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CAPILLARY OIL DEVICE FOR MACHINES

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Fig. 1

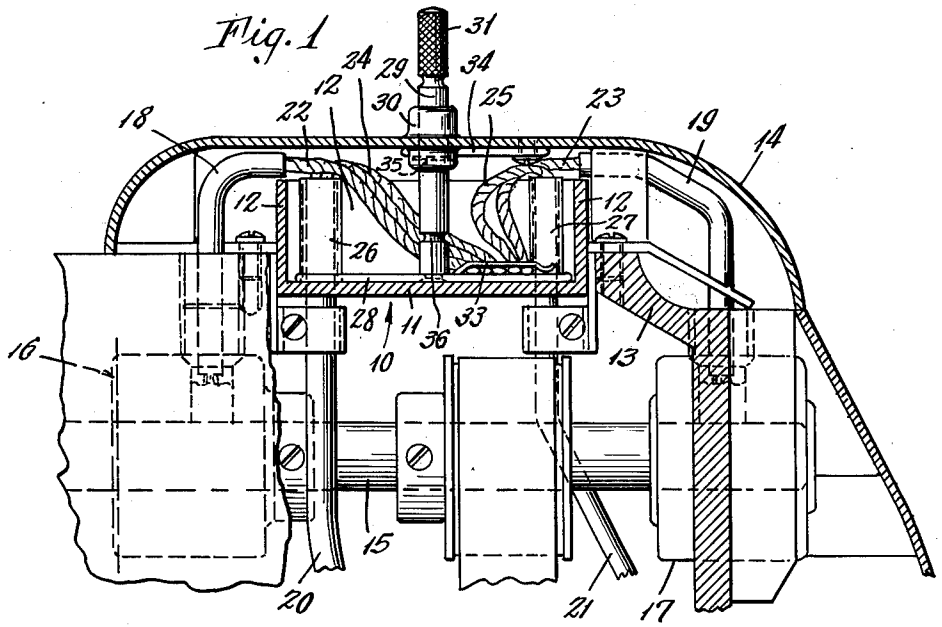
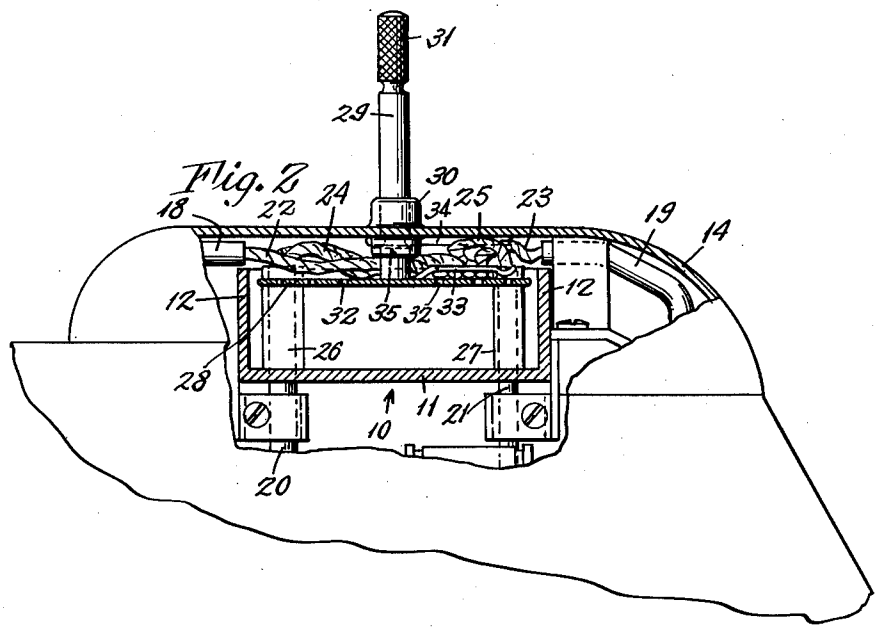


Fig. 2



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CAPILLARY OIL DEVICE FOR MACHINES

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3 Claims. (Cl. 184—6)

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This invention relates to oiling devices for machines and the like, and more particularly to reservoir-type oiling devices having wicks which feed oil to the machine parts by capillary action.

The invention is shown applied to a sewing machine, to automatically feed oil to the bearings and other movable parts thereof; however, it should be understood that the invention is not to be limited to this particular application, since it has utility in connection with other machines, adapted for purposes other than sewing.

An object of the invention is to provide an improved reservoir-and-wick oiling device of the type which may be turned on or shut off at will, the said device when turned on being effective to provide adequate lubrication and when turned off halting withdrawal of oil from the reservoir, and being so arranged that it is temporarily operative to supply a predetermined amount of oil to the machine parts to prevent damage thereto if it should be inadvertently left shut off when the machine is started and run.

Another object of the invention is to provide an improved oiling device as characterized above, which is simple and economical in construction, and is reliable in operation over an extended period of use.

Still another object of the invention is to provide an improved oiling device according to the above, which is adaptable to lubricate a relatively large number of machine parts, yet is compact and of small size.

A still further object of the invention is to provide an improved oiler as above, which may be shut off or turned on quickly and easily, and which provides a visual indication of the "on" and "off" conditions.

In accomplishing the above objects, I provide in accordance with the invention, an oil supply and feed means comprising a reservoir carried by the machine frame and a plurality of capillary wicks having portions extending into the reservoir, in combination with actuatable means connected with both the reservoir and the wick portions, operable to shift one with respect to the other and to maintain the wick portions either in a relatively deep position in the reseroir, to be immersed in the oil thereof, or in a relatively high position out of contact with said oil, thereby to control the removal of oil from the reservoir by said wicks.

As provided by this organization, the wicks when held out of contact with the oil in the reservoir, will still retain a certain amount of residual oil; therefore, if the machine is inadvertently

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operated while the wicks are left out of contact with the oil, the residual oil carried by the wicks will be sufficient to lubricate the bearings and other movable parts for a brief period of time, during which the operator will usually notice the error and correct it.

Also, by the above arrangement, the mechanism which simultaneously lifts all of the wicks out of the oil may be extremely simple, since the wicks all converge at the reservoir and are located closely adjacent each other.

In the specific embodiment of the invention illustrated herein, the reservoir comprises a relatively shallow container having generally upright walls, the entire top of the container being open. Within the container a vertically shiftable plate or shelf is provided, to which the ends of the capillary wicks are secured by a spring clip.

Although such spring clip has been found to be particularly advantageous and convenient, the wicks may be secured to the shelf by lacing them through a series of holes, or by other suitable means, and if desired any two wicks may be formed from a single continuous piece of wicking, in which event an intermediate portion of the wicking will be secured to the shelf. The shelf is carried by an upright rod or plunger, which is vertically slidable in a bearing in the machine frame. The upper end of the plunger is shaped to be readily grasped by the fingers, thereby to enable it to be raised or lowered, to raise or lower the wicks secured to the shelf. A simple spring wire detent is provided on the machine frame, cooperable with an annular groove in the plunger whereby the latter, shelf and wicks may be yieldably held in raised positions, the wicks being thus maintained out of contact with the oil in the reservoir.

The entire organization of reservoir, wicks and plunger and shelf actuating means is extremely simple and economical to fabricate, and has few parts of simple construction, making for reliability of operation at all times.

By virtue of the small number and the arrangement of the parts and their simplicity, the device is very compact and small in size, and since it is only necessary to grasp the plunger and raise or lower it in order to shut off the oiling device or turn it on, this operation may be very easily accomplished. Moreover, the position of the plunger (either raised or lowered) provides a convenient visual indication of the "on" and "off" condition of the device.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a vertical sectional view through the improved oiling device of the present invention, the device being illustrated in its operative position, and being shown mounted on a portion of the frame of a sewing machine, parts of said frame also being shown in section, and

Fig. 2 is a view somewhat like Fig. 1 but showing the oiling device in inoperative or shut-off position.

As shown, the improved oiling device comprises a reservoir 10 in the form of a relatively shallow container having a bottom 11 and upright side walls 12. The reservoir or container 10 is secured to the overarm frame 13 of a sewing machine so as to be rigidly supported thereby, the machine having a housing 14 enclosing said frame and extending over the top thereof. The sewing machine has a rotary shaft 15 carried in bearings 16 and 17, which latter are to be supplied by oil from the reservoir 10, the bearings being connected with oil tubes 18 and 19 through which the lubricant is to be supplied. In addition, the machine has oil tubes 20 and 21 leading to other bearings or relatively movable parts (not shown) which are to be lubricated.

For the purpose of feeding oil through the tubes 18, 19, 20 and 21, capillary wicks 22, 23, 24 and 25 are provided, extending respectively through the oil tubes. The tubes 20 and 21 are shown as extending upward directly into the reservoir 10, passing through the bottom 11 thereof, the said bottom having upright bushings 26 and 27 into which the upper portions of the oil tubes are disposed.

In accordance with the present invention, actuatable means are provided, connected with the wicks 22—25 and with the housing 14 (and therefore the reservoir 10) for shifting the end portions of the wicks whereby said portions may be maintained in a relatively deep position in the reservoir as shown in Fig. 1, or in a raised, relatively high position out of contact with the oil in the reservoir as shown in Fig. 2. This means comprises a movable plate or shelf 28 secured to the lower end of a plunger or slide bar 29, the latter being slidably carried in a bearing 30 secured to the housing 14 of the machine. The slide bar 29 extends above the bearing 30 and has a knurled top portion 31 whereby it may be readily grasped by the hand, and raised or lowered.

The shelf 28 is preferably formed somewhat like a screen, being provided with perforations 32 as shown in Fig. 2, to enable oil to pass through it, and is recessed at its edges to clear the upright bushings 26 and 27 carried by the bottom 11 of the reservoir. According to the invention, the end portions of the wicks 22—25 are secured to the shelf 28 to be shiftable therewith, so that when the shelf is in its lowered position as shown in Fig. 1 the end portions of the wicks will be immersed in the oil of the reservoir and when the shelf is in its raised position as shown in Fig. 2 the wicks will be lifted out of the oil. To enable the wick portions to be quickly and securely attached to the top of the shelf 28, the latter is provided with an elongate spring clip 33 which is adapted to clamp the wicks against the upper shelf surface.

It should be understood that the wick portions may be secured to the shelf 28 by other means than the spring clip 33 shown. For example, the wick portions may be passed back and forth or laced through a series of openings in the shelf, or may be tied to the shelf by individual clips or wire clamps. Also, any two wicks may be formed from a single continuous piece of wicking, in which event an intermediate portion of the wicking would be secured to the shelf 28, the remaining portions then extending through the oil tubes to the desired bearings or other machine parts.

For the purpose of yieldably holding the plunger 29 and shelf 28, together with the attached wicks in their raised positions, a simple and effective detent means is provided, comprising a wire spring 34 secured at one end to the housing 14 of the machine, the other end of the spring extending through a cut 35 in the bearing 30 so as to engage the plunger, and the latter is provided with an annular groove 36 adapted to be cooperable with the spring 34. When the plunger 29 is raised to the position shown in Fig. 2, the spring 34 will engage the groove 36 and retain the plunger in its raised position, together with the shelf 28 and attached wicks.

The above organization of the present invention provides an efficient and effective simultaneous control of lubrication of a number of bearings or other machine parts which are fed oil through capillary wicks, since a number of such wicks may be readily simultaneously immersed in the oil to enable them to supply the machine parts, or lifted from the oil to prevent their removing more of the same from the reservoir. It will be understood that if the machine should be started and run while the wicks are inadvertently left in raised position, out of contact with the oil of the reservoir, a certain amount of residual oil in the wicks will be available to the various moving parts of the machine to prevent damage thereto for an interval of time, during which the machine operator will have an opportunity to observe that the oiling system is not in operative condition. Visual observation of such condition is readily had, being indicated by the raised or lowered position of the plunger 29.

The control by which the capillary wicks are actuated has but very few parts, all of which are of extremely simple construction. Thus the device is economical to fabricate, and by virtue of the few moving parts is extremely reliable in its operation. In addition, the device is adaptable to control a relatively large number of capillary wicks, yet is extremely compact and of relatively small size. By the provision of the plunger 29 extending through the top of the housing 14 at an accessible location, the oiling device may be very easily actuated to turn it on or shut it off.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a sewing machine, an overarm frame; an oil reservoir carried by the frame; a plurality of bearings on the frame; a plurality of capillary wicks, each having a portion engaging a bearing on the frame to deliver oil thereto; and means slidably carried by bearing means at the top of the frame for supporting other portions of the wicks for immersion in the oil of the reservoir, said means including a slide bar projecting above the frame and movable in said bearing means and having finger grip means at the outer end and at the inner end a perforated shelf located over and broadside to the bottom of the

reservoir, said shelf being provided with means to secure the other portions of the wicks thereto to project upwardly therefrom, said slide bar and shelf moving said other wick portions between either a deep position in said reservoir in contact with the oil, or a high position in said reservoir out of contact with the oil, and spring detent means engaging the slide bar to yieldably hold the bar in raised position.

2. The invention defined in claim 1 in which at least some of the wicks have their ends in engagement with the bearings and the midportion secured to the shelf.

3. The invention defined in claim 1 in which the means to secure the wicks to the shelf comprises a spring clip yieldably clamping the wicks to the upper surface of the shelf.

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