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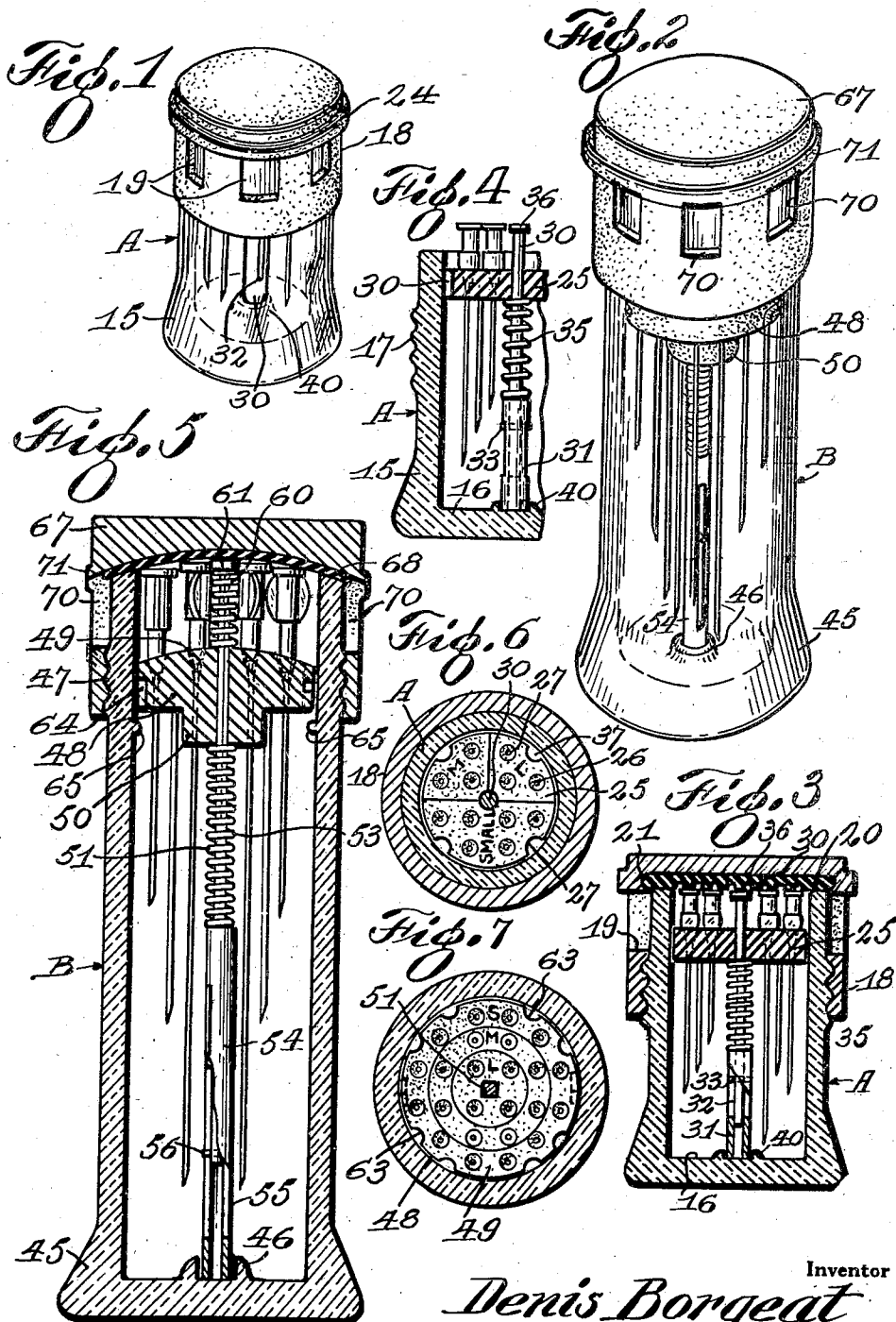
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HYPODERMIC NEEDLE HOLDER

Filed Jan. 29, 1944

2 Sheets-Sheet 1



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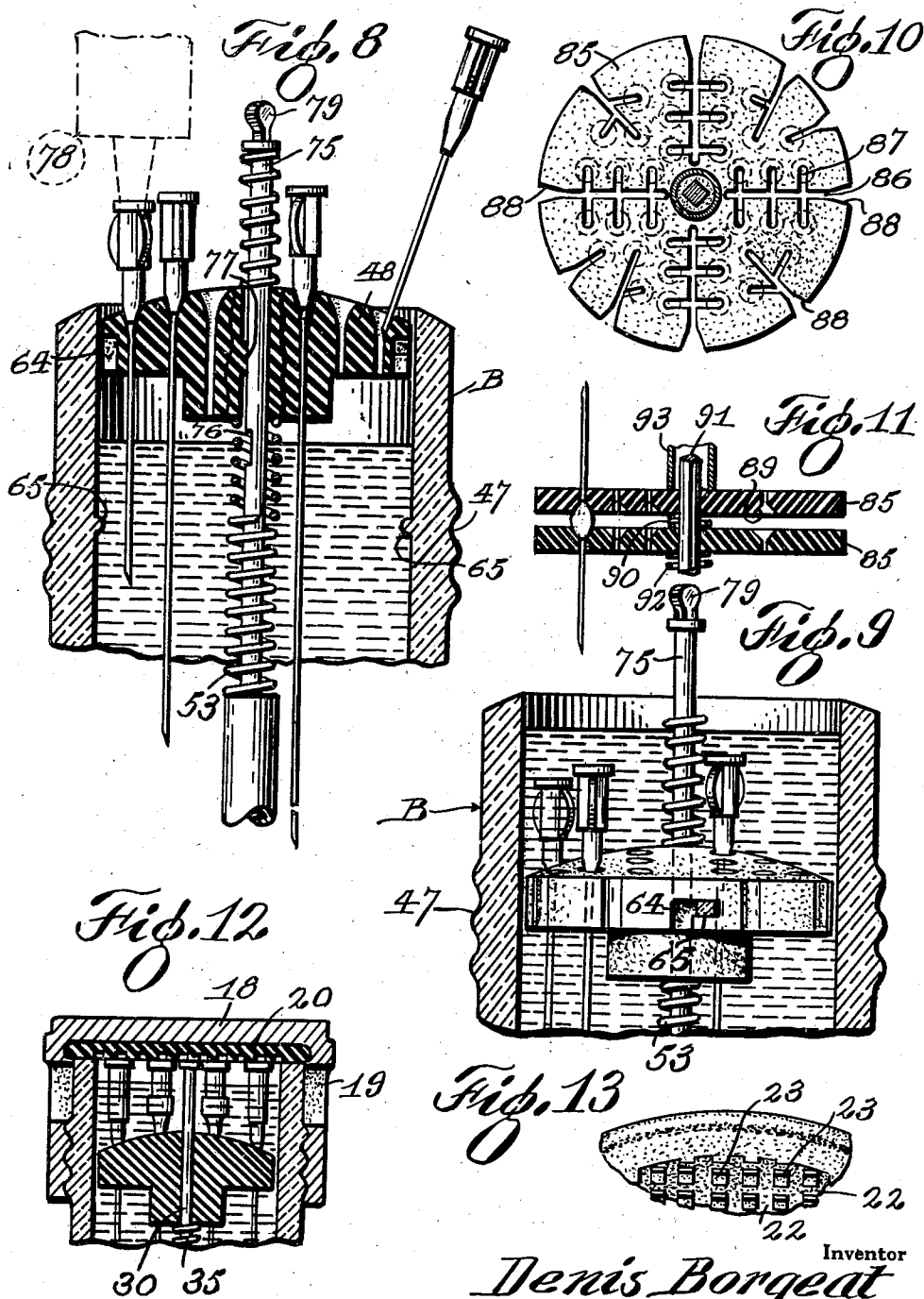
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HYPODERMIC NEEDLE HOLDER

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4 Claims. (Cl. 206-43)

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The present invention relates to a needle holder and, more particularly, a holder for hypodermic needles.

Hypodermic needles have always presented a problem to those who use them constantly, because said needles must always be kept razor-sharp to operate satisfactorily. Consequently, the sharpened end of said needles must be protected carefully as, otherwise, the needles quickly become dulled and of doubtful utility to the conscientious operator.

It has been ascertained that a sharp needle is an imperative necessity for the relatively painless injection, or withdrawal, of fluids from the human body; therefore, the point of hypodermic needles must be prevented from coming in contact with any substance except, of course, the human skin if they are to retain their razor-sharpness for any length of time.

This question of holding, and carrying, hypodermic needles is, therefore, an important one to doctors, dentists and other users thereof. More particularly, the problem of carrying needles around, as in a bag, is especially vexing since said needles cannot be kept loose and must be in aseptic condition and free of internal coagulated or foreign matter.

The present invention has been conceived to avoid the disadvantages noted above and, accordingly, the primary object of the invention resides in the provision of means whereby hypodermic needles of all types can be efficiently supported, and carried around, in a manner such that said needles are removably held with their points suspended in space and in an antiseptic medium, said medium being free to circulate within the needles.

Another important object is the provision of means for holding, or storing, hypodermic needles in a safe and simple manner, whereby said needles are instantly available for use and properly sorted as to size and function.

A further object of the invention concerns a receptacle constituting the means of the character described, said receptacle being adapted to hold an antiseptic fluid or sterilized in a sterilizer while holding the hypodermic needles in the manner described.

Still another object contemplates a receptacle of the type defined above, which receptacle can be safely carried around, be simple of use and of relatively inexpensive construction.

A still further object is the provision of such a receptacle adapted, with very little changes, to the use of various needles such as hypodermic, long surgical needles, injection and body-fluid-

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withdrawing ones, as well as the smaller so-called dental needles.

Other objects and advantages of the invention will become apparent as the description progresses.

As an example, and for purposes of illustration only, four possible embodiments of the invention are shown in the annexed drawings wherein:

Figure 1 is a perspective view of a needle receptacle according to the invention, which receptacle is intended to be portable and hold the general run of hypodermic needles generally required by a physician,

Figure 2 is a perspective view of another form of the invention, of larger size, and intended to be used as a stationary unit for storing long needles and for clinical and hospital use,

Figure 3 is a vertical section through the portable receptacle of Figure 1,

Figure 4 is a similar view showing, in partial section, the same container with the cover removed,

Figure 5 is a vertical section through the larger receptacle of Figure 2,

Figure 6 is a transverse section through the receptacle of Figure 1, just above the needle holding deck,

Figure 7 is a similar view of the larger receptacle of Figure 5,

Figure 8 is an enlarged partial section taken vertically through the upper part of the stationary receptacle of Figure 2 and showing the manner of inserting, removing and suspending the needles,

Figure 9 is a view similar to Figure 8, but showing the deck held in position below the level of the antiseptic fluid for needle-sterilizing purposes,

Figure 10 is a plan view of a modified deck for holding dental needles,

Figure 11 is a vertical section through said deck showing the manner of holding the dental needles,

Figure 12 is a modified form of the small receptacle embodying the curved deck of the stationary receptacle of Figure 5, for holding needles of varying head heights, and

Figure 13 is a fractional plan view of a rubber gasket used in the portable receptacle for closing said receptacle while allowing circulation of an antiseptic fluid within the needles themselves.

Referring to the drawings, wherein similar reference characters represent corresponding parts throughout, the letter A indicates generally the main body of the portable receptacle of Figure 1, which body is preferably made of trans-

parent material for purposes of inside visibility, said body being of cylindrical shape and having an enlarged outwardly tapering bottom edge 15 effectively increasing the outside diameter of the bottom 16 for purposes of stability. The body is threaded at 17 to receive a screw-cap 18, of plastic or other suitable material, said cap having a plurality of relatively large apertures 19 formed circumferentially in the vertical plan thereof, immediately above the threads. For permitting said screw-cap to effect an airtight closure of the body, a special rubber gasket 20 is disposed on the inner upper surface of the cap and is lodged in a circumferential cavity or channel 21, so as to remain firmly in place. As shown to advantage in Figure 13, the lower surface of the rubber gasket is provided with right angular depressions or channels 22, spaced from each other to leave therebetween projecting blocks 23 the purpose of which will be explained later on. Finally, the cap is completed by the addition of an upper and outer circular rib 24 adapted to strengthen said cap and to allow the lowermost aperture 19 to be free when said receptacle is lying on its side in a sterilizer, for instance.

As shown to advantage in Figures 1, 3 and 4, the holder illustrated therein is adapted to hold relatively small needles of the type most generally used by physicians for giving injections of serums and the like; this holder is adapted to be carried around and is consequently of simplified construction, as compared to the stationary holder illustrated in the other figures. The means for supporting the needles consist essentially of a deck 25 apertured as shown in Figure 6, to receive a dozen, or so, hypodermic needles, said apertures 26 having the general appearance of those illustrated in Figure 8 and flared at 27 to permit easy insertion of the needles therein. This deck is adapted to be supported within the receptacle A by means to be presently described.

Said means comprise a vertical rod 30 extending above and below the center of the deck and force-fitted therein, said rod being slidable within a guide tube 31 provided with a pair of diametrically opposed slots 32 adapted to slidably receive a pin 33 inserted in the rod 30 at right angles thereto. Consequently, the tube and rod are inseparably connected but adapted to have in relation to the other a certain telescopic motion. A spring 35 is inserted over the rod 30 between the upper end of the tube 31 and the lower face of the deck. Obviously, this spring is adapted to support resiliently the deck 25 and to urge the same upwardly along with the rod 30. In order to facilitate manipulation of the deck, a head 36 is provided at the top of the rod to serve as a handle for removing the deck from the receptacle or for lowering said deck therein, especially when a liquid is present in said receptacle and it is desired to flush the needles therein.

As shown to advantage in Figure 6, it will be noted that the circumferential edge of the deck is provided with a number of semi-circular depressions, or channels 37, said channels being adapted to allow circulation of the liquid, when used, to prevent said liquid from squirting up through the holes 26 whenever the deck is lowered too suddenly. Also, said channels permit a freer circulation of the liquid under and below the deck, so as to bathe the upper portion of the needles when the receptacle is closed, as shown in Figures 3 and 12. Finally, to prevent side

sway, or lateral slipping, of the guide tube 31 on the glass floor of the receptacle, a circular rib 40 is cast in the floor of the receptacle, in the center of which the lower end of the tube 31 is adapted to rest.

From the foregoing description, it will be evident that a number of hypodermic needles can be conveniently carried within a relatively small enclosure, the method of carrying insuring that the points of the needles are always supported in space and free from contact with anything but an antiseptic liquid that may be placed in said receptacle. The needles may be conveniently assorted as to size and, for that purpose, the top of the deck may be provided with suitable indications as "small," "medium" and "large," so as to facilitate the selection and replacement of the needles. When the cap 18 is screwed-down tight, the gasket 20 making contact with the upper edge of the body insures an air-tight and fluid-tight closure: therefore, the holder may be carried around without danger of leakage and the needles kept, at all times, in perfect antiseptic condition. Since it is sometimes more convenient to sterilize the needles in a sterilizer, the cap is provided with the apertures 19 for permitting access within the receptacle of the boiling fluid used for said sterilization. It is not necessary to remove the cap, because by unscrewing said cap half a turn or so, the gasket 20 will be removed sufficiently from the upper edge of the body to allow access of the boiling liquid for sterilizing purposes. Conversely, after sterilization, the holder may be allowed to drain and, when closed, remains in antiseptic condition.

As stated previously, the liquid in the receptacle has the dual function of sterilizing the needles and also to circulate therein to prevent clogging of the bores after said needles have been used: the channels 22 provided in the gasket 20 are meant to allow this circulation within the needles, when the cover or cap is closed, so that the upper part of the needles, although resting on the gasket, are never entirely closed since they rest on the blocks 23 and a portion at least of the upper needle bore is always exposed to the action of the liquid in the receptacle to allow circulation therein.

A modification of the holder just described is shown in Figures 2 and 5, said last holder being intended principally for stationary purposes and for hospitals and clinical uses. The principle of operation is the same as that previously described, with the exception that the body of receptacle B is higher to accommodate longer needles. Said body B also has a base 45, the tube holding rib 46 and the screw threads 47 adjacent the upper edge thereof. The deck 48, however, is shaped somewhat differently than deck 25, the main difference being that the upper surface of said deck is convex, at 49, the lower face of the deck comprising a central reinforcing enlargement 50. Furthermore, the deck 48 is not secured to the rod 51, which rod corresponds to rod 30 already described. Again, the rod 51 is square instead of being round, so that the deck 48 can be rotated by the simple expedient of rotating the rod for needle selection purposes. Otherwise, the deck supporting means are similar to those of the smaller receptacle, and include the supporting spring 53, the guiding tube 54, said tube having the slot 55 and the pin 56. Thus, the deck 48 is adapted to be resiliently supported on top of the spring 53 exactly as in the smaller model.

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To prevent the rod from falling down within the deck and tube 54, and thereby rendering its manipulation difficult, a second or auxiliary spring 60 is provided above the deck, over the rod and between the surface 49 of the deck and a head 61 disposed at the outer upper end of the said rod. Consequently, this spring tends to lift the rod above the surface of the deck, when the screw-cap is removed, so that manipulation of the deck is thereby facilitated.

For allowing circulation of a liquid past the deck when said liquid is used in the receptacle, the deck is provided with peripheral notches or channels 63, said channels being needed especially when the deck is locked in lower position below the surface of said liquid. The locking means include a right angular cavity 64 provided on the outer circumferential head of the deck and shown more particularly in Figures 5, 8 and 9. Said cavity is adapted to engage a projection 65 formed internally on the inside wall of the body B and adapted to constitute with the cavity 64 a so-called bayonet joint: in other words, the deck may be locked in position by engaging the vertical leg of the cavity over the projection 65 and turning slightly the deck in a horizontal plane a short distance until said projection enters the horizontal portion of the cavity 64. This locking of the deck is particularly useful when it is desired to keep the cap off but with the needles below the level of a sterilizing liquid, when said needles are not used and to keep the same in aseptic condition.

Inasmuch as the surface 49 of the deck is convex, the cap 67 is similarly curved internally to assume a concave form so that the distance between the surface 49 and the smooth gasket 68 is the same at all points, since large size needles are generally of uniform dimension as far as the head thereof is concerned. Again, another advantage of the convex-concave arrangement is to prevent plugging the bore of the needles, at the upper ends thereof, for liquid circulation, this plugging being effectively avoided due to the fact that the top of the needles is horizontal and the cap curved. Therefore, there always exists a space between the gasket 68 and one edge of the needle, wherein the sterilizing liquid may enter and circulate within the needles. Except for the difference just pointed out, the cap 67 is similar to cap 25 in all particulars and includes the apertures 70, the lowermost screw threads and the circumferential rib 71.

Another modification of the invention is shown in Figures 8 and 9 wherein the only difference with the structure of Figure 5 resides in the rod 75 which, instead of being square, is round. All the other features remain the same and consequently carry the same reference characters. The rod 75 is also slidable in a central aperture of the deck 48, but in order to lift the deck above the normal position provided by the spring 53, a notch 76 is made on one side of the rod 75, which notch is designed to engage a corresponding projection 77 formed in the bore of the deck within which bore the rod 75 is slidable. Thus, it is possible to manipulate the rod so that the notch 76 engages projection 77, thereby enabling lifting of the deck above the liquid level and even completely outside of the receptacle. Of course, this arrangement is intended to avoid handling the deck or the needles by the hand, to prevent contamination thereof, the needles being preferably removed from the deck by the simple expedient of inserting the syringe 78 (shown in dotted lines

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in Figure 8) directly into the upper bore of the needle. The position of the rod, when engaged with the projection 77, is shown in Figure 9, wherein said rod is illustrated as being above its normal position shown in Figure 8. For facilitating the movement already described, a small flat knob 79 is provided at the upper end of the rod to constitute the head thereof.

As an extension of the idea making use of the curved deck, as embodied in the clinical model just described, a substantially similar deck may be used also in the portable model, as depicted in Figure 12, for the purpose of accommodating needles having heads of different lengths. Thus, the longer head may be disposed along the peripheral edge of the deck, and the shorter one centrally grouped around the rod 30. Then, the portable model may be rendered more useful, without departing from the features of utility already described.

Finally, a last modification of the invention is shown in Figures 10 and 11, said modification being especially designed for holding, in a spaced position, the so-called dental needles having sharpened edges at both ends thereof, the retaining means being constituted by a bulbous enlargement disposed somewhat centrally along the needle. As well known, this type of needle is adapted to be used in a special type of syringe wherein a rubber stopped tube is used for dental anesthesia. Due to the fact that said needle can be supported only by the bulbous centre, a modified type of deck is necessary to properly hold the same, said deck being shown in the Figures 10 and 11 already mentioned.

The modified deck consists of a pair of independent parallel plates 85, disposed one above the other and provided with similar series of radial slots 86 and transverse shorter slots 87. The outer peripheral end of the slot 86 is flared at 88 to facilitate the insertion of the needle, said needles being normally received by their bulbous centre within a chamber constituted by the co-operating tapering enlargement 89 formed on the inner faces of the plates 85, at the outer end of each cross slot 87.

Thus, a cavity is provided between the co-operating plates 85 in which cavity the needles can be safely and conveniently kept. So as to facilitate the removal and insertion of needles, a spring 90 is disposed between the said plates, tending to separate the same a distance sufficient so as to clear the lower face of the plate 85 from the bulbous enlargement. Again, so that said plates may always remain in their proper registering position, the plates 85 are disposed over a square shaft 91, the lower plate 85 being force-fitted over said shaft and the upper plate 85 slidable thereon. Finally, to prevent the deck supporting spring 92 from urging the deck upwardly so that one point of the needles may contact the rubber gasket of the holder, a length of tubing 93 is loosely inserted over the upper end of shaft 91 to act as a spacer between the deck and the screw-cap, the length of said spacer being in all cases greater than the upper length of any needles to be inserted in the deck.

Obviously, the deck supporting means are the same as those already described and more particularly in connection with Figure 3. Consequently, the shaft 91 corresponds to rod 30, the spring 92 to spring 35 and, of course, there is a lower tubing to guide the bottom end of shaft 91 within the circular rib provided at the bottom of the container.

From the foregoing description, it will be evident that the present invention is a most useful advance of the art, designed to keep hypodermic needles in suspended position so that the sharpened edges thereof are at all times free of contact with solid material. Again, the particular construction enables the sterilisation of the needles by means of boiling, if desired, or for carrying purposes, by means of an antiseptic fluid kept in the receptacle holding the needles and adapted to freely circulate within the needles to keep the bores thereof free of foreign and coagulated material.

It must be understood that various changes as to size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A holder for carrying and supporting hypodermic needles with their points in space, comprising a receptacle adapted to contain a fluid, a cap for closing said receptacle, a needle deck slidable vertically in the receptacle, a vertical rod disposed centrally of the receptacle and passing through the center of the deck, a guide tube at the lower end of said rod, tube-centering means in the receptacle, a spring over the rod between the tube and deck for urging said deck upwardly, and means for telescopically retaining together the tube and rod.

2. In a carrier for hypodermic needles including a receptacle and a selectively closable screw cap, needle-supporting means having flaring apertures adapted to support hypodermic needles at an enlarged portion thereof, so that the points

may be in free space, a central rod extending above and below said supporting means, a guiding tube over the lower portion of the rod, a spring over the rod between said tube and supporting means, and means on the rod for limiting the movement thereof inside the tube.

3. In a carrier for hypodermic needles, a tubular receptacle, a deck movable piston-fashion in said receptacle, said deck having needle-receiving apertures for suspending said needles, a guiding rod disposed axially with respect to the receptacle extending centrally through the deck and adapted to be movable therewith, a tubular member receiving the lower portion of said rod, a spring between the deck and tubular member to urge said deck upwardly, and means whereby the rod and tubular member are movably retained in telescopic relation.

4. As an article of manufacture, a sterilizable carrier and holder for hypodermic needles, comprising a liquid-holding receptacle, cap means for selectively closing and opening said receptacle to the passage of a liquid, a deck in the receptacle, said deck having apertures adapted to support hypodermic needles by their heads so as to suspend the points in space, a vertically movable rod freely projecting through the center of the deck for guiding the same in the receptacle, a spring on the rod and under the deck for urging the deck upwardly, means telescopically receiving the lower end of the rod and retaining the rod and spring together against disassembly, and means in the bottom of the receptacle for centering the lower end of the telescopic means.

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