

June 9, 1942.

J. G. KURTZ

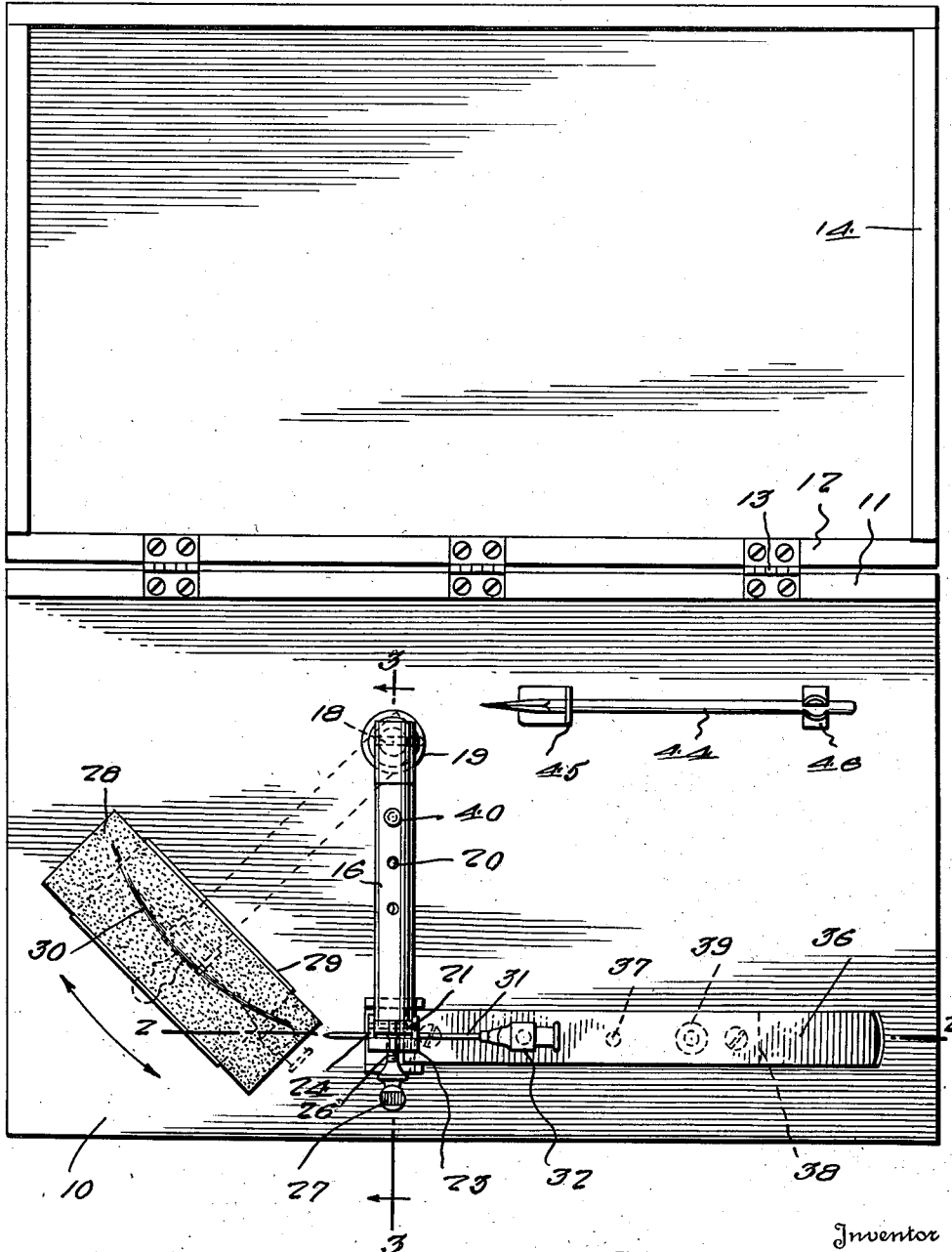
2,286,141

NEEDLE BEVEL MAINTAINER AND HONE

Filed May 21, 1940

2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

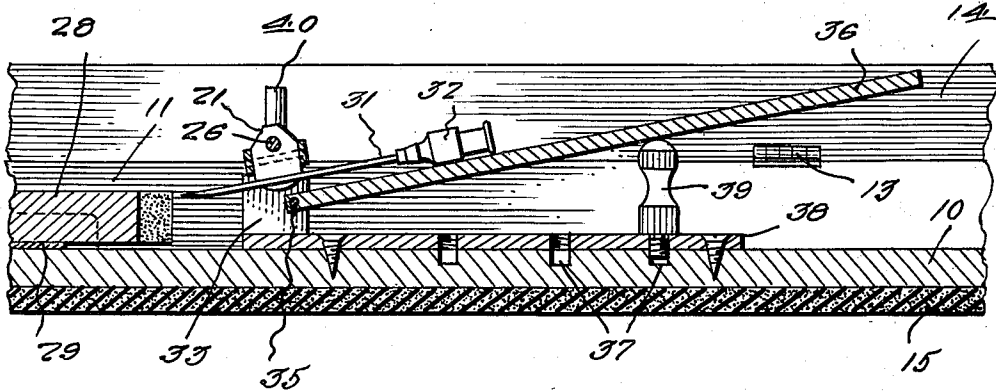


Fig. 3.

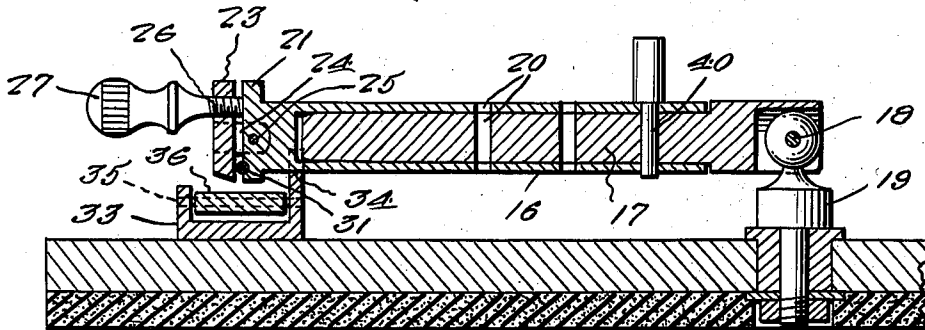
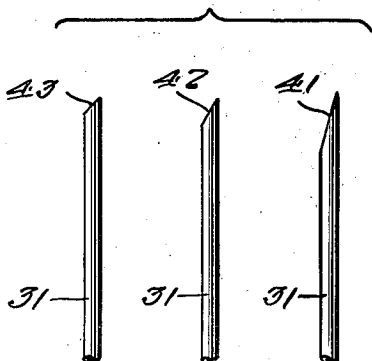
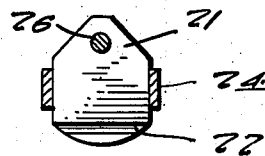


Fig. 5.



Figs. 4.



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NEEDLE BEVEL MAINTAINER AND HONE

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7 Claims. (Cl. 51—157)

The present invention relates to a device for honing or sharpening hypodermic needles.

An object of this invention is to provide a device enabling the honing of the needle point at any desired angle of bevel and insure that the original bevel of the needle point is maintained during resharpening or honing, even when the work is performed by an inexperienced, unskilled or careless person.

Hypodermic needles are manufactured, generally, in three types with reference to the bevel at the point of the needle: the long bevel, which is by far the most commonly used for medication and which is easier of penetration and makes the injection more painless than the shorter bevels; the medium bevel, which is used for spinal and intravenous diagnostic and medication work; and the short bevel also used for less depth penetration spinal and intravenous work including Schick and Dick tests.

An object of this invention is to provide a honing device which may be initially manufactured with any desired number of adjustments, such as three, to adapt the device for quick, easy and accurate setting for honing the long, medium or short needles to be resharpened. For special or different needle point bevels the device may have corresponding adjustments; all of the adjustments are for holding the needle at the proper angle to the stone and also with the bevel face in a plane parallel to the plane of the stone surface.

Another object of the invention is to provide a device which requires but a few strokes of the adjusted needle over the stone, or other sharpening element, to restore a keen edge to the needle; and a device requiring no electric or other motor or device for its operation but which is manually adjusted and operated and comprises an inexpensive device of few parts easily adjusted and not easy to get out of order.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views.

Figure 1 is a top plan view of one form of the honing device of this invention, the mounting for the device being shown in the form of a casing.

Figure 2 is an enlarged fragmentary longitudinal section taken on the line 2—2 of Figure 1 through the needle holder, rest and bevel plane

adjuster, a needle being shown in adjusted position ready for honing.

Figure 3 is an enlarged fragmentary section taken transversely on the line 3—3 of Figure 1, the section being taken through the needle holder seated on the rest.

Figure 4 is a detail enlarged sectional view through the needle clamp as shown in Figure 2, the needle being removed to show the seat or groove therefor, and

Figure 5 is a fragmentary point end view of a group of needles showing the approximate standard bevels of the points thereof.

Referring now to the drawings, the honing or sharpening device is shown in the present instance as mounted upon a baseboard 10 of any suitable dimensions and which, in the present instance, may comprise the bottom of a box or casing. The box or casing comprises a rear flange 11 extending along the rear side of the baseboard 10 and extending upwardly therefrom for connection to a second flange 12 through hinges 13, the flange 12 being a rear wall portion of an enclosing flange cover 14 adapted to house therein the device of this invention when the cover 14 is swung over upon the hinges 13. If desired, the baseboard 10 may have a cushion or a pad 15 at its underside to prevent injury to tables, desks and the like upon which the instrument may be placed when in use.

The baseboard 10 carries a needle holder in the form of a sleeve 16 open at its inner end to receive therein a bar 17, the sleeve 16 adapted to be axially turned or positioned upon the bar 17 into different axially angular positions with respect thereto for the adjustment of the needle holder. The bar 17 is connected by a pivot pin 18 to a post 19 which is swiveled or otherwise mounted for rotation upon the baseboard 10 near the rear edge thereof and intermediate the opposite ends of the baseboard. The needle holder is adapted to be swung upwardly in a vertical plane upon the pivot 18 and is adapted to be swung horizontally as shown in dotted lines in Figure 1 by the turning of the post 19.

Any suitable means may be provided for determining desired fixed angular positions with respect to the bar 17 and the sleeve 16. In the present instance three sets of openings 20 are provided in the bar and sleeve, the openings of each set being adapted to register and the sets of openings being disposed in axially angular relation in the bar so that the sleeve 16 must be turned upon the bar 17 into the respective posi-

tion for the registry of the selected set of openings 20.

The outer end of the sleeve 16 is provided with a needle clamp in the form of a fixed jaw 21 which is flat at its outer side and provided, as shown in Figure 4, with a cross groove or seat 22 of suitable size for receiving therein the shanks of the needles, as shown in Figures 2 and 3. The needle is held to the fixed jaw 22 by a pivoted jaw 23 which may have lugs 24 at its opposite edges extending rearwardly and overlapping the edge portions of the fixed jaw 21 and pivotally connected thereto by a cross-pin 25 or the like so that the jaw 23 may be swung upwardly on the pin 25 to admit the shank of the needle between the jaws and so that the pivoted jaw 23 may be swung downwardly to hold the shank of the needle in the groove or seat 22. A binding screw 26 is threaded through the upper portion of the pivoted jaw 23 and is provided with an enlarged thumb piece or handle 27 at its outer end to facilitate turning of the screw 26 to bind against the upper portion of the fixed jaw 21 for swinging the pivoted jaw 23 downwardly and binding and clamping the shank of the needle in its seat 22.

Disposed in arcuate or circular relation to the outer end of the needle holder, and toward one end of the baseboard 10, a suitable stone 28 is mounted removably in a holder 29 secured to the baseboard 10, the stone 28 being so disposed that when the needle clamp with the needle therein is swung over the stone the stone will extend lengthwise in the same general direction as that of the arc of a circle defined by the swinging of the needle holder back and forth as shown by the broken lines 30 in Figure 1. Thus the entire length of the stone 28 is utilized for the honing or sharpening operation of the needle.

As shown to advantage in Figures 1 and 2 of the drawings, each hypodermic needle 31 is provided with a hub 32 provided with at least one flat face disposed at the bevel side of the needle so that when the flat face of the hub 32 is turned downwardly, as shown in Figure 2, the bevel face of the needle point will be facing downwardly so as to engage the upper surface of the stone 28 during the honing operation. It is important to have the bevel face in a true horizontal plane to uniformly engage the stone 28. To effect this the device is provided with a bevel plane adjuster or with means for axially turning or adjusting the needle so that the bevel face will be directed in a truly horizontal and downward position when secured in the clamp of the needle holder. This plane adjuster includes a rest 33 secured to the baseboard 10 in transverse alignment with the pivoted post 19, preferably, and the rest is substantially U-shaped with its rear flange of greater height than the front flange, and the rear flange having a socket opening 34 of arcuate form adapted to receive the lower side of the sleeve 16 when it is swung away from the stone 28, as shown in Figures 1, 2 and 3 of the drawings. Between the flanges of the rest 33 is pivotally mounted, on a pin 35, the forward end of a flat strip or plate 36, the plate 36 extending from the pivot pin 35 lengthwise of the baseboard 10 but in a direction away from the stone 28. The flat face 36 is adapted to engage the under flat side of the hub 32 of the needle, and the hub 32 together with the shank 31 of the needle is adapted to be turned or twisted in the clamp of the needle holder until the lower flat side of the hub rests uniformly upon the

upper surface of the plate 36. This determines the correct positioning of the beveled point of the needle for sharpening without changing the bevel face in any way.

The pivot pin 35 of the plate 36 is so relatively positioned with respect to the clamp of the needle holder that the hub of the needle may be seated upon the upper surface of the plate 36 in any adjusted position of the needle on the needle holder by swinging the plate 36 into the required angular position above the baseboard 10. The adjustment of the plate or strip 36 must be in accordance with the adjustment of the sleeve 16 upon the bar 17, and after these positions are correctly determined the registering set of openings 20 provided in the needle holder correspond to the relative socket opening 37 provided in the baseboard 10. The openings 37 extend through a reinforcing metallic base strip 38 which is screwed or otherwise suitably secured to the baseboard 10, as shown in Figure 2, and which may be an extension from the rest 33. The socket openings 37 are adapted to selectively receive therein the threaded shank of a post 39. The post 39 is of predetermined height so that when adjusted into a selected socket opening 37 the selected socket opening corresponds with the respective set of openings 20 in the needle holder, as shown in Figure 3, and thus there is a definite relation between the adjustments of the needle holder and the pivoted plate 36.

In the present illustration the sleeve 16 is held in selected position upon the bar 17 by a locking pin 40 which engages through the innermost set of openings 20 in the needle holder, as shown in Figure 3. In Figure 2 the post 39 is shown in the same relative position, the openings 20 and 37 being arranged in corresponding series from the rest 33 outwardly. It will be noted from Figure 1 that when the locking pin 40 is engaged in the outermost set of openings 20 of the needle holder the other sets of openings 20 in the needle holder are not in proper registry so that the locking pin could not interlock the sleeve and bar until the sleeve was turned through a predetermined angle to bring the respective set of openings into registry. Thus there is provided a definite angular relation between the sleeve and the bar for each bevel of the needle.

As shown in Figure 5 hypodermic needles are substantially standardized with a long bevel point as shown at 41, a medium, short bevel point 42 and a short bevel point 43. These standard needles are well known and consequently the openings 20 and 37 in the adjustable devices for the needle are located, in accordance therewith but it is understood that in the case of needles having special bevels other than standard, the honing device may be made to resharpen or hone the needles by merely relatively disposing the openings 20 and 37 to effect the differences in adjustments.

After the needle is ground it may be found expedient to remove any rough edges at the inner wall of the needle, and this may be accomplished by a suitable reamer tool 44 which may be mounted in suitable brackets or clips 45 and 46 on the baseboard 10 for convenient access in finishing the honing operation.

In operation, a needle 31 is selected to be honed and the device is adjusted as to its needle holder and clamp, and also as to the plane adjuster for the bevel face of the needle point. This is effected as above described by properly locating the post 39 beneath the pivoted plate 36 and in-

serting the lock pin 40 in the selected set of openings 20 which correspond to the position of the post 39. The set screw 26 is released sufficiently to admit the shank of the needle 31 into the groove 22 when the set screw is again tightened and the needle is loosely secured in the clamp. The needle holder is now swung down into the seat 34 of the rest so as to properly dispose the hub 32 of the needle at the upper side of the plate 36. As the post 39 is relatively located with respect to the adjustment of the needle holder, the hub 32 will rest lightly upon the upper surface of the hub 36 and by twisting or turning the needle in its clamp the needle may be properly adjusted with its bevel point downward, and the set screw 26 may now be tightened with a final turn. Using the knob or handle 27 of the set screw, the operator grasps the handle and swings the needle holder upwardly on its pin 18 and thence laterally upon the pivoted post 19 to bring the point of the needle into contact with the upper surface of the stone 28. By a back and forth movement over the stone 28, the needle is sharpened with but a relatively few strokes, the bevel of the needle point is maintained accurately and a smooth and even honing or grinding of the surface is effected.

After the operation the needle holder may be swung upwardly on the pivot pin 18 to inspect the point of the needle, and when the honing is completed the needle may be easily released from the holder and another needle replaced. It of course is preferable to collect together needles of one bevel and grind them as a group while the device is adjusted or set for that particular bevel. This of course saves time and facilitates the operation and accuracy of grinding of the needles.

The present disclosure of this invention is in reference to the present day construction of needle which has a hub with a flat side on the same side of the needle which is ground and honed to provide the bevel point. The axially angular adjustment device of the needle may be modified to meet various conditions of manufacture of the needles provided that the device may be in a predetermined adjustment so that no skill is required on the part of the user. It has been too frequently found that hypodermic needles have been destroyed and dulled by use of grinding and honing machines requiring skill in adjusting the holders and rests for the work. The primary purpose of this invention is to leave nothing to skill in the use of the device and to have all required adjustments predetermined by the particular angle of bevel of the needle. By the use of this invention the needles will last indefinitely and will always be in their original correct condition. If grooves and ridges occur in the surface of the stone or abrading element 28 as the outcome of repeated sharpenings, the stone 28 may be reversed or overturned in the holder 29 to present unused surface portions of the stone 28 to the bevel points of the needles.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of the invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A hone and bevel maintainer for hypodermic needles having a bevel point and a hub with a flat side, comprising a movable needle holder having an adjustable needle clamp thereon and

adapted to be moved over the surface of an abrading element, selective holding means for the clamp to secure the same in a predetermined position relative to the angle of the bevel point of the needle, a flat surface gauge for the hub of the needle, and adjustable supporting means for the gauge for selective adjustment relative to the clamp holding means for supporting the gauge adjacent the flat side of the hub in the selected angular position of the needle, the parts being so constructed and arranged that the hub of the needle may be pressed with its flat side against the flat surface of the gauge to axially turn the needle and present the bevel point thereof for flat surface contact with the abrading element.

2. A needle bevel maintainer and hone, comprising a pivoted needle holder and an adjustable setter to engage the needle and determine the true axial position thereof in the holder with the bevel surface of the point facing downwardly, locking means for the holder to secure the same at the required angle relative to the angle of the bevel point of the needle, adjustable supporting means for said setter for axial adjustment relative to said locking means to support the setter in position for axially setting the needle when in the correspondingly adjusted position of the holder comprising a pivoted setter strip to engage the needle, a base element beneath the strip provided with spaced sockets, and a post selectively engageable in the socket openings and engaging the strip to support the setting strip and needle in the desired position, and an abrading element disposed within the radius of the needle holder for honing the bevel surface of the needle point upon the swinging of the needle holder with the needle therein back and forth over the abrading element.

3. A needle bevel maintainer and hone comprising a bar, a supporting post pivotally connected to one end of the bar, a sleeve rotatably mounted on the other end portion of the bar and provided with a needle clamp for holding a needle on the bar, said bar and sleeve provided with registering sets of openings disposed in axially angular relation, a locking pin adapted for insertion in a selected and registering set of openings to hold the sleeve in the desired angular position upon the bar and to support a needle at the required angle for grinding, a pivoted setting strip, means for adjusting the setting strip at various inclined positions relative to the adjustment of the sleeve element bar for engaging the flat side of the needle hub and determining the angular position of the bevel point of the needle for grinding.

4. A needle bevel maintainer and hone comprising a pivoted holder having a clamp rotatably mounted thereon, said clamp having a series of openings therein and said holder having a corresponding series of openings therein disposed in axially angular offset position relative to each other and arranged in circumferential alignment with the openings in the clamp, said clamp adapted to engage the shank of a needle and the openings in the clamp adapted to be selectively aligned with the openings in the holder relative to the angle of the bevel point of the needle to support the needle on the holder at the required angle for honing, a pivoted setting strip adapted to receive the clamped needle over its pivoted end, a base element arranged beneath the strip and provided with spaced sockets therein corresponding to the series of openings in the holder,

a locking pin for engagement in the selectively aligned openings of the holder and clamp to secure the needle in adjusted position, and a post selectively engageable in said socket openings in a position corresponding to that of the locking pin for supporting the same strip at an angle to receive thereagainst the flat side of the hub of the needle and determine the downwardly facing position of the bevel point of the needle for grinding.

5. A needle bevel maintainer and hone comprising a base, a bar pivotally mounted at one end upon the base near one edge thereof, a rest mounted on the base in transverse alignment with the pivotal mounting of the bar, a sleeve rotatably mounted on the bar adapted to seat in said rest, said sleeve having a series of openings therein and said bar having a corresponding series of openings therein, one series of said openings being disposed in axially angular relation to one another and the corresponding openings in the separate series adapted to be aligned in sets upon the rotation of the sleeve on the bar, a fixed jaw on the outer end of the sleeve, a movable jaw pivotally mounted on the fixed jaw and adapted to hold the shank of a needle between the jaws, a set screw carried by one jaw for binding engagement upon the other jaw to clamp the jaws upon the needle, said jaws with a needle therein and said sleeve being adjustable upon said bar to the angle of the bevel point of the needle, a locking pin for engagement in the registering set of openings to hold the sleeve in predetermined adjusted position, a setting bar pivotally mounted on said rest and extending to one side therein, said base having a series of sockets therein corresponding to the openings in the sleeve and bar, a post selectively engageable in said sockets to support the pivoted bar at an angle corresponding to the adjustment of the sleeve on the bar, and an abrading element carried by the base at the opposite side of the rest adapted to receive the clamped and adjusted needle thereover when said pivoted bar with its sleeve and clamp is moved over the element.

6. A hone and bevel maintainer for hypodermic needles having a bevel point and a hub with a flat side, comprising a base, a bar piv-

otly mounted on said base, a sleeve rotatably mounted on the bar and having a series of openings therein, said bar having a corresponding series of openings therein, one series of said openings being disposed in axially angular relation to one another and the corresponding openings in the separate series adapted to be aligned in sets upon the rotation of the sleeve, a fixed jaw having a transverse groove on the outer end of the sleeve, a movable jaw pivotally mounted on the fixed jaw and adapted to hold the shank of a needle between the jaws and in said groove, clamping means for said jaws, said jaws being adjusted upon said bar to the angle of the beveled point of the needle, holding means to hold the sleeve in predetermined adjusted position, a flat surface gauge for the hub of the needle, adjustable supporting means for the gauge for selective adjustment relative to the clamped jaws for supporting the gauge adjacent the flat side of the hub in the selected angularly position of the needle, and an abrading element carried by the base and adapted to receive the clamped and adjusted needle thereover when said pivoted bar with its sleeve and clamp is moved over the element.

7. A hone and bevel maintainer for hypodermic needles having a bevel point, comprising a base, a bar pivotally mounted on the base, a sleeve rotatably mounted on the bar and having a series of openings therein, said bar having a corresponding series of openings therein, one series of said openings being disposed in axially angular relation to the other and the corresponding openings in the separate series being adapted to be aligned in sets upon rotation of the sleeve, a clamp carried by the sleeve and having a groove to receive the shank of a needle and support it in a predetermined position relative to the sleeve, a locking member for engagement in the selectively aligned openings of the holder and clamp to secure the needle in adjusted position, means to set the needle in the desired axial position, and an abrading element carried by the base and adapted to receive the clamped and adjusted needle thereon when said pivoted bar with its sleeve and clamp is moved thereover.

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