

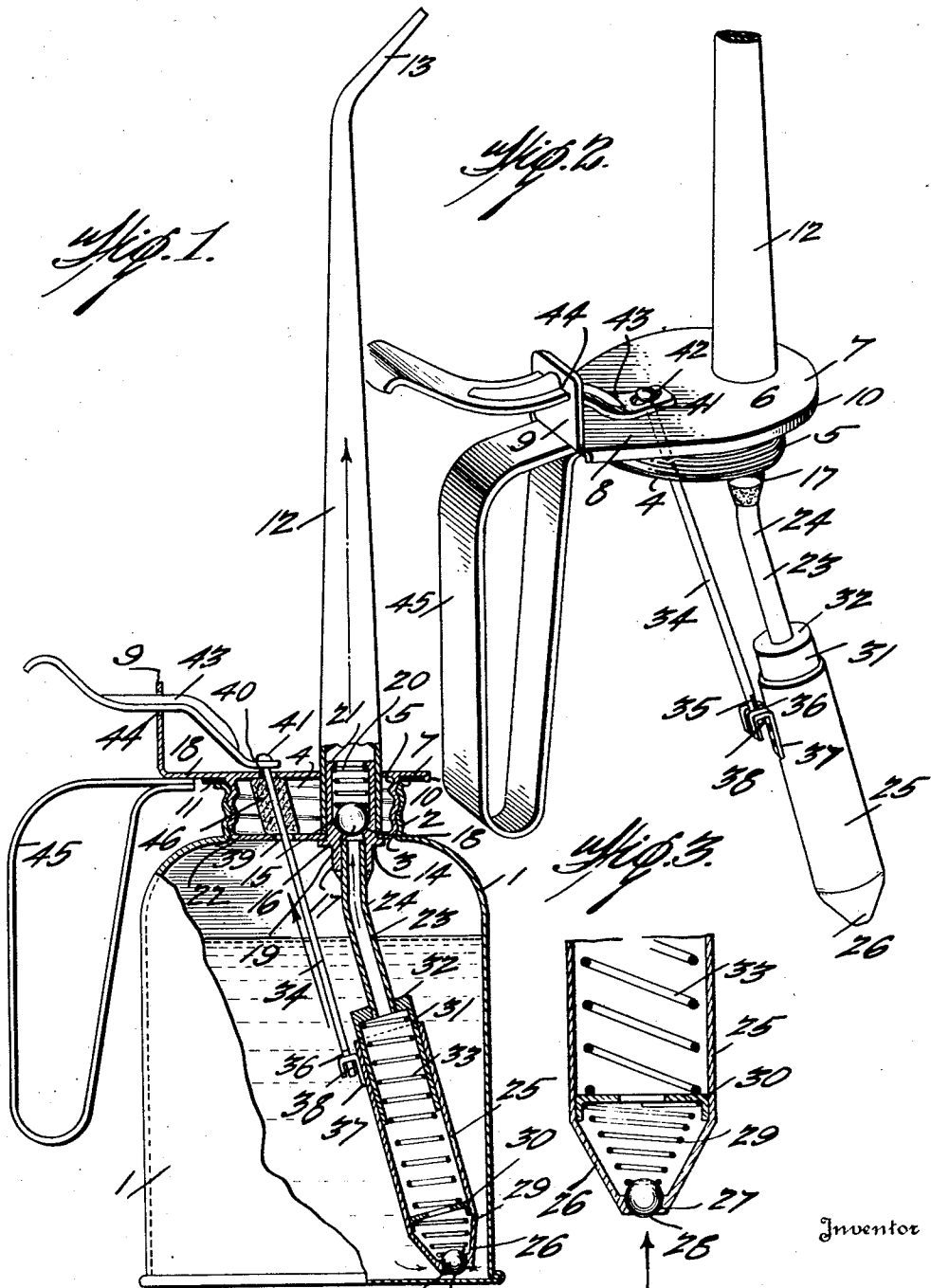
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HAND OILER

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HAND OILER

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This invention is directed to an improvement in hand oilers and particularly hand oilers of that type in which the oil or other fluid may be ejected under pumping pressure from the interior of the oiler through manual operation and at will.

It has been heretofore proposed to provide a hand oiler in the form of a container having a delivery spout, within which container there is arranged cooperating elements providing a pump, with the movable element of the pump remotely operated at the will of the user by a finger-piece conveniently accessible in all positions of the oiler, so that oil may be delivered at will under more or less pressure from the spout.

In all such hand oilers with which I am familiar there are objections and disadvantages from the practical standpoint which it is the aim and purpose of the present invention to obviate. For example, in such previous oilers the pumping assembly has been made up of two cooperating elements arranged in telescopic relation for relative movement and these elements have ordinarily been formed of tube-like sections, the sections being of relatively thin material with attendant liability to distortion under slight strain, with the result of a more or less inaccurate fit and a consequent loss of pressure and inadequate pumping pressure.

The present invention, with a view to avoiding this objection, provides a pumping assembly made up of interfitting relatively movable parts, with such parts of substantial thickness to avoid distortion under ordinary stresses and more particularly carefully machined to insure an absolutely accurate sliding interfit which will positively preclude leakage between the parts during operation.

Furthermore, the movable member of the pumping assembly is operated through an element leading through the spout carrying cap for the container. As the oiler is frequently used in an inverted or substantially inverted position, or at least with the spout downwardly inclined, there is more or less oil accumulated on this element in the successive operations of the pump and this oil finds its

way to the outer surface of the cap and gradually works down outside the container to present an oily accumulation around the container wherever it may be deposited.

A further object of the present invention is the provision of means whereby the element, which extends from the pumping assembly to the manually operable member exteriorly of the oiler, is continually wiped free of any accumulated oil, and thus the possibility of the oil reaching the exterior of the cap through this source is entirely eliminated.

Oilers of this type as previously constructed present a spout carrying cap which is threaded exteriorly of an upstanding rim on the container. When the oiler is in inverted position, oil accumulates at the juncture of the cap and container rim and when the oiler is restored to an upright position, this oil percolates between the cap and rim exteriorly of the latter and flows down outside of the container, with a resultant oily deposit around the container.

The present invention overcomes this objection by making the spout carrying cap as a hollow receptacle closed except for the opening through which the pump operating element passes and arranges this hollow cap for threaded cooperation interiorly of the rim rising from the container proper. Any oil accumulating against this cap when the oiler is inverted in use will accumulate within the hollow cap or if accumulated between the hollow cap and rim, will flow back into the container both from the hollow cap and from a position between the hollow cap and rim, so that there is no possibility of oil reaching the exterior of the container from these sources and hence there is no likelihood of an oily deposit around the oiler when on the shelf or other support.

A further object of the present invention is the provision of a cap closure in the form of a plate through which the spout extends, this plate having a diameter materially greater than the flange of the container, so that the plate serves as a convenient receiver for a gasket and at the same time affords a protection against distortion of the flange of the container or of the threaded connection if

the oiler is accidentally overturned or brought forcibly into contact with the various parts of the machine being oiled during the oiling operation.

5 The invention is illustrated in the accompanying drawings, in which:

Figure 1 is a vertical sectional view, partly in elevation, of the improved hand oiler.

10 Figure 2 is a perspective view showing the cap, protecting cap plate, pumping assembly and spout, which parts constitute in effect a unit bodily separable from the container.

15 Figure 3 is an enlarged broken sectional view showing a portion of the pumping assembly and the valve which cooperates therewith.

20 The improved hand oiler comprises a container 1 which, while preferably of the shape shown, may obviously be of any appropriate outline form. The container is of gradually reduced diameter in its upper portion with the wall terminating in an annular upstanding flange 2 defining an opening 3 leading from the container, the flange being threaded.

25 A pumping unit is designed for removable connection with the container and includes a hollow cap 4, the side wall 5 of which is threaded for cooperation interiorly of the container flange 2. The hollow cap is closed at the upper end by a cap plate 6 which is preferably of somewhat more rigid metal than the remainder of the hollow cap and has a diameter exceeding that of the cap to present a marginal flange 7 which overlies and extends appreciably beyond the flange 2 of the container, as clearly shown in Figure 1 of the drawings.

30 This cap plate 6 is radially enlarged or extended, as at 8, and terminally provided with an upstanding wall 9 to support the finger lever, as will later appear. The cap plate throughout its margin, other than that of the wall 9, is formed with a downturned edge flange 10 which not only serves to stiffen the plate but provides between said flange 10 and the wall 5 of the hollow cap 4 a space for the reception of a gasket 11 against which the upper edge of the flange 2 of the container bears in the assembling of the parts to thereby insure a non-leaking engagement at this point.

35 The cap plate 6 forms a supporting element for the delivery spout 12 which is constructed of appropriate length and of gradually decreasing diameter upwardly, terminating in a laterally bent or if preferred straight delivery end 13, as is usual in this type of device.

40 A nipple 14 is secured in the cap 4, comprising a hollow section 15 of an exterior diameter to fit frictionally within the lower end of the spout 12, the nipple including a flange 16 at the lower end of and projecting beyond the section 15, and a depending section 17 of less diameter than the section 15. The junction of the sections 15 and 17 within the nipple

is formed to provide a valve seat 18, an upwardly opening ball or other valve 19 being arranged to normally cooperate with such seat under the influence of a coiled spring 20, the lower end of which bears on the valve while the upper end engages beneath an inverted edge 21 at the upper end of section 15.

70 The nipple is secured in the cap 4 with the flange 16 underlying the lower wall 22 of the cap, the juncture being sealed and secured as by solder. The section 15 extends through the cap to receive the lower end of the spout, while the section 17 depends from the cap to receive and support the pumping assembly. A pipe section 23 is fitted at its upper end within the section 17 of the nipple, the juncture being sealed and secured, and this pipe, preferably formed with a slight bend at 24, depends into the container.

75 The pumping assembly proper includes a movable cylinder 25 of materially greater diameter than that of the pipe 23, this cylinder being open at its upper end and protruded at its lower end to form a conical terminal 26, the apex end providing a centrally arranged opening 27 normally closed against pressure from within the cylinder by a valve 28, such as a ball, with the valve resiliently held to its seat by a spring 29 bearing between the valve and a flange 30 overlying the valve.

80 The cooperating or plunger member of the pumping assembly is in the form of a hollow, cylindrical sleeve-like member 31 open at its lower end and closed at its upper end except for a threaded opening 32 through which this plunger is removably connected to the lower open end of the pipe 23. A spring 33 bears between the closed upper end of the plunger and the closed lower end of the cylinder and serves to normally maintain these parts at their limit of relatively opposite and separating movement.

85 A characteristic feature of the present invention is in the provision of the cylinder and plunger to insure cooperation against possible distortion under usual stresses and an accurate sliding fit in all relative movements. To secure this, the cylinder 25 is made of an appropriate length of tubing having a wall of appreciable thickness, and the plunger is constructed with a wall of materially greater thickness than that of the cylinder. The interior of the cylinder and the exterior surface of the plunger are carefully and accurately machined to insure a mechanically perfect sliding fit; that is to say, the interfit of the parts is so perfected mechanically that there is substantially a non-leaking fit between the plunger and cylinder in all positions of these parts and particularly during the pumping operation.

90 This not only avoids the possibility of leakage, which is a decided disadvantage of prior construction, but avoids the necessity of utilizing a film of oil to seal the cooperation of

these parts, as is also required in the previous structures. This latter disadvantage of the previous structures is quite apparent in the operation of such oilers, for a very considerable pumping operation is necessary in such oilers to establish this seal and start the pumping of the oil where the oiler has not been in use for an appreciable period.

It has been stated that the pipe section 23 is bent or slightly deflected at 24. This with the relative lengths of such pipe section 23 and pumping cylinder 25 causes the lower conical end of such cylinder, when in its normal position, to rest substantially at the juncture of the bottom and side wall of the container 1 in that portion of the container which is lowest when the container has been turned into a position to deliver through the deflected end 13 of the spout. This co-operation is materially facilitated by the conical end of the cylinder 25, and insures the practical delivery of substantially all of the oil in the container by the pump.

With the present construction and incident to the careful machining of the parts to secure the desired non-leaking sliding fit, the pumping assembly starts pumping delivery of the oil immediately the pump is operated, and it has been found that the oil remaining in the pumping assembly and in the spout after use of the oiler will remain in these parts for a very considerable period after use of the oiler, so that the pumping assembly of the present construction may be said to be continually primed for operation as distinguished from the necessity for such priming at each operation of the prior devices.

The cylinder which constitutes the movable element of the pumping assembly is designed to be manually operated at will and for this purpose there is provided a rod 34, the lower end of which is reduced in width at 35 and fitted between spaced ears 36 carried on a plate 37 secured to the cylinder near the upper end thereof, the ears 36 being downturned to prevent lateral movement of the enlarged end 38 of the rod in the operation of the parts while at the same time permitting ready disconnection of the rod and cylinder whenever such operation is desired. By reason of the inclination of the pumping assembly, the rod 34 may extend in a straight line through the cap.

The rod extends through an opening 39 in the bottom wall of the hollow cap and through an opening 40 in the cap plate 6. The upper end of the rod is headed at 41 and passes through an opening 42 in the inner end of a finger lever 43 in the form of an appropriately bent strip which passes through a transversely elongated opening 44 in the upstanding wall 9 of the cap plate, the free end of the finger lever projecting beyond this wall and being downturned to avoid edge contact with the thumb or finger of the user. The

lower margin of the opening 44 forms a fulcrum for the finger lever and obviously the depression of the free end of this lever by the finger or thumb of the user will reciprocate the cylinder 25, the lever operating the cylinder in one direction and the spring 33 operating it in the opposite direction.

Secured to the cap plate, and more particularly to the underside of the radial extension 8 thereof, is a strip 45 bent into loop form and extending down alongside of and in spaced relation to the container to provide a handle. This handle immediately underlies the free end of the finger lever 43 and affords a means for supporting the container by grasping the handle with the hand with the thumb overlying the finger lever for convenient operation of the pump.

It is noted that all parts described other than the container constitute in effect a unit assembly in that they may be removed from or applied to the container as a unit and thus rendered conveniently accessible for repair or replacement. Furthermore, the pumping assembly including the pipe 23 is deflected from the vertical and in the same direction as that of the delivery end 13 of the spout. Thus, when the oiler is turned to deliver from such spout end, the pumping assembly projects toward the lowest point of the liquid body within the container and will thus insure delivery of oil even with a very small quantity of the latter within the container.

As previously stated, an objection to the previous constructions is the constant accumulation of oil on the rod 34 which gradually reaches the exterior of the cap and flows down the exterior of the container. In order to avoid this possibility, the present construction includes a felt or similar body 46 encircling the rod 34 within the hollow cap 4. This felt or like washer is held between the upper and lower walls of the cap and substantially covers the opening 39 in the lower wall 22 of the cap. This washer continually wipes any accumulated oil from the rod 34 and compels such oil to flow back through the opening 39 into the container. Thus, the rod in that portion projecting above the cap plate 6 is continually dry so far as oil accumulations are concerned and there is no possibility of oil from this source reaching the exterior of the container.

Furthermore, as frequently happens when the container is inverted or even tilted from the horizontal, the tendency of oil to flow between the flange of the container and the cap is, in the previous constructions, a source of annoyance because in such constructions the cap is on the exterior of the container flange and the oil accumulating at the upper end of the cap will naturally flow down on the outside of the container. In the present construction, the cap fits within the flange and the free edge of the flange is in sealed

contact with the cap plate. Any oil which might accumulate between the cap and flange cannot escape over the edge of the flange to flow down the outside of the container but must find its way back into the container when the latter is returned to upright position.

Furthermore, any tendency of oil to pass over the flange, particularly when the oiler is inverted, is taken care of by the hollow cap, for such oil will find its way through the opening 39 past the washer 46 and will accumulate in the hollow cap 4 and when the oiler is returned to normal upright position, this oil within the hollow cap will gradually seep back into the container. Therefore, the hollow cap combined with the gasket 46 has the important function of preventing any leakage of oil over the edge of the flange of the container or reaching the top of the cap plate. Therefore, under this construction the exterior of the container and the cap plate will remain free at all times of accumulated oil and the objectionable oily deposit following such leakage, as in prior structures, is entirely avoided.

In the operation of the oiler, the depression of the finger lever moves the cylinder 25 upwardly against the tension of the spring 33, ejecting the contained air through the spout 12 past the valve 19. On releasing the pressure on the finger lever, the cylinder 25 moves downwardly under the stress of spring 33 and the oil in the container flows past the valve 28 and into the cylinder. On the next stroke of the cylinder this oil is raised by the cylinder and forced upwardly into the spout 12 past the valve 19, the successive pumping movements of the cylinder accumulating sufficient oil in the spout to force the same through the spout outlet 13, the valve 19 of course preventing return flow. It is noted that the oil beyond the cylinder 25 is forced through a greatly restricted passage, namely that of the pipe section 23. This tends to increase the flow of the oil passing into the spout, so that by the similar pumping operation, the oil may be ejected a considerable distance beyond the spout outlet 13, or in other words, delivered with a desirable force frequently found necessary in oiling operations.

It will be noted that the flange 30, ball valve 28 and springs 29 and 33 are in no way fixed within the cylinder 25, so that when said cylinder is separated from the pump assembly, these parts may be readily removed by inverting the cylinder to thereby facilitate cleaning. Furthermore, this particular relation of parts insures ease and simplicity of assembling, as will be apparent.

What is claimed to be new is:

1. In a hand oiler with pump delivery, a container, a cap removably secured thereto, a spout rising from the cap, a pumping as-

sembly arranged within the container, said pumping assembly including a cylinder and a plunger mounted for relative movement and machined for a substantially non-leaking sliding interfit, a pipe section of materially reduced diameter with respect to the plunger of the pump assembly, said pipe being carried by the cap and removably connected to the plunger and providing intermediate the pump assembly and spout a means for increasing the pressure of delivery, and means carried by the cap for operating the pump assembly.

2. In a hand oiler with pump delivery, a container, a hollow cap removably fitted within a flange rising from the container, a spout extending through and beyond the cap, a pipe section of less diameter than the spout and extending below the cap, a pumping assembly removably carried by the pipe section, a rod connected to the pumping assembly and passing through and beyond the hollow cap, a finger lever for operating the rod, and means within the hollow cap to wipe the rod clear of oil in the movement of the rod under the finger lever, whereby oil is prevented from reaching the exterior of the cap on the rod.

3. In a hand oiler with pump delivery, a container having an upstanding threaded flange, a hollow cap adapted to fit within and have threaded connection with said flange, a spout rising from the cap, a pipe section of restricted diameter depending from the cap and in communication with the spout, a pumping assembly removably carried by the lower end of the pipe section, a rod connected to and serving to operate the pumping assembly, said rod extending through the hollow cap, a finger lever mounted on the hollow cap and connected to said rod, and a wiping gasket encircling the rod within the hollow cap.

4. In a hand oiler with pump delivery, a container having an upstanding threaded flange, a hollow cap adapted to fit within and have threaded connection with said flange, a spout rising from the cap, a pipe section of restricted diameter depending from the cap and in communication with the spout, a pumping assembly removably carried by the lower end of the pipe section, a rod connected to and serving to operate the pumping assembly, said rod extending through the hollow cap, a finger lever mounted on the hollow cap and connected to said rod, and a wiping gasket encircling the rod within the hollow cap, said hollow cap being closed against the spout and providing a temporary reservoir for the reception of excess oil during the inversion of the oiler, the hollow cap and container being in communication to permit the oil accumulating in the hollow cap to flow back into the reservoir when the oiler is upright.

5. In a hand oiler with pump delivery, a container, a cap removably secured thereto, a spout rising from the cap, a pumping assembly arranged within the container, said
5 pumping assembly including a fixed cylinder and a plunger mounted for relative movement on the outside of the fixed cylinder and machined for a substantially non-sliding interfit, a pipe section of materially reduced
10 diameter with respect to the plunger of the pump assembly, said pipe being carried by the cap and removably connected to the plunger and providing intermediate the pump assembly and spout a means for increasing the
15 pressure of delivery, a spring between the plunger and cylinder to normally force the plunger away from the cylinder, a rod connected to the plunger and extending through the cap, and a handle mounted on the cap and
20 connected to the rod to operate the plunger in the pumping operation in opposition to the spring.

6. In a hand oiler with pump delivery, a container having an upstanding neck flange,
25 a hollow cap fitted within and connected to said flange, said cap including a top plate having a diameter in excess of the diameter of the flange and having its marginal edge turned downwardly to provide a guard for
30 the flange and cap connection and provide a seat for the reception of a sealing gasket for the flange, said cap plate being radially extended and having a projecting portion provided at its end with an upturned lug, a
35 spout carried by and extending through the cap, a pump depending from the cap, said pump including a pump barrel and a restricted tube between the barrel and the spout, a pump operating rod extending
40 through the hollow cap and above the cap plate, a finger lever fulcrumed on said lug and connected to said rod for operating the pumping assembly, and a handle formed of a bent strip of metal having its two ends connected to the projecting portion of the cap
45 plate and extending downwardly adjacent the body of the container.

In testimony whereof I affix my signature.
SAMUEL O. PAULL.

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