April 14, 1953 J. J. PERKINS 2,634,856

STERILE PACK FOR INDIVIDUAL DISASSEMBLED SYRINGES

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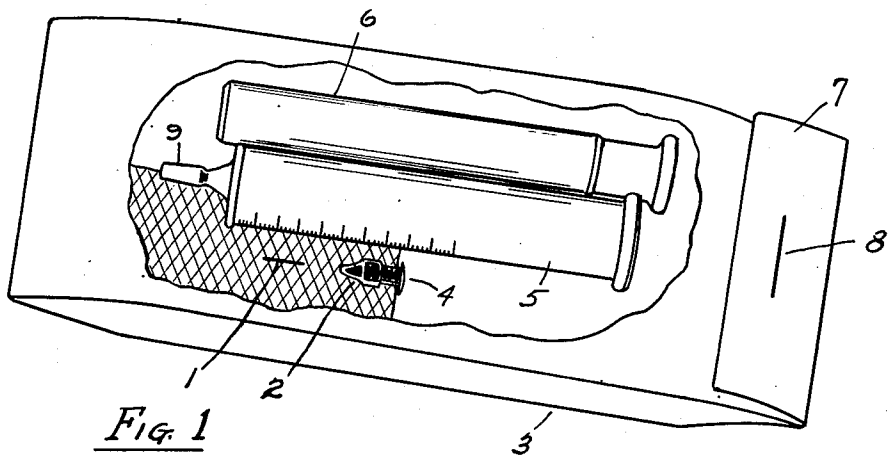

FIG. 1

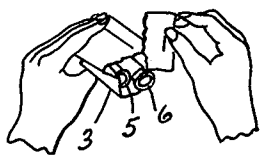

FIG. 2

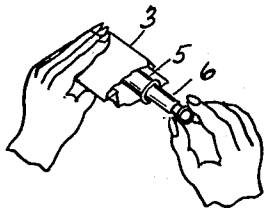

FIG. 3

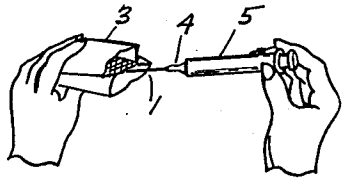

FIG. 4

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STERILE PACK FOR INDIVIDUAL DISASSEMBLED SYRINGES

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1 Claim. (Cl. 206—63.2)

1

This invention relates to the preparation, packaging, and sterilization of syringes and needles for the administration of injectable drugs in hospitals, clinics, and public health centers.

It is known that syringes are used daily in great numbers in hospitals and clinics for the administration of hypodermics, antibiotics, and other drugs. In order to protect the patient, the syringe must first undergo a careful cleaning, followed by some method of sterilization that can be depended upon for uniform and consistent sterility. Various methods are in use for the preparation and sterilization of syringes in hospitals and clinics. Probably the most popular procedure is to wrap the cleaned, assembled or unassembled syringe in a muslin wrapper and then sterilize by means of saturated steam at a temperature of 250° F. for 20–30 minutes or by means of hot air (dry heat) at a temperature of 320° F. for not less than one hour. Another method currently in use is to place the assembled syringe with the needle attached in a large test tube (the top covered with gauze or muslin) and then sterilize by means of dry heat at a temperature of 320° F. for not less than one hour.

Of the current methods described above, each possesses certain disadvantages well known to hospitals, nurses, and allied medical personnel. For example, the daily wrapping of a large number of syringes for mass inoculations is time-consuming, uneconomical, because of the cost attached to daily laundering of the muslin wrappers. Although steam sterilization is acknowledged to be the most efficient method, yet it is known to be a hazardous procedure unless the syringe is sterilized in the unassembled form (plunger separated from barrel). The sterilization of assembled syringes, by means of steam, is known to be conducive to early leakage and breakage, because of the unequal rate of expansion of the two parts during the heating and cooling process. In addition, there is always the possibility that steam will not contact all surfaces of the barrel and plunger, particularly if the parts form a tight fit, such as evidenced in new syringes.

Dry heat (hot air) sterilization of syringes is extremely slow, time-consuming, and not well adapted to the daily preparation of a large number of units. Dry heat cannot be depended upon for uniform penetration throughout the load, and as the result, the exposure period must be prolonged to the point where the procedure actually handicaps daily production requirements for the average hospital or clinic.

2

It is the object of the present invention to provide a pack whereby syringes and appropriate needles may be individually packaged for sterilization by means of pressure steam and, following sterilization, the pack comprises a sterile unit containing the essential parts required by a physician or nurse for an injection.

In the drawing, Fig. 1 is a cutaway view of the pack, Figs. 2, 3, and 4 illustrate the steps for removing the syringe from the pack.

Before loading into the pack, the syringe is disassembled and cleaned. The first step is to stick the needle 1 through one side of a gauze square 2 and fold the gauze so the exposed point is between the folds. The needle can now be dropped into a steam pervious paper bag 3, point down. In this position, the hub 4 of the needle is toward the top of the bag. The disassembled barrel 5 and the plunger 6 of the syringe can now be placed in the bag and the top of the bag suitably sealed, for example by a double fold 7 fastened by one or more staples 8.

The sealed bag is then placed in an autoclave and sterilized under saturated steam pressure at 250° F. for 20–30 minutes. The steam pervious paper of the bag offers little or no resistance to the passage of steam, thus insuring positive sterilization with the desired factor of safety within the shortest possible time.

Upon removal from the autoclave, the paper serves as a barrier to air-borne or contact contamination. Such breathing of air, as caused by changes in temperature, is filtered through the paper.

Upon arrival at the point of use, the top portion of the bag is torn off, as shown in Fig. 2, exposing the upper end of barrel 5 and plunger 6. While holding the bag with one hand, the plunger is withdrawn from the bag and inserted into the barrel (Fig. 3) and then the assembled barrel is withdrawn and the tip 9 of the barrel is pushed into the hub 4 of the needle, completing the assembly of the syringe which can now be withdrawn from the bag (Fig. 4) as a sterile dry assembled unit. All the foregoing operations can be carried out without touching the needle. The needle is always held from the outside of the bag.

The gauze square 2 can be used as a scrub or compress for the inoculation site.

In making the bag, it is necessary to use a steamproof adhesive. The paper should not be glazed or heavily sized, as that destroys the permeability to steam, which is essential, if the low temperature (250° F.) moist heat sterilizing technique is to be used. Dry heat requires a

higher temperature (320° F.) and a longer time (1 hour) than moist heat (20–30 minutes).

What is claimed as new is:

A sterile pack for an individual disassembled syringe comprising a bag of paper freely pervious to steam, a gauze scrub having a needle stuck into the gauze to shield the point of the needle and the gauze supporting the needle in the bag with the point of the needle pointed toward one end of the bag and the hub of the needle toward the other end of the bag, the gauze with the needle stuck therein being an assembly which can be dropped into the bag without puncturing the bag, a plunger and a barrel side-by-side in the bag with the upper ends thereof toward the other end of the bag, a closure for the bag whereby when the bag is closed it forms a barrier to air-borne or contact contamination and when the bag is placed in a steam atmosphere the contents are sterilized by steam which permeates the bag, and said bag with the disassembled syringe and gauze scrub therein being subjected to a steam atmosphere to sterilize the scrub and syringe which are thereafter maintained in a sterilized condition and protected until the bag is opened at the point of use, the bag permitting the parts to be held from the outside of the bag while the syringe is assembled by sequentially inserting first the lower end of the plunger into the upper end of the barrel and then inserting the lower end of the barrel into the hub of the needle so the assembled syringe need not be touched during the assembly, and the gauze which shielded the needle point during sterilization and storage to prevent puncturing of the bag being usable as a scrub for the inoculation site.

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