

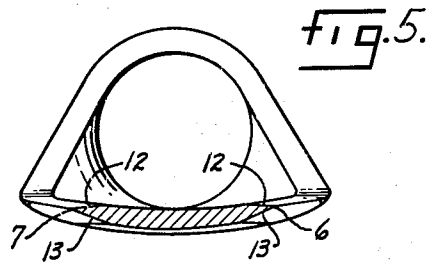
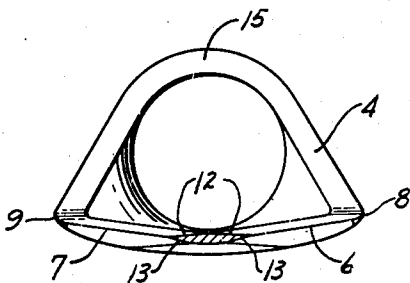
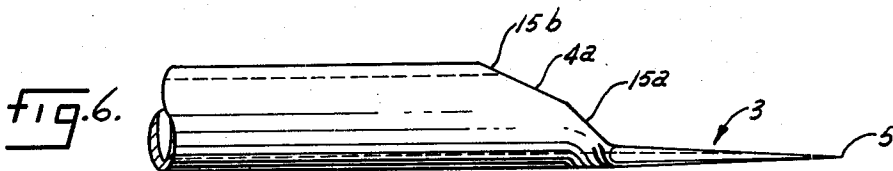
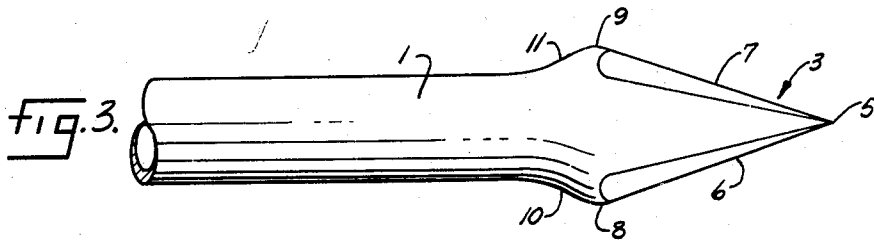
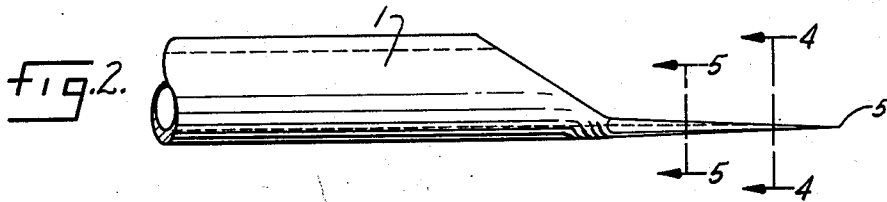
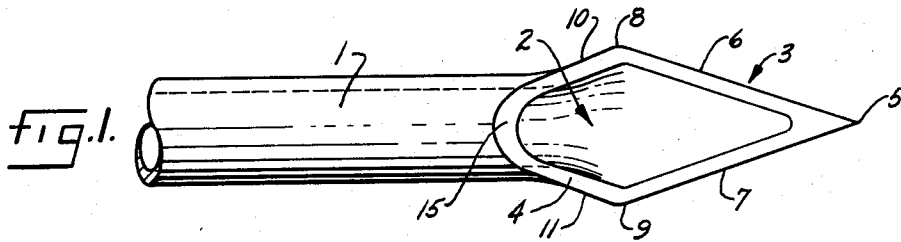
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HYPODERMIC NEEDLES

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1

2,904,045

HYPODERMIC NEEDLES

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8 Claims. (Cl. 128—221)

This invention relates to hypodermic needles and has, as one purpose thereof, the provision of a hypodermic needle having certain specific advantages over those presently known.

Hypodermic needles presently widely employed in the injection of fluids into the flesh of human patients and, by veterinarians, into the flesh of animals generally comprise hollow tubes having a beveled forward end serving as a point. In use these needles cause pain as the needle simultaneously cuts and spreads the flesh; often a plug of tissue becomes embedded in such needles and they are difficult, if not impossible, to reuse and as they are used the initially heavy pressure required for insertion becomes noticeably greater. It is accordingly among the purposes of my invention to provide a hypodermic needle free of all such disadvantages.

Another purpose is to provide a hypodermic needle having an end portion of a particular configuration effective to produce a thin slit as the needle penetrates flesh.

Another purpose is to provide a hypodermic needle having an end portion of a particular configuration effective to greatly reduce, if not eliminate, the likelihood of clogging of the needle as the shank penetrates deeper into flesh after the initial penetration of the needle point.

Another purpose is to provide a hypodermic needle which may be caused to penetrate the flesh to its operative depth with a minimum of pain to the patient, a minimum of damage to the tissue and without cutting a plug of tissue.

Another purpose is to provide a hypodermic needle which may be caused to penetrate the material of the stoppers or covers commonly employed upon the containers for the fluid to be injected without the cutting of a plug of such material and, consequently, without the danger of plugging the needle or contaminating the fluid with such plug or pieces of stopper material.

Another purpose is to provide a hypodermic needle having a pointed portion effective to provide a thin slit in the flesh of the patient, human or animal, the length of said slit being greater than the diameter of the needle body.

Another purpose is to provide a hypodermic needle having a pointed portion effective to provide an initial slit in the flesh of the patient and having an adjacent portion effective to spread said slit, with a minimum of pain to the patient and damage to the tissue, to permit entry of the needle body or shaft into the flesh of the patient.

Another purpose is to provide a hypodermic needle which may be inserted in the flesh of a patient with a minimum of pressure.

Another purpose is to provide a hypodermic needle which may be easily and effectively sharpened for reuse.

Other purposes will appear from time to time during the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a top plan view illustrating the end portion

2

and a major segment of the body portion of the needle of my invention;

Figure 2 is a side elevation illustrating the device of Figure 1;

5 Figure 3 is a bottom view;

Figure 4 is a view taken on the line 4—4 of Figure 2;

Figure 5 is a view taken on the line 5—5 of Figure 2; and

10 Figure 6 is a side elevation similar to that of Figure 2 and illustrating a variant form of my invention.

Like parts are indicated by like numerals throughout the specification and drawings.

Referring now to the drawings and particularly to Figure 1, the numeral 1 generally indicates the hollow tubular shaft or body portion of the hypodermic needle of my invention. The needle 1 has its flesh-contacting or outer end portion 2 formed with a flattened slit-forming point segment 3 and a rear or flesh-spreading heel portion 4. The portion 3 has a sharp point 5 at its outermost end. The portion 3 has rearwardly divergent, oppositely disposed cutting edges 6, 7 extending from the point 5 rearwardly to points adjacent to and outwardly spaced from the heel portion 4 as indicated at 8, 9. The segment 3 includes rearwardly convergent, generally curved or rounded edge segments 10, 11 extending from the points 8, 9 to the base of the heel portion 4.

As may be clearly seen in Figures 4 and 5 the edges 6, 7 are sharpened as indicated at 12, 13 to provide cutting action as the needle of my invention penetrates the flesh of the patient. While the portion 3 is of extremely thin and flat configuration, it will be realized that the surfaces 12, 13 are created by grinding to provide the maximum sharpness of the knife edges or razor-like cutting edges 6, 7.

Similarly, the edge segments 10, 11 are rounded and smooth to insure against tissue damage as the needle of my invention is withdrawn from the flesh of the patient.

It will be observed that the base of the point portion or segment 3, extending between the points 8 and 9 is of an extension greater than the diameter of the needle shaft 1.

Lying in a plane angularly disposed with relation to the longitudinal axis of the shaft or needle body 1 is the heel segment or flesh-spreading portion 4. A beveled arcuate surface 15 is formed along and defines the rearwardly, upwardly inclined heel portion 4 to provide for maximum ease in spreading the tissue, in which a thin slit is formed by the needle portion 3, as the needle further penetrates the flesh of the patient.

Referring now to the variant form of my invention illustrated in Figure 6, it will be understood that the portion 3 illustrated therein is substantially identical with that illustrated in Figures 1—5. The heel segment 4a illustrated in Figure 6 compares generally with the portion 4 illustrated in Figures 1—5 with the exception that the beveled surface 15 thereof is formed in two planes, each angularly disposed with relation to the longitudinal axis of the tube or needle shaft 1. Thus the surface 15 of Figure 6 includes a first portion 15a extending from the needle point portion 3 upwardly and rearwardly at a first angle with respect to the longitudinal axis of the needle 1, and a second segment 15b extending from the upper edge of the segment 15a to the rear of the heel portion 4 at a lesser angle with respect to the longitudinal axis of the needle 1. It will be realized, while not illustrated, that the segment 15b is of generally arcuate configuration while the segment 15a is in two parts, each constituting a continuation of the opposite ends of the segment 15b.

Whereas I have described and claimed a practical and operative device, nevertheless, many changes may be made in the size, shape, number and disposition of parts

3

without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as, in a broad sense, illustrative or diagrammatic, rather than as limiting me to my precise showing.

The use and operation of my invention are as follows:

The point 5 of the needle of my invention is brought into contact with the flesh of the patient. With a minimum of pressure, due to the sharp point 5, the thin, flat point portion 3 and the razor-like edges 6, 7 extending rearwardly in gradually diverging paths, the needle of my invention may then be caused to penetrate the flesh of the patient.

When the needle of my invention has penetrated the flesh of the patient sufficiently to embed the portion 3 to such depth as to embed the points 8, 9 of the portion 3, a very thin slit will have been formed in the flesh of the patient. Because the points 8, 9 are spaced apart a distance greater than the diameter of the needle 1 the heel portion 4 may then penetrate this slit, in response to continued inward movement of the needle 1, and the tissue is thereby simply and easily, with a minimum of pressure and a minimum of pain to the patient, separated by the angularly disposed surface 15 or surfaces 15a, 15b. Since the tissue is simply spread there is no cutting required on the part of the surface 15 and therefore there is virtually no likelihood of further cutting of the tissue or forming of a plug of tissue within the needle shank or shaft 1.

Thus the entire circumference of the needle shaft is caused to pass easily into the tissue of the patient, through the slit formed by the point 3 with a minimum of binding or friction. Moreover, the consequent reduction in pressure necessary to cause the needle to penetrate the tissue gives to the practitioner more control over the point of the needle since heavy pressure or tissue friction is not binding the shaft thereof.

I claim:

1. A hypodermic needle comprising a hollow tubular shaft, a pointed end on said shaft, said pointed end comprising a substantially flat segment of relatively thin cross-section and having rearwardly diverging oppositely disposed cutting edges, said edges terminating at points spaced apart a distance greater than the diameter of said shaft.

2. The structure of claim 1 characterized by and including an end surface on said shaft extending rearwardly from a point adjacent the rear edge of said flat segment and lying in a plane angularly disposed with relation to the longitudinal axis of said shaft.

3. In a hypodermic needle a hollow tubular shaft, a flesh-penetrating portion on said shaft, said portion com-

4

prising a substantially flat flesh-cutting point segment lying in a plane generally paralleling the longitudinal axis of said shaft, and having rearwardly diverging oppositely disposed cutting edges effective to cut a slit having a length greater than the diameter of said shaft and a flesh-spreading segment extending rearwardly from said point segment and lying in a plane angularly disposed with respect to the longitudinal axis of said shaft.

4. In a hypodermic needle a flesh-penetrating and cutting point therefor comprising a substantially flat end portion of relatively thin cross section, said portion having a base wider than the diameter of the needle with which it is employed, said portion having oppositely disposed sharpened cutting edges extending forwardly from said base and lying in converging planes, said edges converging forwardly of said base to form a sharp point.

5. In a hypodermic needle a hollow tubular shaft, an end for said shaft comprising a substantially flat portion of relatively thin cross-section, said end portion lying in a plane paralleling the longitudinal axis of said shaft and having a sharpened point at its outer end and having rearwardly diverging cutting edges extending rearwardly from said point and terminating at points spaced apart a distance greater than the diameter of said shaft.

6. The structure of claim 5 characterized by and including a flesh-spreading heel surface formed at the outer end of said tubular shaft and extending from the base of said end portion rearwardly in a first plane angularly disposed with respect to the longitudinal of said axis and continuing in a second plane angularly disposed at a lesser angle to said axis.

7. The structure of claim 5 wherein said cutting edges are formed by the convergence of upper and lower beveled surfaces extending from said point rearwardly to said spaced terminal points.

8. The structure of claim 6 characterized by and including a pair of rounded shoulder edges lying in rearwardly converging planes and extending from said oppositely spaced terminal points of said cutting edges to the base of said flesh-spreading surface.

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