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E. HENDERSON

3,064,651

HYPODERMIC NEEDLE

Filed May 26, 1959

FIG 1 PRIOR ART

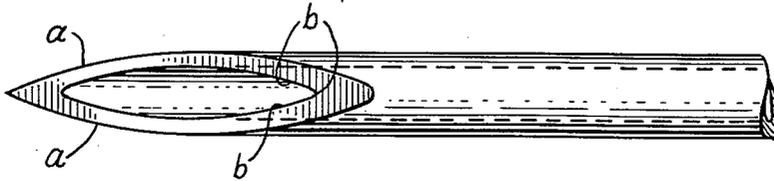


FIG 2

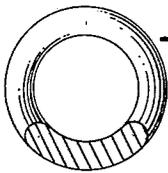
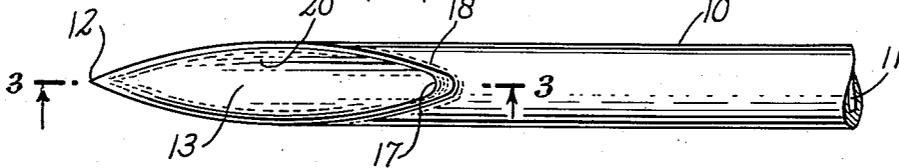


FIG 5

FIG 3

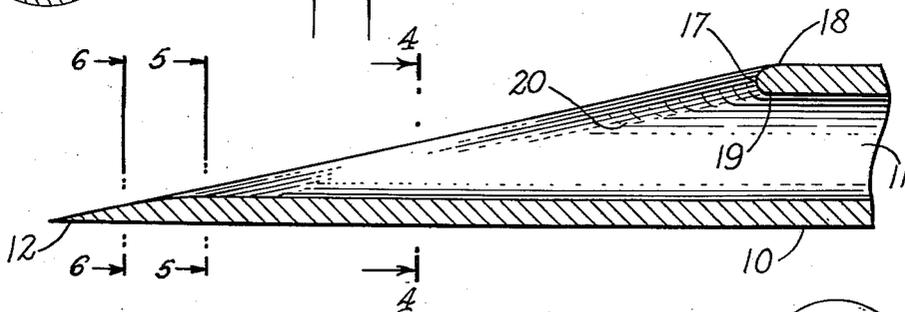


FIG 4

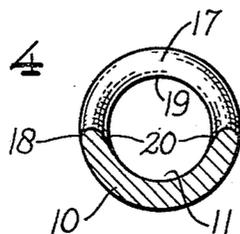
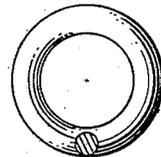


FIG 6



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3,064,651

HYPODERMIC NEEDLE

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 1 Claim. (Cl. 128—221)

This invention relates to hypodermic needles embodying novel features which provide a safeguard against certain hazards experienced in the use of hypodermic needles of conventional types.

The commonly used form of needle comprises a hollow stem or tube with its outer end cut obliquely to provide a sharp penetrating point. The oblique surface thus produced is intersected by the open end of the stem bore to form an end opening adjacent to the penetrating point. The sides and rear end portion of this opening present sharp cutting edges which excise fragments of skin when the needle is injected into tissue in normal use.

As reported in *Lancet* 2, pp. 983—985 (Nov. 8, 1958), Gibson and Norris conducted a series of 300 tests using a conventional form of needle in a wide range of sizes and found that the overall frequency of punched out or excised skin fragments was 69%. They suggest that the skin fragments thus detached might be a possible cause for commonly found subcutaneous and intramuscular abscesses following hypodermic injection.

In an article in the *Canadian M.A.J.*, No. 72, March 1, 1955, pp. 374—375, D. C. Little found that in from 25% to 50% of injections given, a small fragment of tissue was found at the end of the needle after its withdrawal. He noted that, although some particles remain in the needle, others will be sucked into the syringe and others ejected into the body with the injection fluid, all with varying harmful results.

Other observers have suggested that harmful effects such as intraspinal epidermoid tumors were due to skin fragments carried into the spinal canal during withdrawal of cerebrospinal fluid at some time prior to the appearance of the tumors.

Although the above and other disadvantages in use of conventional type needles have long been known, no prior expedient known to me has effectively prevented tissue excisions.

An object of the present invention has, therefore, been to provide a hypodermic needle which is devised to prevent excision of skin fragments or other tissue without impairing the capability of the needle to perform its intended functions.

A further object of the invention has been to provide a hypodermic needle with a penetrating end or point and with no tissue cutting parts.

A hypodermic needle embodying my invention, accordingly, includes a hollow stem or tubular wall having a central bore extending from end to end. Said stem is provided at its outer end with a sharp tissue penetrating point; said bore has an obliquely disposed opening through the stem wall adjacent and anterior to said point; and said opening forms no tissue cutting edge portions but is defined by a continuously rounded edge surface including portions of convex contour merging into adjoining portions of both the inner and the outer surfaces of said stem or wall adjacent to said opening.

The nature of the invention will be more readily understood from the drawings appended to this specification and wherein—

FIGURE 1 is a plan view on enlarged scale of the outer end of a hypodermic needle of a conventional type;

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FIGURE 2, a plan view, on enlarged scale, of the outer end of a hypodermic needle embodying my invention;

FIGURE 3, a fragmentary view, on enlarged scale, in central longitudinal section of the outer end portion of the needle stem shown in FIGURE 2;

FIGURE 4 is a transverse section on the line 4—4 of FIGURE 3;

FIGURE 5, a transverse section on the line 5—5 of FIGURE 3; and

FIGURE 6 is a transverse section on the line 6—6 of FIGURE 3.

Referring to FIGURE 1 of the drawings, a conventional type of hypodermic needle comprises a tubular stem with a central bore extending from end to end, a sharp tissue penetrating tip or point and an oval opening at the outer end of said bore disposed obliquely to the central longitudinal axis thereof, the arrangement being such as to produce sharp outer or lateral cutting edges at *a* and sharp inner cutting edges at *b*. In use, these cutting edges produce the undesirable and dangerous results above referred to.

To remedy the above noted defects a hypodermic needle according to my invention and as seen in FIGURES 2, 3 and 4 comprises a tubular stem 10 with a central bore 11 and a tip having a penetrating point 12 at its outer end. As seen more clearly in FIGURES 5 and 6, said tip is of circumferentially rounded cross sectional contour tapering to the point 12 at its outer end. An oval opening 13 disposed obliquely to the axis of said bore and anterior to said tapered tip end has only rounded defining or edge surfaces, those more remote from point 12 being convexly rounded outwardly at 17 to merge smoothly into and with the outer surface 18 of stem 10 and inwardly at 19 to merge smoothly into and with the inner surface 20 of bore 11. Said convexly rounded edge 17 also merges at its opposite end portions with the circumferentially rounded tapering portion of the tip. Thus, when a needle so constructed is employed, the point 12 penetrates the tissue without cutting; and as the rear edge portion of the bore opening encounters said tissue any intruding or pressed-in portion thereof will be rolled outwardly by the rounded surface instead of being severed or sheared off. Such a needle can be employed with greater facility by the operator and with less discomfort to the patient.

I claim:

A hypodermic needle having an axial bore and being beveled at its outer end to provide a tissue penetrating tip and an obliquely disposed bore orifice extending rearwardly from said tip, said orifice being defined at rear portions thereof by a smooth convexly rounded edge and said tip being of circumferentially rounded cross-sectional contour and tapering to a tissue penetrating point at its outer end, said tip merging at its inner end into end portions of said convexly rounded edge of said bore orifice, thereby to facilitate passage of the needle into and through tissue without excision.

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