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R. HAPPE

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NEEDLE-COOLING AIR NOZZLE SUPPORTING MEANS

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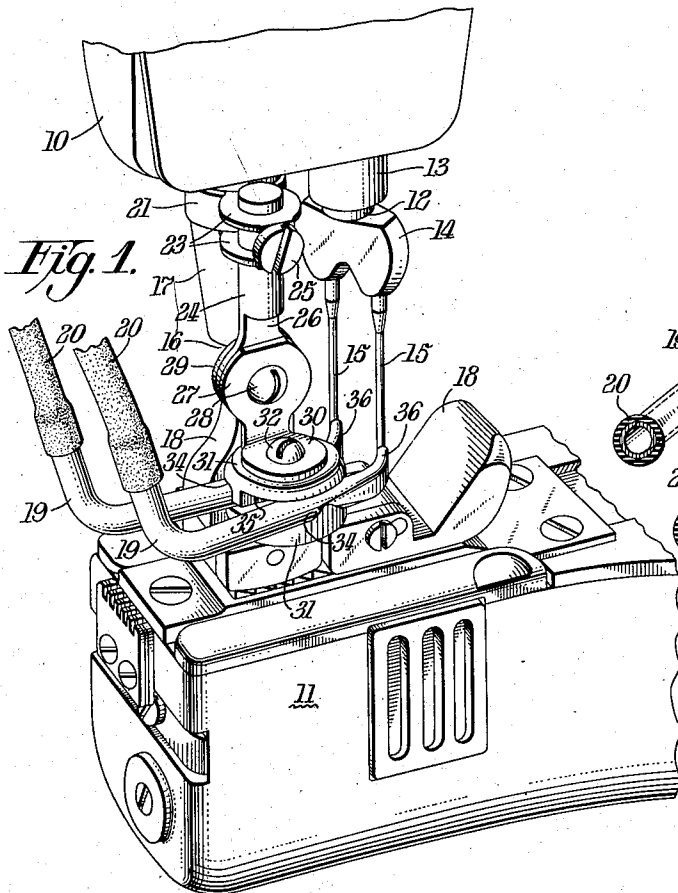


Fig. 1.

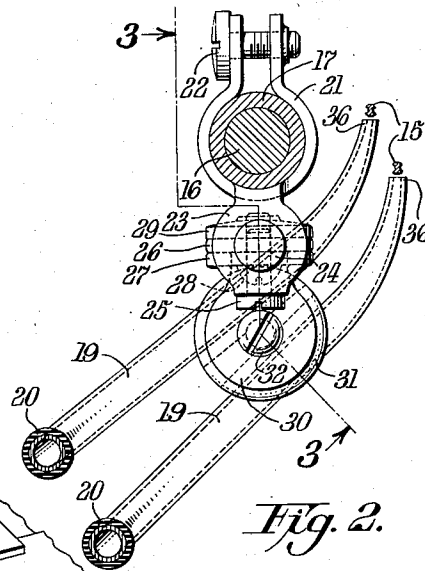


Fig. 2.

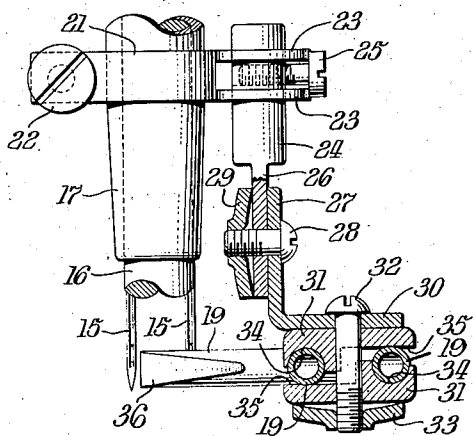
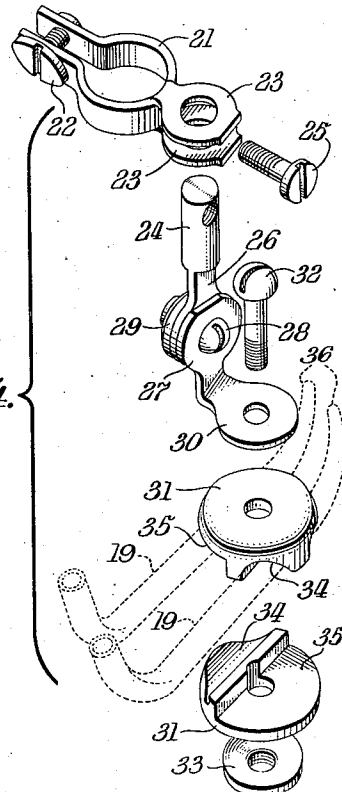


Fig. 3.

Fig. 4.



WITNESS

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## UNITED STATES PATENT OFFICE

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NEEDLE-COOLING AIR NOZZLE  
SUPPORTING MEANS

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2 Claims. (Cl. 112-218)

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This invention relates to nozzles for directing high velocity jets of cooling air against the needles of sewing machines to prevent overheating of the needles and the burning of the thread incident to high needle temperatures induced by high speed sewing of heavy materials.

More particularly, this invention relates to means for adjustably supporting the air nozzles, especially multiple nozzles necessary for multiple-needle sewing machines.

It will be appreciated that many different two-needle sewing machines are encountered having different sizes and styles of needles and set to different gauges and requiring different application of the air jets for optimum cooling.

It is, therefore, a primary object of this invention to provide a support for twin air-nozzles which may be attached to a variety of multiple-needle sewing machines to effect selective individual shifting of the nozzles lengthwise and angularly and, in addition, to effect universal adjustment of the position of both nozzles as a unit.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of preferred embodiments of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 is a perspective view of part of the head and bed of a sewing machine showing attached thereto a needle-cooling air-nozzle supporting means embodying the invention.

Fig. 2 is a top plan view, partly in section, of the supporting means of Fig. 1.

Fig. 3 is a side elevation, partly in section, taken on line 3-3 of Fig. 2.

Fig. 4 is an exploded view of the supporting means of Fig. 1.

Referring to Fig. 1, there is shown the head 10 and bed 11 of a feed-off-the-arm sewing machine of the type shown and described in the U. S. Patent No. 2,318,836, May 11, 1943, of A. B. Clayton, to which reference may be had if desired for a more complete disclosure thereof. A vertical reciprocatory needle-bar 12 operates within a bushing 13 and carries a needle clamp 14 which holds needles 15-15 in spaced apart relation for double seaming. A presser-bar 16 is arranged for vertical movement within a bushing 17 secured to the head 10 and carries a presser-foot 18 which cooperates with the usual

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lower feeding mechanism (not shown) to feed material through the machine and past the paths of reciprocation of the needles 15-15.

Air for cooling the needles 15-15 is fed under pressure and at high velocity to nozzles 19-19 by way of flexible tubes 20-20 from a source of supply which may be an air-pump driven from the power transmitter, as shown and described, for example, in the co-pending application Serial No. 134,958, filed December 24, 1949, of Reynold Happe.

It will be appreciated that the needles make a small "target" for the air jets, and the nozzles must therefore be directed with great care to effect the maximum cooling. This requires great flexibility in positioning the nozzles but, when once positioned correctly, they should be capable of being held securely in this position. Apparatus for accomplishing these desired results will now be described.

A tube-clamp holder 21 has a split shank embracing the presser-bar bushing 17 and is tightened thereon by taking up on the screw 22. Formed with said holder 21, at the end opposite the split portion, are two vertically-spaced and vertically-apertured limbs 23-23 which, together, define a receiving-pocket having a vertical axis. A stud 24 enters the apertures of said limbs 23 and is secured therein by a screw 25 which is threaded into the stud and which, when taken up, clamps the stud securely against the inside edges of the apertured portion in the limbs 23-23.

The stud 24 is formed at the lower end with a flattened apertured portion 26 to which is pivotally secured an angle bracket 27 by means of a screw 28 and a circular nut 29. The bracket 27 has a generally horizontally disposed limb 30 which presents a platform for a nozzle-holding split clamp comprising jaw-like members which may be in the form of disks 31-31 placed in opposed relation and adjustably secured in that relation to said platform by means of a screw 32 and a nut 33. The stud 24 and the bracket 27 therefore constitute a support for the disks 31.

The disks 31-31 are identical and each one is apertured and formed in its face proximate to the other disk with a semi-cylindrical groove 34 lying chordwise and to one side of said aperture. On the other side of said aperture and in the same face is a flat portion 35 cut to approximately the same depth as the groove 34. It will be seen that the disks 31-31 are placed together such that the grooved portion 34 of the face of one disk is opposite the shallow flat portion 35 of the face

of the other disk with a nozzle 19 held therebetween in clamped relation, as most clearly seen in Fig. 3.

To obtain a high-velocity air jet, the delivery end or mouth 36 of the nozzle 19 is reduced in size and provides a very narrow jet, widthwise of the needle. This represents efficient handling of the cooling air, but requires very precise adjustment of the nozzle relative to the needle, as is clear from an examination of Fig. 2.

It will be understood that, by loosening the screw 32 relative to the nut 33, the clamp pressure of the disks 31—31 on the nozzles 19—19 is relieved and said nozzles may each be freely adjusted about and also lengthwise of its individual axis or about the vertical axis of the screw 32. This permits each nozzle to be oriented with the long axis of the nozzle mouth 36 parallel to the axis of the respective needle 15 and with the nozzle mouth directly opposite a needle.

The position of the common plane of the nozzles may be changed by loosening the screw 28 and shifting the angle-bracket 27 about the axis of said screw. This is of practical importance in those cases where to avoid interference, it is necessary to position the nozzles at an inclination to the bed 11. Vertical and angular adjustment of the assembly may be readily taken care of by moving the clamp 21 relative to the bushing 17.

An important feature of the construction according to the invention resides in the compact, small size of the support which provides a minimum obstruction to a clear view of the needles by the operator and thus facilitates the proper guiding of the work. This is attributed to the special shape of the clamping surfaces of the disks 31—31 wherein a semi-cylindrical groove on one disk cooperates with an undercut flat portion on an opposed disk to adjustably retain a cylindrical nozzle therebetween.

Having thus set forth the nature of the invention, what I claim herein is:

1. A clamp for adjustably holding a plurality

of air-nozzle tubes for use in connection with sewing machines, comprising, complementary opposed centrally-apertured disks having their proximate side faces each provided with a flat wall and a tube-receiving groove disposed at opposite sides of the apertures of said disks, said disks being arranged with the groove of each disk opposed to the flat wall of the other disk to permit relative rotation between said disks, and a pivot-bolt passing through the disk apertures for removably securing said disks together in tube-clamping relationship after such rotation.

2. An adjustable support for holding cooling-air nozzles in the proper position relative to the needles of a multiple-needle sewing machine, comprising a stud adapted to be secured to the sewing machine in the vicinity of the needles, an angle-bracket adjustably secured to said stud and presenting a generally horizontal platform, a nozzle-clamp comprising two separable disk elements removably secured together and to said platform by a common fastening, each disk element having in one of its faces, a flat-bottomed and a round-bottomed groove, said disk elements being positioned in face-to-face relation so that the cooling-air nozzles are each clamped, after relative adjustment, between a round-bottomed and a flat-bottomed groove in opposite faces of said disk elements.

REYNOLD HAPPE.

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