

[54] FOOT OPERATION FOR A PUMP

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[51] **Int. Cl.**..... **G05g 1/14**

[58] **Field of Search** 74/512, 560, 107, 103

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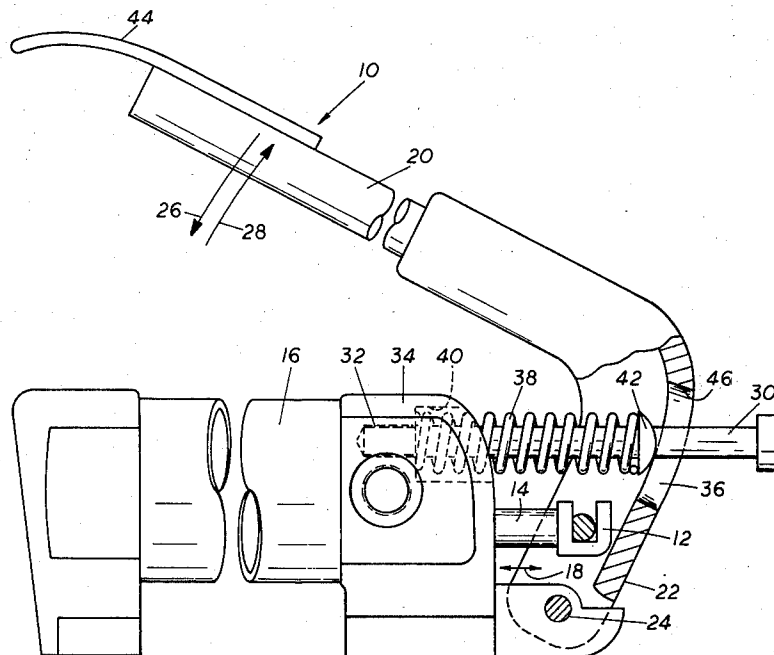
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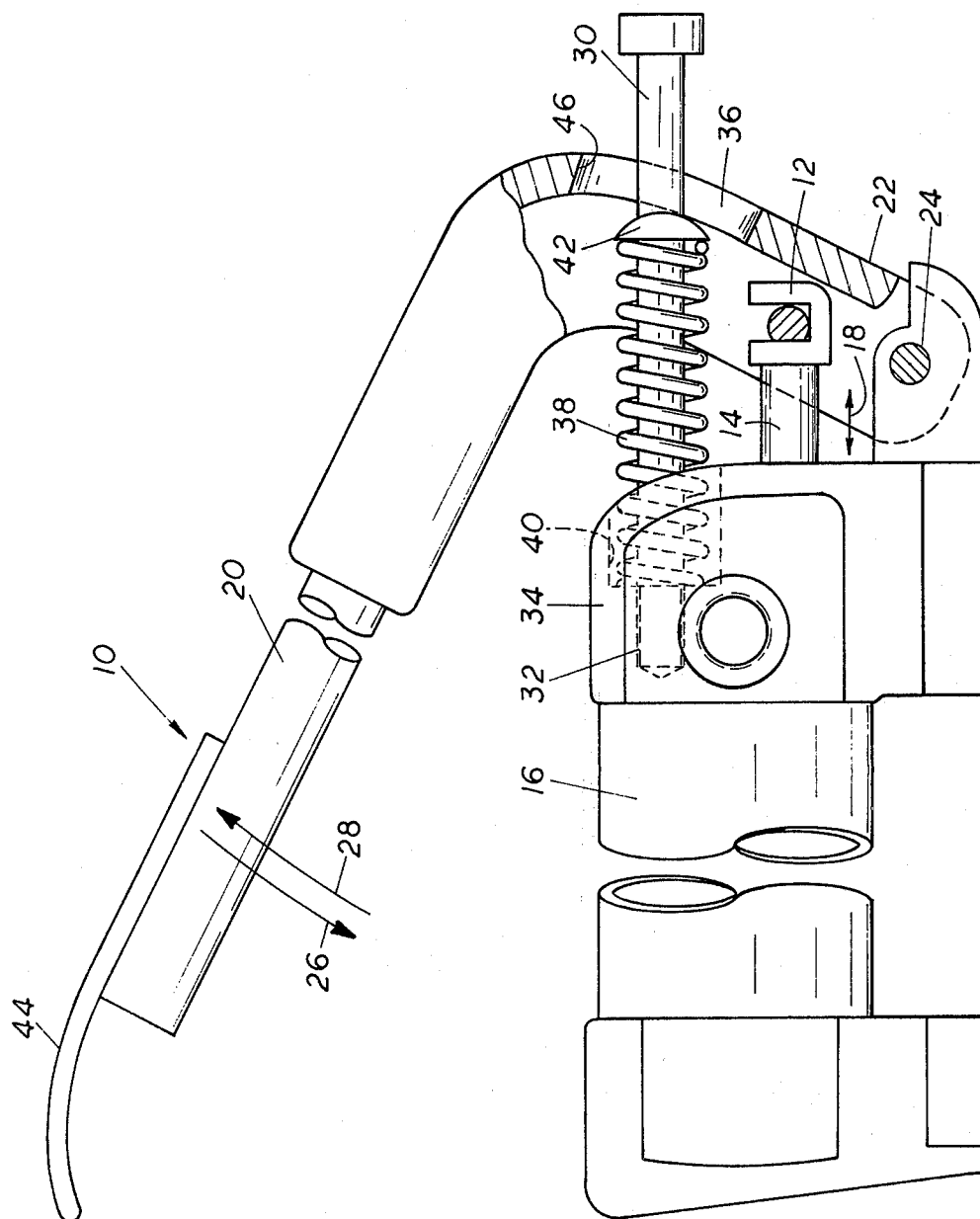
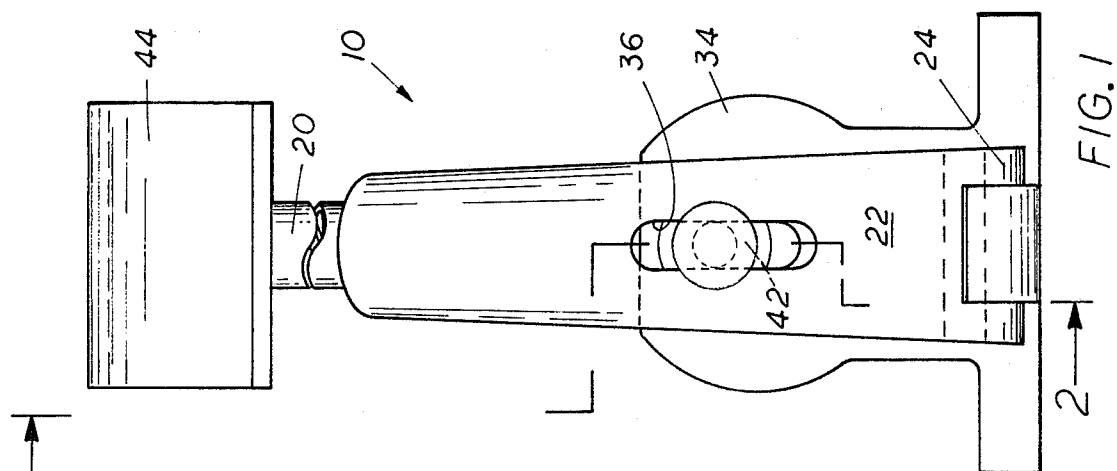
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[57] **ABSTRACT**

A pivotally mounted foot pedal for manual operation of a pump or the like, wherein the pedal is confined to its operating plane by a pivot and a rod which additionally supports the return spring, and after a power stroke limits the movement of the pedal during its return back into its ready position and thus effectively controls the urgency of the return spring, and also prevents damage to parts moving in relation to one another.

5 Claims, 2 Drawing Figures





FOOT OPERATION FOR A PUMP

The present invention relates generally to a foot operator or attachment for manual operation of a pump or the like, and more specifically to an improved foot pedal with a cooperating return spring.

To facilitate in the pumping or up and down operation of a foot pedal, a return spring is customarily provided to raise the foot pedal into its ready position after each power stroke. It is advisable, however, not to allow a sudden release of the pedal, while it is under the urgency of the return spring, to result in damage to the parts thereof. In prior art pedal constructions, the features embodied to control the return spring urgency or bias have added undue complexity and cost.

Broadly, it is an object of the present invention to provide an improved foot operator for a pump or the like overcoming the foregoing and other shortcomings of the prior art. Specifically, it is an object to provide effective return spring service in a foot pedal without unduly complicating the construction of the foot pedal.

A foot-actuated operator for a pump or the like demonstrating objects and advantages of the present invention includes a pivotally mounted member or pedal which is advantageously confined to its plane of operation by a guide member, in the form of a cylindrical rod, which is projected through it. Said rod is additionally used to advantage by serving as a central support for a helical return spring and as a stop limiting the extent of return movement of the pedal, the latter being an effective control over the biasing force of the return spring.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an end elevational view of a foot operator for a pump or the like according to the present invention; and

FIG. 2 is a side elevational view, in section taken along line 2—2 of FIG. 1, illustrating further structural features thereof.

The foot operator 10 hereof, although not necessarily limited to the use of operating a pump is ideal for such use, and accordingly is shown in the drawing as being operatively connected, as at 12, to actuate the piston rod 14 of a pump 16 through reciprocating pumping strokes 18. To this end, the foot operator 10, which consists of two intersecting legs 20 and 22 formed into an L-shape, has its elongated leg 20 in position to serve as a foot pedal, and its shorter leg 22 is pivotally connected, as at 24, so as to partake of pivotal traverses about the pivot 24 which results in the pumping strokes 18. The pivotal traverse of member 10 in the direction 26 is, of course, the power stroke, while reverse movement 28 returns member 10 to its raised, ready position preparatory to another pumping stroke.

Distinguishing the foot operator 10 from prior art devices having a similar function are the structural features now to be discussed. These features include a guide member 30, in the form of a cylindrical rod as illustrated, which is threadably engaged as at 32, to extend from the pump head 34. As best illustrated in FIG. 1, rod 30 is projected through an arcuate slot 36 in the

pivotally connected leg 22 of member 10. As such, rod 30 is effective during the power stroke 26 of member 10 in confining the member to the plane of the rod 30 which, of course, is the plane of the pivotal traverse 26. The plane of rod 30 is also the plane of operation of the pump piston, and thus the confinement of member 10 to the plane of rod 30 contributes to straight line action or travel of the piston within the pump casing 16.

Another significant function of the rod 30 is the support which it provides for a helical return spring 38 seated at one end in counterbore 40 and, at its other end, preferably against a washer 42 slidable along the longitudinal axis of the rod 30. Thus, the position of the helical spring 38 is such that during the power stroke 26, the spring compresses and thus provides the spring bias or urgency which raises member 10 back into its ready position, as illustrated in FIG. 2, preparatory to another pumping stroke.

In the event that the operator's foot slips off of the foot pedal 44 or there otherwise is a quick release thereof, it is advisable to absorb the shock of the spring urgency during reverse direction movement 28 of the member 10, in order to lessen the possibility of breakage of member 10 or head 34 which, in practice, would be costly castings. According to the present invention, this shock is absorbed by the guide rod 30. Specifically, rod 30 will be understood to be long enough so that its free end which extends through the slot 36 is in the path of the pivotal traverse 28 and thus is in physically abutting relation to the slot end wall, specifically designated 46 in FIG. 2.

From the foregoing it should be readily appreciated that there has been described a foot operator 10 of greatly simplified construction in which the rod 30 performs three significant functions, namely to guide the member 10 during its power and return strokes 26, 28, to support the helical return spring 38, and to function as a stop limiting the extent of the return stroke 28 and thus effectively controlling the bias or urgency of the return spring 38.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A foot operator for a pump or the like comprising a member mounted for movement from a ready position through a pivotal traverse providing a power stroke, a guide member oriented in the plane of said pivotal traverse operatively arranged to confine said member to said plane during said power stroke, and a return spring so disposed on said guide member as to be compressed during said pivotal traverse and to bias said member through a reverse direction return stroke back into said ready position thereof, said guide member having a portion located along the path of said pivotal traverse in physically abutting relation to said member during said return stroke, whereby said guide member controls the spring bias used for said return stroke by limiting the extent of said reverse direction movement of said member, wherein said guide member is a cylindrical rod which is projected through an arcuate slot in said member.

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2. A foot operator for a pump or the like as claimed in claim 1 wherein said return spring is a helical coil disposed in encircling relation about said guide member.

3. A foot operator for a pump or the like as claimed in claim 2 wherein said pivotally mounted member is of an L-shape formed by two intersecting legs, said pivotal mounting being adjacent the end of one leg thereby presenting the other leg for foot-actuation through said

power stroke.

4. A foot operator for a pump or the like as claimed in claim 3 wherein said arcuate slot is provided in said leg having said pivotal mounting.

5. A foot operator for a pump or the like as claimed in claim 4 wherein said foot operator operates a pump and said guide member is oriented in substantially parallel relation to the piston rod of said pump.

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