United States Patent [19]

Elliott

[11] **3,872,785**

[45] **Mar. 25, 1975**

[54] **DUAL PRESSURE REFUSE COMPACTOR**

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[22] Filed: **Nov. 13, 1972**

[21] Appl. No.: **306,147**

[52] **U.S. Cl.** ..... **100/48,** 100/98 R, 100/269 R, 83/617

[51] **Int. Cl.** **B30b 15/20**

[58] **Field of Search**.... 100/43, 48, 53, 98 R, 269 R, 100/50, 249, 179, 250, 251; 83/617

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[57] **ABSTRACT**

The shearing stroke is at high psi and then the pressure is reduced about one half to prevent overcompacting. Full pressure is restored on retracting stroke.

3 Claims, 3 Drawing Figures

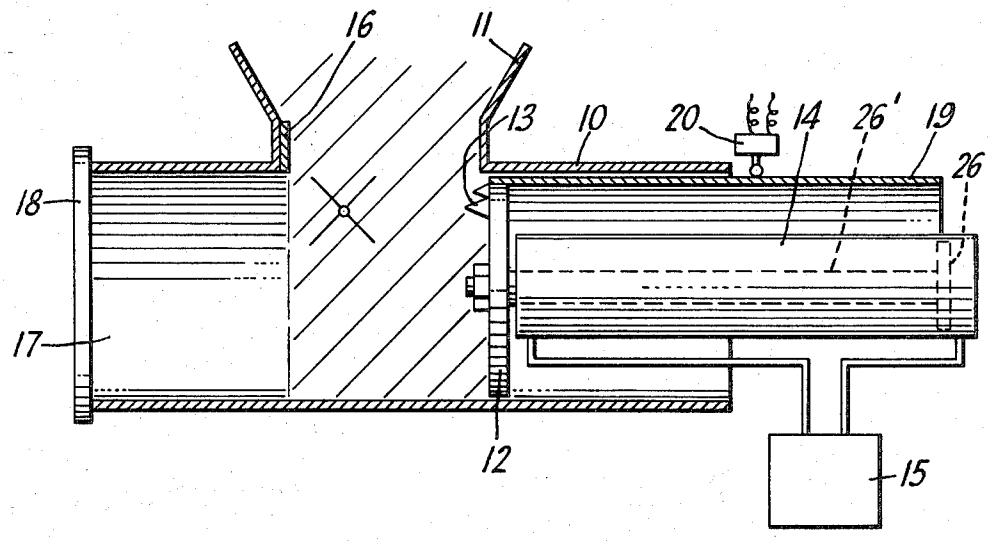


FIG. 1

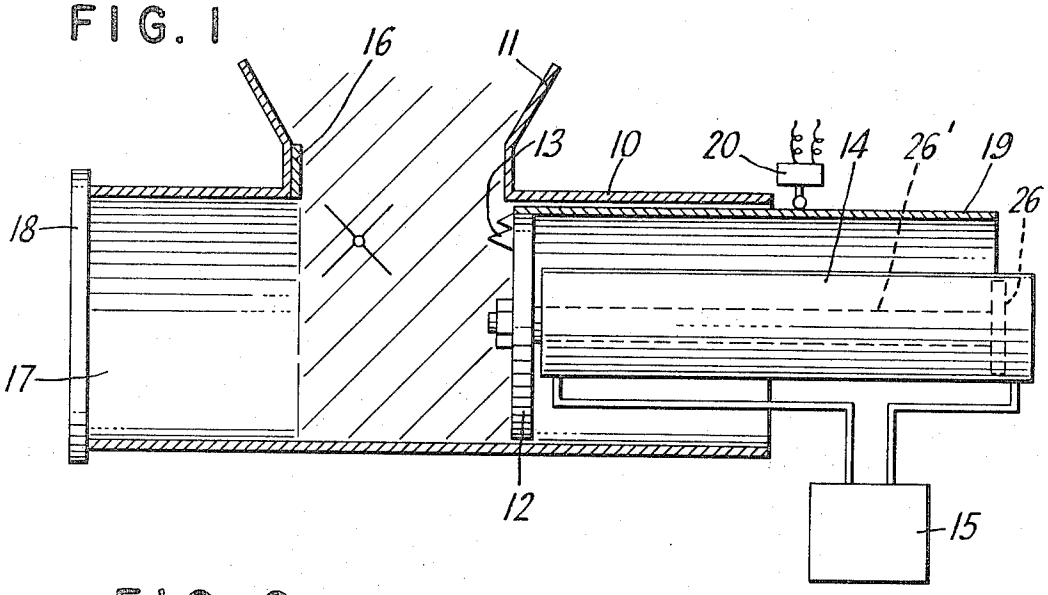


FIG. 2

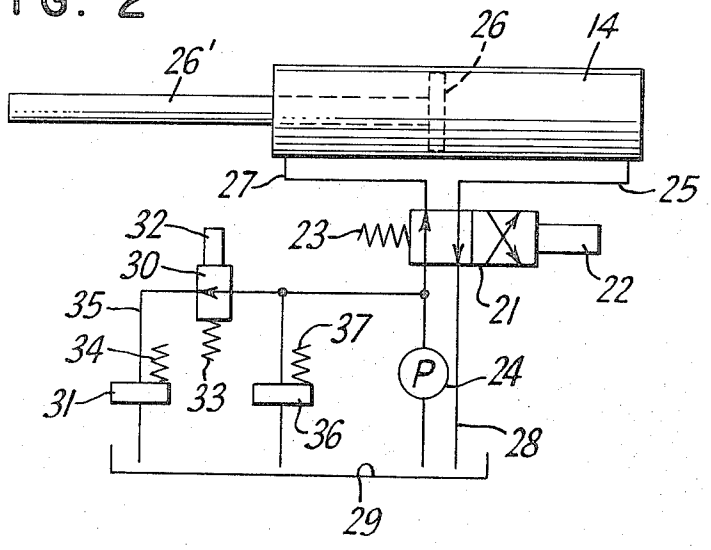
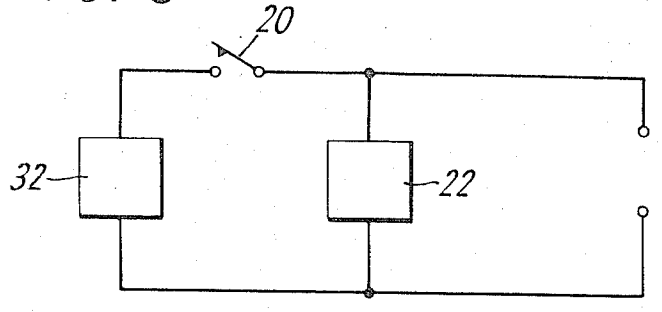


FIG. 3



DUAL PRESSURE REFUSE COMPACTOR

This invention relates to a refuse compactor, and more particularly, to a dual pressure refuse compactor.

Briefly, in the invention full pressure is available during that part of the stroke when the ram is moving past the hopper and shearing the refuse. After the ram passes the hopper and enters the compacting chamber pressure is reduced about one half to prevent overcompacting of the refuse. On the retracting stroke the full pressure is restored.

In the drawings FIG. 1 is an illustration of one form of my invention;

FIG. 2 is an illustration of the hydraulic control circuit; and

FIG. 3 is an illustration of a portion of the electrical control circuit.

Referring now to FIGS. 1–3, illustrated therein is a refuse compactor cylinder 10 having a feed chute or hopper 11. A ram 12 having shear teeth 13 is operated by a hydraulic actuator 14 controlled by a controller 15. When the ram 12 is moved forward past the feed chute 11 the teeth 13 cooperate with a shear plate 16 to shear off the garbage or refuse just ahead of the ram from what may be piled above it in the chute 11. During this shearing part of the ram stroke full pressure is made available to the actuator 14 by controller 15. After the teeth 13 pass plate 16 and the ram 12 enters the forward or compacting chamber 17 of the cylinder 10 the pressure is reduced by about one half by the controller 15. The compactor cylinder 10 is closed at its front end by a door 18.

The ram has a shield or shroud 19 behind it. In the FIG. 1 position shroud 19 is engaged with a switch 20 so as to hold it open. When the ram 12 passes the shear plate 16 the shroud 19 will be past the switch 20 so that it is free to trip to closed position. Closure of switch 20 results in reduction of pressure by the controller 15. This will be apparent by now considering FIG. 2.

On initiation of the forward stroke for ram 12 a four way hydraulic valve 21 is shifted to the left by a solenoid 22. Four way valve 21 is biased to the illustrated reverse position by a spring 23. When valve 21 is shifted to the left high pressure liquid flows from a pump 24 through valve 21 and line 25 into the rear of actuator 14. This drives the piston 26 and ram 12 forward. Liquid in front of piston 26 returns through line 27, valve 21 and line 28 to the pump sump 29. After teeth 13 pass plate 16 and shroud 19 clears switch 20, closure of switch 20 results in energization of valve 30 to open position so that pressure can be reduced by a low pressure valve 31. Valve 30 is opened by a solenoid 32 and is biased to closed position by a spring 33.

Valve 31 is biased by a spring 34 to closed position and is adjustable so that it will open at a preselected pressure. In one embodiment of the invention for an industrial type refuse compactor the pressure is reduced from 2000 psi during shearing to 1000 psi during compacting. Therefore, the valve 31 is set to automatically

close at pressures below 1000 psi and automatically open at pressures above 1000 psi. Thus, when the switch 20 is closed to open valve 30 the pressure from pump 24 is relieved from 2000 psi to 1000 psi by virtue of the opened line 35 and low pressure set valve 31. The pressure relieved liquid flows through valve 30, line 35 and valve 31 back to pump sump 29. Overcompaction of the refuse is undesirable for several reasons. It may be too heavy to handle or move, or may be too dense to incinerate.

A high pressure set safety relief valve 36 is provided. This valve 36 is also biased to closed position by a spring 37, but will automatically open at pressures above 2000 psi to prevent the build up of dangerous overpressures in the event of jams.

The ram 12 is mounted at the outer end of the rod 26′ for piston 26. At the end of its forward stroke it is reversed by the controller 15 and at this time full pressure of 2000 psi is restored to overcome any refuse or garbage which may become jammed in the cylinder 10 as between the shroud 19 and the cylinder 10. This will be understood by considering FIG. 3.

FIG. 3 illustrates part of the electrical control circuit in controller 15. This part of the circuit is de-energized at the end of the compacting stroke. Since there's then no power available to the solenoid 22 for valve 21 its spring 23 returns it to the FIG. 2 illustrated reverse position. Also, however, there's also no power then available to the solenoid 32 for valve 30 so its spring 33 returns it to closed position even though the switch 20 may be closed at the start of the retraction stroke. Since valve 30 is closed full pressure of 2000 psi is restored to reverse the piston 26.

I claim:

1. A refuse compactor comprising a housing closed at one end by a door, a feed opening in said housing, a ram mounted for reciprocation in said housing, cooperating refuse shearing means on said ram housing, drive means to reciprocate said ram whereby said ram shears refuse at the start of its forward stroke and thereafter compacts the refuse during the remainder of its forward stroke, means for reducing the force driving said ram after said ram shears refuse whereby overcompacting of the refuse is prevented.

2. In a refuse compactor as in claim 1, means for restoring full force to said ram during its reverse stroke.

3. In a refuse compactor as in claim 2, a hydraulic actuator for driving said ram, a hydraulic pump, a hydraulic circuit connecting said pump to said actuator for driving the same, said force reducing means comprising a pressure reducing valve, means responsive to the forward stroke position of said ram for connecting said pressure reducing valve in said circuit, and control means operative at the end of the forward stroke of said ram for disconnecting said pressure reducing valve from said circuit whereby full pressure is then restored to said actuator.

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