Nov. 23, 1948. F. F. GUNTHER 2,454,602

NEEDLE HOLDER AND STERILIZER

Filed June 30, 1944

Fig. 1.

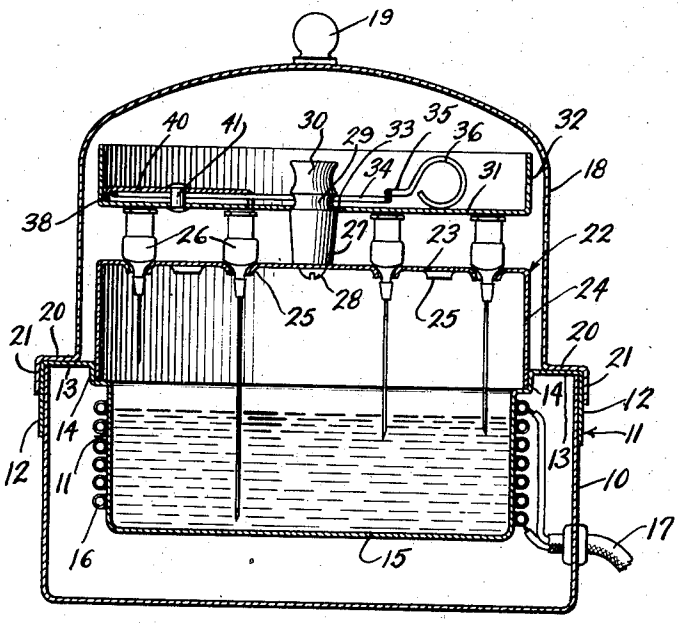


Fig. 4.

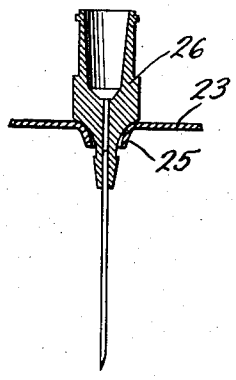


Fig. 2.

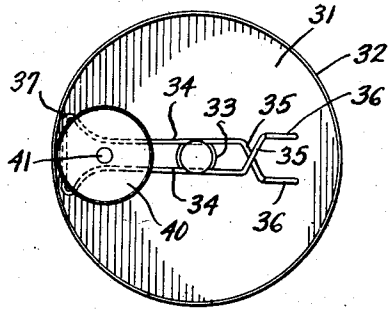


Fig. 5.

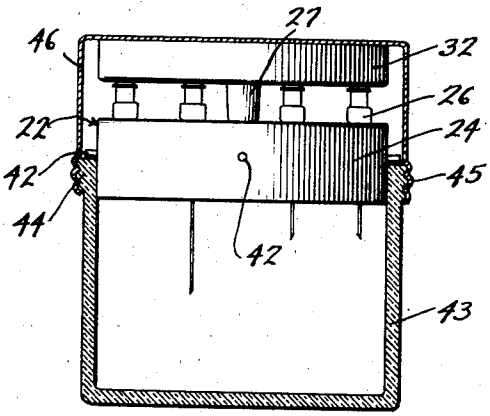
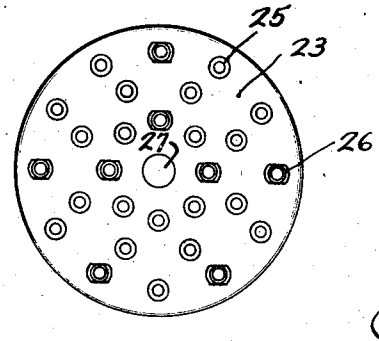


Fig. 3.



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NEEDLE HOLDER AND STERILIZER

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7 Claims. (Cl. 21—91)

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This invention is directed to a holder and dispenser for hypodermic needles and relates more particularly to a dispenser which may hold the needles during a sterilizing operation.

In the use of needles for hypodermic syringes, it is well known that the greatest problem involved is that of sterilization. It has been found that it is impractical to sterilize each needle before each use particularly on occasions where mass injections are performed as is the case in preparing the armed forces for combat duty. On the other hand, it is highly desirable that a number of needles be sterilized and then maintained in readiness for use without further handling which results in recontamination.

In the past it has been the custom to insert the point of a sterilized needle into a soft, presumably sterile material such as cork or the like. This is accompanied by several disadvantages. First, the cork is often not sterile as believed and furthermore it is found that small particles of cork are forced into the hollow needle and later injected into the patient.

It has also been the custom in the past to sterilize a large quantity of needles and then store them in a container in which they are disposed in random fashion, necessitating handling thereof as they are attached to the syringe.

It is an object of the present invention to provide a novel, cheap, efficient needle holder and dispenser into which cleaned and sharpened needles may be disposed whereupon the entire assembly may be subjected to a sterilizing operation and may be left in the sterilizing atmosphere until one or more of the needles is used, the needles then being available for attachment to the syringe without the necessity of their being handled and again contaminated.

It is another object of the present invention to provide an improved needle holder and dispenser so constructed that the needles may be inserted and locked therein and when so locked the entire assembly may be handled with no further thought to the loss of the needles since they are mechanically retained therein and when exposed may be applied to the syringe without being touched by the hand.

It is another object of the present invention to provide in a needle holder and dispenser, a dispensing member or base which is apertured to receive therethrough the shanks of the needles and to support the same by means of the enlarged heads thereof, a cover for disposition over the needles and against the upper ends of the heads thereof whereby the needles are prevented from

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longitudinal movement in the apertures, and means for securing the cover removably in position over the needles.

It is still a further object of the present invention to provide in a needle holder and dispenser of the above character, a lower base portion of sheet material or the like having apertures in the upper surface thereof for loosely receiving the shanks of needles and supporting the same by the enlarged heads thereon, this base being provided with suitable means for interlockingly engaging a cover member adapted to extend over the upper ends of the heads of the needles a distance approximately the height which the heads of the needles extend above the apertured part of the base, thereby to securely lock the needles within the base when the cover is attached in the assembly and to render the needles, and particularly the heads thereof, freely accessible for engagement with the needle attachments on syringes when the cover is removed therefrom, this entire assembly being susceptible of sterilization as a unit and to be maintained in sterile condition until all of the needles are removed.

It is another object of the present invention to provide a needle holder and dispenser of the above character in which the base member is provided with a depending skirt whereby the shanks of needles in the base are protected against breakage at the points thereof so long as they are shorter than the skirt on the base or the supporting adjunct thereof when the base structure is utilized as a stand from which the needles may be dispensed.

While the embodiment herein is shown and described as utilized for sterilizing, supporting and dispensing hypodermic needles, it will be understood that it may be equally well utilized for other articles where its advantages are desirable.

Many other objects and advantages of the invention will become apparent from the following description and accompanying drawing in which:

Figure 1 is a transverse, cross-sectional view of a holder and dispensing unit and a sterilizing unit embodying the features of my invention;

Figure 2 is a plan view looking down upon the structure of Figure 1 when the sterilizer cover is removed;

Figure 3 is a plan view looking down upon the structure shown in Figure 1 with the sterilizer cover and the dispenser cover removed;

Figure 4 is a fragmentary, enlarged vertical sectional view of a portion of the base showing the

manner in which a needle is supported thereby; and

Figure 5 is a transverse, cross-sectional view partly in elevation of a modified form of my invention.

It will be understood that the embodiments shown herein are for illustrative purposes only and may be changed or modified without departing from the spirit and scope of the invention as set forth in the appended claims.

In the construction shown in Figure 1 there is provided a sterilizer base 10, here shown circular in configuration. Mounted upon the sterilizer base 10 is a sterilizing liquid container 11 having a skirt 12 formed to fit over the upper part of the wall of the base 10. The skirt 12 and the wall of the base 10 may be secured together by a press fit and further may be spot welded together if desired.

The sterilizing liquid container 11 is further provided with a radially inwardly extending flange 13 merging into a radially inwardly stepped portion 14 which in turn merges into a depending, radially inwardly disposed liquid container 15.

To the end that liquid within the container 15 may be readily heated and vaporized a suitable filament 16 may be wound therearound and connected with a source of electrical current 17.

To the end that the sterilizer may be completely closed during the sterilizing operation and for later maintaining the sterility of the sterilized needles, there is provided a sterilizer cover including a dome part 18 having an upper handle 19 and a radially outwardly extending flange 20 terminating in a depending circular skirt 21. As will be seen from Figure 1, the flange 20 seats on to the flange 13 of the container portion and the depending skirt or flange 21 seats around the outer side of the flange 12, whereby the cover is securely maintained in substantial sealing engagement on the assembly.

The needle holding and dispensing assembly, as will be seen presently, is arranged to be set within the sterilizer described above and over the liquid bath therein, this relationship being maintained by disposition of a circular part of the holder assembly within the stepped portion 14 immediately above the liquid container portion 15.

This liquid holder and dispenser includes a dispenser member 22 having an upper plate-like part 23 bordered by a depending skirt 24 which may be of any desired depth, depending upon the size of needle to be accommodated and the size of the sterilizer with which it is to be associated. The part 23 of the dispenser is, as shown in Figures 1, 3 and 4, punched to provide a plurality of apertures each being bordered by a depending circular skirt 25. Thus it will be seen that when the shanks of hypodermic needles 26 are extended through the apertures so formed, the neck portions thereof fit against the depending circular flanges 25 in each aperture to provide a relatively secure mounting for each needle.

From the foregoing it will be seen that so long as the device is maintained upright in the position shown in Figure 1, the needles are retained in the dispenser device in an orderly manner. Furthermore, it will be seen that they are loosely fitted within each of the apertures, whereby the physician or technician need merely move the attachment part of a syringe downwardly upon the device and insert the said part in the tapered orifice of the needle head. The further application of a slight amount of pressure securely fits the needle onto the syringe and the physician or technician then performs the injection without the needle having been contaminated by handling. Because of the desired loose fit of the needle in the dispenser 22, however, it will be seen that should the device be accidentally tipped or handled, the needles will immediately fall from the positions shown in Figure 1 requiring further handling and thus recontamination to again position them within the device.

To the end that the needles may be securely, yet loosely maintained as shown at all times except when being withdrawn by the attachment part of the syringe, there is provided herein a novel arrangement for holding the needles in position which may be itself handled, without contaminating the needles, to remove the same from the assembly.

This holding arrangement as shown herein includes an upstanding central post 27 which is suitably secured as by a screw 28 to the central part of the dispenser member 24. The post 27 is provided with an intermediate groove 29 and a knob-like handle 30 at the upper end thereof. The holder device proper includes a plate-like cover 31 which may, if desired, be provided with an upstanding flange 32 therearound, the part 31 being apertured centrally as at 33 to receive the upper part of the post 27 therethrough when the cover is disposed in overlying relationship to the tops of the heads of the needles 26. When in this position it will be seen that the groove 29 of the post 27 extends immediately above the upper surface of the plate part 31 thereof.

In order that the holder may be detachably secured in the position shown in Figure 1, it is provided that a spring member having resilient arms 34 secured together at their lower ends and terminating near their outer ends in cross pieces 35 which in turn terminate in ring handles 36. This spring member may be secured to the plate part 31 in any suitable manner, but in the present instance is provided with ear-like portions 37 at the end remote from the handles 36 which extend through apertures in a skirt 38 of a circular holder member 40 while the resilient arm portions 34 extend through an aperture in this skirt 38. The member 40, as will be seen from Figure 1, is suitably secured to the plate part 31 by means of a suitable rivet 41.

With the above arrangement it will be seen that one need merely compress the handle portions 36 together, whereupon the resilient arms 34 are spread out of engagement with the groove 29 while release of these handles permits the arms 34 to engage in the groove and securely maintain the holder over the tops of the needles as shown in Figure 1.

In the construction shown in Figure 5, the dispenser and holder arrangement is identical to that shown in Figure 1 except that in this form of the invention the skirt 24 is provided with studs 42 extending radially outwardly therefrom.

These studs 42 are for the purpose of suspending the dispenser member 22 in the upper part of a preferably transparent container 43 and may rest upon the upper edge thereof as shown or may be connected thereto by a bayonet fit if desired. It will be understood, of course, that other mechanisms for securing and sustaining the dispenser member in a transparent container may be utilized.

Preferably the upper portion of the outer surface of the container 43 is threaded externally as at 44 to receive a threaded portion 45 of a

cover or cap member 46. The depth of the cap member preferably is such that when screwed tightly onto the container 43 it abuts the upper edge of the skirt 32 of the holder member, thereby to augment the action of the spring arms 34 in holding the cover member in position over the upper sides of the enlarged heads of the needles 26. When the assembly is secured together as shown in Figure 5, it will be seen that the needles will be securely maintained in position in the event that the holder is tipped, rolled or placed up-side-down. Furthermore, the particular needle which is desired, dependent upon the length of the shank thereof, may be determined before the container is opened so that that needle may be immediately and quickly attached to the syringe to enable the container to be again closed.

In using the construction of Figure 5 it is contemplated that both the container 43 and the cap 46 will be sterilized along with the dispenser, the holder and the needles, whereupon it can be assembled and taken into the field and used until all of the needles are contaminated by use. If desired, the container 43 may have alcohol or the like therein and the needles may be further sterilized by periodic shaking since the orderly position thereof will not be disrupted by such shaking.

It will be understood of course that in the construction shown in Figure 1, if electrical power is not available, any other suitable means may be used for heating the base portion of the sterilizer. This heating may even be accomplished over an open fire since the cover 18 efficiently seals the interior from soot which might accumulate.

From the foregoing it will be seen that there is provided herein an improved dispenser, holder mechanism for hypodermic needles or the like, together with an improved carrier and sterilizing apparatus, this arrangement being such that the needles may be securely maintained, yet loosely maintained in the dispenser to be readily removed by the attachment part of a syringe. Furthermore, it will be seen that in spite of this loose engagement of the needles by the dispenser, the mechanism may be handled with little care, without fear of the needles becoming disarranged and thus necessitating further handling thereof.

What I claim is:

1. In a holder and dispenser for hypodermic needles or the like, an apertured dispensing member for receiving the shanks of needles loosely therethrough and for supporting them by the enlarged heads thereof; a removable cover member for overlying the ends of the enlarged heads remote from the needle shanks; said dispensing member and said cover member having co-operating clamping means for removably holding the cover member in spaced relation to the dispensing member a distance sufficient to accommodate the portions of the needles extending above the dispensing member and retain the needles in the apertures against longitudinal movement, head first, outwardly therefrom until the cover is removed.

2. In a sterilizing apparatus for hypodermic needles or the like having shanks and enlarged heads thereon, an outer container member, an inner container for a sterilizing medium, means between the containers for heating the sterilizing medium, a needle dispenser including a part for receiving the shanks of the needles therethrough, said dispenser being seated upon the inner container, means for removably holding the needles in the dispenser against outward, head first movement therefrom, and means for enclosing the needles and the dispenser in the container with the sterilizing medium to maintain a sterilizing atmosphere therein.

3. In a holder and dispenser for hypodermic needles or the like having enlarged heads, a dispensing member for receiving the shanks of needles therethrough and for supporting them by the enlarged heads thereof, a cover member for overlying the ends of the enlarged heads remote from the shanks, and means for removably securing the cover in position over the needles to hold them substantially immovably longitudinally in the apertures of the dispensing member; said last named means including upstanding, grooved means on the dispensing member and spring means on the cover for detachable, resilient engagement with said grooved means to maintain the cover on the dispensing member against movement away therefrom when the spring means is engaged with said grooved means.

4. In a device for storing hypodermic needles having relatively thin shanks and enlarged heads, a needle retaining assembly for insertion into a container; said assembly including a needle retaining section having a plurality of apertures for receiving the needle shanks and for supporting the needles substantially vertically by the heads thereof; means on said retaining section for engaging the container and an upstanding, cover retaining part; a removable needle holding cover section including a substantially horizontally disposed plate apertured to receive said upstanding part and means on said cover section for releasably engaging with said upstanding cover retaining part of the needle retaining section to removably secure said cover section over the enlarged heads of the needles to prevent accidental removal thereof from the needle retaining section until said cover section is released and removed therefrom.

5. In a holder and dispenser for hypodermic needles or the like having enlarged heads, a dispensing member for receiving the shanks of needles therethrough and for supporting them by the enlarged heads thereof, a cover member for overlying the ends of the enlarged heads remote from the shanks and means for removably securing the cover in position over the needles to hold them substantially immovably longitudinally in the apertures of the dispensing member, said last named means including a post fixed to and rising from the dispensing member, and spring means on the cover for detachable, resilient engagement with the post to maintain the cover on the dispensing member against movement away therefrom when the spring means is engaged with the post.

6. In a sterilizing apparatus for hypodermic needles and the like, a container for a sterilizing medium, means within said container constituting an apertured plate to receive a plurality of needles in the apertures, a post fixed to and rising from said plate, a removable hold-down plate apertured to receive said post and to rest on the needles when said plate is in holding position, and means carried by said hold-down plate for gripping said post to prevent accidental removal of said hold-down plate.

7. In a sterilizing apparatus for hypodermic needles and the like, a container for a sterilizing medium, an apertured plate across said container for receiving a plurality of needles with their

points down and supporting the needles by the heads thereof for sterilization, a removable hold-down plate adapted to rest on the needle heads when the needles are held by said first mentioned plate, and said two plates having co-operating clamping means for securing said hold-down plate in holding relation against said needles, whereby upon the removal of said hold-down plate a syringe may be connected to a needle supported by the first plate without removing the needle from the sterilizer.

FREDERICK F. GUNTHER.

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