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MEANS FOR THE LUBRICATION OF THE RACEWAYS OF ROTATING GRIPPERS OF DOUBLE QUILT STITCH SEWING MACHINES

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FIG. 1

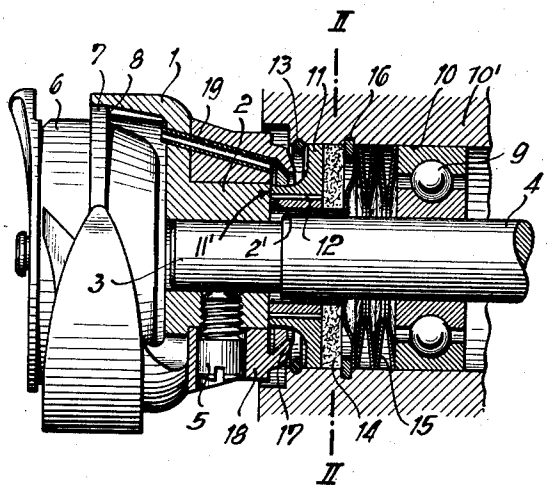
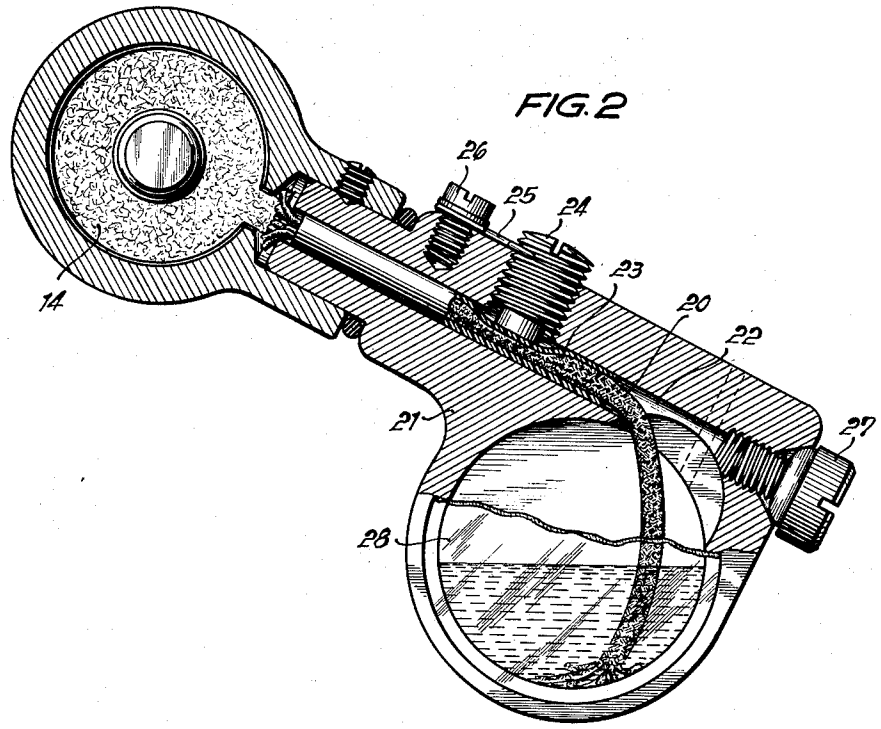


FIG. 2



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MEANS FOR THE LUBRICATION OF THE RACEWAYS OF ROTATING GRIPPERS OF DOUBLE QUILT STITCH SEWING MACHINES

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3 Claims. (Cl. 112—256)

The lubrication of high speed industrial sewing machines presents the constructer with the problem, on the one hand, of providing the high speed rotating or oscillating parts with sufficient lubrication and, on the other hand, of preventing with certainty the soiling of the workpieces by lubrication oil.

The lubrication of the thread holder raceways in the rapidly rotating loop takers of high speed sewing machines is especially difficult. This lubrication must be so provided that, during the operation of the sewing machine, a sufficient quantity of lubricating means is automatically supplied to the raceways, whilst on the other hand, when the machine is stationary, the supply of lubricating means must cease. The known thread holder lubricating means which fulfill these requirements are rather complicated in construction and the supervision of their correct operation is possible only by skilled specialists.

The lubricating means, according to the invention, is characterised by its simple construction and, in addition, by the fact that it is easy to adjust and to supervise.

According to this invention, in order to lubricate the raceways of the thread holder in a rotating loop taker, lubricant is fed to one side of a ring, collar or like member around the loop-taker shaft, is caused to pass through said member into contact with an end face of the loop taker and, when the machine is running, is thereby directed outwardly by centrifugal force and guided to the said raceways.

In the preferred forms of the invention, the lubricant is fed to a felt or like absorbent pad, disposed around the loop taker shaft and in contact with one side face of said ring or like member, and said member has axially directed passages to convey lubricant from said pad to the said end face of the loop taker. Instead of having the axially-directed passages, said member may be of a porous material, for example a sintered metal, so as to convey the lubricant from the absorbent pad to the loop taker.

An example of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a side view of the main parts of the lubrication arrangement shown in part section; and

Fig. 2 is a section through the complete arrangement on the line II—II of Fig. 1.

The loop taker **1** is fixed with its hub or boss **2** on the stepped end **3** of the driving shaft **4** by means of a screw **5**. In the loop taker **1**, the bobbin casing or thread holder **6** is provided with a bearing rib **7** which lies in the raceway **8**. The loop taker **1** usually rotates at double the sewing speed: that is, it reaches a speed of rotation of about 10,000 revolutions per minute in modern high speed sewing machines.

The driving shaft **4** is mounted in a ball bearing **9** which is located in a bore **10** of a bearing block **10'** carried by the machine frame (not shown). In the bore **10**, there is also located a ring **11** loosely surrounding the shaft **4** which ring has axially running oil channels **12** at a radial distance from the shaft **4**. This ring **11**

serves as a counter bearing for the hub or boss **2** of the loop taker; it is secured in the bore **10** in the direction of the loop taker by means of a spring retaining ring **13**.

An oil absorbing disc **14** of felt or the like lies against the rear of the ring **11** which disc is pressed by means of a plate spring column or pack **15**. The plate spring column **15** is, on the one hand, supported against the outer race of the ball bearing **9** and is, on the other hand, limited by means of a spring retaining ring **16** inserted in an annular groove of the said bore **10**.

During the operation of the machine, oil comes from the disc **14** through the channels **12** to the mutually sliding surfaces **11'** and **2'** of the ring **11** and the hub or boss **2** respectively and from there it is thrown outwards by centrifugal action. This thrown-out oil is caught by an annular lip **17** which is formed on the collar **18** fixed on the said hub or boss **2** of the loop taker. One or more oil tubes **19** lead obliquely outwards from the groove formed by the lip **17** into the inner cavity of the loop taker **1** which receives the bobbin casing **6**, so that the thrown-out oil caught by the annular lip **17** finds its way through the oil tubes **19** to the raceway **8** of the loop taker.

The felt disc **14** is continually supplied with lubricant by means of a wick **20**, one end of which lies within an oil container **21** and the other end of which is brought into communication with the felt disc **14**. The wick **20** is passed through a flexible tube **23**, inside the inclined conduit **22**, the cross section of which tube can be varied at one point by means of a pressure screw **24**. More or less lubricant is supplied to the disc **14** by means of the wick **20** according to the pressure put upon the wick by adjustment of the screw **24**. The screw **24** is secured against automatic alteration of the adjustment by means of a spring **25** engaging its thread. The spring **25** is fixed to the oil container **21** by means of the screw **26**.

A screw closing the oil filling opening of the reservoir **21** is indicated at **27** and an inspection glass forming one side of the oil container is indicated at **28**, which glass may have a scale for checking the oil consumption.

In the embodiment, the ring **11** consisting of brass or steel is provided with axially running oil channels **12**. These oil channels **12** may, in certain circumstances be omitted if the ring **11** is made of porous, oil permeable material, for example, sintered metal.

What I claim is:

1. In a sewing machine utilizing a bottom thread, a loop taker shaft, a loop taker structure fixed on said shaft and having a raceway, a thread holder positioned in the raceway of said structure, a bearing block having a bore and a bearing in said bore for said shaft, an absorbent pad for lubricant in said bore around said shaft, a ring in said bore around said shaft disposed between said pad and loop taker, said ring and loop taker provided with mutually sliding surfaces, said ring provided with axial passageways therethrough for lubricant from said pad to said sliding surfaces, an annular lip on said loop taker structure around and outwardly of said sliding surfaces and forming a groove for lubricant from said surfaces, said loop taker structure provided with tubes for lubricant extending from said groove obliquely relative to the longitudinal axis of said shaft to said raceway, and means for supplying lubricant to said pad.

2. In a sewing machine utilizing a bottom thread as set forth in claim 1, said means for supplying lubricant including a reservoir for lubricant, a wick extending from said reservoir to said pad, a resilient tube enclosing a portion of said pad, and a member for pressing on said tube for varying the cross section of said tube.

3. The combination in a sewing machine with a loop taker construction thereof comprising, a driving shaft,

a bearing in which said driving shaft is rotatable, a bearing block having a bore in which said bearing is disposed, a raceway fixed to said driving shaft, means for supplying lubricant to said raceway, a lubricant absorbing pad in the bore of said bearing block around said driving shaft between said bearing and the loop taker construction, a ring between said pad and the loop taker construction, said ring and the loop taker construction having mutually slidable surfaces, said ring being provided with axial channels therethrough for leading the lubricant from said pad to said slidable surfaces, the loop taker construction having an annular lip outwardly of said sliding surfaces forming a groove for the lubricant from said sliding surfaces, the loop taker

construction being provided with circumferentially disposed tubes extending in diverging relation from the groove to said raceway for the lubricant from the groove to said raceway.

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