Nov. 5, 1940. E. F. TERRY 2,220,301

OILING DEVICE

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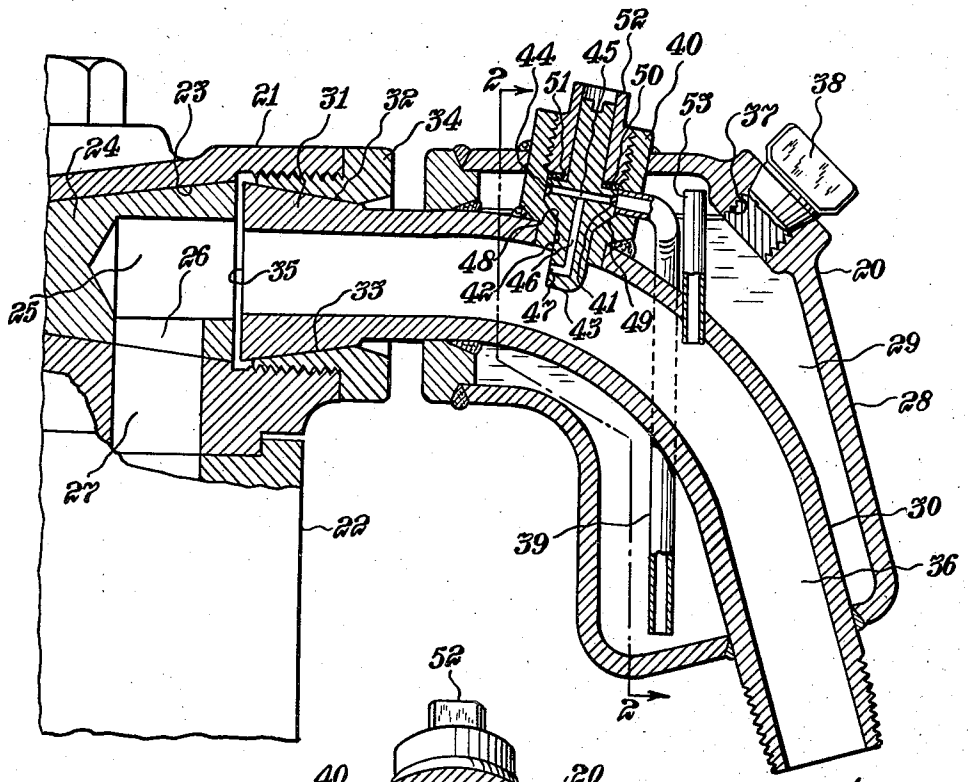


FIG.-1.

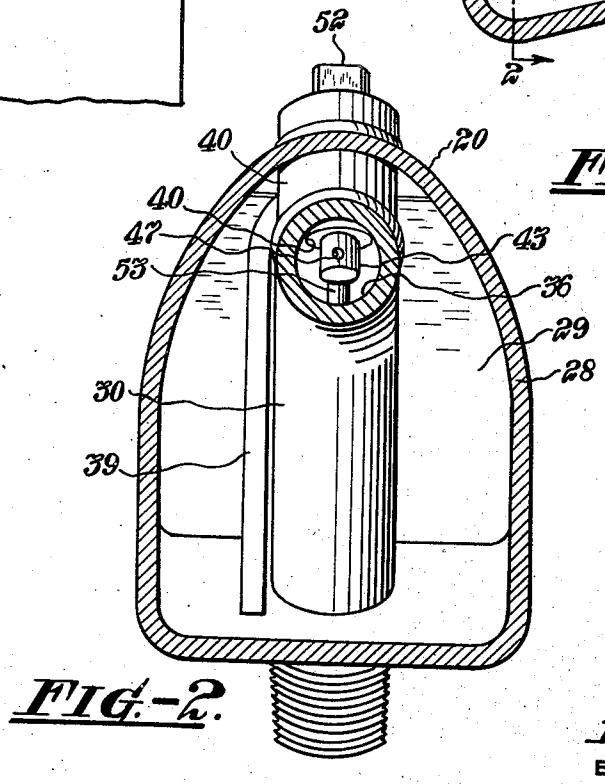


FIG.-2.

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OILING DEVICE

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2 Claims. (Cl. 184—55)

This invention relates to oiling devices, and more particularly to an oiling device for metering oil into the pressure fluid stream flowing to pneumatically actuated tools.

One object of the invention is to assure the retention of oil vapor in suspension in the pressure fluid entering the tool so that oil will be carried in that state to all the bearing portions of the tool to which the pressure fluid has access.

Another object is to assure a favorable operative position for the oiling device in all the various positions which the tool carrying the oiling device may assume during operation.

These and other objects may be readily accomplished by attaching the oiling device swingingly directly to the pneumatic tool so that the distance between the parts to be lubricated and the point at which the oil is introduced into the pressure fluid stream is maintained as short as possible. The oil will then remain in suspension in the pressure fluid until the pressure fluid reaches the various chambers and cavities of the tool to which it has access and a uniform distribution of the oil to the parts requiring it will thereby be effected.

By reason of this arrangement the undesirable occurrence of oil gravitating to the wall of the pressure fluid supply conduit and being impelled therealong in the form of a stream by the pressure fluid will be entirely eliminated. By being swingingly attached to the tool the oiling device will, moreover, act as a pendulum and readily swing into a position in which the various ports and passages of the oiling device serving to effect the delivery of oil into the pressure fluid stream will always assume the positions best suited to assure uniformity of oil delivery.

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, partly in section, of an oiling device constructed in accordance with the practice of the invention and a portion of a pneumatic tool to which the oiling device is attached, and

Figure 2 is a transverse view taken through Figure 1 on the line 2—2.

Referring more particularly to the drawing, the oiling device, constructed in accordance with the practice of the invention and designated in general by 20, is shown attached to a pneumatic tool of which the back head 21 and the cylinder 22 are shown as casing parts.

The back head 21 may be attached to the cylinder 22 in any convenient manner and has a tapered bore 23 constituting a valve chamber to accommodate a throttle valve 24. The throttle valve is of the rotary type and has a longitudinally extending passage 25 from which radiates a port 26 for conveying pressure fluid to a supply passage 27, in the back head and the cylinder, leading to a suitable distributing valve mechanism (not shown) but which may be located in the rearward end of the cylinder 22.

The oiling device 20 comprises a receptacle or casing 28, of angular shape, the interior of which constitutes a reservoir 29 for oil, and extending through the reservoir is a "gooseneck" or angle-connection 30 which may constitute the end portion of a pressure fluid supply line and is attached directly to the pneumatic tool, as for example to the back head 21.

In order to assure a pendulum action of the oiling device so that the casing 28 will readily assume a vertical position in the various positions of operation which the pneumatic tool may occupy the angle-connection is attached swingingly to the back head. To this end the terminus of the angle-connection is provided with an enlargement 31 within extends into the end of the bore 23 and has a tapered surface 32 which seats upon a correspondingly shaped bearing surface 33 within a plug 34 threaded into the end of the bore 23.

The surfaces 32 and 33 cooperate with each other to prevent leakage of pressure fluid from the bore 23 to the atmosphere and will be maintained in sealing engagement with each other by the pressure fluid flowing through the angle-connection 30 and acting against the end of said connection which constitutes a pressure surface 35.

The oil intended to be delivered from the reservoir 29 into the passageway 36 in the angle-connection, and which oil may be introduced into the reservoir through an opening 37 normally sealed by a plug 38, is conveyed from the reservoir by a conduit 39 having one end located near the bottom of the reservoir. The opposite end of the conduit is attached to a plug 40 extending through the walls of the connection 30 and the casing 28.

The plug 40 is hollow, having a bore consisting of an enlarged portion 41 and a reduced portion 42 to accommodate a nozzle member 43 which controls the delivery of oil from the conduit 39 into the passageway 36. The nozzle member 43 is rotatable in the plug 40 and has an annular groove 44 in its periphery registering with the outlet end of the conduit 39. A passage 45 extends transversely through the plug from one

side to the other of the groove 44 and is in communication with a passage 46 that communicates with a transversely extending passage 47 in the inner end of the nozzle member and opening into the passageway 36.

At the juncture of the reduced and enlarged portions of the bore and the plug 40 is a tapered seating surface 48 which cooperates with a similarly formed surface 49 on the nozzle member to prevent the leakage of pressure fluid from the passageway 36 through the plug 40 to the atmosphere. Additional precautions are taken, however, to prevent the loss of fluid medium through the plug 40. To this end a gasket 50 is seated upon the shoulder 51 carrying the tapered surface 49 and a plug 52 is threaded into the plug 40 to press the gasket 50 firmly against the shoulder 51 and also to hold the nozzle member against unauthorized rotative movement.

In order to insure the same pressure value within the reservoir 29 as that existing within the passageway 36 a tube 53 is disposed in the wall of the angle-connection 30 to extend to a point near the wall of the casing 28, that is to say, to a point above the surface of the oil in the reservoir.

The operation of the device is as follows: Let it be assumed that the pneumatic tool occupies an operative position in either a horizontal or a vertical plane and that the oiling device has swung to its lowermost position and that pressure fluid has been admitted through the supply line including the angle-connection 30 for distribution to the motor element of the tool. Pressure fluid will then enter the reservoir 29 through the tube 53 and create a pressure on the oil. During the subsequent operation of the tool the pulsations caused in the pressure fluid stream by the admission and cut-off of pressure fluid into the tool will be communicated into the reservoir. The resulting fluctuations of pressure within the reservoir will cause oil to rise through the conduit 39 and to be forced through the passages 44, 45, 46 and 47 into the passageway 36 where it will intermingle with the pressure fluid and be carried thereby into the pneumatic tool.

In the event that it be desired, for any one of well known reasons, to reduce the quantity of oil delivery to the pressure fluid stream in the passageway 36 the nozzle member 43 may be given a partial turn in the plug 40 to place the passage 47 at an angle to the direction of the pressure fluid stream and thereby reduce the effective area of the passage 47 which will be presented to the force of the draft of the pressure fluid.

In practice the present invention has been found to serve efficiently as a means for effecting the adequate lubrication of pneumatic tools. The close proximity of the oiling device to the points intended to be lubricated assures the entrainment of the oil in the pressure fluid stream and, therefore, the delivery of the oil in the form of a mist which will be certain to be carried to all the surfaces requiring lubrication.

A further highly desirable advantage of the present invention is that by so attaching the oiling device to the pneumatic tool that the oiling device will always assume substantially the same operative position irrespective of the position of the pneumatic tool the uniform delivery of oil to the pneumatic tool will be assured under all circumstances.

I claim:

1. In an oiling device, the combination with a pneumatic tool casing having a passage for pressure fluid, of an angle-connection swingingly attached to the casing to convey pressure fluid into the passage, a receptacle on the angle-connection having a reservoir for oil, a tube for conveying pressure fluid from the angle-connection into the reservoir, a conduit for conveying oil from the lower portion of the reservoir into the angle-connection, and means adjustable with respect to the angle-connection for controlling the flow of oil into the angle-connection.

2. In an oiling device, the combination with a pneumatic tool casing having a passage for pressure fluid, of an angle-connection swingingly attached to the casing to convey pressure fluid into the passage, a receptacle on the angle-connection having a reservoir for oil, a conduit extending from the bottom of the reservoir to a point above the angle-connection for conveying oil from the reservoir, and a nozzle in the receptacle extending into the angle-connection to convey oil from the conduit into the angle-connection and being adjustable to control the rate of flow of oil.

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