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SURGICAL INSTRUMENT FOR INTRADERMAL INJECTION OF FLUIDS

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FIG. 1

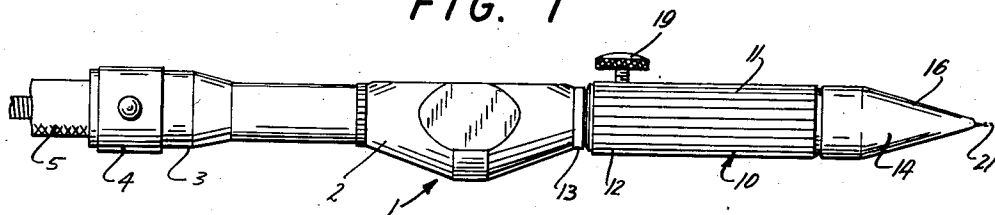


FIG. 2

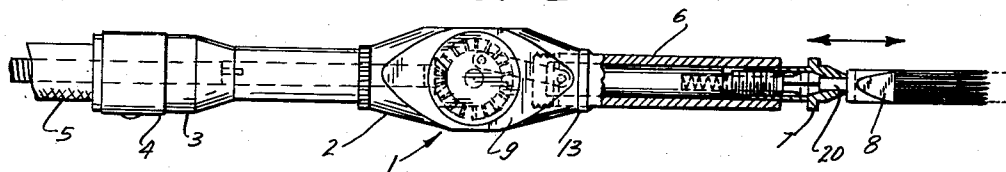


FIG. 3

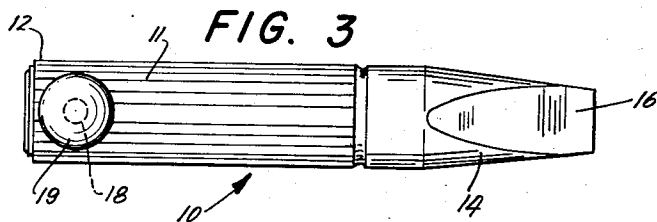
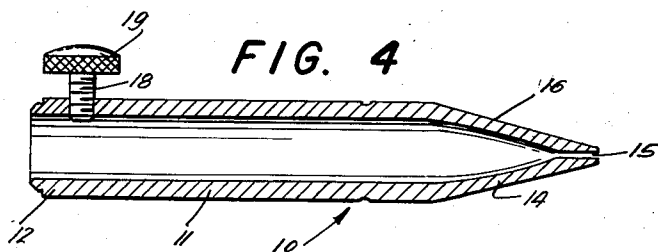


FIG. 4



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SURGICAL INSTRUMENT FOR INTRADERMAL INJECTION OF FLUIDS

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2 Claims. (Cl. 128-253)

This invention relates to a surgical instrument for subcutaneous injection of liquefied pigments, medicinal solutions and other cosmetic or therapeutic materials used in treatment of skin discoloration of birth marks, burns, frost bites, skin grafts and blemishes caused by a disease or otherwise.

The principal object of this invention is the provision of a novel surgical device of the character described which provides the means for controlling the depth of application of solutions, and especially the means for a rapid varying of the depth of application, in addition providing the means for a more secure and comfortable finger grip by the operator and also for providing for an efficient cleaning and sterilization of the instrument.

The present invention aims to provide an improved device for controlling the depth of application of the liquefied material.

Another object of this invention is to provide the means for rapidly varying the depth of application during the operation without the necessity of stopping the motor.

It is a further object of this invention to provide a device with an improved finger grip for the surgeon.

It is a still further object of this invention to provide a device which may be efficiently and rapidly cleaned and sterilized.

In accordance with the invention, a surgical instrument is provided in which the finger piece is arranged for radial or longitudinal adjustment and may be immediately locked into any radial or axial position by a locking screw. The construction in accordance with the invention is advantageous in that the adjustment may be easily and simply made by one hand of the surgeon while the instrument is in use.

Other objects and advantages of the invention will be apparent from the description and from the accompanying drawings which show, by way of example, an embodiment of the invention.

In the drawings:

Figure 1 is a side view of a surgical instrument in accordance with the invention.

Figure 2 is a view corresponding to Figure 1 with the reciprocating mechanism shown in dotted lines and with the barrel in section.

Figure 3 is a view of the finger piece in accordance with the invention removed from the handpiece.

Figure 4 is a vertical sectional view of the finger piece.

Referring to the drawings, there is shown in Figure 1 a surgical instrument or skin injector 1 in accordance with the invention, and including a handpiece or housing body 2 with a connector 3 having a bushing 4 to receive a conventional flexible power cable. The housing 2 terminates in a barrel 6 with a smooth outer surface. A chuck 7 projects through the barrel 6 to receive a conventional assembly of needles 8. Within the housing or body 2 is a reciprocating mechanism 9 whereby the rotary motion supplied by the flexible cable 5 is converted into reciprocatory motion for the back-and-forth movement of the

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needles 8. The invention so far described has been heretofore used in an instrument of this type.

In accordance with the invention, improved means are provided for adjusting a finger piece 10 secured in position over the barrel 6. It is very important that an adjustment be quickly and easily made during the course of an operation. The finger piece 10 includes a tubular portion 11 adapted to closely fit and slide over the smooth external tubular surface of the barrel 6. The length of the finger piece 10 is such that when in position on the barrel and with its inner end 12 in abutment against a collar 13 of the body 1, the maximum desired length of the needles 8 will project outwardly.

In order to cover the reciprocating chuck 7, a sheath extension 14 is provided at one end of the finger piece 10. The sheath 14 is made with an opening 15 at its end, the opening formed with a cross-sectional shape to conform to the configuration of the brush assembly 8. In some cases it may be preferable to make the opening secured to fit a brush assembly having a circular grouped arrangement of the needles. In other instances it may be preferable to have the opening 15 rectangular or oval in shape such as, for example, to conform to the cross-sectional shape of a plurality of needles arranged in a single line. The outer surface of the sheath 14 is flattened as indicated at 16 for better visibility and for guidance of the instrument inasmuch as the tip of the sheath is adapted to be rested on the skin.

Adjacent the end 12 of the sheath 10 there is provided a threaded opening to receive an adjustment screw 18 which may have a knurled or slotted head 19.

In making the instrument ready for an operation, the chuck member 7 is opened to receive a shank 20 of the needle assembly 8. No particular attention need be taken as to the radial or axial position of the needle assembly in the chuck 7 as the sheath is placed in position over the needles and moved radially so that the needle assembly conforms to the shape of the opening in the sheath, and then, while the needles are in reciprocation, the axial adjustment of the sheath is made so that the desired extension of the needles is made as indicated in Figure 1 at 21. Obviously, a greater or lesser extension of the needles may be made by varying the axial position of the sheath along the barrel 6.

While the invention has been described and illustrated with reference to a specific embodiment thereof, it will be understood that other embodiments may be restored to without departing from the invention. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A surgical instrument for intradermal injection of fluids comprising a tubular barrel handpiece having a smooth outer surface, a plurality of needles arranged in a row secured in a needle assembly and extending from said barrel, reciprocating means for the needle assembly carried by the barrel, a generally tubular finger piece overlying the barrel and having a smooth inner surface, a sheath extending from one end of the finger piece and having an elongated opening therein conforming to the shape of the needle assembly, the inner surface of the sheath being tapered towards its elongated opening, the smooth inner surface of the other end of the finger piece slideably receiving the smooth outer surface of the tubular barrel, and an adjustment screw threadedly engaged in the finger piece releasably locking the finger piece in position on the barrel and providing the sole means for adjustably securing the finger piece in position on the barrel, whereby the rotative and axial position of the finger piece may be adjusted with respect to the barrel

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to vary the effective length of the needle assembly, the tapered inner surface of the sheath cooperating with the row of needles to rotatively align the sheath in proper position even while the needles are being reciprocated.

2. A surgical instrument for intradermal injection of fluids comprising a tubular barrel, a plurality of needles arranged in a row secured in a needle assembly and extending from said barrel, reciprocating means for the needle assembly carried by the barrel, the barrel having a smooth outer surface, the length of the smooth surface being at least twice as great as its diameter, a tubular finger piece having a smooth inner surface overlying the smooth surface of the barrel, a sheath extending from one end of the finger piece and having an elongated opening at the end thereof conforming to the cross-sectional shape of the needle assembly, the inner surface of the sheath being tapered towards its elongated opening, and an adjustment screw releasably locking the finger piece in

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position on the barrel and providing the sole means for adjustably securing the finger piece in position on the barrel, whereby the rotative and axial position of the finger piece may be adjusted with respect to the barrel to vary the effective length of the needle assembly, the tapered inner surface of the sheath cooperating with the row of needles to rotatively align the sheath in proper position even while the needles are being reciprocated.

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