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EUROPEAN PATENT APPLICATION

21 Application number: 88311754.1

51 Int. Cl.4: **F 01 B 31/00**
F 01 L 15/00

22 Date of filing: 12.12.88

30 Priority: 11.12.87 US 131678

43 Date of publication of application:
 14.06.89 Bulletin 89/24

84 Designated Contracting States: DE FR GB IT NL

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54 Assembly of valve housings and a cylinder.

57 The valve housings 12, 14 are formed from solid, metal stock, and are bored through and tapped to define fluid inlet ports 18 and outlet ports, chambers, and tapped mounting holes. A cylinder 16 is replaceably fastened between the housings by means of tie bolts 26 fixed in one of the housings and in penetration of the other. Ends of the cylinder open onto fluid inlet and discharge, valve-confining chambers. Pulsation dampener bottles or tanks are removably fixed to the housings for communication with the inlet and outlet chambers, and admit fluid thereinto, and discharge fluid therefrom, respectively.

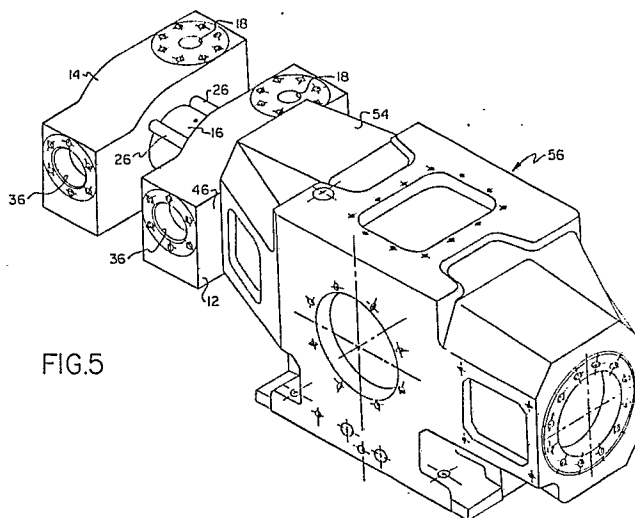


FIG.5

Description

ASSEMBLY OF VALVE HOUSINGS AND A CYLINDER

This invention pertains to an assembly which comprise piston cylinders and valve housings, such as are used in reciprocating machinery, viz., pumps, gas compressors, engines and the like, and in particular to a novel assembly of valve housings and a cylinder, in combination, of simple manufacture, greater service life, and less weight.

Such structures of combinations known in the prior art are commonly castings which constitute a principal source of machine failure, complex and, therefore, expensive fabrication, and undue weight. Accordingly, it is an object of this invention to set forth the aforesaid novel assembly, in combination, to avoid or minimize the cited disadvantages of prior art structures.

The present invention is an assembly for use in reciprocating-piston machinery, characterised by a pair of valve housings, each having a transverse bore formed therein, and a cylinder, the ends of said cylinder being set in said bores, and means engaged with said housings removably fastening said ends in said bores.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which

Figure 1 is an exploded view of an embodiment of the invention;

Figure 2 is a partial plan and partially cross-sectioned top view of the Figure 1 embodiment;

Figure 3 is a side view taken from the top view of Figure 2;

Figure 4 is an end view, partially cross-sectioned, taken from the left-hand side of Figure 3; and

Figure 5 depicts the the novel assembly fastened to the distance piece of a portion of machinery.

As shown in the figures, the assembly 10, which embodies the invention, comprises a pair of valve housings 12 and 14, and a piston cylinder 16. Each of the housings is fabricated from solid metal stock, has a fluid inlet port 18, a fluid outlet port 20, and a transverse bore 22. Ends 24 of the cylinder 16 are set in the bore 22 and fastened in place by four tie rods 26. The tie rods 26 are threaded at each end; first ends thereof are fixed in tapped holes formed in a side 28 of of housing 12, and the second ends are passed through mounting holes 30 which penetrate housing 14. Nuts 32 receive and fasten the second ends to fix the housings 12 and 14, in cooperation with the cylinder 16, in spaced apart disposition.

The fluid inlet ports 18 each open onto a fluid inlet chamber 34, and the fluid outlet ports 20 each open onto a fluid outlet chamber 36. The chambers 34 and 36 open onto bore 22 and receive, in the innermost portions thereof, inlet and discharge valves 38 and 40, respectively. Outermost portions of chambers 34 and 36 are closed off by replaceable valve covers 42. Bore 22, in housing 14, is closed at its outermost end by a replaceable plug 44. Housing 14 is also defined

as an outer head, whereas housing 12 is also defined as an inner or frame head. The latter is so named as it is configured for direct fastening thereof to the frame of its associated machinery. Side 46 of housing 12 has a plurality tapped holes 48 formed therein to receive studs 50 and nuts 52 for fastening the assembly 10 to such associated machinery. Figure 5 shows the assembly 10 fastened to the distance piece 54 of a portion of machinery 56.

Pulsation dampener tanks or bottles are used with the assembly 10. A suction dampener tank 58 is removably bolted to housings 12 and 14, for communication with ports 18, and a discharge dampener tank 60 is removably bolted to the aforesaid housings for communication with the ports 20. Dampeners 58 and 60 have flange-ended pipes 62 for bolting thereof to lands 64 and 66 (of housings 12 and 14) through which the ports 18 and 20 open. Tank 58 has a flanged, fluid admittance pipe 68, and tank 60 has a flanged, fluid discharge pipe 70.

Only by way of example, housings 12 and 14 are fabricated from solid, eight inch thick steel plate, each (in this embodiment) having an overall length of just under two feet. The pieces of plate are simply bored through, shaped, reamed and tapped, as necessary, to form therein the ports, bores, chambers and tapped holes to define solid and rugged housings 12 and 14.

It will be readily appreciated that such fabrication is less complex and expensive than to form such housings by casting, and yields a superior and durable component. The assembly 10, further, lends itself to a most facile maintenance and repair. The simple removal of four nuts 32 (and detachment of the tanks 58 and 60 as well, if in use) allow the separation of the assembly 10, removal and replacement of the cylinder 16 and/or any cylinder liner being employed, and access to a cylinder-confined piston (not shown). The valve covers 42, further, provide equally ready access to the chamber-confined valves 38 and 40.

Claims

1. An assembly for use in reciprocating-piston machinery, characterised by a pair of valve housings, each having a transverse bore formed therein, and a cylinder, the ends of said cylinder being set in said bores, and means engaged with said housings removably fastening said ends in said bores.

2. An assembly as claimed in claim 1, characterised in that each of said housings has been fabricated from solid metal stock, has a fluid inlet port and chamber, and a fluid outlet port and chamber, said transverse bore opening onto said chambers, said means fastening said cylinder ends in said bores, fixing said

housings together in a spaced apart disposition.

3. An assembly as claimed in claim 2, characterised by means, in communication with said inlet chambers of said pair of housings, for dampening fluid pulsations.

4. An assembly as claimed in claim 2 characterised by means, in communication with said outlet chambers of said pair of housings, for dampening fluid pulsations.

5. An assembly as claimed in claim 2, characterised in that said pulsations dampening means comprises a tank bridging between said inlet chambers.

6. An assembly as claimed in claim 4, characterised in that said pulsations dampening means comprises a tank bridging between said

outlet chambers.

7. An assembly as claimed in claim 5, characterised in that said tank has a fluid admittance port.

8. An assembly as claimed in claim 6, characterised in that said tank has a fluid discharge port.

9. An assembly for use in reciprocating-piston machinery, characterised by a cylinder having open ends, and a pair of valve housings, wherein one of said valve housings is set across one of said open ends of said cylinder, and the other of said valve housings is set across the other of said open ends of said cylinder, and including means engaged with said housings removably fastening said housings to said ends.

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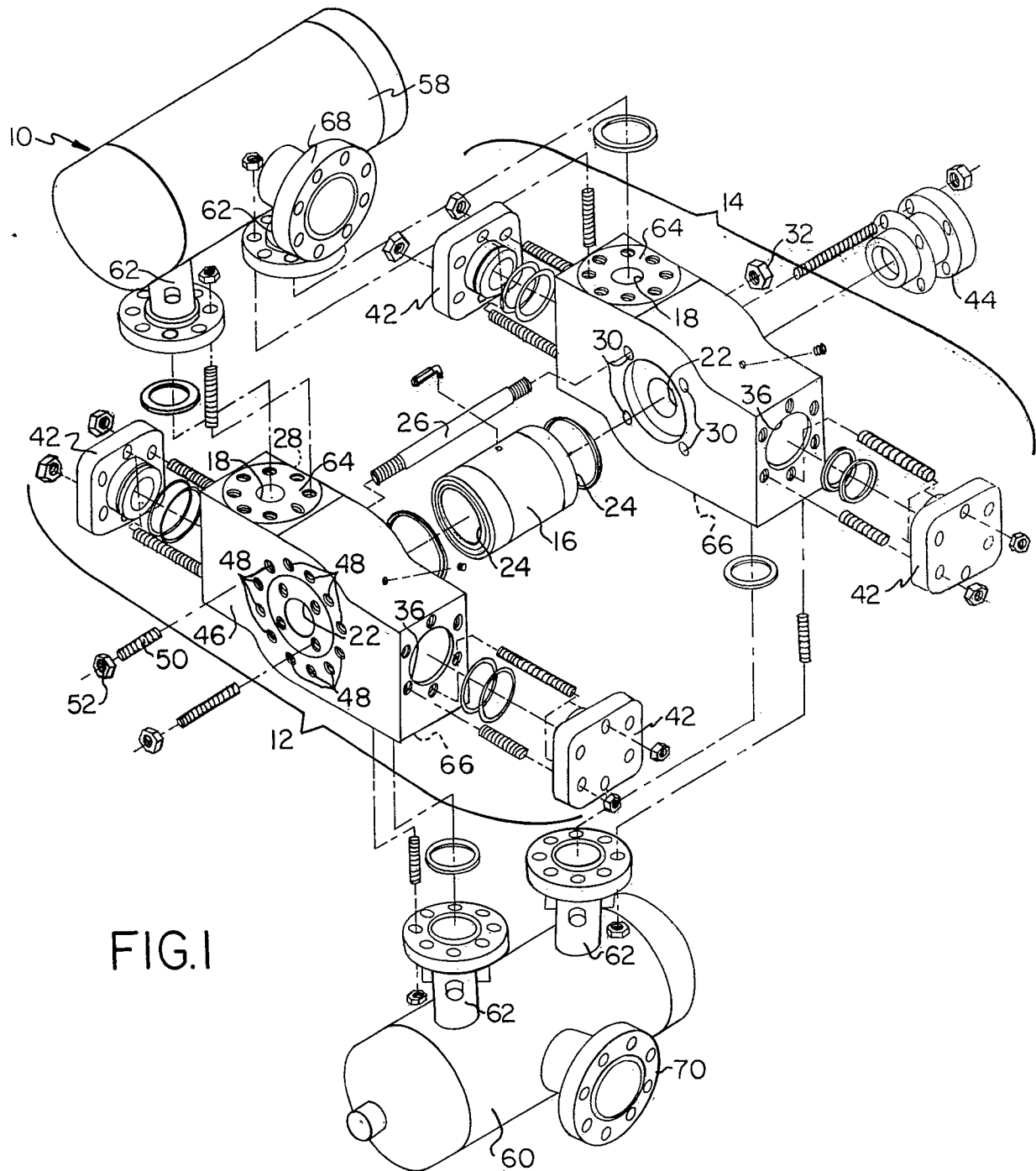


FIG.1

FIG.2

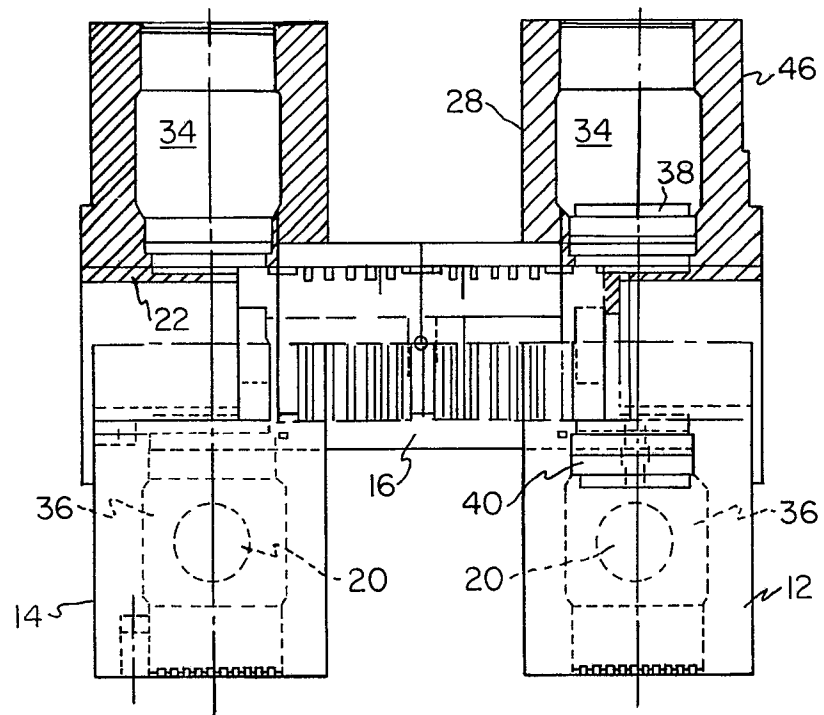


FIG.3

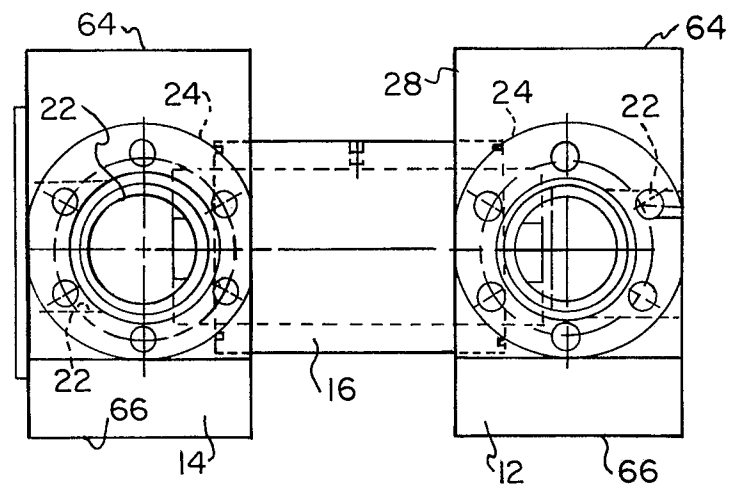
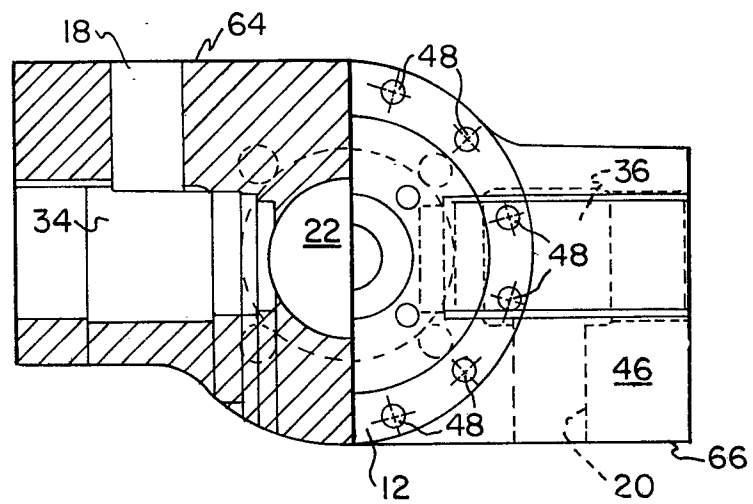


FIG.4



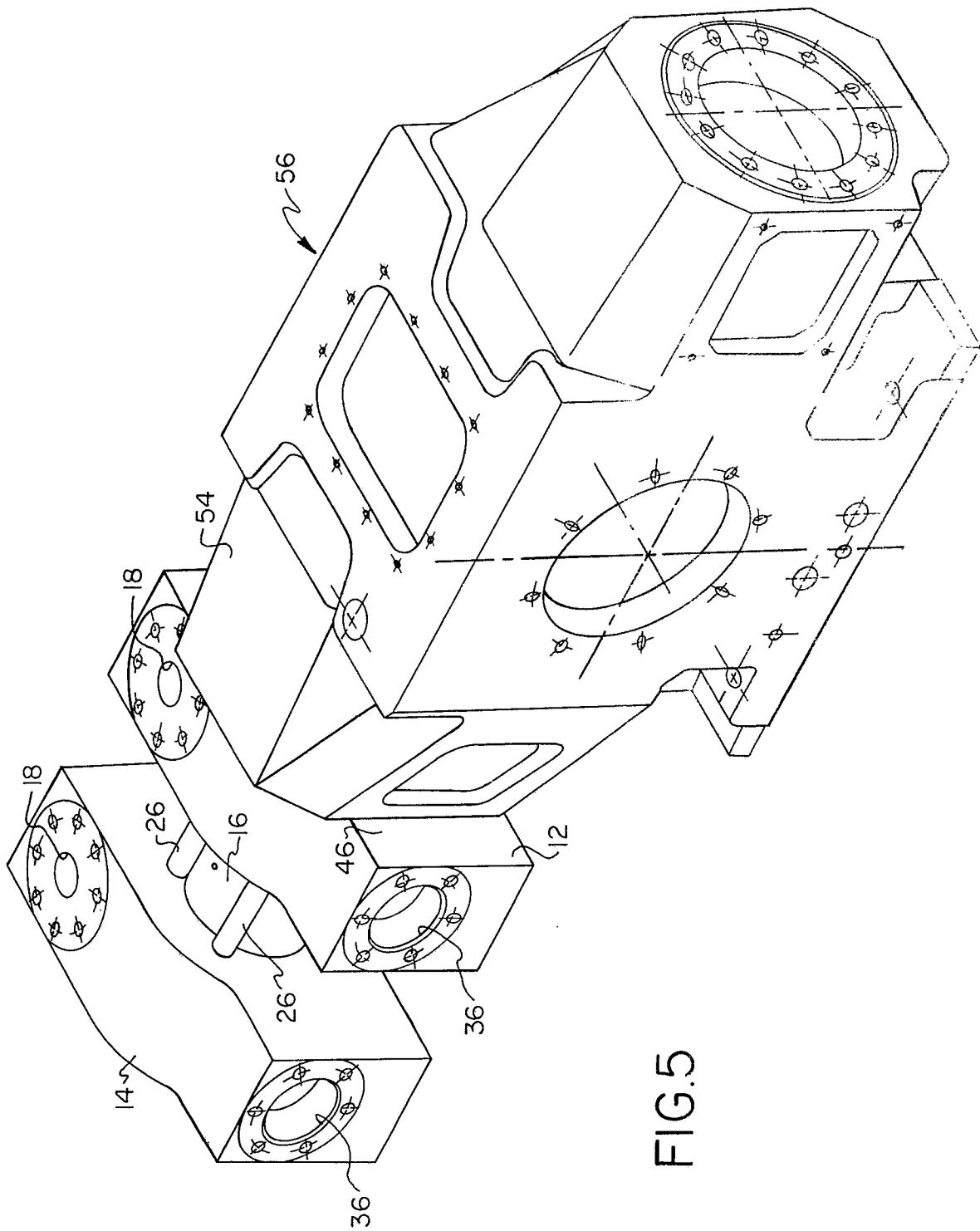


FIG.5