Dec. 19, 1939. E. STEIN 2,183,659

NEEDLE LUBRICATOR

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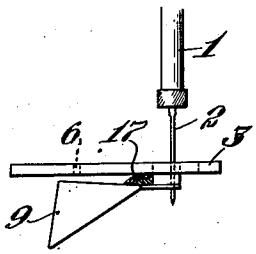

Fig. 1

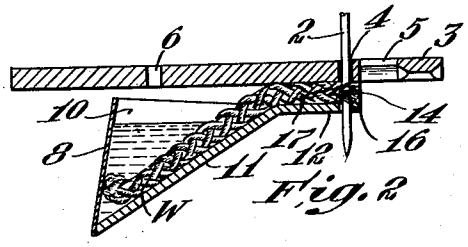

Fig. 2

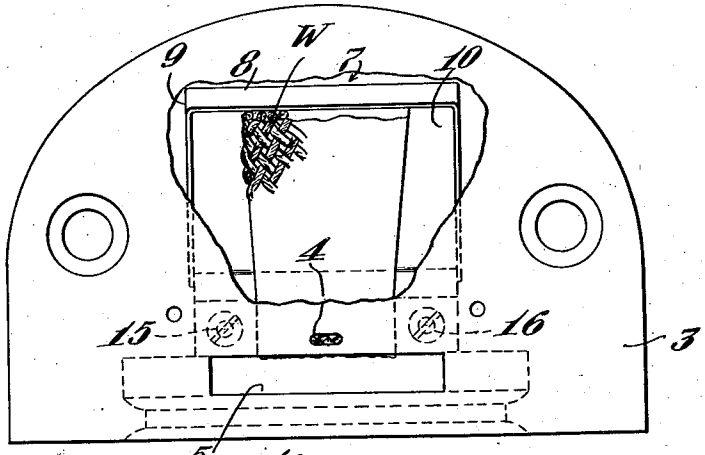

Fig. 4

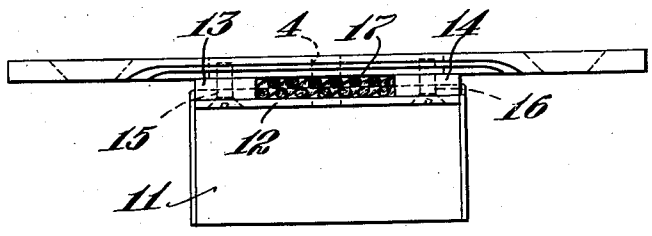

Fig. 3

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NEEDLE LUBRICATOR

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5 Claims. (Cl. 112—256)

This invention relates to sewing machines, and more particularly to means for applying lubricant to the sewing machine needle and needle thread during the sewing operation.

When the material being sewn is of a sticky, gummy or rubbery nature, for instance sheet rubber, rubberized fabric or materials coated with an adhesive such as rubber cement, latex or the like, the needle may be so fouled with the sticky or gummy substance that it is difficult to drive it through the work. An abnormal amount of power is thus required, and the coating of the needle with the gummy material may result in breakage or skipped stitches or damage to the goods being sewn. The shuttle also may become fouled with the sticky substance so that it does not pass freely through the loop of needle thread thus further contributing to frequent thread breakage, irregular stitches and abnormal consumption of power.

Moreover, when sewing certain materials of a hard or close texture, for example leather, with a dry, that is to say an unlubricated needle, there is a tendency for the needle to heat even to the extent of losing its temper so that it bends or breaks, and the operation of the machine requires the expenditure of much more power than when sewing other and softer materials.

To avoid the above difficulties it has heretofore been proposed to deliver a lubricating medium, for example oil, to the needle or needle bar from a suitable supply reservoir or to provide an oil-impregnated pad which is rocked back and forth in time with the operation of the needle and so as to engage the needle when the latter is near the upper end of its path of movement, thus to lubricate the needle and to facilitate its entrance into the work and to prevent sticky or gummy substances from adhering to the needle.

However, such prior devices have usually been of somewhat complicated character and not always readily applicable to ordinary types of sewing machine, and in general have been so located as to expose oily parts above the work support where they are subject to the rapid accumulation of dirt and dust and where dripping of oil onto the work is always a possibility.

In accordance with the present invention provision is made for adequate lubrication of the needle and shuttle by the use of a simple device readily applicable to existing sewing machines of usual type; which is so located as to avoid any possibility of the dropping of oil upon the work and upon which dust does not readily accumulate; and which is of such simple construction and so readily applied as to make it available to almost any user.

In the accompanying drawing wherein a preferred embodiment of the invention is illustrated by way of example,

Fig. 1 is a fragmentary diagrammatic elevation showing the work support of a conventional sewing machine and indicating the needle, the needle bar, and the lubricating device of the present invention;

Fig. 2 is a vertical section, to larger scale, through the center of the needle hole and illustrating the lubricating device of the present invention;

Fig. 3 is a view from the right-hand side of Fig. 2, showing the lubricating appliance as associated with the work-supporting plate; and

Fig. 4 is a diagrammatic plan view of the work-supporting plate with the lubricating device associated therewith.

Referring to the drawing, the numeral 1 designates the needle bar of the sewing machine, and 2 the needle mounted therein. The work supporting plate is indicated at 3. The work support 3 has the needle hole 4 and the slot 5 for the reception of the feed dog, (not shown), and is also preferably provided with an oil hole 6.

In accordance with the present invention, a reservoir 7, for the reception of lubricant, is provided, such reservoir, as here shown, being of substantially triangular contour in vertical section in order that it may hold a substantial quantity of lubricant and still not interfere with the shuttle, looper or other parts of the sewing machine which are ordinarily located between the work plate. This reservoir may be of sheet metal or any other suitable material, for example a moulded plastic substance such as one of the synthetic resins, and as shown comprises the substantially vertical wall 8, the substantially vertical triangular end walls 9 and 10, and the inclined wall 11. This inclined wall reaches from near the lower part of the wall 8 substantially to the upper edges of the walls 9 and 10. However, the upper edge of the wall 11 is preferably spaced below the top edges of the walls 9 and 10 a distance substantially equal to the thickness of the applicator wick which is used. The upper edge of the wall 11 merges (preferably integrally) with a substantially horizontal applicator support 12. Secured to the upper surface of this member 12, at the opposite edges of the latter, are spacing and guiding blocks 13 and 14, respectively, the inner edges of said blocks being spaced apart a distance substantially equal to the width of the ap-

plicator wick which is to be used—the blocks being of a vertical thickness substantially equal to the thickness of the wick. The member 12 and the blocks 13 and 14 are furnished with openings for the reception of screws 15 and 16 by means of which the reservoir is attached to the underside of the work plate 3, the latter being furnished with screw-threaded openings for the reception of the upper ends of these screws. The member 12, the blocks 13 and 14, and the plate 3 cooperate to form a substantially horizontal guide passage for the upper end portion of the absorbent applicator wick W, the lower portion of which is disposed within the reservoir 7. The upper end 17 of this wick rests upon the part 12 (Fig. 2) so as to lie so close to or transversely of the path of movement of the needle 2, that as the needle passes down through the opening 4 in the work plate it wipes against the material of the wick. As this wick is of absorbent material, for example felt, cotton wicking or the like, and since the reservoir is supplied with a suitable lubricating medium, for example oil, the end portion 17 of the wick is always supplied with lubricant through capillary action, and thus as the needle wipes the wick, the needle receives a thin film of lubricant just sufficient to prevent gummy or adhesive materials from sticking to the needle and to enable the needle to pierce work of a hard and dense character. Furthermore, as the needle passes downwardly through the wick with the upper thread in its eye, the thread is moistened with the lubricant, and as the shuttle passes through the loop formed by this thread the oily loop supplies oil to the outer surface of the shuttle, thus tending to prevent the gummy material from sticking to the shuttle and reducing the resistance as the shuttle passes through the loop. Since the lubricant is supplied below the work plate there is no danger of the dripping of lubricant onto the work, and since the end 17 of the wick receives the lubricating medium by capillary action only, there is little danger than an oversupply of lubricant will be transferred to the needle. Moreover as the reservoir and wick are located below the work plate and closely adjacent to the under surface of the latter, there is little opportunity for dust and dirt to accumulate in the reservoir or on the wick. Lubricant may be introduced into the reservoir 7 through the needle hole 4 or through the oil hole 6 if the latter be provided. As the reservoir is capable of holding a substantial amount of lubricant, as well as a substantial length of wick, the device may be depended upon to supply lubricant to the needle and shuttle for a long period without refilling or renewal of the wick, and as the end 17 of the wick becomes worn the wick may be advanced by sliding it over the surface 12 and between the guide blocks 13 and 14, so as to provide a fresh material for contact with the needle.

As the device is of very simple character it may be constructed very cheaply, and as it requires no change in the sewing machine mechanism or the addition of moving parts thereto, its application to an ordinary sewing machine can be made at a minimum cost.

Although the reservoir herein disclosed is of a preferred shape and construction, it is to be understood that the invention is not necessarily limited to the use of a reservoir of this particular contour, but that reservoirs of any suitable shape such as may conveniently be located beneath the work support without interference with other parts of the machine, may be employed. It is further contemplated that a certain degree of lubrication, sufficient at least for some purposes, may be provided merely by the use of an oil-impregnated applicator located like the portion 17 of the wick and supported beneath the work plate by means, for example, similar to the parts 12, 13 and 14, and even though no reservoir as such be provided for supplying additional lubricant.

I claim:

1. A lubricating device for use in a sewing machine of the kind in which a needle moves up and down through an opening in a work support, said device comprising an applicator disposed beneath the work plate and so located with respect to the needle path as to be engaged by the needle while the latter is below the work plate, and means for supporting the applicator in operative position.

2. A lubricating device for use in a sewing machine of the kind in which a needle moves up and down through an opening in a work support, said device comprising a lubricant-impregnated applicator disposed beneath the work plate and so located with respect to the needle path as to be wiped by the needle while the latter is moving up and down below the work plate, means for supporting the applicator, and means for supplying lubricating medium to the applicator.

3. A lubricating device for use in a sewing machine of the kind in which a needle moves up and down through an opening in a work support and cooperates with a shuttle below the work support in the formation of stitches, said device comprising a reservoir for lubricant, means for securing the reservoir to the under side of the work plate, and an applicator of absorbent material having a part disposed in the reservoir and having another part so located with respect to the needle path as to be engaged by the needle and the needle thread as the needle descends below the work plate.

4. A needle-lubricating device for use in a sewing machine of the kind in which a needle moves up and down through an opening in a work support, said device comprising a reservoir having an inclined wick-supporting wall and having an attaching element whereby the reservoir may be secured to the under side of the work plate, and a wick arranged within the reservoir with a portion thereof resting upon said inclined wall and with its upper end located so close to the needle path as to be wiped by the needle when the point of the latter is below the work plate.

5. A needle-lubricating device for use in a sewing machine of the kind in which a needle moves up and down through an opening in a work support, said device comprising a reservoir for lubricant disposed below the work plate, the reservoir having an inclined wall forming a support for an absorbent wick, the inclined wall merging with a substantially horizontal wick-supporting part spaced from the under side of the work support a distance substantially equal to the thickness of the wick, spaced guides arranged to engage the opposite edges of the wick, and means for securing the reservoir to the under side of the work support.

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