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DISPOSABLE NEEDLE ASSEMBLY

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Fig. 1

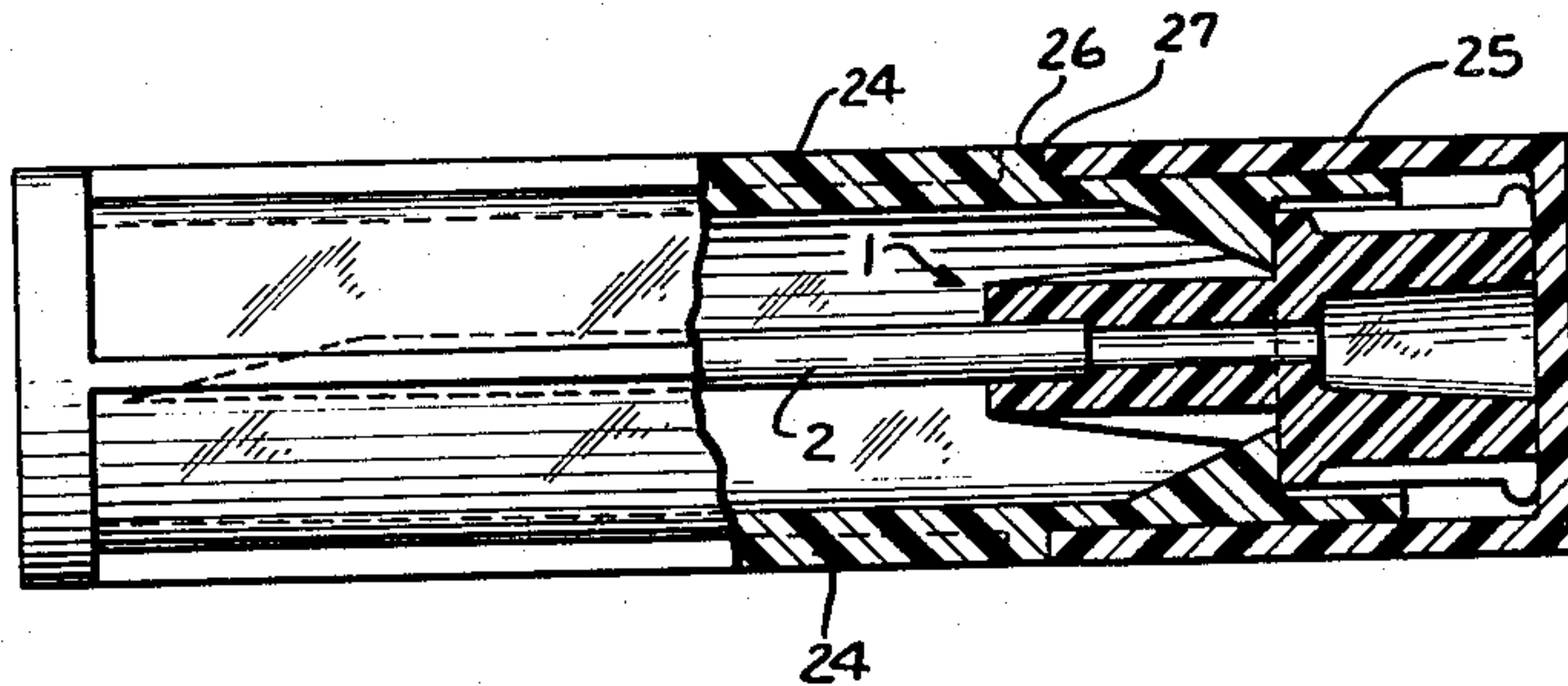


Fig. 3

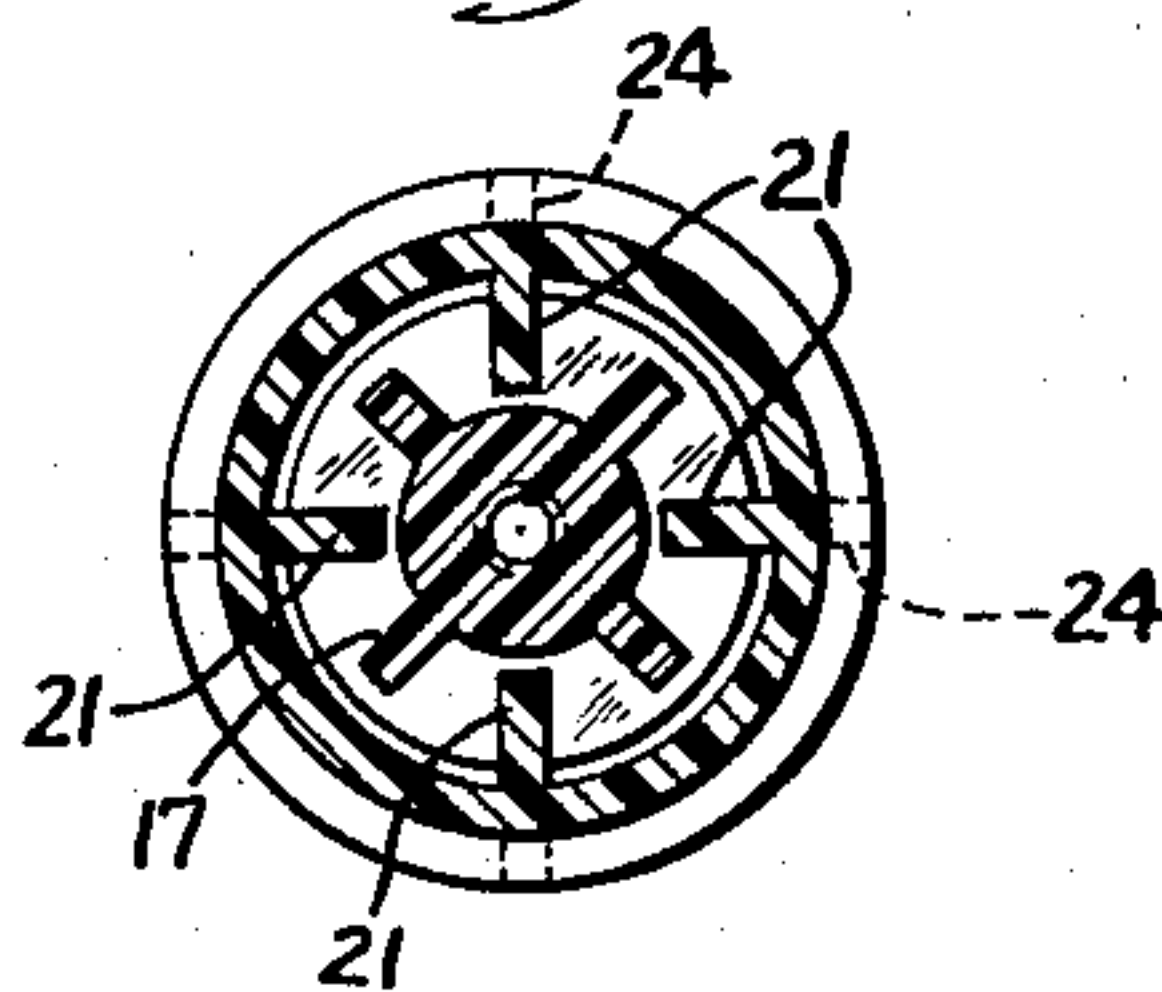


Fig. 2

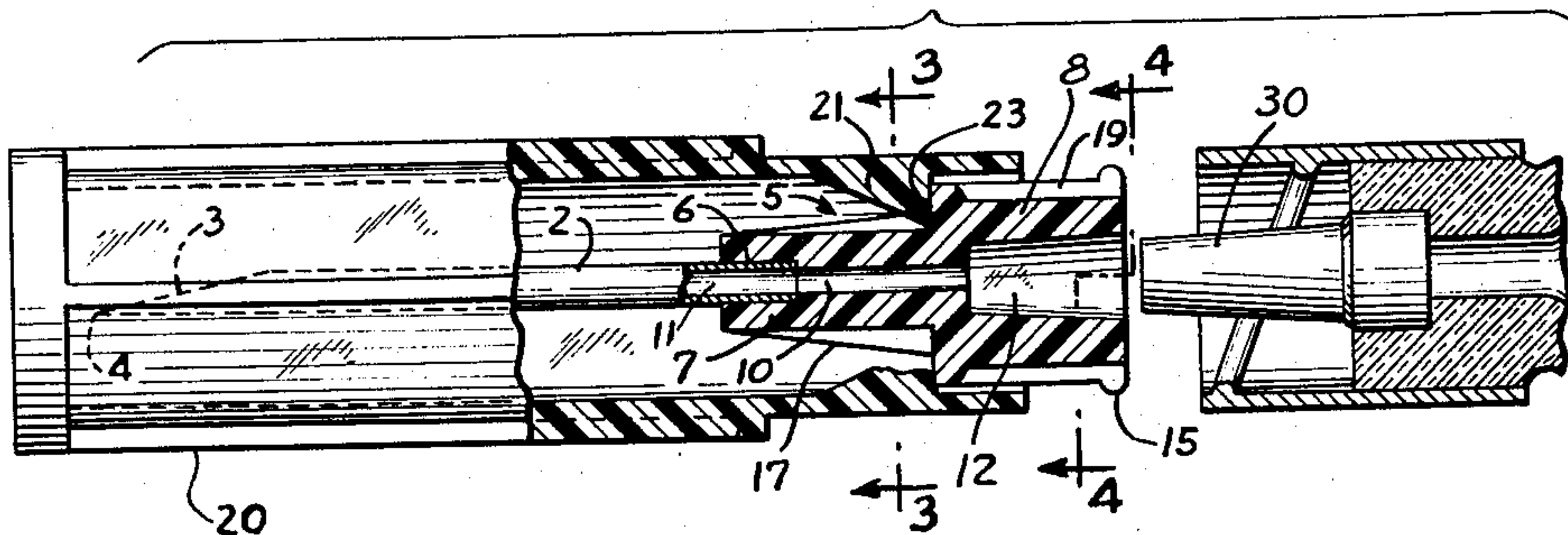
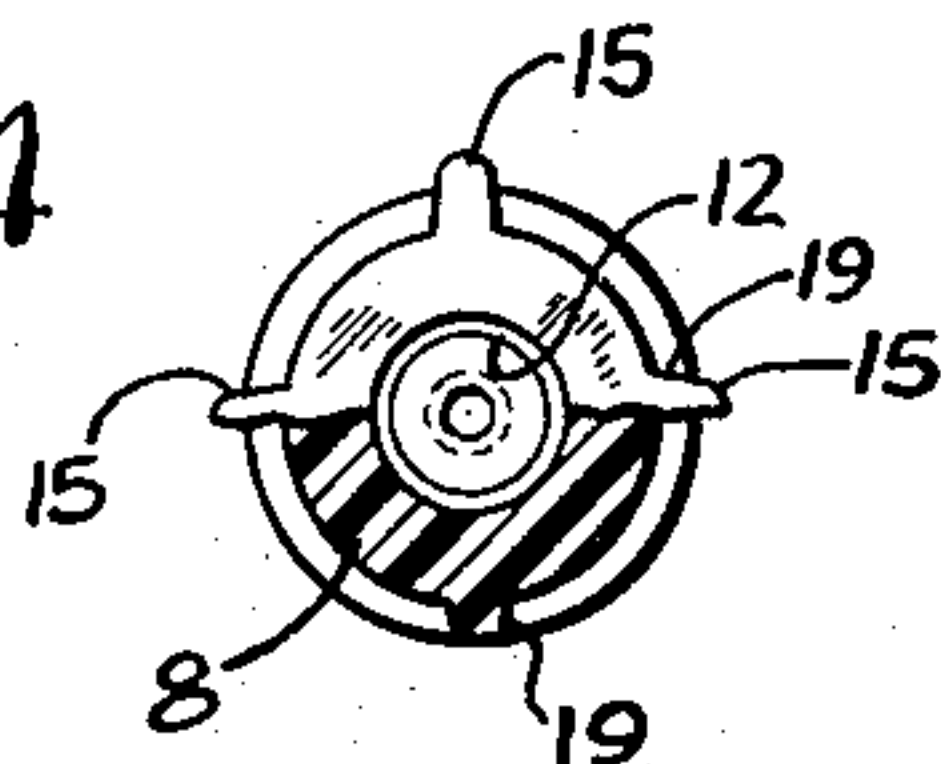


Fig. 4



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## DISPOSABLE NEEDLE ASSEMBLY

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1 Claim. (Cl. 206—43)

This invention relates to needles used in surgery which include a canula and a hub at one end thereof.

It is one of the objects of the present invention to provide a needle of the above mentioned type with a casing for housing the entire needle and maintaining it sterile, which casing can be opened to permit access to the needle, and wherein the casing may be manipulated to manipulate the needle to a position on a syringe, all without touching the needle itself or otherwise interfering with the sterility thereof.

It is a further object of the present invention to provide a casing or housing for a needle of the above mentioned character which casing is made of flexible material so that it can be inserted over the end of the needle that is on a syringe and by gripping the end of the casing between the thumb and forefinger, the end of the casing may be brought into pressure engagement with the hub of the needle for gripping the needle to remove it from the syringe, all without any danger of contaminating the needle or infecting the operator by touching the needle.

It is a still further object of the present invention to provide a packaged hypodermic needle, the package including a casing and a cover so arranged as to protect the needle from mechanical damage and insure sterility during the storage period, or even permit sterilization after assembly and closing of the package, the package being sealed to protect against accidental opening and constructed to give an indication that the package has been opened when that is the case.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing which forms a part thereof.

In the drawing:

Figure 1 is a side view of a needle package embodying the present invention, with a part of the package shown in longitudinal cross section;

Figure 2 is an exploded view showing the assembly of Figure 1 with the cover removed and in position for inserting the needle into a Luer lock syringe;

Figure 3 is a sectional view taken along the line 3—3 of Figure 2, and

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 2.

Reference may now be had more particularly to the drawing wherein like reference numerals designate like parts throughout.

In the drawing there is shown at 1 a hypodermic needle for use as an accessory to varying types of instruments for administration of substances to a patient or for extraction of fluid from a patient. The needle includes a canula 2 which is a stainless steel tube of small diameter cut at one end as indicated at 3 to form a penetrating point 4 which may be of any shape known in the art. The opposite end 6 of the canula extends into a hub 5 that includes a post 7 at one end of which the canula is anchored, and that has a head 8 integral with

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the post. The post 7 is cylindrical and has a central axial bore 10 extending the full length thereof. The hub may be made of any desired material, a preferred material being a plastic material, such as, for instance, cellulose acetate, which is molded around the canula. The lumen 11 of the canula is in alignment with and opens into the bore 10, the bore being approximately of the same diameter as the diameter of the lumen 11. The bore 10 communicates with a cavity 12 in the head of the hub, which cavity is tapered in accordance with conventional Luer lock practice approximately 0.06 inch per inch. In one construction the inside diameter of the bore 10 was .169 inch at its outer end and .154 inch at an axial distance of .250 inch from the outer end. The head of the hub has one or more lugs 15 on the outside thereof which provide means for securing the hub of the needle in a standard Luer lock type of syringe. The post 7 has a series of lengthwise extending triangular ribs 17, in this instance, four, equally spaced about the periphery thereof. Each of the ribs 17 is integral with the post 7 and terminates at and is integral with the bottom surface of the head 8. The head 8 may have a similar number of ribs 19.

The hypodermic needle fits into an enclosure comprising a bottom casing 20 which is tubular in shape closed at the bottom and open at the top. The interior of the casing 20 has, adjacent the open end thereof, a series of ribs 21 in number and in spacing equal to that of the ribs 17 of the post. Each of the ribs at 21 constitutes a shoulder stop 23 engaged by the bottom of the head 8 of the hub and limiting the extent of insertion of the needle into the casing 20, thereby preventing movement of the needle into the casing beyond a predetermined point. This prevents the penetrating point of the needle from touching the bottom of the casing 20. The peripheral wall of the casing 20 may be made very thin, and may be reenforced by uniformly spaced longitudinally extending ribs 24, which also facilitate firm gripping of the casing 20.

A top cover or cap 25, circular in cross section, slides over the open end of the casing 20 into abutment with a peripheral flange 26, thus creating a closed package. The inside of the cap 25 holds the hub against the shoulder. This package protects the needle from mechanical damage and insures sterility during the storage period. The unit may be sterilized after assembly and closing of the package. Optionally, a heat seal may be formed at 27 to protect the unit from accidental opening and loss of sterility. This heat seal is frangible and may be readily broken by manual manipulation of the cover 25 with respect to the casing and thereby the breaking of the seal gives an indication that the package has been opened.

In order to use the needle the operator removes the cap 25. This exposes the cavity 12 inside the hub of the needle. A syringe tip 30 is inserted into this cavity. The syringe tip may be that of a Luer slip or Luer lock type of syringe which has a conventional Luer taper. The peripheral wall of the cavity 12 has a corresponding taper. In order to insure the desired engagement between the syringe and the needle a slight twist is required. This results in threading of the lug or lugs 15, in engagement with a corresponding helix in the sleeve of the syringe, as is already known in the art. The turning action of the needle is accomplished by twisting the bottom casing 20, whereupon the ribs 21 of the casing 20 engage the ribs 17 of the needle and transmit the turning torque to the needle. This torque creates the movement of the Luer lock projections 15 in the helix of the Luer lock syringe. After the desired engagement has been accomplished, the casing 20 remains over the needle, and may be permitted to remain there until the moment of injection or filling of the syringe, whereby the



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casing 20 continues to protect the sterility of the needle. The casing 20 is removed from the assembly by a longitudinal movement.

In the instance of the filling of the syringe the casing may be replaced thereafter to continue to protect the needle against contamination until the time the needle is about to be used for injection.

The disengagement of the syringe and the needle after use can be done by using the bottom casing 20 as a wrench to transmit torque to the needle to unthread it from the syringe.

The casing 20 may be made of any desired material. If it is made of pliable material such as, for instance, polyethylene which is the preferred material, the casing may be manually gripped between the thumb and index finger adjacent to the open end of the casing, and the casing may thus be manually flexed into gripping engagement with the head 8 of the hub for pulling the needle off of the end of the syringe after the needle has been unthreaded from the locking engagement with the syringe, or for pulling the needle off of the tip of a syringe of a type different from the Luer lock type if that is the type being used.

In compliance with the requirements of the patent statutes there has here been shown a preferred embodiment of the present invention, it being understood that the invention is not to this precise embodiment the same being merely illustrative of the principles of the invention. What is considered new and sought to be secured by Letters Patent is:

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In combination a needle having a canula with a penetrating point at one end and a hub at the opposite end, a tubular casing for the needle, said casing being closed at one end and open at the opposite end, the canula extending into the closed end and the hub being at the open end of the casing, cooperating means between the hub and the casing for interlocking the two against relative rotation while permitting longitudinal sliding of the needle with respect to the casing whereby the casing can be used as a wrench for turning the needle therein to bring the hub thereof into and out of mounting position with respect to a syringe, a closure cover telescoped over the open end of the casing, the needle and the interior of the casing being sterile, and the cover being heat sealed to the casing at a portion thereof sufficiently spaced from the closed end of the cover to permit removal of the cover as a complete unit adapted for subsequent replacement on the casing.

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