April 21, 1953 F. H. SOHN 2,635,398

DEVICE FOR SHARPENING HYPODERMIC NEEDLES

Filed Aug. 15, 1952 2 SHEETS—SHEET 1

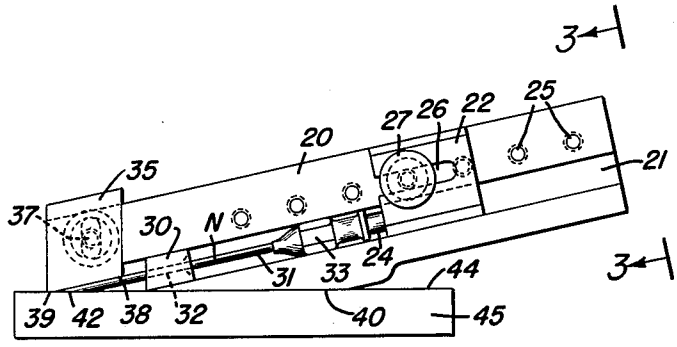


FIG. 1.

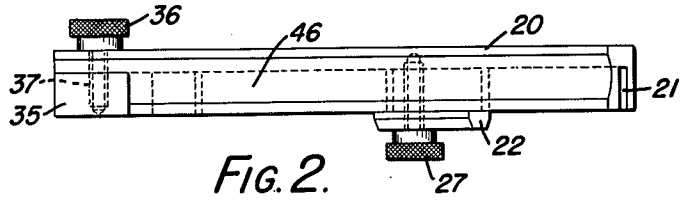


FIG. 2.

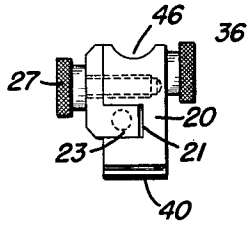


FIG. 3.

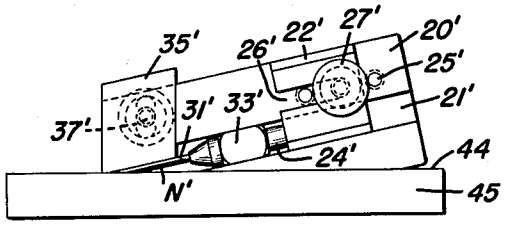


FIG. 4.

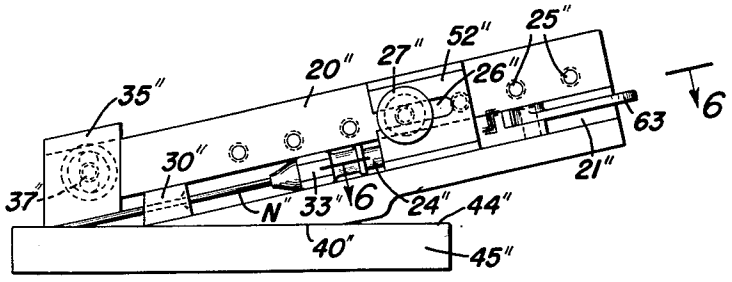


FIG. 5.

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DEVICE FOR SHARPENING HYPODERMIC NEEDLES

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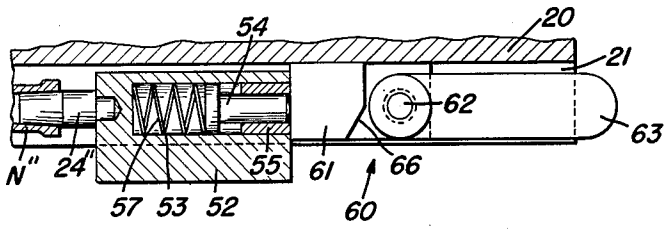


FIG. 6.

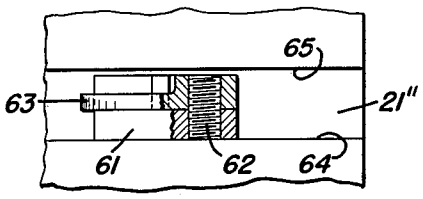


FIG. 7.

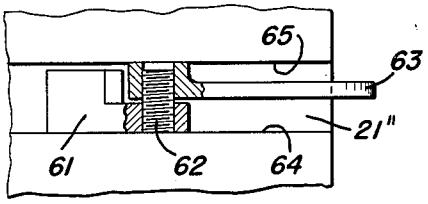


FIG. 8.

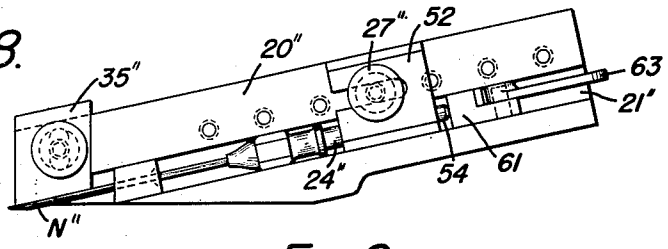


FIG. 9.

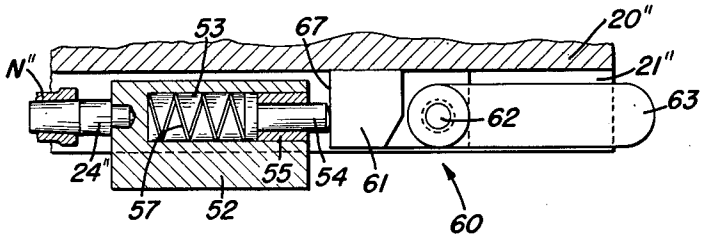


FIG. 10.

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DEVICE FOR SHARPENING HYPODERMIC NEEDLES

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Application August 15, 1952, Serial No. 304,573

20 Claims. (Cl. 51—216)

1

The present invention relates to devices for sharpening tools, and more particularly to a device for holding hypodermic needles for sharpening the same.

It is well known that hypodermic needles quickly become dull. If used without sharpening, they are hard to insert into the tissues and flesh; and their insertion and removal are painful.

The usual practice in sharpening hypodermic needles has been for the operator to hold the needle between his or her fingers and rub the oblique cutting edges upon an abrasive stone. This method, however, has many drawbacks. If the sharpening operation is to be done properly, great skill is required of the operator. Experience indicates that this skill is ordinarily lacking in a physician or his nurse, or technician. A needle should be sharpened so that its cutting edges are positioned obliquely to its longitudinal axis and so that they lie in the same plane. Otherwise the flesh or tissues will be torn during the insertion or removal of the needle. The operator has no definite means of determining that the plane of the cutting edges of the needle is in alignment with the plane of the abrasive stone. Hence, in many instances the needle is not sharpened in the proper plane, and a great deal more of the needle is ground away than is necessary. Moreover, during sharpening, the needle may be raised or lowered or rotated slightly, thus tending to round off the cutting edges instead of providing clean sharp edges. Hence, the needle will not produce a clean cutting effect when injected into the flesh.

In these days, when a great many diabetics carry hypodermic needles around with them for injection of insulin, there is more than ever a need for a practical device for sharpening hypodermic needles. Needles are expensive and, if unnecessarily ground away, there is great waste.

One object of the present invention is to provide a holder for hypodermic needles for use in conjunction with a hone, or other abrasive stone, which will correctly position a needle relative to the stone so that it may be properly sharpened.

Another object of the invention is to provide a holder of the character described which will enable anyone to properly sharpen a hypodermic needle without training or unusual skill. In this connection, one object of the invention is to provide a holder which will permit an individual diabetic to sharpen his own needles.

Further objects of the invention are to provide a holder for sharpening hypodermic needles

2

which is simple in construction, has no parts to get out of order, requires a minimum of adjustment and skill in use, and is relatively inexpensive.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims.

In the drawings:

Fig. 1 is a side elevation of a needle holder constructed according to one embodiment of this invention, showing a hypodermic needle mounted therein for sharpening, and showing the needle engaged with the sharpening stone;

Fig. 2 is a plan view of the device;

Fig. 3 is an end view of the device, taken as indicated on the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a view similar to Fig. 1 showing a modified construction;

Fig. 5 is a view, similar to Figs. 1 and 4, showing a still further modification of the invention;

Fig. 6 is a section on the line 6—6 of Fig. 5, looking in the direction of the arrows;

Figs. 7 and 8 are fragmentary side views illustrating the operation of the clamp which forms a backing member for the needle holder in this embodiment of the invention;

Fig. 9 is a view similar to Fig. 5, showing the position of the needle holder when it is freed to float; and

Fig. 10 is a fragmentary section of the parts in the position shown in Fig. 8, and similar to the section of Fig. 5.

Referring now to the drawings by numerals of reference, and first to the embodiment of the invention shown in Figs. 1 to 3 inclusive, 20 denotes a base or block for carrying the needle and the parts which support and hold the same. The block 20 has a longitudinal groove 21 in one side which has parallel, plane side walls, and a plane bottom. Adjustably mounted on the block 20 to slide in the groove 21 is a holder 22 which is of general L-shape. This holder seats against one side face of block 20 and has a projecting portion or leg 23 that has plane parallel sides and that engages in the groove 21.

The block 20 is provided with a plurality of equi-spaced holes 25; and the holder 22 is provided with an elongate slot 26. A knurl-headed screw 27, whose shank is adapted to pass through the slot 26 of holder 22, and which is adapted to thread into any selected one of the holes 25 in the block 20, is provided to secure holder 22 in any adjusted position longitudinally on the block 20.

A tapered arbor 24 is secured in the holder 22

with a pressed fit. Every hypodermic needle N is provided at one end with a tapered bore to receive the syringe. The arbor **24** is made to the same taper as the syringe arbor so that a needle N, which is to be sharpened, can readily be pushed onto the arbor **24** and will be securely held there. The slot **21** is made of a size to snugly receive the hexagonal gripping portion **33** of the needle so that the needle, when mounted on arbor **24**, will be held against rotation in the slot **21**. It is an easy matter, therefore, to position the needle in the device of the present invention so that its cutting edge will be in the proper plane for sharpening.

Mounted in the slot **21** to have a pressed fit therein is a guide **30**. This guide has a hole **32** through it through which the shank **31** of the needle N, which is to be sharpened, can be passed. The guide block serves not only as a means for supporting the needle, but also as a means for straightening the needle, for as the shank **31** of the needle is passed through hole **32** it will be straightened if it is bent.

Mounted upon the block **20** is a slide **35** that forms a backing or seat for the needle adjacent the point of the needle. This slide is adjustable transversely of the block **20** and is secured in any adjusted position by a knurl-headed locking screw **36** which passes through an elongate slot **37** in the block and threads into the slide **35**.

The backing slide **35** has a bottom face, a portion **38** of which is parallel to the axis of the needle, and another portion **39** of which is inclined to the portion **38** at an angle corresponding to the angle which it is desired to sharpen on the needle. The tubular needle N seats against portion **38** of slide **35**.

The bottom face **40** of the block **20** is inclined to the longitudinal center line of slot **21**, that is, to the longitudinal axis of needle N, at an angle equal to the angle which it is desired to sharpen on the end face of the needle.

To use the device, the needle, which is to be sharpened, is mounted upon the arbor **24** of the holder **22**, with its shank **31** passing through the hole **32** in the guide **30**, and with the end face **42**, which is to be sharpened, in a plane parallel to the plane of the active surface **44** of the abrasive stone **45** that is to be used in sharpening the needle; and the holder **22** is adjusted in the slot **21** to a position where the surface **42** of the needle projects enough beyond the bottom face **40** of the block **20** to permit taking off the desired amount of stock in sharpening. Then the holder **22** is secured in its adjusted position by threading up on the locking screw **27**. Then the backing slide **35** is adjusted so that the needle is supported adjacent its point and will not bend or deflect in the grinding operation. Then the operator grasps the device, holding the surface **42** of the needle against the plane face **44** of the abrasive stone **45**, and moves the block **20** back and forth across the stone. In this movement, the surface **40** of the block riding upon the plane surface **44** of the stone guides the needle in its sharpening motion. Thus, the needle will be ground to the desired angle.

In order to assist the operator in holding the block firmly during the grinding operation, a groove **46** may be provided in the upper face of the block, as shown in Fig. 3. The operator can place his index finger in this groove, while grasping the block at opposite sides with his thumb and other fingers, respectively. The guide surfaces **39** and **40** for the needle straddle the needle,

insuring accurate positioning of the needle for sharpening.

Of course, in time, the surface **40** will be worn down, but this is a hardened surface to begin with and will wear much less slowly than the needle, so that many needles can be sharpened before the device is worn away. The slide **35** can be adjusted to compensate for wear of the surface **39**.

The needles used by diabetics for insulin injection are much shorter than those used by physicians and in hospitals for injections. Hence a device can be made in a pocket size according to this invention for use by diabetics in sharpening their needles. Such a device is illustrated in Fig. 4. It is a miniature of the device shown in Figs. 1 to 3 except that the guide **30** is omitted since the shank of the insulin-injecting needle is so short that the guide is not needed. Otherwise, the device of Fig. 4 is like that of Figs. 1 to 3, and the same reference numerals are used in Fig. 4 to designate the like parts of the device of Figs. 1 to 3 except that the reference numerals in Fig. 4 are primed.

With the constructions illustrated in Figs. 1 to 4 inclusive the needle is held firmly against the hone. In many cases, it may be desirable to have the needle pressed resiliently against the grinding stone. For this purpose, the modified construction of holder shown in Figs. 5 to 10 inclusive may be employed. Here the supporting block, the backing slide, and the guide may be identical with those previously described. Like parts are indicated in Figs. 5 to 10 inclusive by the same reference numerals as employed in Figs. 1 to 3 inclusive.

The principal difference between the construction of Figs. 5 to 10 inclusive and that of Figs. 1 to 3 inclusive is in the holder. In Figs. 5 to 10 inclusive, the holder is denoted at **52**. It is L-shaped, as before, and has one leg engaging in the slot **21''** of the block **20''**. This slot, as before, is of a width to fit closely to the hexagonal portion **33''** of the shank of the needle. It carries an arbor **24''**, similar to that previously described, on which the needle is mounted. It has a slot **26''** in it; and it is adapted to be secured in any adjusted position by a knurl-headed screw **27''** which may be threaded into any of the holes **25''** of block **20''**. It differs from the holder **22** previously described, however, in that it is hollowed out, as denoted at **53** (Fig. 6), to receive the head of a spring-pressed plunger **54**. This plunger is guided in bore **53** by a bushing **55**. It is constantly urged outwardly of the bore **53** by a coil spring **57** which is interposed, between the inner end of the plunger and the opposed bottom face of the bore.

A locking member **60** is provided to cooperate with the holder **52**. This locking member comprises a block **61** in which is fixedly secured a fine screw threaded shaft **62**. Mounted upon this shaft and in threaded engagement therewith is a lever arm **63**. The block **61** is adapted to be inserted in the slot **21''** of the supporting base **20''** with the block **61** seated against one plane side **64** (Figs. 7 and 8) of slot **21''**. When the lever **63** is swung inwardly about the shaft **62**, from the position of Fig. 7 to that of Fig. 8, it threads on that shaft a sufficient distance to abut against the side **65** of the slot **21''**, and to lock the block **61** in the slot. When the lever **63** is swung outwardly to the position of Fig. 7, it threads on shaft **62** a sufficient distance to clear the side **65** of the slot, as shown exaggeratedly in Fig. 7.

This releases the clamping block. The block 61 is cut away, as denoted at 66 (Fig. 6) to permit free outward swinging movement of the lever.

The needle is adapted to be passed, as in the first described embodiment of the invention, through a hole in a guide block 30'' which is secured in slot 21''; and it is adapted to be backed up by a backing slide 35''. The backing slide is slidable transversely of block 20'' and is adapted to be secured in position by a knurled nut which passes through a slot 37'' in block 35'' and threads into the backing slide. The backing slide may be identical with that previously described.

In use, the needle, which is to be sharpened, is mounted upon the arbor 24'' with its shank passing through the hole in block 30'', the holder 52 is secured on the block 20'' in the same general way as described in reference to the block 22'', namely, it is adjusted along the block 20'' until the needle N'' extends into a position to be engaged by the stone. Then the backing slide 35'' is adjusted so that the needle is supported adjacent its point. The locking member 60 is then shoved into and along the slot 21'' until it abuts against the holder 52. Then the lever 63 is swung downwardly to lock the locking member in position. Then the screw 27'' is released, allowing the holder 52 to float in the slot 21''. The release of the screw 27'' causes the spring plunger 54, by its abutment against the face 67 (Fig. 10) of the locking member 60 to move to the left, holding the needle resiliently against the sharpening stone.

The spring pressure forces the needle to position shown in Fig. 9, tending to hold it in that position under spring load. The spring 57 is selected to apply about a four pound spring pressure. This is sufficient to hold the needle N'' in engagement with the surface 44'' of the stone 45 and to insure that as the block 20'' is moved back and forth across the stone with its surface 40'' riding on the surface 44'' of the stone, the proper amount of stock will be removed from the needle to sharpen the needle.

In all embodiments of my invention the cutting edges will be ground on the needle in the proper plane, thereby insuring that a minimum length of the needle will be removed in a sharpening; in successive sharpenings a needle will be sharpened in parallel planes, thereby insuring maximum life of the needle; the needle is positively backed up during sharpening; the backing slide is adjustable so that various diameters of needles can be sharpened in the one holder; the holder is adjustable so that different lengths of needles can be sharpened; bent needles are straightened in the act of mounting them in the device; and the sharpening operation itself is effected with a pressure feed.

While the invention has been described in connection with several different embodiments thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, and adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention, what I claim is:

1. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said block having a bottom face slidable over said abrasive member and inclined to the longitudinal center line of said slot at an angle equal to the angle at which it is desired to sharpen the cutting edges of a needle, and a backing slide movable transversely of said block to back up the needle behind and adjacent its point.

2. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to the holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said block having a bottom face slidable over said abrasive member and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the cutting edges of a needle, means for clamping the holder in any adjusted position, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point.

3. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to the holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said block having a bottom face slidable over said abrasive member and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the cutting edges of a needle, means for clamping the holder in any adjusted position, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, said backing member having a bottom surface adapted to extend longitudinally beyond the point of the needle when the needle is in sharpening position and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the cutting edges of the needle and adapted to engage the abrasive member whereby said device contacts the abrasive member at opposite sides of the point of the needle.

4. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, a needle holder adjustable longitudinally on said block, an arbor

secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of adjustment of said block, and means for holding the needle against rotation during such adjustment, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

5. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, a needle holder adjustable longitudinally on said block, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of adjustment of said block, means for holding the needle against rotation during such adjustment, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

6. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, a needle holder adjustable longitudinally on said block, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of adjustment of said block, means for holding the needle against rotation during such adjustment, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle, and said backing member having a bottom surface adapted to extend longitudinally beyond the point of the needle when the needle is in sharpening position and inclined to the direction of adjustment of said holder at the angle at which it is desired to sharpen the cutting edges of the needle and adapted to engage the abrasive member whereby said device contacts the abrasive member at opposite sides of the point of the needle.

7. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, means for holding the needle against rotation during such adjustment, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

8. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting

block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said slot being shaped to engage said needle and to hold said needle against rotation during adjustment of said holder, and said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

9. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said slot being shaped to engage said needle and to hold said needle against rotation during adjustment of said holder, and said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point.

10. A device for use in sharpening a hypodermic needle that has a gripping portion which is polygonal in cross section, comprising a supporting block, said supporting block having a slot in one side face thereof that has parallel plane side faces, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, the side walls of said slot being spaced to engage the gripping portion of the needle to hold the needle against rotation during adjustment of said holder, said block having a plane bottom face slidable over an abrasive member and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the cutting edges of the needle.

11. A device for use in sharpening a hypodermic needle that has a gripping portion which is polygonal in cross section, comprising a supporting block, said supporting block having a slot in one side face thereof that has parallel plane side faces, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, the side walls of said slot being spaced to engage the gripping portion of the needle to hold the needle against rotation during adjustment of said holder, said block having a plane bottom face slidable over an abrasive member and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the

cutting edges of the needle, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point.

12. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supportnig block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said block having a bottom face slidable over said abrasive member and inclined to the longitudinal center line of said slot at an angle equal to the angle at which it is desired to sharpen the cutting edges of a needle, and a backing slide movable transversely of said block to back up the needle behind and adjacent its point, and a guide member secured in said slot intermediate said backing slide and said arbor and having a bore through which the needle must be passed.

13. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to the holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said block having a bottom face slidable over said abrasive member and inclined to the longitudinal center line of said slot at the angle at which it is desired to sharpen the cutting edges of a needle, means for clamping the holder in any adjusted position, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, and a guide member secured in said slot intermediate said backing slide and said arbor and having a bore through which the needle must be passed.

14. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, a needle holder adjustable longitudinally on said block, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of adjustment of said block, means for holding the needle against rotation during such adjustment, a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, and a guide member secured to said block between said backing member and said arbor and having a bore through which the needle must be passed, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

15. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of adjustment of said block, means for holding the needle against rotation during such adjustment, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle, and said backing member having a bottom surface adapted to extend longitudinally beyond the point of the needle when the needle is in sharpening position and inclined to the direction of adjustment of said holder at the angle at which it is desired to sharpen the cutting edges of the needle and adapted to engage the abrasive member whereby said device contacts the abrasive member at opposite sides of the point of the needle, and a guide member secured in said slot intermediate said backing slide and said arbor and having a bore through which the needle must be passed.

16. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of said abrasive member, said supporting block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, said slot being shaped to engage said needle and to hold said needle against rotation during adjustment of said holder, and said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle, and a backing member adjustable transversely of said block to back up the needle behind and adjacent its point, and a guide member secured in said slot intermediate said backing slide and said arbor and having a bore through which the needle must be passed.

17. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of an abrasive member, a needle holder movable longitudinally on said block, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of movement of said holder, and means for resiliently urging said holder in one direction to hold a needle resiliently in sharpening position, said block having a bottom face slidable over said abrasive member and inclined to the direction of adjustment of the holder at the angle at which it is desired to sharpen the cutting edges of the needle.

18. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of an abrasive member, said block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to the holder and on which the needle,

which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, means for clamping said holder in any adjusted position, an abutment member adapted to be secured to said block, and resilient means interposed between said holder and said abutment member for resiliently urging said holder in one direction to hold a needle resiliently in sharpening position when the clamping means is released.

19. A device for use in sharpening hypodermic needles on an abrasive member, comprising a supporting block adapted to be reciprocated over the face of an abrasive member, said block having a slot in one side face thereof, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide the holder in its adjustment, an arbor secured to the holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot, means for clamping said holder in any adjusted position, an abutment member adapted to be secured in said slot, a spring-pressed plunger mounted in said holder to engage said abutment member to urge said holder resiliently in one direction to urge said needle resiliently to sharpening position when the clamping means is released.

20. A device for use in sharpening a hypodermic needle that has a gripping portion which is polygonal in cross section, comprising a supporting block having a slot in one side face thereof that has parallel plane sides, a needle holder adjustable longitudinally on said block and having a portion engaging in said slot to guide said holder in its adjustment, an arbor secured to said holder and on which the needle, which is to be sharpened, is mounted with its longitudinal axis extending in the direction of the longitudinal center line of said slot and with its gripping portion engaging the side walls of said slot whereby the needle is held against rotation during adjustment of said holder, a backing member adjustable on said block transversely of said block to back up the needle behind and adjacent its point, a guide member secured in said slot intermediate said backing member and said arbor and having a bore through which the needle must be passed, releasable means for clamping said holder in any adjusted position on said block, an abutment member adapted to be secured in said slot against movement therein, and a spring-pressed plunger mounted in said holder to project therefrom at the opposite side thereof from said arbor and to engage said abutment member for resiliently urging said holder, when the clamping means is released, in a direction to hold the needle resiliently in sharpening position, said block having a plane bottom face slidable on an abrasive member and inclined to the direction of adjustment of said holder at the angle at which it is desired to sharpen the cutting edges of the needle.

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No references cited.