

[54] **LUBRICANT SEALING DEVICE FOR A
 WORK FEEDING MECHANISM OF A
 SEWING MACHINE**

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[22] Filed: **Mar. 2, 1972**

[21] Appl. No.: **231,276**

[30] **Foreign Application Priority Data**

Mar. 29, 1971 Italy..... 22415 A/71

[52] U.S. Cl..... **112/256, 277/174**

[51] Int. Cl..... **D05b 71/00**

[58] Field of Search..... **112/256; 277/174;**
308/3.5; 184/6.14, 5, 100

[56]

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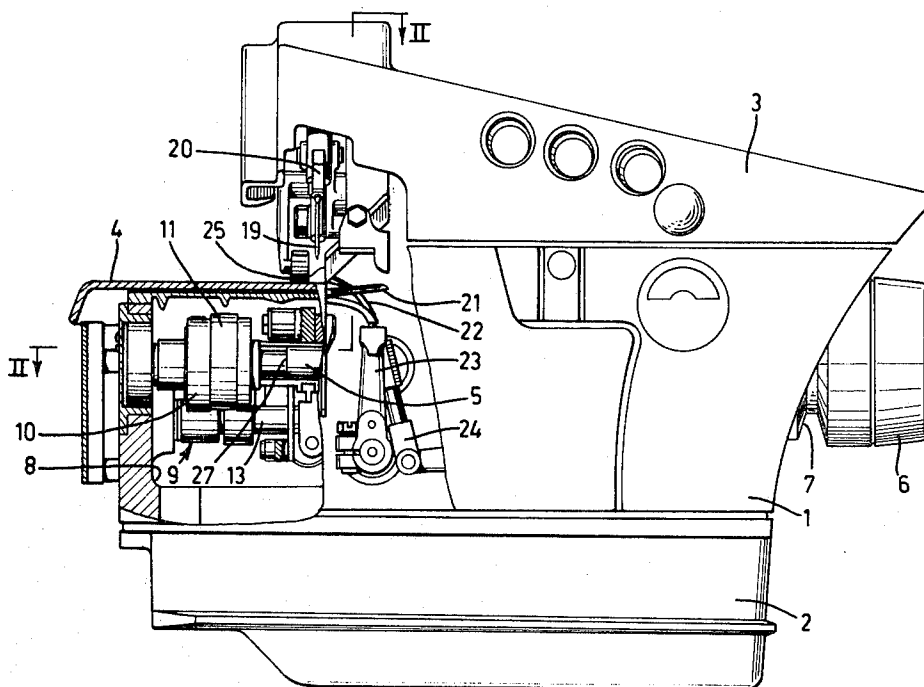
Primary Examiner—Geo V. Larkin

[57]

ABSTRACT

A lubricant seal member for a sewing machine carried on the feed bars that actuate the device for advancing a workpiece as it is sewn and disposed so as to prevent the leakage of lubricant from the source of drive for the feed bars to the workpiece advancing device.

3 Claims, 4 Drawing Figures



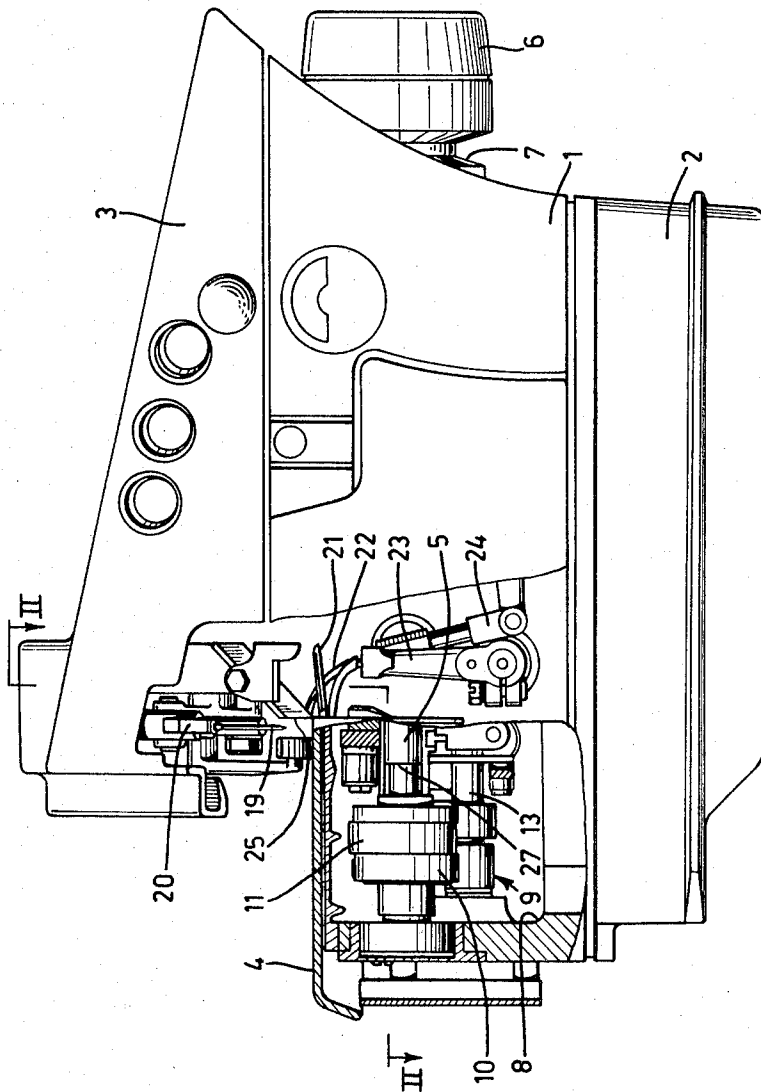
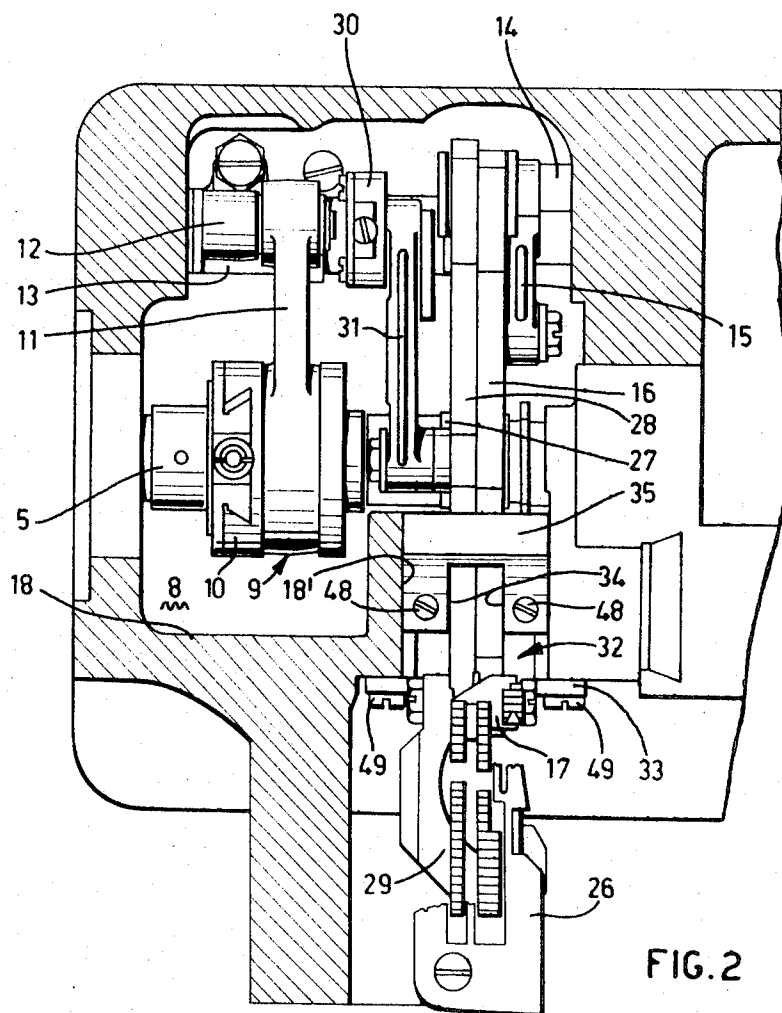


FIG. 1



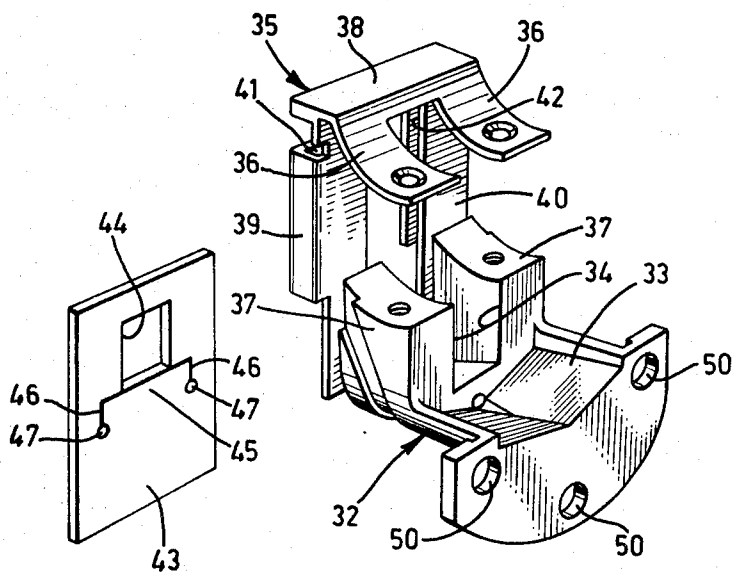


FIG. 3

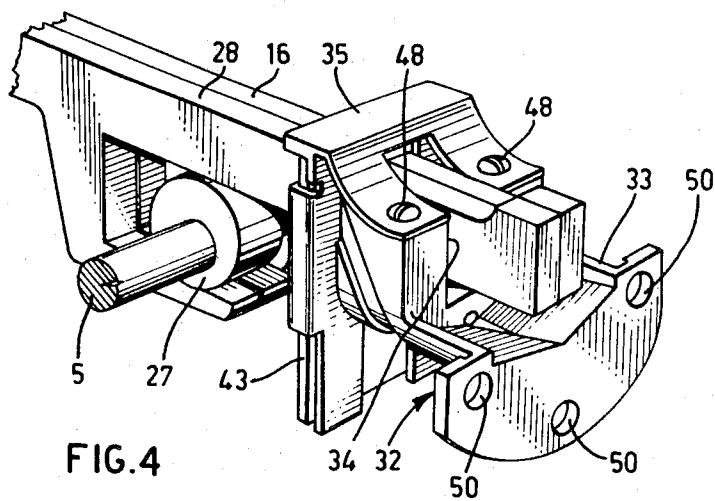


FIG. 4

LUBRICANT SEALING DEVICE FOR A WORK FEEDING MECHANISM OF A SEWING MACHINE

SUMMARY OF THE INVENTION

The present invention refers to a lubricant sealing device for a work feeding mechanism of a sewing machine.

As is well known, in some models of sewing machines the actuating mechanisms and all surfaces subject to frictional engagement with other parts of the machine must be subjected to an amount of lubricant which necessitates separating the area where the devices operate from the area where the stitching and the work feeding mechanisms operate so as to prevent the lubricant from contacting the feeding mechanism and being absorbed by the workpiece being sewn.

For this reason the frame of the machine has been fitted with a chamber in which there are mounted the actuating mechanisms for the feed dogs of the work feeding mechanism, which are spaced from the chamber and operatively connected with the mechanisms by means of special feed bars.

The feed bars extend through a section of the chamber, which is disposed between the two areas and of a size to accommodate only the feed bars and prevent leakage of the lubricant from the chamber. With the feed bars arranged in this manner, the lubricant tends to leak out of the chamber through the working clearances for the feed bars during their working cycles and permits the escaped lubricant to flow towards the stitching mechanisms and the feed dogs.

The aim of the present invention is that of preventing leakage of the lubricant out of the chamber and thereby eliminate any possibility of the lubricant reaching and soiling the workpiece.

In order to reach this aim the technical problem to be solved was that to provide a device capable of sealing the chamber while at the same time permit the feed bars to function in a normal manner.

To solve this problem the invention provides a lubricant sealing element for a work feeding mechanism of a sewing machine comprising one or two feed bars which are moveable alternatively in a horizontal and vertical direction causing the feed dogs to travel in an elliptical pathway during their function of advancing the workpiece. The sealing element includes an aperture through which the feed bars extend and is of a size which conforms to the cross-sectional configuration of the feed bars. The walls of this aperture being in frictional contact with the outer surfaces of the feed bars are effective in wiping the lubricant there from during their horizontal movement.

The advantage resulting from the present invention is the lubricant sealing element functioning in cooperation with the feed bars completely seals the chamber and prevents the lubricant from leaking out along the feed bars to the workpiece feeding mechanism.

Further aims and advantages of the invention will become more fully apparent by reference to the appended claims and as the following detailed description proceeds in reference to the figures of drawing wherein:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view in partial section of a sewing machine to which the present invention is applicable,

FIG. 2 is a sectional view taken along line II—II in FIG. 1,

FIG. 3 is a perspective view in exploded form of the device according to the present invention, and

FIG. 4 is a perspective view of the device in the FIG. 2 shown assembled and its relationship to the feed bars.

DETAILED DESCRIPTION OF DRAWINGS

For purpose of illustration, the present inventions shown mounted on an overlock industrial sewing machine.

This machine is normally composed of a bed 1 (FIG. 1) fitted below with a reservoir 2 for the collection of the lubricant. A standard 3 is positioned above the bed 1 and adjacent to a bed plate 4 on which the piece to be sewn is caused to move.

These elements joined together form the frame of the sewing machine and house the required mechanisms and elements necessary for it to perform its intended function.

Within the base 1 a rotatable main shaft 5 is journaled with one end thereof protruding from the frame on which is fixed a handwheel 6 fitted with a belt pulley 7. The pulley 7 can be connected with a normal driving motor (not illustrated).

On the other end the main shaft 5 terminates in a chamber 8 where it supports the actuating mechanism 9 of the work feeding mechanism. This mechanism includes an eccentric 10 fitted with a pitman 11 (FIGS. 1 and 2) whose fulcrum is on an arm 12 of a rock shaft 13. Shaft 13 is provided with another arm 14, similar to arm 12, which is connected by means of a link 15 with a feed bar 16 having a toothed feed dog 17 on its free end.

The feed bar 16 extends from the chamber 8 parallel with an offset vertical partition 18 of the latter and positions the feed dog 17 in an area spaced from said chamber.

In the area where the feed dog 17 operates a needle 19 (FIG. 1) is supported by a needle clamp 20 and is alternatively moved in the well-known manner along a substantially vertical rectilinear path causing it to pass through the bed plate 4 and intersects both paths of the well-known primary and secondary loopers 21 and 22 respectively which cooperate with the needle to form the normal stitching pattern for the overlock stitch.

The loopers are actuated by known mechanisms carried within the frame and for purpose of brevity the only parts shown are their supports 23 and 24.

On the bed plate 4 there is also provided a presserfoot 25 cooperating with the feed dog 17 to move the piece forward as it is sewn by the stitching means. The cooperation between the presserfoot and the feed dog is made possible because the bed plate 4 includes a throat plate 26 (FIG. 2) out of which the said feed dog periodically protrudes.

The actuating mechanism 9 reciprocates the feed bar 16 horizontally and by means of an eccentric 27 on shaft 5 which is operatively associated with said feed bar (FIG. 4) the latter is moved both horizontally and vertically simultaneously. This motion causes the feed dog carried on the free end of the feed bar to move through an elliptical pathway during the performance of its intended function.

The elliptical movement of the feed dog 17 is arranged so that it moves upwardly to protrude through

the forward portion of the throat plate 26 to contact the sewn workpiece and then moves rearwardly sliding said workpiece to the rearward portion of the throat plate. The feed dog is then lowered below the throat plate and moved forwardly to repeat the cycle.

The sewing machines of the above-mentioned type can also be fitted with a second work feeding mechanism which includes a second feed bar 28 with a feed dog 29 on its free end and which is disposed immediately adjacent to the first feed bar. The second feed bar is actuated by a link 31 which is operatively connected to an arm 30 carried on the rock shaft 13.

The structure of the second work feeding mechanism as well as its operation has not been described for it functions in the same manner as the work feeding device described above.

The sewing machines to which the invention is applicable operate at high speed, and the lubricating requirements for the various actuating mechanisms causes a great quantity of lubricant to be circulated within the chamber 8.

To prevent the lubricant from leaking out of the chamber and moving along the feed bars to the feed dogs, the partition 18 includes a recess 18' in which there is assembled a lubricant sealing device 32 composed of a support member 33 which has a conforming fit in recess 18' and which is provided with a guide channel 34 (FIGS. 2 and 3) through which the two feed bars 16 and 28 extend. Obviously, when the machine is designed to have one feed bar only, the support member 33 will be replaced by a similar one with a narrower central slot which conforms to the thickness of one feed bar only.

The lubricant sealing device 32 is also composed of a guide element 35 formed by two spaced parallel plates 36 having a configuration conforming to the upper ends of two upwardly directed spaced checks 37 and forming the guide channel 34 therebetween. The two plates 36 are interconnected by a crosspiece 38 from which two guides 39 and 40 depend.

Guides 39 and 40 include integrally formed and vertically extending pathways 41 and 42 respectively. The central slot 34 is formed to conform only to the width of the feed bars and clearance must be provided in order for them to move vertically during the performance of their intended function.

To prevent the lubricant from escaping through the clearances provided to permit vertical movement of the feed bars, the lubricant sealing device 32 is also provided with a lubricant sealing element 43 fabricated from a wear resistant organic sheet material such for example as sheet teflon or the like. The sealing element is relatively thin with a configuration that is substantially rectangular and is provided with an aperture 44 of a size that conforms to the outer dimension of a cross-section of the two feed bars or one only if the machine is designed for one feed dog only. In operating position, the feed bars extend through the aperture 44 of the sealing element 43.

To assemble the sealing element 43 onto the feed bars the lower part of said element includes a reed plate 45 formed by a pair of spaced apertures 47 which are interconnected by a slit 46 a portion of which commu-

nicates with the lower surface of aperture 44. By simply folding or flexing the sealing element 43 aperture 44 can be enlarged a sufficient amount so as to easily assemble over the ends of the feed bars.

After the sealing element 43 is assembled on the feed bars it is released and the elasticity thereof will cause it to return to its initial shape whereby the walls of the aperture 44 will make and maintain frictional engagement with said feed bars. To prevent movement of the lubricant sealing element 43 during horizontal movement of the feed bars, the sides thereof are assembled in the above-mentioned pathways 41 and 42 of the guide element 35 where it is free to follow the feed bars during their vertical movements only.

The feed bars move simultaneously within the lubricant sealing element 43, which faces the slot 34 and is of sufficient size so as to completely seal any passage to the outside of the chamber 8 which is being formed within the slot and at the same time is effective in wiping the lubricant from those portions of the feed bars within said chamber. The lubricant thus that is wiped from the feed bars drops down into the chamber 8 and only enough lubricant remains thereon to lubricate those surfaces in contact therewith.

When the lubricant sealing device is assembled, the guide element 35 is fixed by two screws 48 on the support member 33 that is in turn fixed in the recess 18' by means of screws 49 (FIG. 2) inserted into holes 50. As to what is described up to now, the support member 33 can be designed with the central slot 34 which can accommodate one or two feed bars. Obviously the lubricant sealing element 43 can be provided with an aperture 44 of a size appropriate for the feed bar or feed bars on which it is to be assembled. Additionally the sealing element 43 is easily replaced should wear develop due to continued frictional contact with the feed bars.

I claim:

1. A lubricant sealing device for the workpiece feeding mechanism of a sewing machine of the type having at least one feed bar movable in a horizontal and vertical direction to define an elliptical pathway for a toothed feed dog carried thereon, the improvement comprising:

- a. a support member having a guide channel within which movement of the feed bar is guided;
- b. a flexible lubricant sealing element having internal surfaces conforming to the cross sectional configuration of the feed bar defining an opening through which the latter extends;
- c. guide means on said support member for permitting vertical movement only of said sealing element during actuation of the feed bar.

2. The lubricant sealing device according to claim 1 wherein said sealing element is fabricated from wear resistant organic sheet material.

3. The lubricant sealing device according to claim 1 wherein said guide means includes means defining vertically disposed opposed pathways within which the sides of said sealing element extend for guiding the latter during its vertical movement by the feed bar.

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