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COOLING DEVICE FOR SEWING MACHINE NEEDLES

Filed March 7, 1951

Fig. 1.

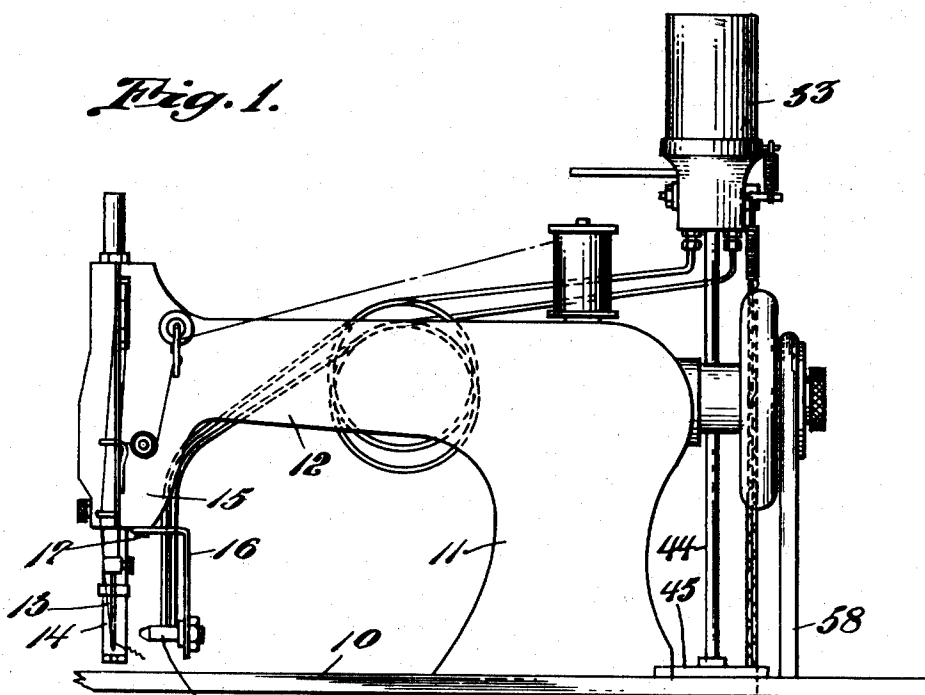


Fig. 2.

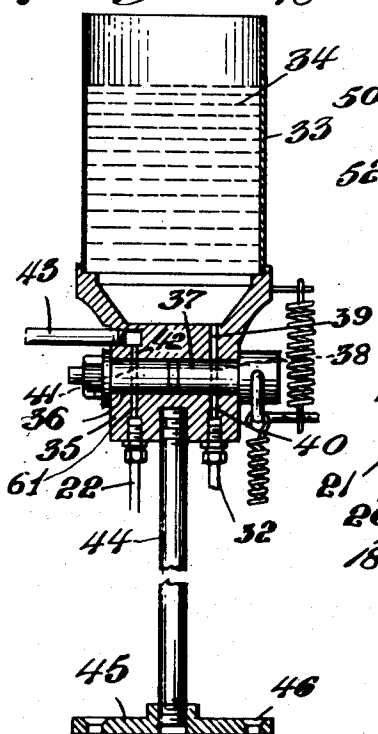


Fig. 3.

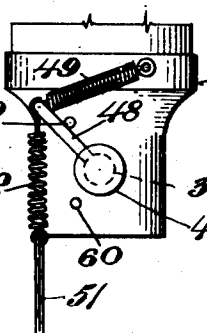
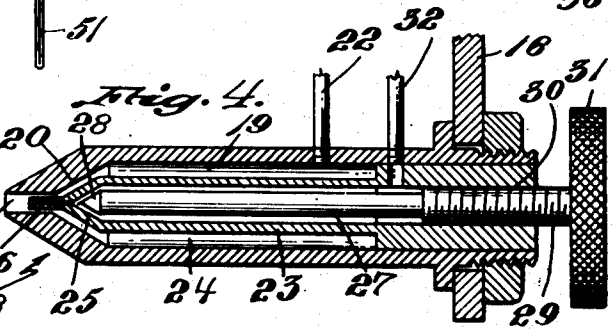


Fig. 4.



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COOLING DEVICE FOR SEWING MACHINE
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1 Claim. (Cl. 112—218)

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This invention relates to a sewing machine.

Heretofore, in the use of a sewing machine, the reciprocating needle has been found to get exceedingly warm when operating upon some of the synthetic fabrics or in using some of the synthetic threads, such as nylon.

One of the objects of this invention is to provide an arrangement to cool the needle when operating under such conditions.

Another object of the invention is to provide a coolant which will be applied in such fine mist form as not to spot or injure the material which is being worked upon.

Another object of the invention is to provide such control for the coolant that it is automatically turned on or turned off in accordance with the turning on or turning off of the operation of the machine.

Another object of the invention is to utilize both air and liquid as a fluid and to simultaneously control the supplies of both of these.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claim.

In the accompanying drawings:

Figure 1 is an elevation somewhat diagrammatic illustrating a sewing machine equipped with this invention;

Figure 2 is a sectional view through the liquid container and the control valves for both liquid and air;

Figure 3 is a fragmental view looking at the end of the tank shown in Figure 2; and

Figure 4 is a sectional view on a somewhat larger scale than Figure 1 of the nozzle.

In proceeding with this invention, I provide two conduits from sources of supply of air and water with two valves which act together for the control of these supplies and I deliver these supplies to a nozzle where the air and water are mixed and are projected together in a fine spray toward the needle to cool the needle as it operates.

With reference to the drawings, the sewing machine comprises a base 10 with an upstanding arm 11 overhanging as at 12, there being a reciprocating needle shown at 13 which is operated by usual mechanism in the upstanding and overhanging arms 11 and 12. The presser foot 14 is also illustrated which has its usual motion. At a point below the guide 15 for the presser foot and needle, I have mounted a bracket 16 by a screw 17, at the lower end of which bracket a nozzle 18 is supported, which nozzle is shown in greater detail in Figure 4.

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This nozzle has a bore 19 which is tapered at its forward end as at 20 having a mixing chamber 21 adjoining the bore 19. A conduit 22 supplies air to this bore 19. Within the bore 19 there is a tubular member 23 which provides between its outer surface and the bore 19, an annular chamber 24 which receives the air under pressure. This tubular member is tapered at its end 25 providing a discharge opening 26 of small diameter, and within this tube there is a needle 27 having a tapered end 28 which may be threadingly adjusted by means of the threads 29 in the threaded bore 30 of the tubular member so as to vary the size of the discharge to the opening 26. A hand wheel 31 is provided at the end of the needle for adjustment purposes. This needle 27 also provides an annular chamber about it through which water may be supplied through the conduit 32.

A source of water is provided by means of a tank 33 having water 34 therein, and at the base of this tank there is a block 35 which is provided with a bore 36 in which there is rotatably located a valve plug 37 having an opening 38 to register with an opening 39 to the water tank and opening 40 to the conduit 32, while there is also provided another opening 41 through the plug to register with the conduit 42 connecting with an air supply 43 and an opening 61 to the air conduit 22. This whole mechanism is supported on a standard 44 having a base 45 which may be secured by means of screws through holes 46 to the base 10. The valve plug 37 is provided with an enlarged end 47 from which a lever 48 extends, which lever is pulled by spring 49 (Fig. 3) against the pin 50 to rotate the valve plug so that the openings 38 and 41 will be out of register with the openings for communicating the fluid supplies therethrough. This valve plug may be rotated through a flexible chain 51 attached through a spring 52 to the arm 48 and to a foot treadle 53 (Fig. 1) pivoted as at 54 so as to swing into engagement with a switch 55 and close the circuit to an electric motor 56 from some energy supply 57 so as to start the operation of the sewing machine through a belt 58 from said motor 56. At the same time that the sewing machine is started, the arm 48 will engage stop 60 so as to open the valves and permit the water and air to be supplied to the nozzle. The air will be under pressure of about sixty pounds and will be forced to the mixing chamber 21 drawing with it the water from the supply in the chamber about the needle valve and directing it through an opening from this mixing chamber in a fine mist

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against the needle which will cool the needle as desired.

I claim:

In a sewing machine, a reciprocating needle, a nozzle having an outlet opening directed toward said needle and having a mixing chamber communicating with said opening, air and liquid channels communicating with said mixing chamber for mixing the two fluids for joint discharge from said opening, a reservoir for a liquid, said reservoir having a base provided with parallel bores therein, one of which is open to said liquid, a source of air supply, means communicating said air source to the other of said bores, separate conduits connecting said bores each with one of said channels, and valve means intersecting both

of said bores for controlling both the said conduits at the same time.

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