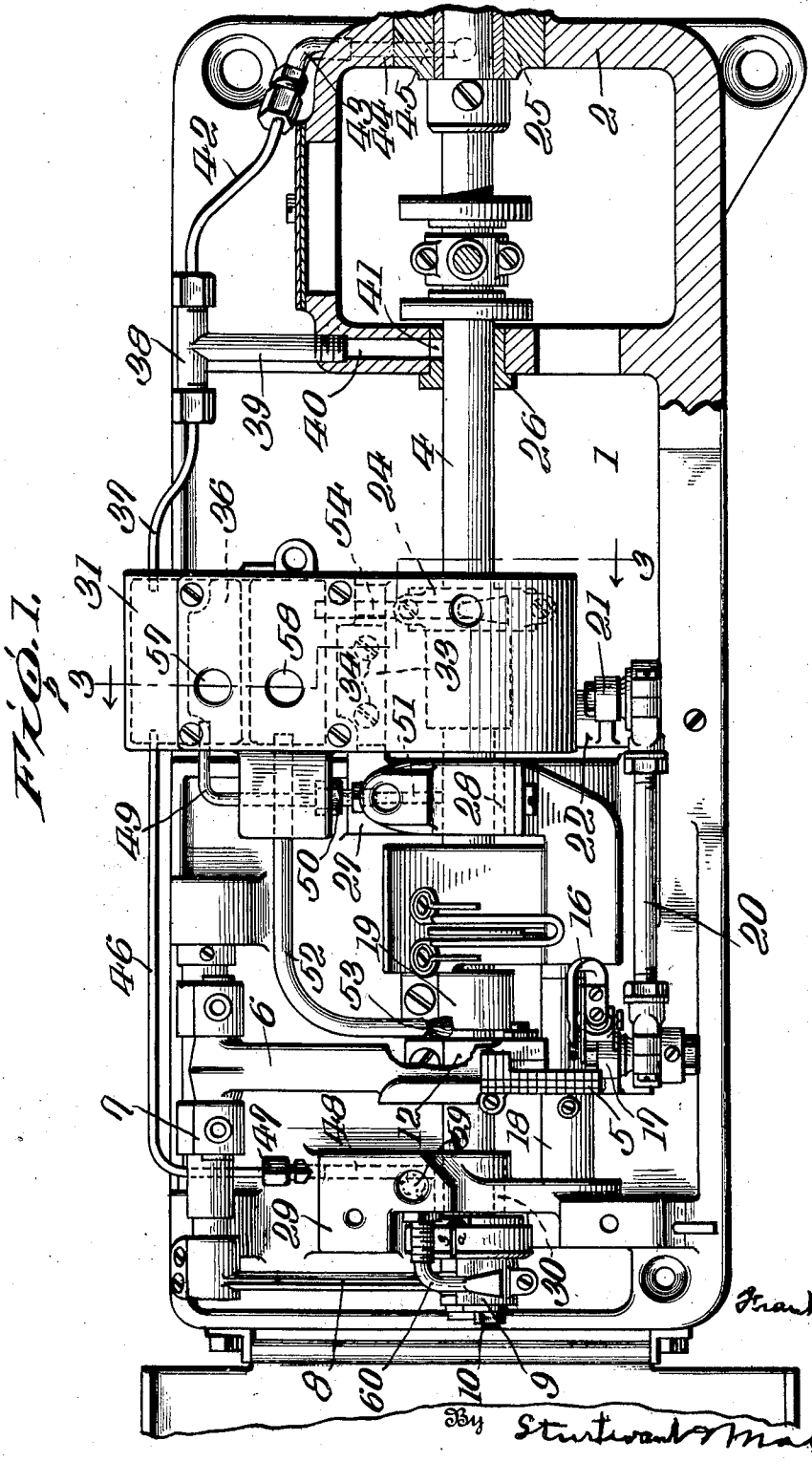
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SEWING MACHINE

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Fig. 1.



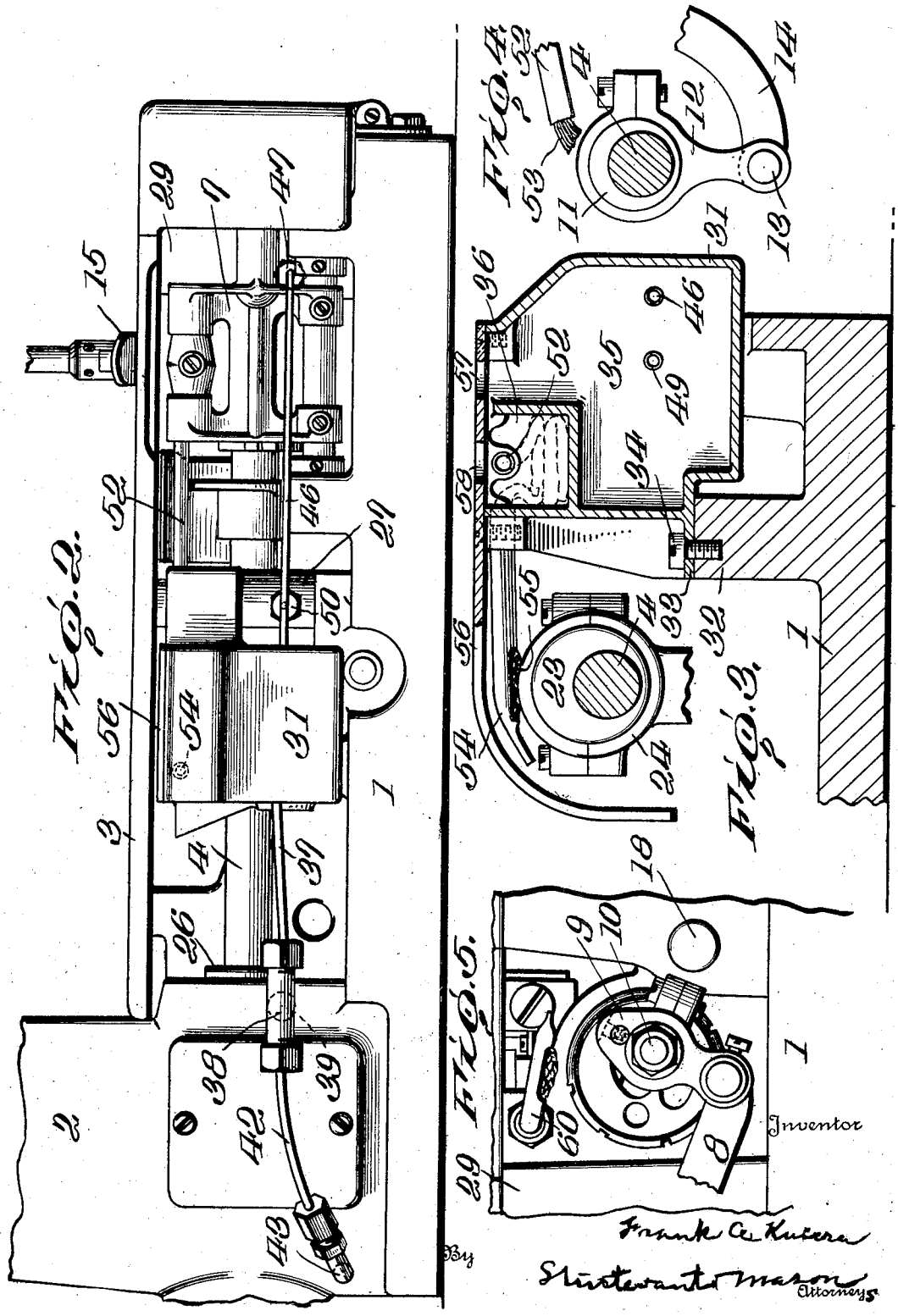
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SEWING MACHINE

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Patented Aug. 13, 1935 2,011,491

UNITED STATES PATENT OFFICE

2,011,491

SEWING MACHINE

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Application March 22, 1934, Serial No. 716,886

2 Claims. (Cl. 184—6)

The invention relates to new and useful improvements in sewing machines, and more particularly to a lubricating system for lubricating certain of the bearings thereof.

An object of the invention is to provide a lubricating system and storage supply for furnishing lubrication to the bearings of the main actuating parts located beneath the plane of the work support.

In the drawings which show by way of illustration one embodiment of the invention:

Figure 1 is a view partly in plan and partly in section of the parts located beneath the work support.

Figure 2 is a side elevation of the machine as viewed from the rear.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a detail showing the means for supplying lubricant to the eccentric strap which lifts the feed bar.

Figure 5 is a view showing the means for lubricating the crank at the end of the shaft which moves the feed bar back and forth.

The invention is directed to a sewing machine having a supporting bed carrying a work support and a standard which are of the usual type. The actuating shaft for the machine is located beneath the work support. The feeding mechanism is operated by an eccentric carried by the actuating shaft which operates through an eccentric strap for raising and lowering the feed bar. The back and forth movements of the feed bar are derived from a crank pin eccentrically mounted on the distal end of the actuating shaft. It is very essential in the furnishing of lubrication to the moving parts beneath the cloth plate that the means utilized shall be so controlled as to prevent lubricating oil from finding its way to the upper face of the cloth plate so as to soil the fabric being stitched.

The present invention has to do with a lubricating system for the parts beneath the cloth plate wherein the entire system is located beneath the plane of the cloth plate so that there is no storage of oil above the plane of the cloth plate that can find its way onto the cloth plate through leakage and gravity action on the lubricating oil.

In carrying out the invention, a storage receptacle has been provided which is located wholly beneath the cloth plate, which storage receptacle has two compartments from one of which pipes lead to the bearings of the actuating shaft and to ports extending through bushings in which the shaft rotates. The lubricating oil is fed by gravity to the wearing surfaces of the bushings and the flow of the oil will be controlled by the consumption thereof at the bushings. Pipes lead from the other compartment to a position adjacent the parts which are actuated by the shaft, and these pipes are provided with wicks which are contacted by the actuated parts and thus lubrication furnished thereto.

It is believed the invention will be better understood by a detail description of the illustrated embodiment thereof. The machine includes a supporting bed 1 on which is mounted a standard 2 and also upstanding supporting brackets carrying a work support 3. The actuating shaft which is indicated at 4 is mounted for rotation in bearings in the standard and in the supporting brackets just referred to.

In order to feed the material across the work support, a feeding mechanism is provided which includes a feed dog 5 carried by a feed bar 6 which is connected to a feed rocker 7 in the usual way. The feed rocker 7 is mounted in bearings carried by the supporting bed and receives its oscillation from an arm 8 which is connected to a link 9 which in turn cooperates with a crank pin 10 at the distal end of the actuating shaft 4. The feed bar is raised and lowered by an eccentric 11 on the main actuating shaft 4. An eccentric strap 12 cooperates with this eccentric and said eccentric strap is pivoted at 13 to a bracket arm 14 carried by the feed bar 6. The material is held on the work support by a presser foot 15 which is of the usual character.

The machine is provided with a stitch forming mechanism including a needle and a looper. The looper is illustrated at 16 and is mounted on a carrier 17 which in turn is attached to a looper support 18. The looper support receives its oscillations from an eccentric on the main actuating shaft 4 through an eccentric strap 19. Said eccentric strap is connected to a ball stud carried by an arm attached to the looper support 18.

The looper carrier is oscillated by a link 20 which is connected to a ball stud carried by an arm 21 attached to a cross shaft 22. The cross shaft 22 is in turn oscillated by means of an eccentric 23 on the actuating shaft 4. An eccentric strap 24 cooperates therewith and is attached to a ball stud carried by an arm projecting from the shaft 22. The looper operating mechanism per se forms no part of the present invention and will not be further described.

The main actuating shaft 4 extends through the standard and rotates in a bushing 25 at the

outer side of the standard and a bushing 26 at the inner side of the standard. A supporting bracket 27 is provided with a bushing 28 for the actuating shaft 4, and a supporting bracket 29 is provided with a bushing 30 for said actuating shaft. Therefore the actuating shaft is supported and rotates in these four bushings, each of which must be lubricated. The eccentric straps which impart the movements to the looper and also the eccentric strap which raises and lowers the feed bar must be lubricated, as well as the link connection to the crank at the distal end of the actuating shaft. The invention is directed particularly to a lubricating system for supplying the proper lubrication to these parts under control so that there is no waste of the lubricating oil which may escape and find its way or be thrown onto the surface of the cloth plate by the rapidly operating parts beneath the same.

Mounted on the bed 1 is a storage receptacle 31. At one side of the supporting bracket 27 the bed has an upstanding bracket lug 32 for supporting this storage receptacle for the oil. Said storage receptacle is provided with a flange 33 and bolts 34, 34 which pass through said flange and fixedly secure said receptacle to the bed. The receptacle is provided with two compartments: the major compartment 35 which stores the oil that is supplied to the bushings of the main actuating shaft, and the auxiliary compartment 36 which stores the oil that is supplied to the eccentrics operating the looper and raising and lowering the feed bar. Extending from the compartment 35 is a pipe 37 which is joined to a header 38. The pipe 37 is slightly inclined downwardly from the chamber to the header so that the lubricating oil will flow freely into the header. Extending from the header 38 is a branch pipe 39 which is threaded into the standard, and a port 40 leading from the end of the pipe 39 establishes communication between said pipe and the bushing 26. The bushing 26 has an opening 41 therein in alignment with the port 40. This opening is arranged intermediate the ends of the bushing so that lubricating oil will flow therethrough only as it is taken up by the moving parts. Also extending from the header 38 is a pipe 42 which is joined to an auxiliary header 43 connected to the standard and in alignment with a port 44 leading to an opening 45 in the bushing 25. This pipe 42 inclines downwardly slightly so that the oil will flow freely into the auxiliary header 43. Thus it is that these headers are supplied with oil. As the main shaft rotates, the bearing surfaces of the bushings will be freely lubricated through these ports 40 and 44. When the machine is at rest there is no free escape for the lubricating oil from the headers, as the ports are closed by the presence of the shaft in the bushings.

There is a pipe 46 leading from the chamber 35 which is connected to a header 47 threaded into the bearing bracket 29. In alignment with this header 47 is a port 48 which leads to an opening in the bushing 30. This pipe, as shown in Figure 2, has a slight downward inclination to aid in the free flow of the oil to the header 47.

There is a pipe 49 leading from the chamber 35 which is connected to a header 50 in alignment with a port 51 leading to an opening in the bushing 28. These pipes 46 and 49 therefore supply oil to the bushings 28 and 30 in a manner similar to that described in connection with the bushings 25 and 26.

All of the pipes 27, 46 and 49 enter the chamber 35 at points above the bottom of the receptacle so that any sediment in the oil will be likely to accumulate in the bottom of the receptacle. The level of the oil is of course kept well above the pipes so that there is a head gradually forcing the lubricating oil out through the pipes to the headers adjacent each bushing which is to be lubricated.

As noted above, the auxiliary chamber 36 is utilized for supplying oil to the eccentrics and the bearing portions of the eccentric straps which cooperate therewith. Inasmuch as the surfaces which are to be lubricated are moving in eccentric paths relative to the axis of the actuating shaft, it is preferred to supply lubrication to these parts through the aid of pipes containing wicks which are saturated with lubricating oil and arranged so that the part in its movement will contact with the wick and take therefrom a small amount of lubricating oil which will find its way to the surfaces to be lubricated.

Extending from the auxiliary chamber 36 is a pipe 52 which terminates just above the path of movement of the eccentric strap 19. This pipe is supplied with a wick 53 which is coiled within the auxiliary chamber 36 and projects slightly from the end of the pipe. The pipe enters the chamber 36 adjacent the top of the chamber and the oil is supplied to the pipe through capillary attraction. The wick which extends into the oil will cause the oil to pass into the pipe and enter the pipe, and at the end of the wick a drop of lubricating oil will accumulate so that the rotating part as it contacts with the wick will take the oil therefrom.

There is also a pipe 54 which extends from the auxiliary chamber 36 to a position over the eccentric 23. The end of this pipe as shown is closed. There is an opening in the underface of the pipe and the wick indicated at 55 filling the pipe and coiled within the auxiliary chamber also projects through the opening. This pipe 54 with its projecting wick is so positioned that the eccentric strap 24 in its rotation will contact therewith when at its extreme upper throw, thus taking from the wick a very small amount of lubricating oil which will find its way down onto the bearing surfaces between the eccentric and the eccentric strap. These parts moving in eccentric paths are difficult to lubricate without waste or throwing of the lubricating oil. Through the use of these wicks and pipes as described above, just the right amount of lubricating oil is placed on the moving part so that it can find its way to the bearings without the throwing of the oil from said part.

There is, however, a guard provided for protecting the parts which are being lubricated in connection with the eccentric strap 24. This guard is in the form of a cover plate 56 which is attached to the receptacle 35 by screws. The cover plate extends laterally over the pipe 54 and is curved downwardly at the opposite side of the eccentric strap so that said eccentric strap is covered by said cover plate. This cover plate is provided with an opening 57 through which oil may be supplied to the chamber 35, which is also provided with an opening 58 through which oil may be supplied to the auxiliary storage chamber 36.

As a means for lubricating the moving parts at the distal end of the actuating shaft 4, the supporting bracket 29 is provided with a chamber 59. Extending from this chamber is a pipe 60 which is provided with a wick. The wick is coiled in the chamber 59 and projects from the end of the pipe. The pipe is so disposed relative to the rotation of the crank 10 on the end of the shaft that

the link 9 will contact with the wick and take the necessary lubricating oil therefrom for free lubrication of the bearing surfaces between the crank and the link 9. Oil is supplied to this chamber 59 through an opening in the work support.

From the above it will be apparent that a lubricating system has been provided for supplying just the right amount of lubrication to the bearings in the main actuating shaft and also just the right amount of lubrication for the major actuated parts which impart movements to the feed and the looper. All of the lubricating oil comes from the centrally arranged storage receptacles, and the system is constructed so that when the machine is in operation proper lubrication is provided for all the moving parts without furnishing an excess of lubrication which is likely to be thrown by the moving parts so as to soil the fabric being stitched. On the other hand, when the machine is idle and not in operation, the lubricating system automatically takes care of this changed condition and no lubricating oil is wasted. The wicks are only supplied with oil as it is taken away by the moving part contacting therewith, and the bushings are only supplied with oil as it is consumed by the wear incident to the rotation of the actuating shaft.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A sewing machine including a supporting bed, a work support carried thereby, a receptacle for lubricating oil mounted on said bed and located wholly beneath said work support, a main actuating shaft, bearing bushings carried by said bed in which said shaft rotates, said receptacle having a supply chamber for lubricating oil, pipes leading from said chamber to each bushing, said pipes and supply chamber being disposed so that oil will flow from the supply chamber through the pipes to the bushing by gravity, said pipes being connected with openings through the bushings disposed intermediate the ends thereof whereby the escape of oil from the bushings is prevented when the machine is not in operation.

2. A sewing machine including a supporting bed, a work support carried thereby, a receptacle for lubricating oil mounted on said bed and located wholly beneath said work support, a main actuating shaft, bearing bushings carried by said bed in which said shaft rotates, eccentric members carried by said shaft, said receptacle having a supply chamber for lubricating oil, pipes leading from said chamber to each bushing, said pipes and supply chamber being disposed so that oil will flow from the supply chamber through the pipes to the bushing by gravity, said pipes being connected with openings through the bushings disposed intermediate the ends thereof whereby the escape of oil from the bushings is prevented when the machine is not in operation, said receptacle having an auxiliary supply chamber for lubricating oil disposed above the axis of said shaft, and pipes leading from said auxiliary chamber adjacent the upper end thereof to said eccentric members, each pipe having a wick therein so disposed as to supply lubricating oil to the eccentric members during the rotation thereof.

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