March 9, 1937. H. J. HERSEY, JR., ET AL 2,073,009

OILER FOR TOOLS OPERATED BY FLUID PRESSURE

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FIG. 2.

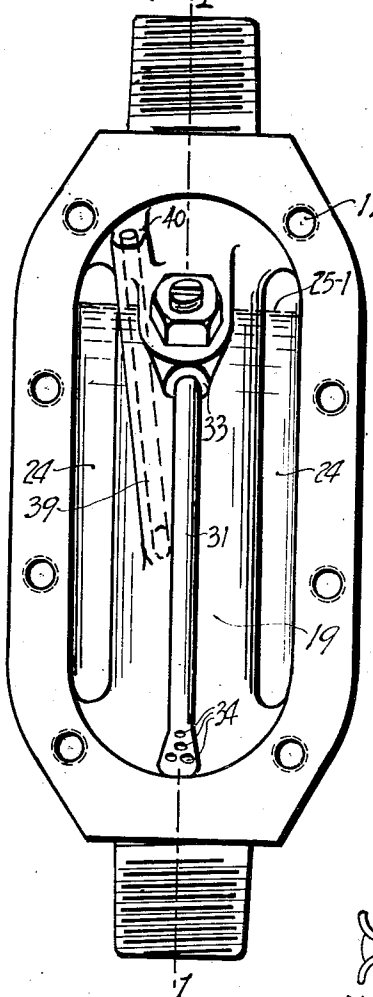


FIG. 1.

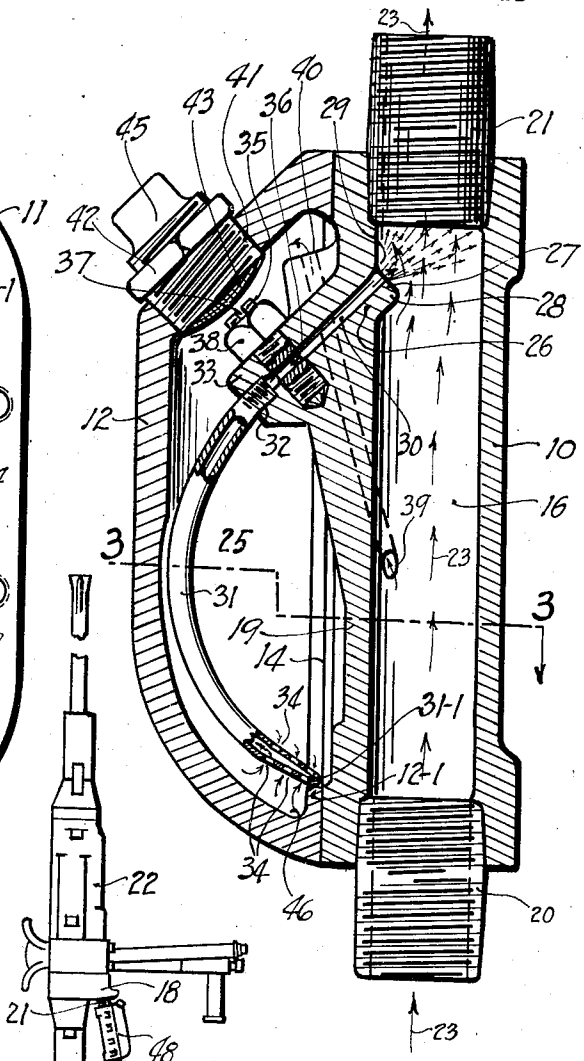
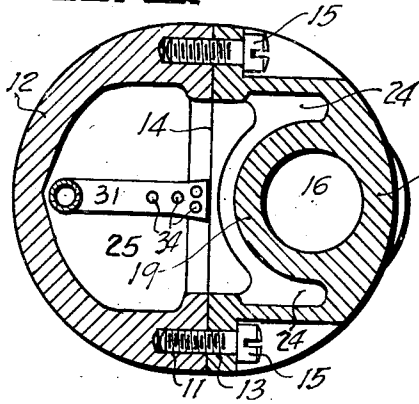


FIG. 4.

FIG. 3.



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OILER FOR TOOLS OPERATED BY FLUID PRESSURE

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4 Claims. (Cl. 184—55)

This invention relates to an oiler for tools operated by fluid pressure, and more particularly, for compressed-air rock drills, pneumatic hammers, and so on, although not necessarily restricted thereto.

The principal objects of our invention are to provide:

First. An oiler that is light in weight and comparatively small in size, so that it can be conveniently attached to the tool itself.

Second. An oiler which shall provide normal drainage in almost every position, and be provided with a sediment trap.

Third. An oiler in which drain-back of oil into airline is prevented when air is shut off.

Fourth. A valve construction that cannot readily be tampered with, or adjustment changed by operator.

Fifth. An oiler in which the main air passage is practically unrestricted and the oil is efficiently emulsified and atomized upon entering the main air stream.

Sixth. A construction that is simple, durable and inexpensive.

In attaining these objects, we provide a body or housing structure composed of a base, and a tightly fitting cap, preferably made of aluminum. Extending longitudinally through the base, is a passage of generous dimensions forming a part of the main airline leading to the tool to which the oiler is attached. Between the passage walls and the housing walls are recesses, which, together with an ample recess in the cap, constitute an oil reservoir. From a point near the bottom of the reservoir, where it has its intake, a small conduit or pipe tangent to the inside surface of the cap leads up into the main air passage, and has its upper terminus in a spraying or atomizing nozzle near the upper end of the main air passage while its lower tip is provided with an intake tip for oil. The nozzle extends into the main air passage in the shape of a slight protruberance, and constitutes a shield against which the oncoming air impinges and acts in the capacity of an ejector to create a suction drawing oil from the reservoir and projecting it into the air passage as an emulsifying spray. In order to equalize the air pressure in the oil reservoir, a small vent conduit extends from a point in the main air line somewhat below the oil discharge mouth, into the upper part of the oil reservoir.

At a suitable point along the oil conduit, may be disposed a regulating valve accessible through a removable plug in the cap. The oil conduit and the air-vent conduit, together with the regulating valve, are preferably disposed in the base structure, self-contained therewith, and conveniently accessible when the cap is removed from the base. This accessibility is especially desirable for cleaning.

The features of this invention for which the protection of Letters Patent of the United States is desired, are collectively grouped in the claims concluding this specification.

In the drawing,

Fig. 1 represents a vertical section taken along the line 1—1 in Fig. 2;

Fig. 2, an elevation of the base, the cap being omitted;

Fig. 3, a horizontal section taken on line 3—3 in Fig. 1; and,

Fig. 4, an outline sketch showing the oiler attached to an ordinary compressed air rock drill.

Referring to the drawing, the numeral 10 denotes the base, and the numeral 12 the cap, of the oiler, the plane of separation between the two being along the line 14 The coinciding faces of the base and cap are preferably ground perfectly true and smooth, and before assembling them, they are covered with a suitable soft gasket compound, being then tightly drawn in place by any suitable means, for instance, screws 15, extending through holes 13 of the base and threaded in holes 11 in the cap.

Through the base from bottom to top extends a passage 16, Fig. 1, which may form the continuation of the airline between the hose 17, Fig. 4, and the connection 18 of an ordinary compressed air drill 22. The air flows in the direction of the arrows 23, Fig. 1.

The passage 16 is defined within a barrel 19, into the ends of which, may be screwed the nipples 20 and 21 to receive the connections from the hose 17 and the drill 22, respectively. A reservoir for oil may be provided in proximity to the passage 16 in any suitable manner, for example, by means of recesses 24 on both sides of the barrel, and recess 25 in the cap 12. A suction nozzle 26 opens into the passage 16 for the purpose of injecting a spray of oil into the passing stream of compressed air. This nozzle is so disposed, that as the current of compressed air flows past, the current has the tendency to produce a vacuum just in front of the nozzle tip 27, whereby oil is sucked through the nozzle on the ejector principle in a manner that is well known.

In the present instance, a portion 28 protrudes into the main air passage and deflects the air current in the vicinity of the nozzle tip, as indicated by the larger arrows, Fig. 1, tending to produce a vacuum in the angular niche 29, and therefore drawing in the oil which emerges from the nozzle as a fine spray, indicated by the smaller arrows. The oil spray is thoroughly mixed with the air stream, thereby forming an emulsion flowing directly into the drill mechanism with almost no possibility of condensation before reaching the working parts of the drill.

The oil nozzle may be connected with the lower part of the oil reservoir by means of a duct 30 and a tube 31, the latter forming a continuation of the duct. The tube is preferably screwed as at 32, into the structure 33, and further is preferably curved so that its tip 31—1 contacts the portion 12—1 of the cap as indicated in Fig. 1. In this position the tube is free from contact at all other points but is under tension due to the portion 12—1 being stressed against the tip 31—1 as the cap 12 is drawn against the base when tightening the screws 15. This tension causes the curved tube to be positively held in place, and prevents the jar and rattle of the drill in operation, from shaking the tube loose.

Oil from the reservoir is drawn into the tube through holes 34, and the amount of oil that enters, may be closely regulated by a valve 35, having a port 36. The valve 35 is preferably threaded, and at 37 may be slotted for engagement by a screwdriver. When properly adjusted, the valve may be secured in place by a locknut 38.

In order to equalize the air pressure in the oil reservoir and in the main air passage, a vent duct 39 is provided which preferably extends from a point intermediate the oil nozzle and the lower end of main air-passage 16, up to a high level, such as 40, in the oil reservoir.

The oil reservoir may be filled through an opening 41 to any desired level 25—1, and into this opening may be threaded an ordinary pipe bushing 42 having a screen 43 across its lower circumference to guard as much as possible against the entry of dirt into the reservoir. As a closure for the reservoir, a pipe plug 45 may be removably screwed into the bushing.

A small recess at 46 provides a trap for sediment which may be cleaned out by removing the cap 12. The removal of the cap also provides access to every part of the oiler for cleaning it, but at the same time is rendered sufficiently tedious that the usual operator in the field does not care to attempt any tampering with adjustment of the oiler.

It will be noted that the oil duct and the vent duct are both so located and arranged that drainage of oil from the reservoir in the usual working positions of the drill, does not occur when the compressed air is shut off.

Some of the advantages accruing through the use of the present device may be appreciated by reference to Fig. 4 where the drill 22, is shown supported on a standard 47 in an ordinary working position, and the location of our improved oiler with reference to the drill, is indicated at 48, close up to the drill and so as to be carried around with it as an integral part thereof. This is made possible because of the small size and light weight of our oiler.

In the operation of the drill, the close proximity of the oiler to the working parts of the drill, is a great advantage because the emulsified oil does not have a chance to be condensed before reaching the operating parts. This cures a fault which exists in oilers as heretofore constructed, because of their excessive weight, and the necessity of attaching them to the air hose at a considerable distance away from the drill, generally about ten feet, and often fifty feet.

While minor details are herein specifically shown and described, it is to be understood that these may be changed from time to time, as required by individual circumstances, so long as they come within the spirit of the following claims.

Having fully described our invention, what we claim is:

1. An oiler for compressed air tools and the like, including a body portion having a main air passage therein, a cap disposed axially along the body portion and separably joined thereto along a plane, an oil reservoir defined at least partially by and within the cap in proximity to the main air passage, a suction nozzle opening into the main air passage, a curved depending oil conductor provided with an intake tip and extending from the nozzle into the lower interior of the cap in such a manner that the inside surface of said cap is tangent to the curve of the oil conductor, and the intake tip of the oil conductor has a bearing in proximity to the joint plane, and an air duct extending from said main air passage into the upper interior of the said cap.

2. An oiler for air tools and the like, including a body portion having a main air passage therein adapted to form part of an airline leading to an air tool, a cap disposed axially along the body portion and separably joined thereto along a plane common to and coextensive with the body portion and the cap, a nozzle extending into the main air passage near the upper end thereof, said nozzle having a protruding portion in front thereof for deflecting the air current past the mouth of the nozzle, an oil reservoir defined by and between the body portion and the cap and located below the nozzle, a curved conduit extending from the nozzle into the lower part of the reservoir, the curve of said conduit being tangent to the inside surface of the cap and the said conduit being provided with an intake tip having a bearing in proximity to the joint plane, and an air duct extending from a point intermediate the lower part of the reservoir and the nozzle mouth to a point in the upper part of the said oil reservoir.

3. An oiler for compressed air tools, including in combination, a base having a main air passage therein and a plane face on the outside extending axially along the main air passage, an air nozzle extending into the main air passage near the top thereof, said nozzle having means effective to cause a current of air flowing through the said main air passage to create a suction through the nozzle, a cap suitably recessed and having a joint face coinciding and coextensive with the plane face of the said base, a reservoir space for oil in said cap, a curved oil pipe tangent to the inside surface of the cap and extending from the lower part of the said reservoir to the nozzle, said oil pipe being provided with an intake tip having a bearing in proximity to the joint face, and a regulating valve disposed in the said base in cooperative relation to said nozzle.

4. An oiler, including in combination, a base having a main air passage, a cap separably joined to the base so as to define in common a reservoir for oil, a nozzle leading from the upper reservoir space into the main air passage, and a curved resilient tube fixed in the reservoir end of the nozzle so as to extend into the lower reservoir space, the said cap being adapted when in place, to contact and stress the said curved resilient tube.

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