

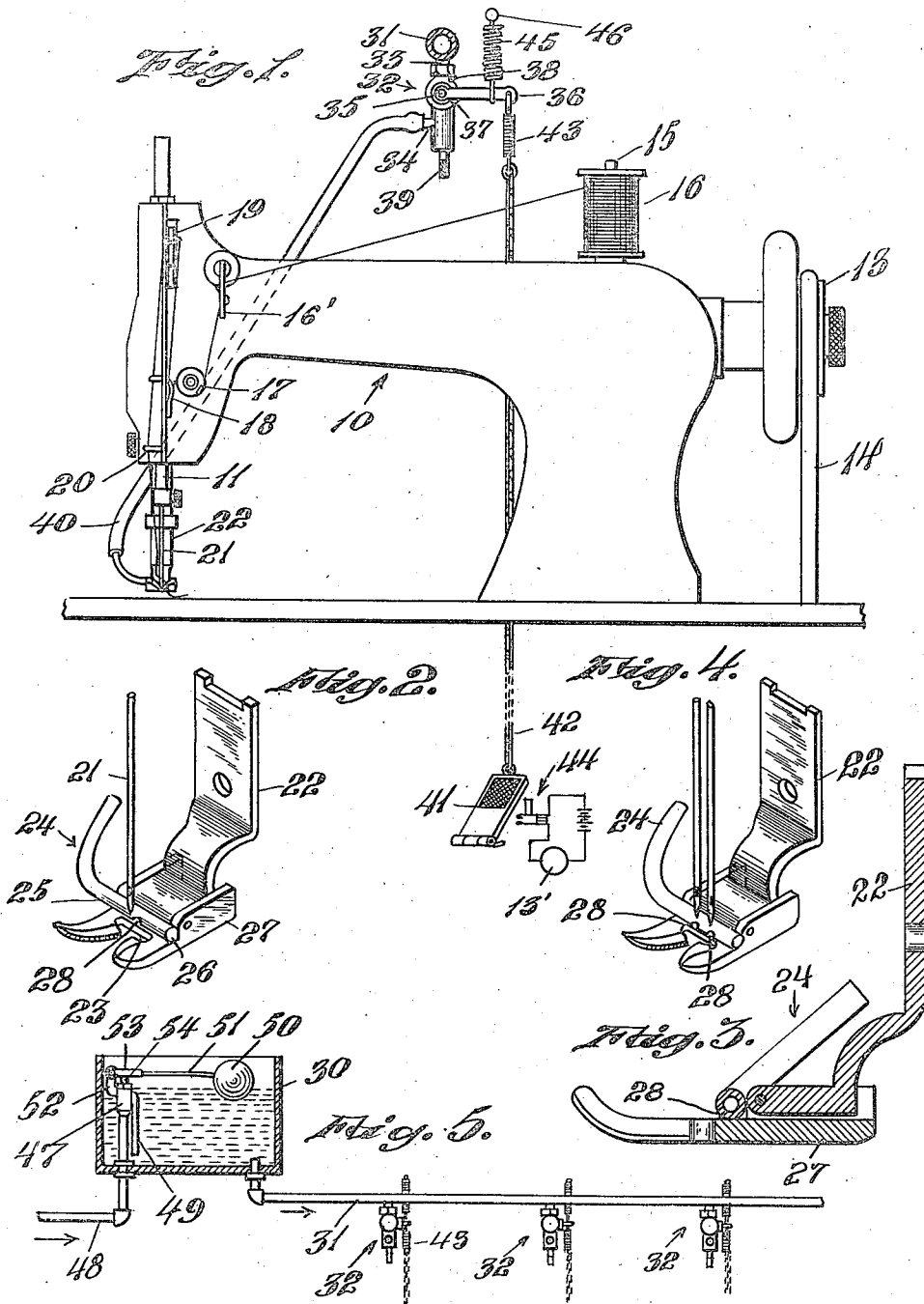
Dec. 28, 1948.

A. J. GIGLIO

2,457,362

APPARATUS FOR COOLING SEWING MACHINE NEEDLES

Filed Dec. 22, 1944



INVENTOR
Antonio John Giglio
BY *Barlow & Barlow*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,457,362

APPARATUS FOR COOLING SEWING-MACHINE NEEDLES

Antonio J. Giglio, Providence, R. I., assignor to Premier Thread Company, a corporation of Rhode Island

Application December 22, 1944, Serial No. 569,322

3 Claims. (Cl. 112-218)

1

This invention relates to a sewing machine and is an improvement upon my prior invention described in Patent No. 2,316,648, granted April 13, 1943.

In this prior patent a liquid coolant is applied to the needle of a sewing machine by a conduit which extends through the presser foot to discharge through its ends directly onto the needle of the machine. When the nature of the work requires the machine to be equipped with a plurality of needles, such an arrangement cannot be satisfactorily used to uniformly apply coolant in amounts required directly onto all the needles.

One of the objects of this invention is to provide for the uniform application of coolant to a single or a plurality of needles.

Another object of the invention is to position the coolant conduit at such a location that the same may be tapped to provide additional discharge openings directly opposite additional needles which may be added to the machine.

Another object of the invention is to provide for supplying the coolant at a pressure of a constant value.

Another object of the invention is to provide for supplying a coolant to each of a plurality of sewing machines from a common source at a constant pressure.

Another object of the invention is to provide for the control of the amount of coolant discharged onto the needle or needles of each of several machines in accordance with the individual requirements of the work acted upon by each machine.

Another object of the invention is to provide liquid coolant in uniform amounts onto each of a plurality of needles carried by a common needle bar.

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 drawings:

Fig. 1 is an elevational view of a sewing machine embodying my invention and showing diagrammatically an electric circuit to a driving motor;

Fig. 2 is a view in perspective showing the presser foot of the machine with a part of the coolant conduit attached thereto and with the needle in a raised position relative to the presser foot;

Fig. 3 is a sectional view taken along a line extending substantially centrally and lengthwise through the presser foot shown in Fig. 2;

2

Fig. 4 is a view in perspective similar to that shown in Fig. 2 but illustrating two needles in their raised positions relative to the coolant nozzle and presser foot; and

Fig. 5 is a view partially in section and somewhat diagrammatically showing a coolant supply source with an arrangement for maintaining the coolant at a substantially constant level and a main conduit leading therefrom through which the coolant is supplied to a plurality of sewing machine stations.

Referring to the drawing for a more detailed description of the invention, the numeral 10 designates generally a sewing machine head of a type having a needle bar 11 which is vertically reciprocated by a mechanism (not shown) which is carried within the hollow of the head. A grooved pulley 13 transmits power, by means of an endless belt 14, to this mechanism from a motor (not shown) but diagrammatically indicated at 13' in its electric circuit. A standard 15 rotatably receives a thread supply 16. The thread is led from this supply to the usual tension devices 16', 17, guide 18, feed bar 19, guide 20 and from there to the eye of the needle 21. A presser foot 22 is secured to a vertically movable bar in the head and is provided with a slotted opening 23 through which the needle or needles of the machine pass.

In accordance with the invention I provide a conduit having a rigid portion 24 for discharging a liquid coolant directly onto the needle. This rigid portion 24 is of tubular formation bent substantially into an L-shape providing a straight leg 25 which is closed at one end as at 26. This leg 25 is attached to the lower part 27 of the presser foot adjacent to the edge of the opening 23 and in position to extend laterally across the presser foot adjacent to the path of travel of the needle. The straight leg 25 is provided with an opening 28 positioned in line with the needle and through which coolant is discharged laterally of the conduit directly onto the needle. Should the machine be equipped with a plurality of needles, as shown in Fig. 4, then a plurality of openings, one opening for each needle, will be provided. Should additional needles be added to a machine initially provided with a conduit having a single opening, then it will be merely necessary to tap the conduit at appropriate locations to provide the necessary additional openings 28, one for each additional needle. In the event of a change in the number of needles to an amount less than the initial number of discharge openings provided in the conduit then the unused open-

ings may be temporarily plugged with a small pointed dowel which may be whittled from a match stick or the like.

A reservoir 30 is provided for the liquid coolant. This reservoir is positioned sufficiently above the sewing machine presser foot to develop the necessary head or pressure to feed the coolant through the conduit. When several sewing machines are to be supplied with coolant from the reservoir, a main conduit 31 may lead from the reservoir to the various stations for the several machines, each presser foot of which should be at the same level. In this conduit 31 threaded openings are provided for threadingly receiving valves generally designated 32, there being a valve 32 for each machine. Each valve is of a similar construction and comprises an inlet 33, an outlet 34, and a valve stem 35 to which there is connected a handle 36 movable between limit abutments 37 and 38, to rotate the valve stem to open or closed position.

In order to control the amount of coolant passing through the outlet 34, the discharge opening in the valve is controlled by a needle valve having a stem 39 which is rotatable to increase or decrease the size of the discharge opening in a manner well known in the valve art. From each valve there extends a flexible tubing 40, the end portion of which receives the end portion of the rigid conduit part 24, thus completing the conduit of liquid from the valve to the presser foot.

The flow of coolant through the valve occurs only at such times as the machine is in motion. The handle 36 is connected to the treadle 41 by means of a flexible connector 42 attached at one end to the treadle and at the other end to a pull spring 43 depending from the handle 36. As the treadle is depressed to move the switch 44 of the electric motor 13' to closed position, the handle 36 will be moved to rotate the valve stem 35 to open position to permit the flow of coolant through the valve. When the treadle is released to permit opening of the switch 44, a pull spring 45 conveniently anchored at one end above the handle as at 46 and attached at the other end to the handle, will move the handle to closed position against the stop 38 and arrest the flow of coolant through the valve.

It is desirable that the flow of coolant shall be under pressure of a constant value and accordingly I provide for the maintaining of a constant level of coolant in the reservoir 30. This I accomplish by providing a valve device 47 into which opens the supply pipe 48. This valve 47 has a discharge spout 49 which extends adjacent to the bottom of the reservoir. A ball float 50 has its stem 51 pivotally connected to a bracket 52 carried by the valve casing. The stem 51 has an enlargement 53 which contacts the end of the valve closure member 54. When the coolant in the reservoir is at the predetermined level the relationship between the enlargement 53 and stem 51 is such that the valve is closed to the flow of coolant therethrough. As the level of

the coolant in the reservoir lowers through the use thereof the float 50 will lower and depress the closure member 54 to move the same to open the valve to the flow of coolant therethrough to replenish the used coolant. When the predetermined level of the coolant has again been reached the raising of the float 50 will permit the closure member 54 to be returned to closed position and stop the flow of coolant through the valve.

It will be apparent that the arrangement of coolant feed herein disclosed is suitable for use with a single machine or with a plurality of machines. When used with a plurality of machines the flow and amount of coolant to each machine is controlled in accordance with the individual requirement of the work performed on each machine.

I claim:

1. In a sewing machine, a reciprocating needle, a presser foot, a conduit for conducting liquid coolant to said needle having a portion thereof extending laterally across said presser foot and attached thereto at a location adjacent to the path of movement of said needle, said portion comprising a tubular member having an opening therein facing said needle for the discharge of coolant onto said needle.

2. In a sewing machine, a plurality of reciprocating needles, a presser foot, a conduit for conducting liquid coolant to said needles having a portion extending laterally across said presser foot and attached thereto at a location adjacent to the path of movement of said needles, said portion comprising a tubular member having an opening for each of said needles, each of said openings facing said needles for the discharge of coolant onto said needles.

3. In combination, a plurality of sewing machines, each having a reciprocating needle and a presser foot at a common level, a common liquid coolant reservoir positioned at a location above said level, a main conduit from said reservoir, individual conduits from the main conduit extending to each presser foot and opening at a location facing said needle and adjacent thereto, said coolant flowing by gravity through said conduit under pressure maintained substantially at a constant value and a valve in each individual conduit for regulating the amount of the flow of coolant through each individual conduit.

ANTONIO J. GIGLIO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
197,575	Theine	Nov. 27, 1877
760,439	Erbor	May 24, 1904
877,556	Eaton	Jan. 28, 1908
1,057,099	Stanbow	Mar. 25, 1913
2,316,647	Giglio	Apr. 13, 1943
2,316,648	Giglio	Apr. 13, 1943