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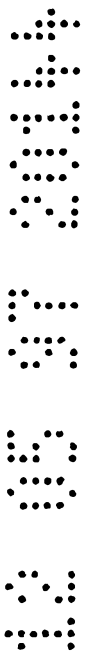
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(56) Related Art
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A B S T R A C T

A valve assembly (10) comprising a first valve (11) located within a first housing, a second valve (12) located within a second housing, each valve (10, 11) having an actuating shaft extending out of the housing whereby rotation of the shaft operates the valve, characterised in that the valves are rigidly interconnected in a spaced configuration with a common shaft (30) interconnecting the actuating shafts and actuating means to rotate the common shaft (30) to simultaneously operate both valves (10, 11).



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COMPLETE SPECIFICATION
STANDARD PATENT

Applicants:

POOL-WATER PRODUCTS AUSTRALIA PTY LTD
A.C.N. 005 340 036

Invention Title:

IMPROVEMENTS IN AND RELATING TO VALVES

The following statement is a full description of this invention,
including the best method of performing it known to us:

IMPROVEMENTS IN AND RELATING TO VALVES

5 This invention relates to improvements in and relating to valves and especially relates to valves that are used in swimming pools and spas.

Swimming pools and spas are usually coupled to filtration systems that include a pump and a filter unit. The system may also incorporate a heater to heat
10 the water that flows through the system. The componentary that makes up the plumbing associated with pools and spas usually incorporates a series of valves that can be either manually, electrically or hydraulically operated to re-direct the flow of water
15 within the pipework. The plumbing that is associated with a pool and spa arrangement needs to be designed in a manner that it takes up as little room as possible. The common practice of placing a series of valves adjacent to the filtration equipment and if necessary
20 providing mechanisms to operate these valves at that site leads to an increase in the complication, cost and overall size of the plumbing associated with a pool and spa. It is this problem that has brought about the present invention.

25 The present invention facilitates the interconnection of two valves on a common drive shaft so that a single actuating mechanism can be used to operate both valves.

30 According to a first aspect of the present invention there is provided a valve assembly comprising a first valve located within a first housing, a second valve located within a second housing, each valve having an actuating shaft extending out of the housing whereby

rotation of the shaft operates the valve, characterised
in that the valves are rigidly interconnected in a
spaced configuration with a common shaft interconnecting
the actuating shafts and actuating means to rotate the
5 common shaft to simultaneously operate both valves.

Preferably, a rigid separator is bolted to each
housing with its axis aligned with the axes of the
actuating shafts.

The rigid separator preferably comprising end
10 flanges coupled to either end of a hollow tube, the end
flanges being bolted to the valve housing. Preferably,
the tube has a cut-out the width of which corresponds to
the length of travel of the actuating means.

According to a further aspect of the present
15 invention, there is provided a valve coupling assembly
comprising a separator terminating in end flanges each
adapted to be bolted to a valve housing and a shaft
adapted to interconnect the actuating shafts of each
valve whereby the separator rigidly interconnects each
20 valve spaced apart so that rotation of the shaft
simultaneously controls operation of the valves.

Preferably, each end flange is of circular
cross-section with a mutually perpendicular annular
skirt, each skirt being rigidly secured to one end of a
25 cylindrical connector. Preferably, the cylindrical
connector has a cut-out in its wall, the width of which
corresponds to the length of travel of the actuating
means.

An embodiment of the present invention will now
30 be described by way of example only with reference to
the accompanying drawings in which:

Figure 1 is a side elevational view of a valve
assembly for use with a pool/spa filtration system,

Figure 2 is a rear elevation of the assembly shown in Figure 1,

Figure 3 is a plan view of the assembly shown in Figure 1,

5 Figure 4 is a side elevational view of a valve coupling assembly that forms part of the assembly shown in Figures 1 to 3,

Figure 5 is a rear elevation of the valve coupling assembly, and

10 Figure 6 is a plan view of the valve coupling assembly.

The accompanying drawings illustrate a valve assembly 10 that is for use with swimming pools or spas and is adapted to be coupled with the filter and heating assemblies that form part of swimming pool and spa arrangements. The invention concerns coupling existing valve assemblies in tandem with a common drive shaft and then using a single actuation means that may be an electric motor, a hydraulic drive or a manually operable lever to operate both valves simultaneously. The equipment has been designed so that it can be retrofitted to existing valve assemblies and in its simplest arrangement shown in Figures 4 to 6, the equipment comprises four components, namely a separator sleeve 20 of cylindrical configuration, end flanges 21 and 22 and a drive shaft 30 shown in Figure 2. The actuation means is coupled to the drive shaft and may comprise a handle, not shown, or a small electric motor 31 that causes axial rotation of the drive shaft 30. Alternatively, hydraulic or pneumatic drive mechanisms may be used to axially rotate the drive shaft.

The assembly 10 is shown in Figures 1 to 3 and in essence comprises a pair of conventional three way

valves 11 and 12. Each valve includes an inlet port 15 and two outlet ports 13 and 14 and a valve member, not shown, that switches flow from one outlet port to the other. The valve member is driven by a sub-shaft, not shown, that extends through the housing of the valve. To couple the two valves together as shown in Figures 1 and 3, it is important that the valve housings be axially aligned so that a common shaft 30 can be placed across the sub-shafts. It is also important that the valve housings be secured together in a rigid manner so that the torque that is imparted to operate the valves does not cause the assembly to twist or distort. To effect the preferred spacing, axial alignment and rigidity of assembly, the components of Figures 4 to 6 are utilised whereby each end flange 21 or 22 comprises a circular planar flange 26 with a circular cut-out 24. The circular flange is provided with a plurality of equally spaced holes 25 on a common pitch circle. These holes correspond to the spacing of holes used to hold the housing parts of the valve together. The planar flange 26 terminates in a mutually perpendicular annular skirt 27 which is arranged to be a close fit on the exterior of a cylindrical separator 20. The end flanges 21 or 22 may be glued or bolted to the separator 20.

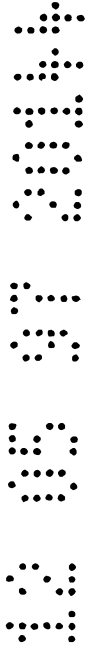
The drive shaft 30 which is a hollow cylindrical member is arranged to be a press fit onto the end of the sub-shafts projecting from the housings of the valves. The shaft 30 has teeth (not shown) that engage with similarly profiled projections on the subshafts to ensure that the rotational movement of the shaft 30 is imparted to the sub-shaft of each valve. To provide access to the drive shaft 30 and to facilitate location of actuation means such as an electrical motor 31, an

arcuate cut-out 35 is provided in the wall of the separator 20. The width of the cut-out 35 is designed to facilitate the necessary movement of a handle projecting perpendicular to the shaft 30 to effect valve operation. Thus, if the handle has to move through 90° to initiate the valve operation, the cut-out 35 is designed to ensure that as the handle abuts each wall 36, 37 of the cut-out 35 the desired rotational movement is facilitated. As shown in Figure 6, the cut-out 35 terminates on either side at angle of 57.5° to the horizontal. To ensure accuracy of alignment and ease of assembly, the first end flange 21 is glued to one end of the separator 20 and then bolted onto one valve housing. The second end flange 22 is then bolted to the other valve housing and then screwed onto the end of the separator 20 through small screws extending through the skirt 27 and the wall of the separator. The cut-out 35 is then machined by use of a router into the wall of the separator to the exact angular inclination as shown in Figure 6. The use of the cylindrical tube 20 firmly secured to sturdy end flanges ensures that there is no independent rotation of the valve housings relative to the tube and no twisting or other distortion of the assembly. The axially aligned interconnecting shaft 30 and its positive location on the sub-shafts of the valves also ensure that the valves operate as one. The design of the assembly is such that it can be disassembled to enable servicing of the valve components and valve seals. The cut-out 35 in the wall of the separator 20 provides access to automated drive actuators such as electric motors or hydraulic/pneumatic drivers but also provides room for an operating handle to rotate whilst at the same time defining end stops

that constrain the movement of the handle.

5 The assembly described above allows improved pool/spa design by minimising the need for componentary and reducing the overall cost and size of the plumbing associated with pool/spa assemblies. The assembly can be used to enable separate filtration and heating of pool or spa with a common filtration system to divert water flow for backwashing of filters and to allow two sets of filtration equipment to share one common heater.

10 The components of the assembly are manufactured in strong, hard wearing plastics that are ultra violet resistant.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A valve assembly comprising a first valve located within a first housing, a second valve located within a second housing, each valve having an actuating shaft extending out of the housing whereby rotation of the shaft operates the valve, characterised in that the valves are rigidly interconnected in a spaced configuration with a common shaft interconnecting the actuating shafts and actuating means to rotate the common shaft to simultaneously operate both valves.
2. A valve assembly as claimed in claim 1, wherein a rigid separator is bolted to each housing with its axis aligned with the axes of the actuating shafts.
3. A valve assembly as claimed in Claim 2, wherein the rigid separator comprises end flanges coupled to either end of a hollow tube, the end flanges being bolted to the valve housing.
4. A valve assembly as claimed in claim 3, wherein the tube has a cut-out the width of which corresponds to the length of travel of the actuating means.
5. A valve coupling assembly comprising a separator terminating in end flanges each adapted to be bolted to a valve housing and a shaft adapted to interconnect the actuating shafts of each valve whereby the separator rigidly interconnects each valve spaced apart so that rotation of the shaft simultaneously controls operation of the valves.

6. A valve coupling assembly as claimed in claim 5,
wherein each end flange is of circular cross-section
with a mutually perpendicular annular skirt, each skirt
being rigidly secured to one end of a cylindrical
5 connector.

7. A valve assembly as claimed in claim 6, wherein
the cylindrical connector has a cut-out in its wall, the
width of which corresponds to the length of travel of
10 the actuating means.

8. A valve assembly substantially as described
herein with reference to Figures 1 to 3.

15 9. A valve coupling assembly substantially as
described herein with reference to Figures 4 to 6.

20 DATED this 12th day of May 1997.

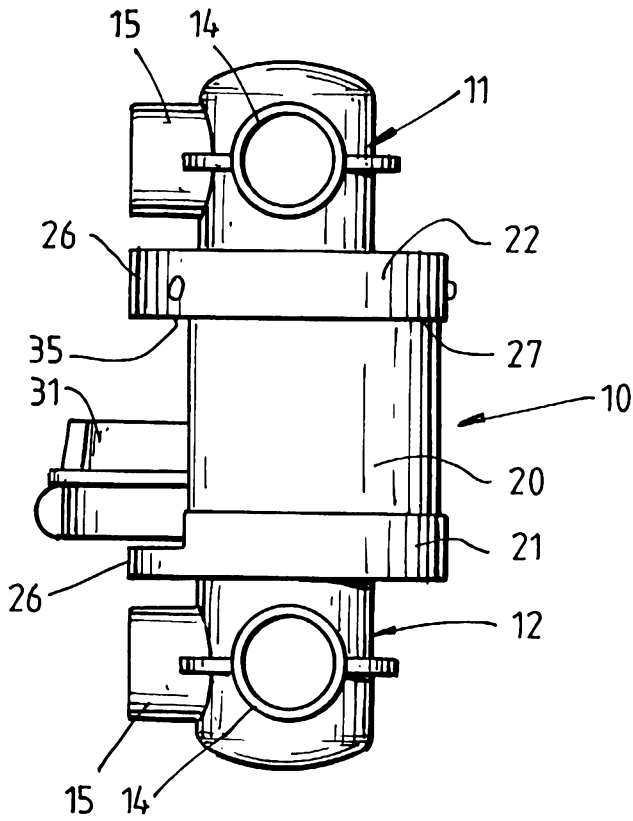
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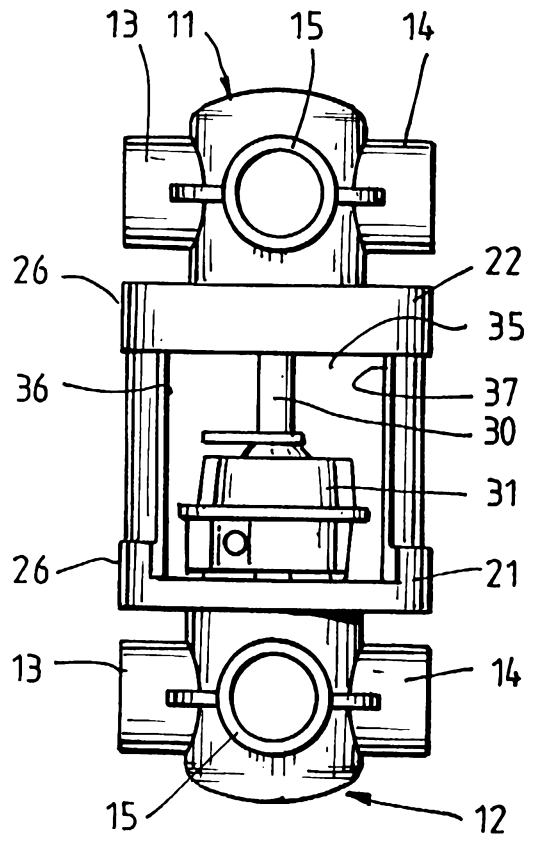
By Its Patent Attorneys

25 GRIFFITH HACK & CO.

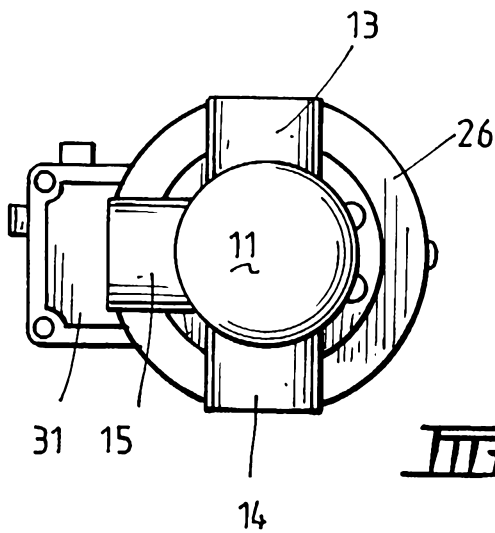
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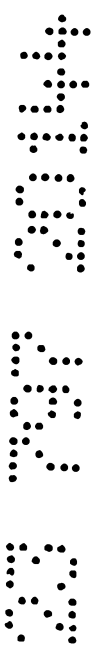
III. 1.



III. 2.



III. 3.



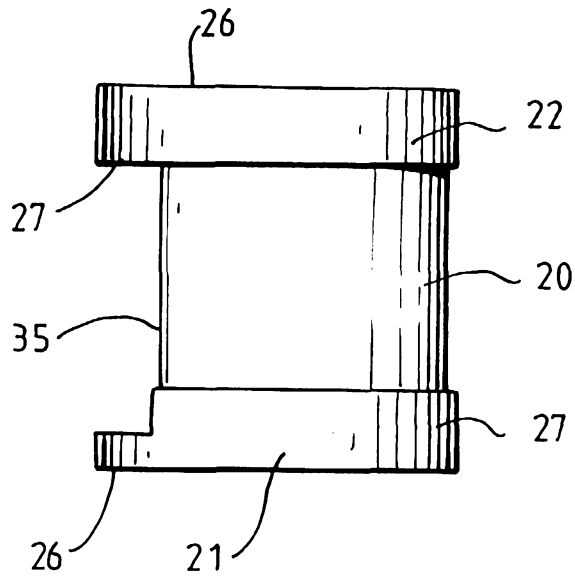


FIG. 4.

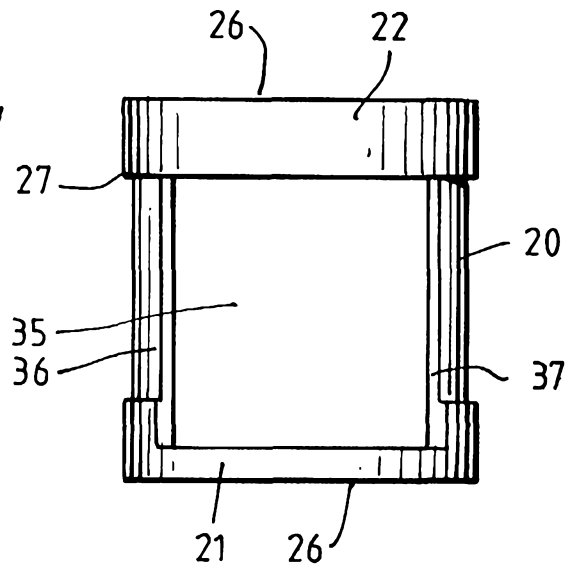


FIG. 5.

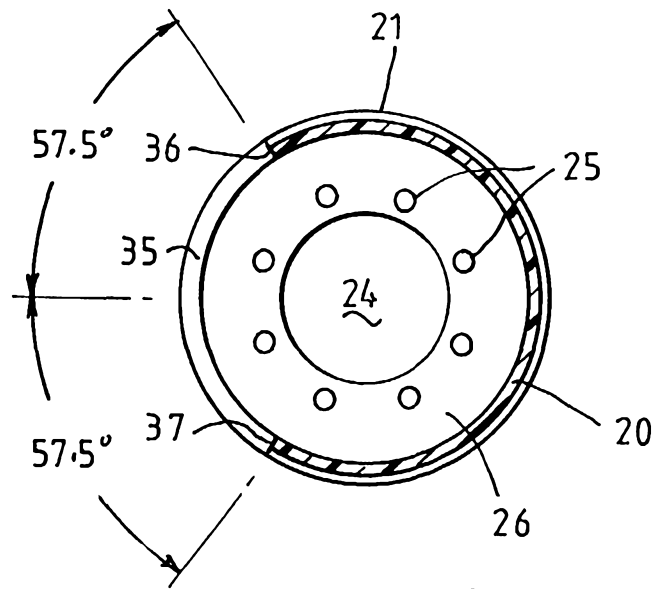


FIG. 6.

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