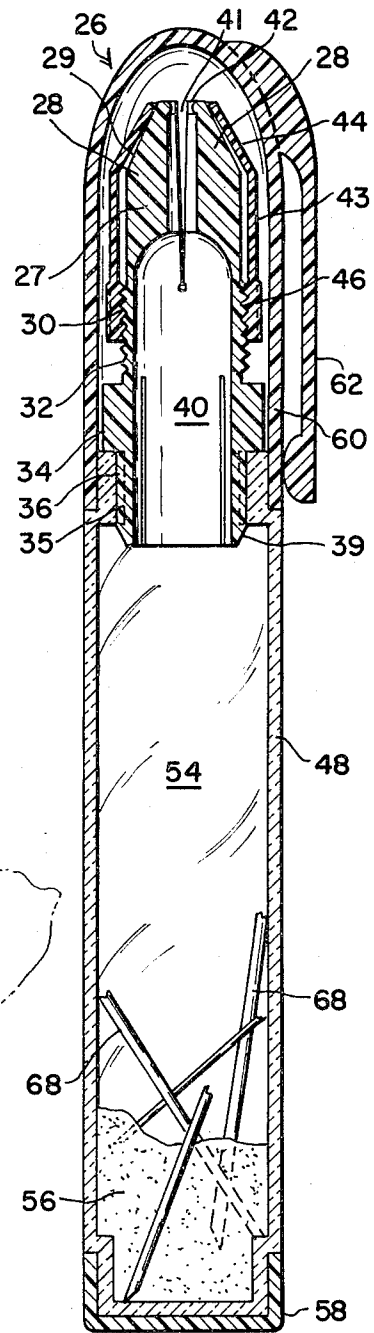


Fig. 3.

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DISPOSABLE HYPODERMIC NEEDLE DESTROYER

This invention relates to a new and useful device for the destruction of hypodermic needles used in conjunction with disposable hypodermic syringes. This invention more particularly relates to a device capable of being carried by a nurse or other person administering parenteral medication which can quickly, easily and effectively destroy the used hypodermic needle.

With the advent of disposable syringes, each used in conjunction with its disposable needle, the possibility of cross infection became greater. An intact syringe and needle, once discarded by the primary user could transmit hepatitis and other infections, when used again inadvertently, or if picked up by unauthorized personnel and used. An intact needle also poses a threat to cleaning and sanitary personnel, who may be stabbed by the used, infected shaft while gathering trash. A number of devices have been introduced into the market to accomplish the necessary destruction of the needle. However, these devices are of a stationary nature and require that the used hypodermic syringe be brought to the vicinity of the destroying device which is oftentimes not readily accessible at the time of use of the syringe. However, the possibility of accidental cross-infection exists between the time the syringe is used and the time the needle is destroyed and the possibility of the unit falling into the wrong hands, or the unit not being brought back to the area of destruction is not eliminated.

The principal object of this invention is to provide the medical practitioner or administrator with a means of destroying the infection-carrying capacity of the used, disposable hypodermic syringe-needle combination, immediately after use, at the site of the administration of the medication.

Another object of the present invention is to provide a portable hypodermic needle destroyer that is positive acting and simple and easy to use by nurses, doctors, or the like.

Still another object of the present invention is to provide a disposable hypodermic needle destroyer that is available to the administrator of the shot immediately after the shot is given.

A further object of the present invention is to provide a hypodermic needle destroyer that is portable, inexpensive to manufacture, easy and safe to use and is positive acting in operation.

Other objects of the invention will become apparent from the following description of the embodiments thereof when taken in conjunction with the drawing, which accompanies the specification wherein:

FIG. 1 is a front elevational, sectional view through a sheath covering the lower portion of a hypodermic needle, in accordance with the present invention;

FIG. 2 is a fragmentary cross-sectional elevational view of the upper portion of the sheath showing the hypodermic needle positioned just prior to its destruction;

FIG. 3 is an enlarged front elevational, cross-sectional view of a further embodiment of the present invention illustrating broken needles safely contained;

FIG. 4 is a fragmentary front elevational cross-sectional view of the structure shown in FIG. 3 being used to destroy a needle;

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

FIG. 6 is a front elevational fragmentary view illustrating mounting the needle destroyer to the needle container.

Referring now to the drawings, FIGS. 1 and 2 illustrate one form of the embodiment in which a resilient sheath 10 is removably mounted on the end of a disposable hypodermic syringe for covering and protecting the needle and maintaining the unit in sterilized condition. The inner diameter of sheath 10 forms a tight frictional fit with the outer periphery of the syringe and securely covers the needle 12 of syringe 14. The end of sheath 10 has an axially aligned opening or passageway 16 therethrough, interrupted by a diaphragm 18 intermediate of its ends. Advantageously the portion of passageway 16 at the apex of the outer peripheral surface of sheath 10 diverges, as indicated at 20 to form a conical entranceway to aid in introducing the needle 12 as will be discussed below. Preferably conical portion 20 locates and directs the needle into passageway 16. The remaining portion of passageway 16, indicated at 22, advantageously has a diameter equal to or slightly less than the outer diameter of needle 12 to provide a positive holding action on the needle.

To use syringe 14, sheath 10 is removed and the syringe is used for the medical purpose desired. To prevent other use being made of syringe 14, immediately after use, needle 12 is inserted into the conical guide 20 of passageway 16 in sheath 10 and a pressure exerted on the syringe forcing needle 12 through diaphragm 18 and into portion 22. Needle 12 is inserted to its full length into sheath 10, so that the conical guide 20 abuts the bottom of syringe 14 and the negative clearance of portion 22 of passageway 16 distends sheath 10, thereby positively holding the needle firmly within sheath 10, as seen best in FIG. 2. The operator or administrator holding sheath 10 firmly about needle 12 pivots syringe 14 such as in the direction of arrow 24 whereby needle 12 is snapped off about the lip of conical guide 20. The sheath fixedly retains the broken needle in portion 22 of opening 16 and is then reinserted over the end of syringe 14 and the unit may be safely discarded. Since the destruction of the needle takes place immediately after the medication or other use is made of syringe 14, there is no change for cross infection nor is there any possibility of the syringe being used again by unauthorized personnel, nor can the needle accidentally harm any cleaning or sanitary personnel handling the rubbish or trash in the hospital or medical office. Since the sheath is readily available after use of the syringe, the destruction of the needle on the syringe can be done quickly and safely immediately after use.

A further embodiment of the invention is illustrated in FIGS. 3 through 6 in which a portable needle and destruction unit 26 is shown. Unit 26 has a needle clamping body 27 shown with a resilient three jawed chuck and containing an open end interior volume 40. Also, body 27 could have four, five or more jaws. The jaws 28 of the chuck are adjustable advantageously from a zero orifice to an orifice capable of accepting at least a 13 gauge hypodermic needle and in unrestrained condition remain in maximum open position. The outer surfaces of the ends of jaws 28 are tapered as indicated at 29. Body 27 has a cylindrical skirt portion 30 extending downwardly from jaws 28 which has a pair of outwardly directed radial shoulders 34 intermediate of its ends and on opposite sides. The portion of skirt 30 between jaws 28 and shoulders 34 is threaded as indicated

at 32. Skirt 30 has on opposite sides of each of shoulders 34, a pair of longitudinally extending slits 37 defining a pair of arms 36. Extending along arms 36 are outwardly directed ribs 38. Arms 36 terminate in an outwardly directed lip 39. Body 27 contains a longitudinal passageway 41 extending between jaws 28, which communicates with interior volume 40. The outer ends of jaws 28 have an interiorly directed finger 42 for gripping the needle in a manner to be discussed below.

Mounted about the outer surface of body 37 is a jaw closer 43 having beveled fingers 44 which slidably engage the tapered outer surface 29 of jaws 28 and form cam surfaces for interacting with the tapered surfaces of jaws 28. The inner bottom portion of jaw closer 43 is threaded at 46, which threads mate with threads 32 on body 27.

Mounted on the open end of body 27 is container 48 which has a reduced neck portion 50 with an interior diameter to cooperatively receive the outer diameter of lower portion of skirt 30. Neck 50 has a pair of longitudinally extending grooves 52 on opposite sides, seen best in FIG. 5, which matingly receive ribs 38. Neck 50 is of a length substantially the distance between the lower surface of shoulders 34 and the upper surface of lips 39 to securely hold container 48 on body 27. Container 48 has an interior volume 54 for holding destroyed needles. For safety purposes, a bactericidal compound 56 is inserted within volume 54 prior to use, as shown in solid form, which will prevent the compound from spilling out if the container is inverted. The bactericidal compound could also be in jellied or highly viscous form or soaked in cotton or the like. To have container 48 reusable, a cap 58 is securely mounted on the bottom of container 48 and held in position either by a force or friction fit, clamp or is threaded.

To hold unit 26 in a pocket of the user, a cap 60 is positioned over body portion 27 and snugly engages neck 50 of container 48. A clip 62 on cap 60 allows unit 26 to be fastened in the pocket of the user.

In operation, after use of syringe 64, the user inserts a needle 66 on syringe 64 within opening 41 such as shown in FIG. 4. Cylindrical jaw closer 43 is rotated to urge FIGS. 44 downwardly on tapered surface 29 of jaws 27 which closes fingers 42 on the ends of jaws 27 tightly against needle 66. The syringe 64 is bent as illustrated in FIG. 4, thereby snapping needle 66 off adjacent the bottom of syringe 64. Upon unthreading jaw closer 43, needle 66 is released and falls within volume 54 of container 48 into the bactericidal or bacteriostatic compound 56. The used needles as shown in 68 can do no further harm of cross-infection or unauthorized use.

As seen by rotating jaw closer 43, fingers 44 move along the tapered surfaces 29 on jaws 27 forcing jaws 27 to be tightly closed when closure 43 is moved down-

wardly on body 27 as shown in FIG. 4 or allows jaws 27 to open due to the inherent resilience of body 27 when moved upwardly as shown in FIG. 3. To replace container 48, an inward pressure is exerted on shoulders 34, as seen best in FIG. 6, allowing arms 36 to be flexed inwardly thereby disengaging lips 39 from the underside of neck 50 and container 48 can be slid off of lower portion of skirt 30.

Advantageously, body 27 can be made out of tough, durable, resilient plastic or a resilient metal. Similarly, container 48 should be of transparent plastic to allow easy visibility as to when it should be emptied or discarded. Also, other means of mounting container 48 to body 27 than that shown, such as threads or clamps, can be used.

It will be evident to persons skilled in the art that this invention can be adapted to various other uses and situations, and that various changes and modifications can be made all within the scope and spirit of this invention. It is therefore to be understood that any patent issuing, is not limited to the modifications disclosed herein, or in any manner other than by the scope of the appended claims when given the range of equivalents to which this patent may be entitled.

I claim:

1. A portable needle destroyer of a hypodermic needle on a disposable syringe comprising a needle covering sheath adapted to be removably mounted on said syringe, said sheath having a body defining an interior volume to receive said needle when said sheath is mounted on said syringe, said body having a closed tip at the end remote from said syringe and containing a longitudinal passageway communicating with said volume, said passageway having an entrance at the outer end of said tip and having an interior diameter to snugly receive said needle.

2. A portable destroyer of a hypodermic needle on a disposable syringe comprising a needle covering sheath removably mounted on said syringe, said sheath having a body defining an interior volume, said body containing a longitudinal passageway in the end of said sheath communicating with said volume, said passageway having an entrance which is conical to aid in locating the passageway for the needle and having an interior diameter to snugly receive said needle, a diaphragm intermediate of the ends of said passageway being closer to the outer tip of said sheath, the portion of the passageway interiorly of the diaphragm having a diameter equal to or less than the diameter of said needle.

3. A needle destroyer as in claim 1 wherein said sheath is formed of a flexible material.

4. A needle destroyer as in claim 1, wherein said passageway in said sheath is interrupted by a diaphragm intermediate of its ends.

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