

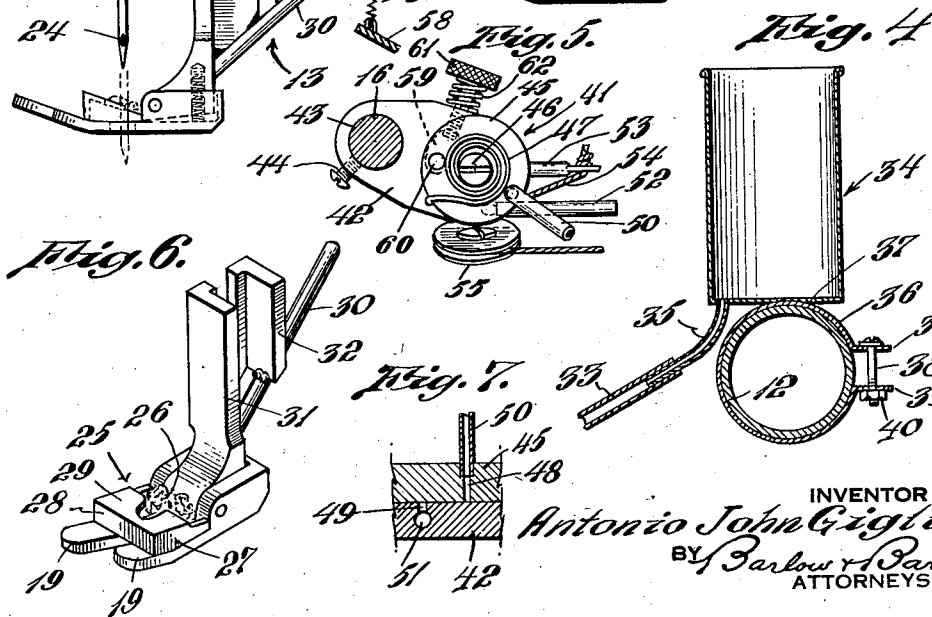
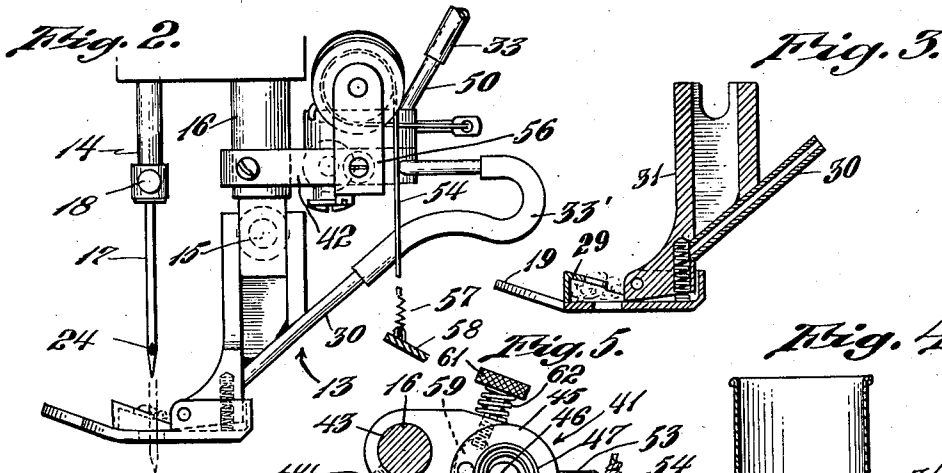
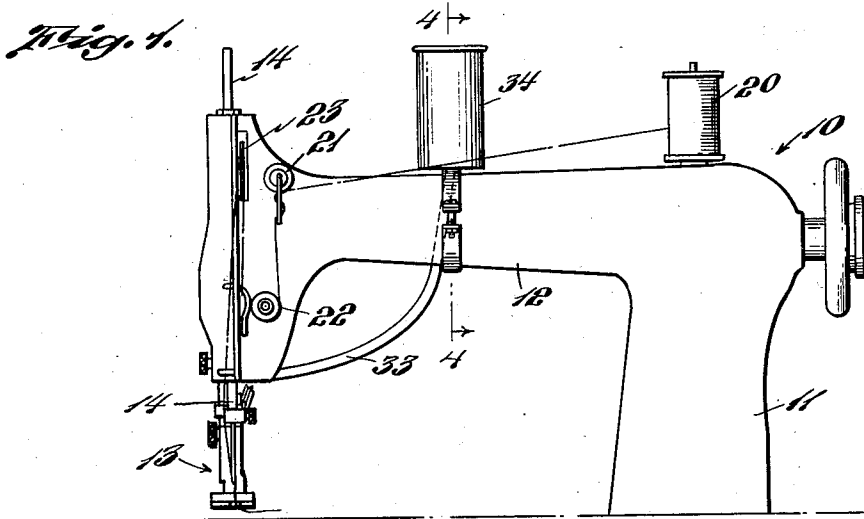
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NEEDLE COOLING DEVICE

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NEEDLE COOLING DEVICE

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2 Claims. (Cl. 112—256)

This invention relates to a sewing machine.

Heretofore in the use of a sewing machine where cotton, silk or linen thread has been used, the heat developed by the needle did not cause a sufficient deterioration of the thread to occur to be readily noticed. With the development of synthetic yarns, it has been found that the heat developed by the reciprocation of the needle will cause complete destruction of the thread. For instance, "nylon" thread melts or becomes fused at a temperature to which the needle of a sewing machine ordinarily becomes heated in use. Consequently difficulties are encountered in the use of such a thread.

One of the objects of this invention is to provide an attachment for a sewing machine such that the needle may operate sufficiently cool so that the thread will not be scorched or detrimentally affected by heat developed by the needle in the ordinary type of sewing machine when in use.

Another object of the invention is to cool the reciprocating needle of the sewing machine.

Another object of the invention is to so lubricate the needle and thread of a sewing machine and the work through which it passes as to reduce friction which develops heat in the ordinary reciprocation of the needle.

Another object of the invention is to provide a coolant reservoir and liquid dispensing means so that liquid coolant is applied to the needle at each reciprocation thereof.

Another object of the invention is to terminate the flow of coolant to the needle when reciprocation of the needle stops.

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 claims.

In the accompanying drawing:

Fig. 1 is an elevation of a portion of a sewing machine showing the needle, foot and my coolant in its position with relation to the frame and these parts;

Fig. 2 is a view on a larger scale of the needle and foot with my coolant applied thereto; also the shut off for the coolant;

Fig. 3 is a sectional view of the foot and valve and showing my device carried thereby;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a top plan view of the valve showing the post on which it is mounted in section;

Fig. 6 is a perspective view of the foot alone;

Fig. 7 is a vertical section through the valve.

In proceeding with this invention, the basic

consideration is that of applying some fluid to the reciprocating needle which will circulate and disperse heat or evaporate and by means of its evaporation absorb the heat and disperse the heat more quickly than heat would be radiated from the needle or the yarn. One of the most convenient ways of accomplishing this result is to carry a pad by the foot of the machine so that as the needle reciprocates, it will pass through the pad and liquid carried by the pad will be applied to the needle so that the same may evaporate and disperse the heat of the needle.

With reference more particularly to the drawing, 10 designates generally the framework of the machine with the standard portion 11 and overhanging arm 12. A foot designated generally 13 is carried by a reciprocating member 16 by means of the clamp 15 and has its usual function in time with the reciprocation of the guide rod 14 in the machine, which carries a needle 17 by means of its thumb screw 18. This needle passes through the bifurcations 19 of the foot in the usual manner. A spool of thread 20 is carried on the frame 10 which passes over suitable guides, 21, 22 and 23 to be fed through the eye 24 of the needle 17.

In the path of vertical movement of the needle 17, I have provided a container 25 for a pad 26 of felt or some resilient elastic, absorbent material such as fibers of cotton waste or other suitable absorbent fibers in a sufficient quantity to hold the desired amount of liquid coolant so that when the needle descends it will pass through this fibrous material and pick up from the fibrous material the liquid coolant which is contained therein. This container 25 has suitable side walls 27, end wall 28 and a top wall 29 and is conveniently carried by the foot by being superimposed on the bifurcations.

In order to feed the liquid coolant to the pad 26, I provide a tubular pipe 30 as a part of a conduit and which is supported by portions 31 and 32 of the foot, this tube being connected by means of flexible conduits 33 and 33' of rubber to a control valve 41 and from the control valve to a liquid reservoir 34 which may contain water as a coolant or lubricant or some other liquid such as oil or the like which may serve this purpose. The reservoir 34 has a tube 35 to which the rubber tube 33 is connected.

In order to conveniently mount the reservoir 34 in position, I provide a band 36 secured as at 37 to the bottom of the reservoir and which will embrace the overarm 12 and be bound in position by means of a bolt 38 extending through ears 39 and into nut 40.

The control valve 41 which is interposed in the liquid conduit from the reservoir 34 to the felt pad comprises a base portion 42 having an opening 43 for the reception of the member 16 to which it is firmly attached by means of the set screw 44. A block 45 is pivotally mounted by means of the screw 46 on the body 42 and is urged toward a stop by a spiral spring 47. The block 45 has an opening 48 therein, while the body 42 has an opening 49 therein. The conduit 50 leads to the opening 48 and a conduit 51 leads from the opening 49. The pivotal relation of the block 45 to the body 42 is such that these openings may align or partially align to permit passage of liquid from the conduit 50 through the openings 48 and 49 and out the opening 51. Conduit 50 is illustrated as a rigid pipe leading from the block and to which one end of the rubber hose 33 is attached. A rigid pipe 52 extends from the opening 51 and one end of the rubber hose 33' is attached thereto, while the other end is attached to the pipe 30 of the foot unit. A lever arm 53 extends from the block 45 and a cord 54 extends over pulley 55 which is mounted on a bracket 56 on the body 42, which cord extends beneath the table portion of the machine and through spring 57 to the treadle 58 which serves to energize the electric motor for actuating the machine.

In order to limit the movement of the block 45 with reference to the body 42, a slot 59, shown in dotted lines, is formed in the body 42 and a threaded pin 60 carried by the block 45 is positioned in the block 45 to move in this slot. In order to adjust the effective length of the slot, thumb nut 61 is threaded so as to enter the end of the slot 59 to limit the effective length of the slot as it will engage the pin 60, and this will also serve to control the amount of alignment of the openings so as to govern the amount of flow. A spring 62 beneath the head of this thumb nut serves to hold the thumb nut in its adjusted position.

When it is desired to start the machine, the treadle 58 will be depressed to start an electric motor, and upon pressing this pedal, the cord 54 will be pulled through spring 57 and cause an

opening in the valve which will permit the liquid to feed down into the reservoir for holding the same, as the supply is needed. For stopping the machine, the liquid will be shut off, and no further supply will be afforded until the next operation of the machine. In this way the valve is firmly mounted leaving the foot free to operate in its accustomed manner.

The coolant or lubricant may contain rust-resistant chemicals and may be varied with reference to the harshness of the fabric which is to be operated upon by the needle.

I claim:

1. In a sewing machine having a treadle for controlling the starting and stopping of the same, a reciprocating needle, a presser foot the lower portion of which foot is provided with a chamber, an absorbent pad therein through which said needle passes, a conduit extending to said chamber for transmitting a coolant to said pad, a reservoir of liquid coolant spaced from said presser foot, a conduit extending from said reservoir to said chamber, a valve controlling said conduit, means for opening and closing said valve including means operatively connected to the said treadle for actuating the said valve upon the stopping and starting of the machine.

2. In a sewing machine having a treadle for controlling the starting and stopping of the same, a reciprocating needle, a presser foot bar and presser foot the lower portion of which foot is provided with a chamber, an absorbent pad therein through which said needle passes, said foot having a conduit extending therethrough and opening into said chamber for transmitting a coolant to said pad, a valve carried by the presser foot bar and through which said conduit extends, a reservoir of liquid coolant spaced from said valve, a flexible conduit extending from said reservoir to said valve and communicating through said valve with said conduit, means for opening and closing said valve and resilient means operatively connecting the said opening and closing means to the said treadle for controlling the flow of coolant through said conduits.

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