May 13, 1930. A. M. BATES 1,758,101

SEWING

Filed April 20, 1925

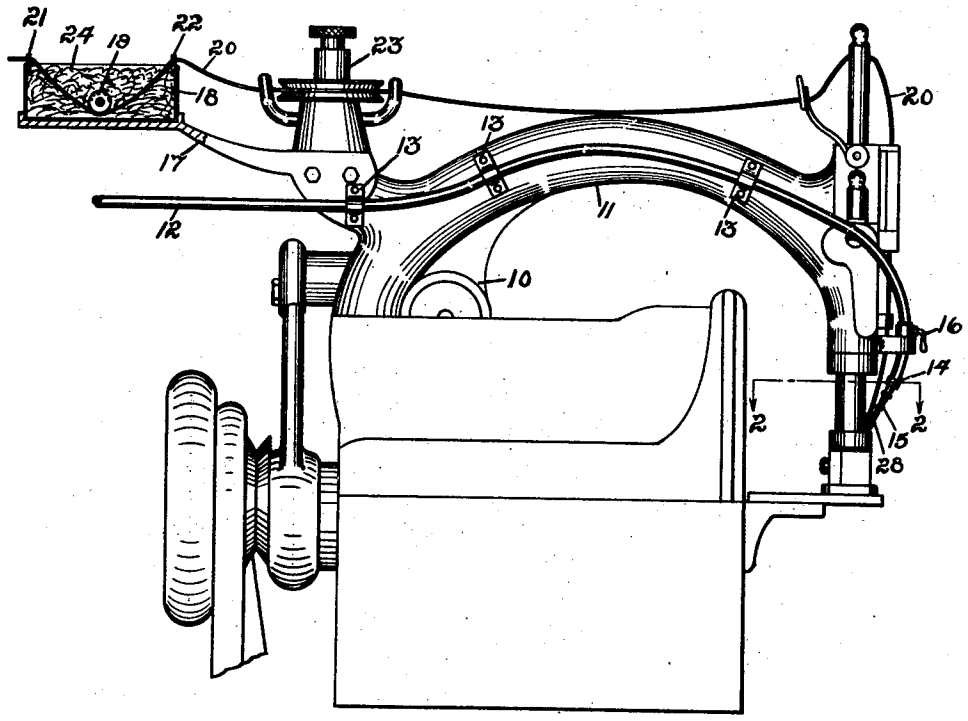



FIG. 1.

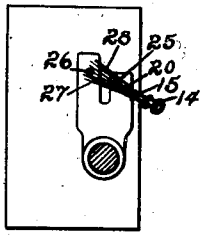



FIG. 2.

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Patented May 13, 1930 1,758,101

# UNITED STATES PATENT OFFICE

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## SEWING

Application filed April 20, 1925. Serial No. 24,364.

This invention relates to sewing, and more particularly to lubricating the thread and preventing the overheating of the sewing machine needle.

A sewing machine cannot be run at any considerable speed in sewing certain kinds of material, such as paper, without overheating the needle, unless some provision is made to prevent this result. According to this invention the thread is lubricated, a blast of air is directed against the needle, and vaporizable liquid is supplied in close proximity to the needle. Other features of the invention will appear as the description proceeds.

In the accompanying drawing forming part of this specification, Fig. 1 is a somewhat diagrammatic elevation of a sewing machine adapted to carry out this invention; Fig. 2 is a somewhat diagrammatic section substantially on the line 2—2 of Fig. 1, showing the relation of the air nozzle to the needles.

The particular construction of the sewing machine is immaterial. One form of sewing head 10 is shown having an arm 11 supporting the needle operating parts. A pipe 12 is attached to this arm in any convenient manner, as by clips 13, and is bent downward toward the needle and terminates in a nozzle 14. Preferably this nozzle is of an adjustable type so that, by turning the tip 15 of the nozzle, the size of the opening may be varied. A stop-cock 16 is provided for shutting off the air completely, when desired, without changing the adjustment of the nozzle.

In the construction shown, a bracket 17 is attached to arm 11 and is adapted to support a receptacle 18. The receptacle 18 is provided with a roller 19. A thread 20 is led from any suitable source through an eye 21 on the receptacle, beneath the roller 19 and out through another eye 22 to suitable tension means 23 on the sewing machine, from which it passes to the needle in the usual manner. The receptacle is filled, or partly filled, with a lubricant 24. The preferred form of lubricant is soft soap, or a mixture of soap and water.

The sewing machine may be provided with one or more needles. In the form shown there are two needles 25 and 26, as shown in Fig. 2. Thread 20 is led to needle 25, and another thread 27 may be led through receptacle 18 on one side of thread 20 and forward through any desired tension means to needle 26.

In the arrangement shown in Fig. 2, it is clearly indicated that nozzle 14 is adapted to play a jet of air 28, indicated in that figure, primarily against needle 25, but a little out of direct alignment with that needle, so that a portion of the blast passes on unimpeded to needle 26. In this way both needles are cooled by a blast through one nozzle. A small nozzle is used, and a narrow blast is directed exactly onto the needle or needles, so that a minimum power for producing the blast is necessary. While the blast may be directed against the needle alone and produce sufficient cooling, it is preferable to have it contact the thread, and to have the thread moistened by some liquid, such as water, which is vaporized by the action of the air and produces an additional cooling effect in the immediate vicinity of the needle.

In order to avoid friction of the needle on the thread as well as friction of the thread through the material and against other parts of the sewing machine, it is desirable to have the thread lubricated. In order that the proper amount of lubricant may be used and that it may remain in the desired condition, it is preferable to use a lubricant that is not vaporized by the action of air at ordinary temperatures. A lubricant such as soap is preferable to such a lubricant as oil, in sewing paper, because soap is not absorbed by, and does not materially affect the condition of, the paper around the needle holes, as does oil. Vaporizable liquids other than water might be used for their cooling effect, and lubricants other than soap might be mixed with the cooling fluid, but soap and water form a desirable combination which is not costly and is readily obtainable, and the two substances are completely miscible and easily applied.

It is evident that the presence of a vaporizable liquid in the thread will have a cooling effect on the needle even in the absence

of a specially directed jet of air, as there will be always some vaporization of the liquid adjacent the needle and consequently some cooling effect, which will increase automatically as the temperature of the needle increases. A vaporizable liquid might be supplied in the vicinity of the needle by means other than the thread, either with or without the jet of air. Therefore, while moistening the thread with a vaporizable liquid, lubricating the thread, and directing a jet of air against the needle and adjacent thread are features which may be combined advantageously and work together to produce a result which is more than the sum of their separate results, it is possible to obtain beneficial results from less than the complete combination disclosed.

Numerous other changes in the exact combination disclosed might be made within the scope of the invention claimed and still retain some of the benefits of this invention. The scope of the invention is indicated by the following claims.

What I claim is:

1. The method which consists in moistening a thread with a vaporizable liquid, passing the moistened thread through the eye of a needle, sewing paper with the needle and thread at such a rate of speed as to heat the needle, and directing a jet of air against the needle and the moistened thread beside the needle.

2. The method which consists in moistening a thread with a vaporizable liquid and a lubricant miscible with the liquid, passing the thread through the eye of a needle, sewing paper with the needle and thread at such a speed as to heat the needle, and directing a jet of air against the needle and against the thread beside the needle.

3. The method which consists in moistening thread with soap and water, passing the thread through the eye of a needle, sewing paper with the needle and thread at such a speed as to heat the needle, and directing a jet of air against the needle and against the thread beside the needle.

4. In a sewing machine, a needle, means to operate the needle, an adjustable nozzle in position to direct a regulated blast of air against the needle to prevent its overheating, a pipe leading to said nozzle and a stop-cock in said pipe.

5. In a sewing machine, a needle, means to operate the needle, a receptacle for liquid, means to guide thread through the receptacle on its way to the needle, and means to direct a jet of air against the needle.

6. In a sewing machine, a needle, means to operate the needle, a receptacle, means to guide thread through the receptacle to the needle, and means to direct a jet of air against the needle and the thread adjacent to the needle.

7. In a sewing machine, a pair of needles, means to operate the needles, and means to direct a jet of air so that it will strike one needle at a little to one side of the center and pass therefrom against the other needle.

In testimony whereof, I have hereunto signed my name to this specification.

ADELMER M. BATES.