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B. S. LEMENT
HYPODERMIC NEEDLE
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Fig. 2

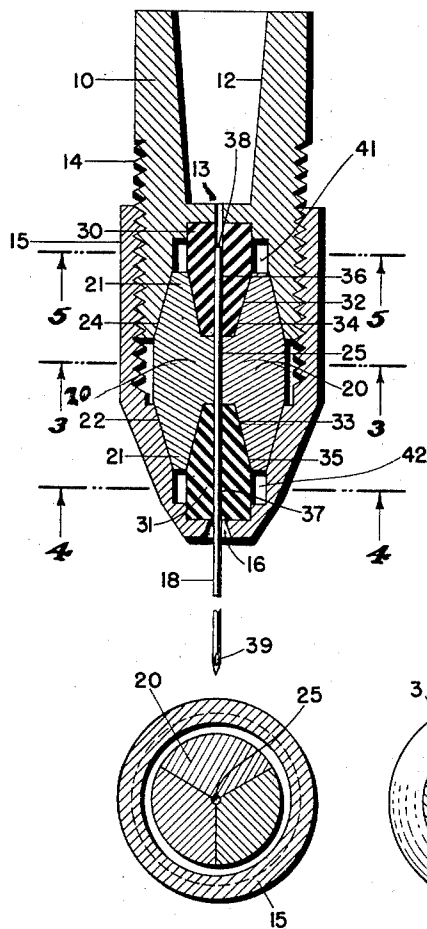


Fig. 3

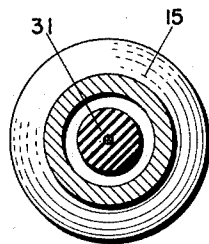


Fig. 4

Fig. 1

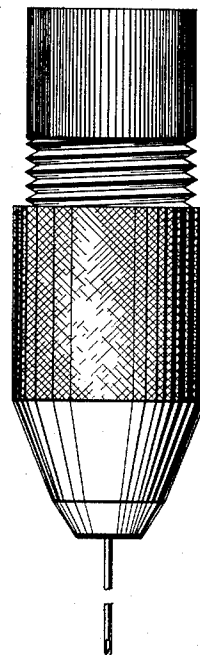


Fig. 5

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HYPODERMIC NEEDLE

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2 Claims. (Cl. 128—221)

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This invention relates to a device for holding a hypodermic needle for injecting it into human or animal tissue and the like in connection with the use of a syringe and more particularly to a hub for holding a hollow straight shank needle and connecting it to a syringe whereby medicinal solution may be drawn into the syringe and injected.

The device of the invention may be used interchangeably and repeatedly with a number of needles of varying lengths and diameters in connection with various syringes and has the advantage that the needles used may be inexpensively manufactured because a permanent hub built onto every needle as is the usual practice is not required. A selected straight shank hypodermic needle is simply inserted in the hub of the invention which is then tightened to grip the needle much the same as a replaceable victrola needle is placed in the sound head of a phonograph, the hub is placed on a selected syringe and the assembly is ready to use.

The usual practice in forming hypodermic needles is to fit a permanent metal hub on the inner end of each needle shank as a part of its manufacturing process which then adapts it to be connected to a syringe which adds considerably to manufacturing expense. With continued use the sharpened point of the needle becomes dull and it must be reground which shortens its effective length or the needle is discarded and replaced by a new needle. The permanent hub of the usual needle does not wear out during the serviceable life of the needle and is discarded after only a very small fraction of its normal serviceable life which involves a needless and expensive waste.

When a needle of desired length for a particular purpose is ground down its effective length is so shortened that it is no longer useful for that purpose. In the usual construction the needle and permanent hub thereon is gripped and held by an all metal to metal contact resulting in lack of flexibility and resiliency to the normal bending stresses to which the needle is subjected in ordinary use so that many needles must be discarded before the end of their normal period of service due to breakage.

The present invention overcomes many of the above disadvantages and provides a needle hub which because of the simplicity of its easily replaceable parts is inexpensive to manufacture, easy to keep clean and has a long service life, and may be used over and over with the same or different needles.

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Accordingly it is an object of this invention to provide a hub for holding a hypodermic needle in operation which will hold interchangeably needles of various diameters, lengths and types and which is adaptable to be used with various syringes, and which grips the needle with a firm, leak-proof fit.

The invention comprises a hollow body adapted to fit standard syringes and which may also be made to fit special syringes, a plurality of metal gripping jaws in said body, cooperating compressible washers and a cap adapted to receive a hollow needle, which when made up tightly on the body causes the gripping jaws firmly to grip the needle shank and compresses the washers around it to form a firm flexible leak-proof joint between needle and syringe which can withstand normal and unusual stresses to which the needle is subjected.

The embodiment disclosed is for illustrative purposes and is not intended to limit the scope of the claims.

In the drawings:

Fig. 1 is an elevation view of the hub of the invention with a needle inserted therein which is broken away in part;

Fig. 2 is a section view in elevation;

Fig. 3 is a section taken along the line 3—3 of Fig. 2;

Fig. 4 is a section taken along the line 4—4 of Fig. 2;

Fig. 5 is a section taken along the line 5—5 of Fig. 2.

In the drawings 10 is a body having a tapered inner surface 12 in its top adapted to fit over the nozzle of a standard syringe and an internal passage 13 for the passage of medicinal solution. The body 10 has external threads 14 which receive an internally threaded cap 15 having an internal tapered passage 16 in its end for receiving a hollow hypodermic needle 18 having a straight shank throughout its length.

Inside the body 10 and cap 15 are radially disposed gripping jaws 20 preferably three, each having tapered ends 21 adapted to seat on an internal tapered surface 22 in the cap 15 and in an identical internal tapered surface 24 in the body 10. The gripping jaws 20 are seated in this manner so that when the cap 15 is screwed onto the body 10 the gripping jaws are pressed together to grip the needle 18 in gripping surfaces 25 of the gripping jaws 20. A pair of washers 30 and 31 are snugly seated in the body 10 and against the inner end of the cap 15 respectively and have tapered ends 32 and 33 adapted to fit

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in corresponding tapered surfaces 34 and 35 in the ends of the gripping jaws 20. The washers 30 and 31 have internal passages 36 and 37 respectively so that when the body 10, cap 15, gripping jaws 20 and washers 30 and 31 are all assembled a continuous hollow passage is aligned for the reception of the needle 18 so that its upper end 38 may be adjustably positioned within the washer 30 and medicinal solutions may be drawn through the hollow passage 39 of the needle into the syringe to which the hub is attached.

To insert a needle 18 in the hub the cap 15 is unscrewed so that the gripping jaws 20 and washers 30 and 31 are loosely aligned within it and the needle is inserted in the end 16 through the passage 37, between the surfaces 25 of the gripping jaws 20 and into the passage 36 in the washer 30. The cap 15 is screwed up tightly on the body 10 so that the gripping jaws 20 are moved together toward the needle 18 to grip it firmly in the surfaces 25. At the same time the washers 30 and 31 are compressed within the surfaces 34 and 35 so that they also firmly grip the needle 18 and at the same time the washers may expand during compression into the hollow spaces 41 and 42. The spaces 41 and 42 provide relief for the compression of the washers 30 and 31 so that they may be compressed until the gripping jaws 20 firmly grip the needle 18.

Clearance is provided in the passage 16 between its internal surface and the needle 18 with the result that the needle 18 may bend below the gripping jaws 20 in the washer 31 which acts as a cushion to distribute the bending stresses throughout a large portion of the length of the needle below the jaws 20. This has the additional advantage of avoiding an all metal to metal contact and saves many needles from breaking which is the result of such a contact without cushioning as is found in the usual construction.

The washers 30 and 31 are made of a suitable rubber or other compressible and resilient material which will withstand the chemical action of the medicinal solutions used and sterilizing temperatures.

It will thus be seen that there has been provided by the present invention a hub for holding a hypodermic needle which is simple, inexpensive, easily cleaned and the parts of which are easily replaceable and which can hold a straight shank hollow needle.

The manufacture of hypodermic needles which may be used with the hub is less expensive. An over length needle may be used with the hub of the invention and positioned with its point at a distance from the end of the cap 15 to give the desired effective length for a particular use. When the needle is reground and thereby shortened it can then be re-positioned with its new point at the same distance out and with the same effective length of needle as before, because the position of the inner end 38 may be varied. This obviates the necessity of discarding a needle which must have a certain length for a particular

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requirement when it has been shortened by dulling and regrinding. Various types of needles of different required lengths and diameters can be used in the same hub or the same needle may be adjusted so as to have various effective lengths. The hub is interchangeable with standard or special syringes to which it is easily adaptable. The same hub can be used over and over and need not be discarded as is the case with the ordinary permanent type hub when the needle to which it is attached has worn out or broken. The compressible washers 30 and 31 facilitate release of a needle by springing the gripping jaws 20 apart when the cap 15 is unscrewed.

I claim:

1. A hub for holding a straight shank hypodermic needle in operation, comprising a hollow externally threaded body having an internal tapered surface, a cap threaded on said body having an end passage to receive said needle and an internal tapered surface, tapered radially disposed gripping jaws seated in said respective internal tapered surfaces and having cooperating needle gripping surfaces and internally tapered end surfaces, and tapered hollow compressible washers seated in said tapered end surfaces and abutting said body and said cap respectively whereby said jaws and washers are compressed to grip a needle therein when said cap is screwed up on said body.

2. A hub for holding a straight shank hypodermic needle comprising a hollow body having an axial longitudinal passage connecting with an internal partly conical and outwardly flaring surface in one end of said body and external threads on said end, a cap engaging said threads having an end passage large enough to receive said needle with clearance between the needle and the cap, said end passage connecting with an internal partly conical and inwardly flaring surface in said cap, a plurality of radially disposed longitudinally aligned needle gripping jaws positioned between said cap and body and adapted to seat in the conical flaring portions of both said surfaces, said jaws having cooperating internal surfaces which are adapted along their central portions for gripping said needle and are outwardly flaring at their end portions, and a pair of compressible washers having internal passages receiving said needle for a substantial portion of its length, said washers being seated in the outwardly flaring end portions of the internal surfaces of said gripping jaws and abutting in an endwise direction the internal end surfaces of the cap and body respectively whereby said gripping jaws and washers are compressed to grip said needle therein when said cap is screwed onto said threads.

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REFERENCES CITED

The following references are of record in the file of this patent:

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