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J. P. LITTLE ET AL

3,669,576

FUEL PRIMING PUMP

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Fig. 1.

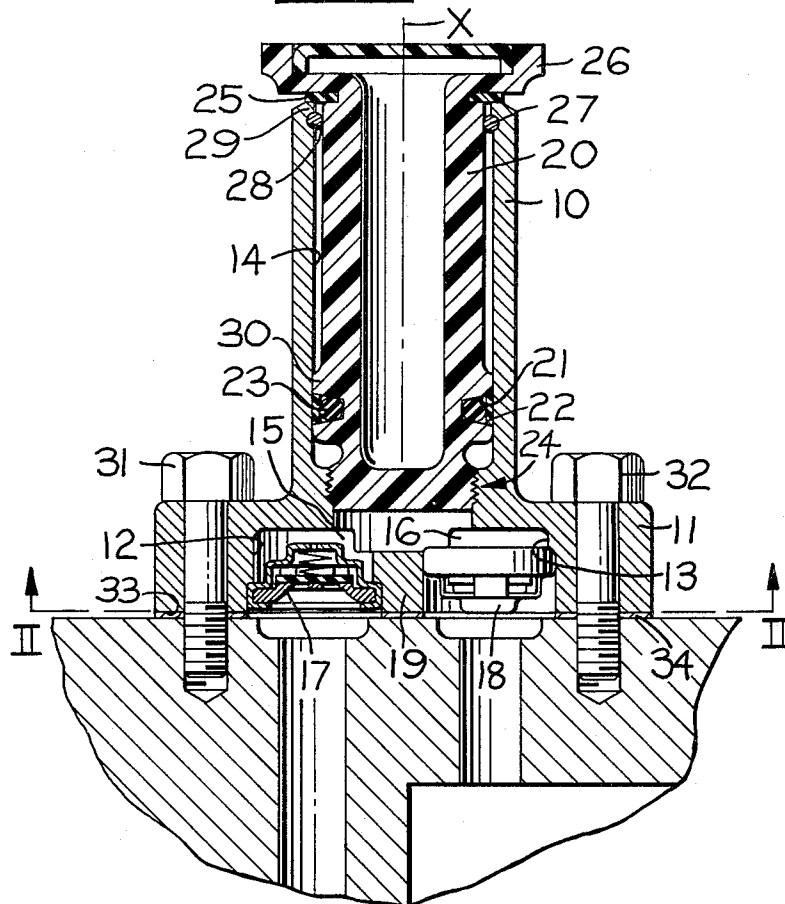
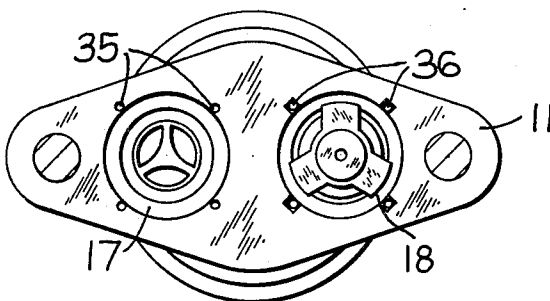


Fig. 2.



INVENTORS

JOSEPH P. LITTLE

JERRY A. CLOUSE

BY

Fryer, Ginnwald, Feix, Phillips & Lempert

ATTORNEYS

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FUEL PRIMING PUMP

Joseph P. Little, Morton, and Jerry A. Clouse, Washington, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

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1 Claim

ABSTRACT OF THE DISCLOSURE

A manually actuated fuel priming pump for an internal combustion engine comprises a one-piece housing having a barrel terminating at its lower end in a flange disposed transversely to the barrel. A plunger is reciprocally mounted in a chamber of the barrel to selectively pump fuel from a first to a second valve located in the flange of the housing. The plunger has an annular groove formed therearound which seats an annular ring of low friction material therein. An O-ring seal is also disposed in the groove to urge the annular ring into intimate contact with wall portions defining the chamber.

BACKGROUND OF THE INVENTION

Fuel priming pumps for internal combustion engines are normally associated with check valves mounted in external hardware, such as an adapting bracket or the like. Such pumps give rise to installation, servicing and related problems due to their somewhat complex construction. In addition, a number of conventional priming pumps are prone to leakage and exhibit an inability to be worked easily.

SUMMARY AND OBJECTS OF THIS INVENTION

An object of this invention is to overcome the above, briefly described problems by providing a unitized, non-complex and economical fuel priming pump exhibiting a high degree of structural integrity for long service life and which can be expeditiously installed and serviced. The pump comprises a housing having a cylindrical chamber formed in a barrel portion thereof and a plunger reciprocally mounted in the chamber.

One novel aspect of this invention comprises a flange portion, formed as an integral part of the housing at the termination of the barrel portion, having first and second one-way valve means positioned therein. The valve means function to communicate fuel to an internal combustion engine for priming purposes upon reciprocation of the plunger.

Another novel aspect of this invention comprises an annular groove formed on the plunger to retain an annular ring composed of a low friction material therein. An annular resilient means is also disposed in the groove to urge the ring into intimate contact with wall portions defining the chamber which reciprocally mounts the plunger therein.

BRIEF DESCRIPTION OF THE DRAWING

Other objects of this invention will become apparent from the following description and accompanying drawing wherein:

FIG. 1 is a cross-sectional view of a fuel priming pump embodiment of this invention, shown attached to the fuel pump of an engine; and

FIG. 2 is a bottom plan view of the pump taken in the direction of arrows II-II in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The illustrated, unitized fuel pump embodiment comprises a metallic housing preferably formed as a single

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casting. The housing comprises a barrel portion 10 terminating at its lower end at a flange 11 disposed transversely relative to the barrel portion and longitudinal axis X of the pump. First and second passage means or bores 12 and 13 are formed in the flange portion to communicate with the lower, closed end of a cylindrical chamber or bore 14 via passages 15 and 16, respectively.

Conventional first and second one-way valve means 17 and 18 are positioned in the first and second passage means 12 and 13, respectively. The valve means are disposed concentrically about and transversely of axis X and are separated from each other by a central partition or baffle 19 formed as an integral part of the housing.

The identical one-way valves may be of a standard type and are positioned in a reverse manner. In particular, valve 17 will permit a liquified and pressurized combustible fuel, originating at an engine's fuel supply and engine-driven pump (not shown), to flow through such valve and into the lower end of chamber 14. Valve 18 will open to permit the fuel to flow therethrough, from the chamber, upon reciprocation of a plunger means 20.

The plunger may comprise a molded semi-rigid, glass-fiber filled Nylon material and is reciprocally mounted in chamber 14 for movement along central longitudinal axis X. The plunger has an annular groove 21 formed therearound, adjacent to a lower end thereof. An annular ring 22 of rectangular cross-section is at least partially disposed in the groove.

The ring is preferably composed of a low friction material, such as Teflon, which intimately contacts wall portions defining chamber 14 to greatly reduce friction therebetween when the plunger is reciprocated. An annular resilient means 23, such as a rubber-like O-ring seal, is also disposed in the groove to constantly urge ring 22 radially outwardly relative to axis X. In addition to its urging function, resilient means 23 further functions as a seal thereat during pumping.

A locking means 24 is located at lower ends of the plunger and housing for selectively locking the plunger to the housing (FIG. 1) after the engine priming operation has been completed. Such locking means may comprise interengaging thread means for permitting the plunger means to be rotated to have its externally formed threads locked to the mating threads formed internally on the housing. A sealing gasket 25 may be attached to the upper end of the plunger to be compressed between an enlarged head or handle portion 26 of the plunger and the upper portion of the housing.

In addition, a stop ring 27 may be secured in an annular groove 28 formed internally of the housing. The ring may be secured in place, after the pump has been assembled, by means of a rolled lip 29 formed integrally with the housing. An annular shoulder 30 is formed adjacent a lower end of plunger 20 to provide stop means, by its engagement with the lower edge of ring 27, to prevent removal of the plunger when it is drawn upwardly to its fully extended position.

The pump may be attached to the main fuel pump housing of an internal combustion engine by means of laterally spaced fastening means 31 and 32. The fastening means are positioned outboard of the first and second valve means 17 and 18 and may comprise standard bolts, as illustrated. The bolts are suitably positioned to extend through bores formed in the flange and are threadably attached to the housing of the main fuel pump.

The flange terminates at its lower end in a flat surface 33, disposed perpendicularly relative to axis X, which abuts a standard gasket 34 for sealing purposes. The lower ends of one-way valves 17 and 18 are substantially flush with respect to such flat surface and may be staked to the housing in a conventional manner as shown at 35 and 36, respectively.

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What is claimed is:

1. A fuel priming pump comprising a housing consisting of a single metallic casting having a barrel portion, having means defining a cylindrical chamber therein, and terminating in a flange portion disposed transversely relative to said barrel portion, plunger means reciprocally mounted in the chamber of said barrel portion for movement along a central, longitudinal axis thereof, said plunger means terminating at an upper end thereof in an enlarged head overlying an upper end of said barrel portion to form a handle for pumping purposes, means forming first and second passage means in said flange portion each communicating with said chamber, a first one-way valve means positioned in said first passage means for permitting liquified fuel flow therethrough to said chamber and a second one-way valve means positioned in said second passage means for permitting liquified fuel flow therethrough from said chamber upon reciprocation of said plunger means, said first and second valve means being positioned on opposite sides of said longitudinal axis and substantially parallel thereto, fastening means positioned outboard of said first and second one-way valve means for attaching said housing to an engine, said flange means terminating at its lower end in a flat surface disposed perpendicularly relative to said longitudinal axis, locking means including interengaging thread means positioned at lower ends of said plunger means and said housing for threadably locking said plunger means to said housing, annular cooperating stop means positioned adjacent an upper end of said housing and adjacent a lower end of said plunger means for preventing removal of said plunger means from said housing, said stop means comprising an annular seal positioned at the upper end of said

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housing and mounted in an annular groove formed internally of said chamber and an annular shoulder formed on the periphery of said plunger means adjacent to the lower end thereof, and means forming an annular groove around and adjacent to a lower end of said plunger means, an annular ring composed of a low-friction non-metallic material at least partially disposed in said groove and annular resilient means disposed in said groove for urging said annular ring in intimate contact with wall portions defining said chamber.

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WILLIAM L. FREEH, Primary Examiner

R. E. GLUCK, Assistant Examiner

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