Dec. 17, 1963 A. J. CLAISSE ETAL 3,114,455

SEALED HYPODERMIC NEEDLE PACKAGE

Filed July 24, 1961

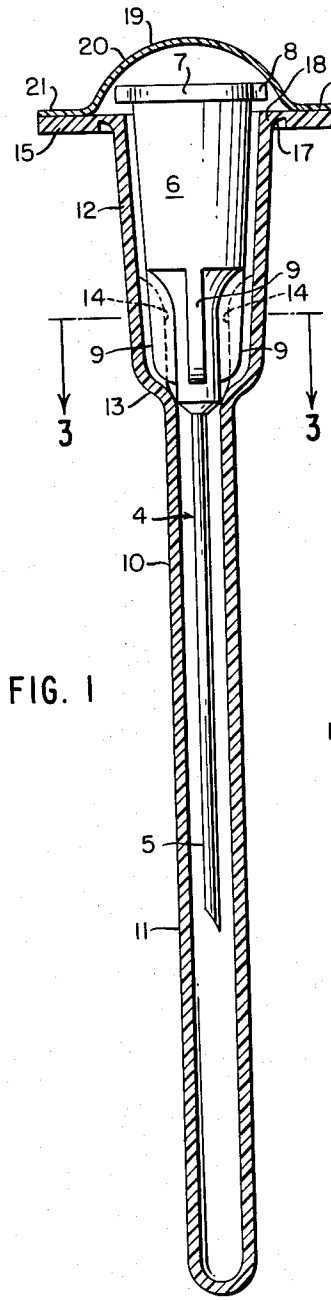

FIG. 1

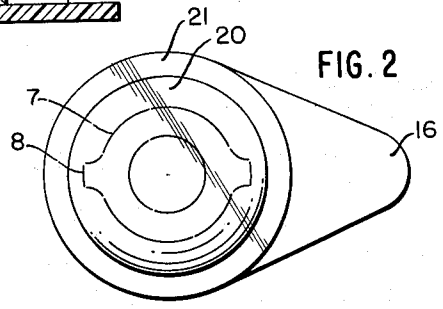

FIG. 2

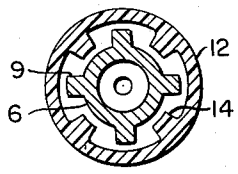

FIG. 3

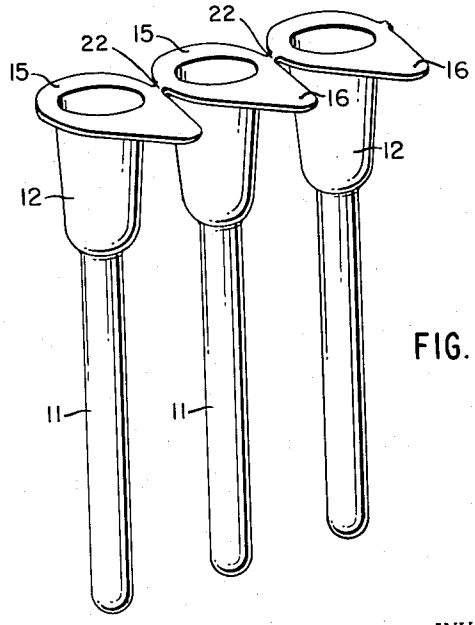

FIG. 4

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United States Patent Office 3,114,455 Patented Dec. 17, 1963

3,114,455

SEALED HYPODERMIC NEEDLE PACKAGE

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Filed July 24, 1961, Ser. No. 126,319
Claims priority, application Great Britain July 28, 1960
8 Claims. (Cl. 206—56)

This invention relates to the packaging of disposable hypodermic needles or other surgical instruments which it may be desired to protect and store in sterile condition within an individual sealed contained or sheath of such character that the package may be readily opened to allow access to the needle. A needle thus exposed may be connected to a hypodermic syringe before being withdrawn from its sheath and discarded after a single use.

The desired results may be achieved in accordance with the present invention by the production of a new and improved sealed package comprising a hypodermic needle or the like enclosed within an elongated container in the form of a sheath having a closure member attached to one end and a continuous line of reduced thickness in the material of the sheath so located that the closure member may be separated from the sheath by breaking along the weakened line and the enclosed needle thus made accessible.

Preferably and as herein shown the sheath is provided with an out-turned flange and an interior shoulder. The flange affords convenient means for attaching the closure member and the weakened line of reduced thickness may be located at approximately the line of juncture between the body of the sheath and its flange. Thus the rim of the flange and the closure member may be readily severed and removed as a unit when the needle is to be used.

The interior shoulder of the sheath is useful in supporting the needle with its adaptor extending outwardly beyond the open end of the sheath whereby it may be reached for connection with a hypodermic syringe before being wholly withdrawn from its sheath.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which:

FIG. 1 is a view of the package in longitudinal section,

FIG. 2 is a top end view.

FIG. 3 is a view in cross section on the line 3—3 of FIG. 1, and

FIG. 4 is a view in perspective.

In the contruction illustrated the hypodermic needle, indicated generally by the reference 4, comprises a steel cannula 5, pointed at its lower end and a molded adaptor 6, secured to the upper end of the cannula 5. The adaptor has the form of a hollow, open-topped molded shell, whose interior communicates with the bore of cannula 5. At the upper end of the adaptor is an outwardly projecting annular flange 7, which is widened at two diametrically opposite points to provide a pair of lugs 8, the flnage 7 and lugs 8 serving to effect the detachable connection of the needle 4 to a hypodermic syringe. At its lower end, the adaptor 6 is reduced in diameter and shaped to provide four radially projecting wings 9. The needle structure 4 is supported within an open-mouthed, tubular container in the form of a sheath indicated generally by the reference 10. This sheath comprises a narrow tube 11, which accommodates the needle proper 5, and merges upwardly into the tubular housing 12 of a larger diameter for the accommodation of the adaptor 6. The step 13 between the tube 11 and the housing 12 of the sheath provides an internal annular shoulder on which the lower end of adaptor 6 rests, holding the cannula 5 suspended within the closed lower end of the tube 11. The relative lengths of adaptor 6 and housing 12 are such that the adaptor projects through the open upper end of its sheath, leaving the flange 7 and lugs 8 exposed for engagement with the cooperating parts of the syringe without any necessity for withdrawing the needle structure from the sheath. The housing 12 is formed internally with four inwardly projecting ribs 14, which engage in the gaps between the wings 9 and the adaptor and prevent relative rotation of the needle and its sheath, as will be clear from FIG. 3.

At the upper end of housing 12, there is formed integrally with the sheath 10 an outwardly projecting flat flange 15, which on one side is increased in width to constitute a tab 16. Near its junction with the rim of the housing 12, the flange 15 is formed on its underside with an annular groove 17, leaving the flange connected to the remainder of the sheath 10 solely by a thin annular web 18 forming an endless weakened line. The open mouth of the sheath 10 is closed by a closure member 19, formed of thin transparent sheet material and comprising a central domed portion 20 and a plane peripheral flange 21, welded or otherwise secured to the upper surface of flange 15 on the outer side of groove 17.

The sheath 10 is conveniently formed by molding from a suitable plastic material, such as impact polystyrene. A plurality of conjoined sheaths may be formed at each molding operation, a part of such a molding being shown in FIG. 4. The flanges 15 of all the sheaths lie in the same plane and are integrally united with one another by narrow bridges 22, which can subsequently be broken to separate the individual sheaths. To facilitate separation the bridges 22 may be made of reduced thickness or otherwise weakened.

After the needles 4 have been inserted in their sheaths, the sheaths are hermetically sealed by applying the closure members 19 (which may be preformed as parts of a continuous strip) and heat sealing these members to the flanges 15 of the sheaths. Sterilization of the needles is best carried out after the packages have been sealed and is most conveniently effected by subjecting the sealed packages to radiation, though by employing permeable material for the sheaths and/or closure members gas sterilization techniques can be employed. Conveniently the sheaths are left in conjoined condition until immediately before the individual needles are required for use, it being possible to pack and store a large number of individual sheaths in a very small space by arranging the strips of conjoined sheaths in alternately reversed positions. However, if desired, the sheaths may be separated from one another at any stage of manufacture, or may be formed from the beginning as separate articles. Separate sheaths may conveniently be packed in alternately reversed positions in a packing strip formed for example by superimposing two layers of paper and adhering the layers together along a number of spaced parallel portions to define pockets into which the sheaths are inserted.

When a needle is required for use, the application of only a slight force between tube 11 and a tab 16 is sufficient to break the web 18 and allow removal of the flange 15 together with the closure member 19 from the remainder of the packages. The parts 7 and 8 of the adaptor are then freely accessible for engagement with the cooperating parts of the syringe and owing to the interengagement between ribs 14 and wings 9 the needle structure can be securely engaged with the syringe without any necessity for touching the needle or withdrawing it from its sheath, the sterilized needle structure re-

maining within its sheath in the position shown until connection with the syringe has been established and the assembled instrument made ready for immediate use.

Having thus disclosed our invention and described in detail an illustrative embodiment thereof we claim as new and desire to secure by Letters Patent:

1. A sealed package comprising a hypodermic needle enclosed within an elongated sheath of plastic composition having an outwardly projecting flange at one end and a closure member attached to said flange, the said flange having a line of reduced thickness inside the attached area of the closure member, whereby the closure member may be wholly removed for access to the enclosed needle by breaking along said line.

2. A sealed package as described in claim 1, further characterized in that the body of the sheath merges into an outwardly directed flat flange and has a continuous line of reduced thickness located approximately at the juncture between the body of the sheath and the flange whereby the rim of the flange and the closure member may be severed and removed as a unit when the needle is to be used.

3. A sealed package comprising a hypodermic needle enclosed within an elongated sheath having its open end surrounded by an outwardly projecting flange, a circular closure member attached to the flange in an annular area spaced outwardly from the open end of the sheath and the material of the flange being reduced in thickness in a continuous circle lying wholly within the annular area of attachment of the closure member.

4. A sealed package comprising a hypodermic needle having its cannula secured at its upper end in an adaptor of substantially greater diameter and being enclosed in an elongated sheath therewith, the sheath having an outturned flange at its open end and an internal annular shoulder supporting the adaptor with the upper end of the adaptor projecting above said flange, and a removable convex closure member attached to the flange over the projecting end of the adaptor, said flange having a line of reduced thickness inside the attached area of the closure member, whereby the closure member may be wholly removed for access to the enclosed needle by breaking along said line.

5. A packaged hypodermic needle comprising an elongated generally tubular sheath of one-piece molded construction whose lower end is closed and whose upper end is formed with an open mouth, including an outwardly projecting horizontal flange formed with an annular groove surrounding the mouth of the sheath to form a continuous line of reduced thickness, an annular shoulder formed in the interior of the sheath, the internal diameter of the sheath above the shoulder being larger

than that below the shoulder, and a plurality of inwardly projecting radial ribs formed integrally with the sheath above the shoulder; a hypodermic needle mounted in the sheath and including an elongated adaptor having a plurality of outwardly projecting radial wings formed integrally therewith, and a cannula having its upper end secured in the adaptor, the needle and the sheath being so dimensioned that with the lower end of the adaptor resting on the annular shoulder, the lower end of the cannula is supported above the lower end of the sheath, the upper end portion of the adaptor projects beyond the upper face of the flange and the ribs engage between the wings to limit relative rotation between the needle and the sheath; and a closure member extending across the open mouth of the sheath having a dished central portion enclosing the projecting upper portion of the adaptor and a peripheral portion secured to the flange on the outer side of the annular groove, so that the closure member may be wholly removed for access to the enclosed needle by breaking along the line of reduced thickness.

6. A packaged hypodermic needle as defined in claim 5, further characterized in that the outwardly projecting flange of the sheath merges at one side of its periphery into a tab projecting outwardly beyond the annular groove that surrounds the mouth of the sheath.

7. An assembly comprising a plurality of sealed packages according to claim 5, the packages being connected together by thin easily frangible bridge pieces joining the flanges.

8. A sealed package comprising a hypodermic needle enclosed within an elongated sheath, said sheath having an open end, a closure member attached to said sheath to close said open end, said sheath having a continuous line of reduced thickness in the material thereof located inwardly of the attached area of said closure member so that the closure member may be separated from the sheath by breaking along the weakened line of reduced thickness.

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