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(54) **A fluid manifold system**

(57) A fluid manifold system comprising a plurality of fluid lines with at least one supply line (4) and one exhaust line (2), said lines connecting to external distribution lines by way of a series of adjustable valves (7).

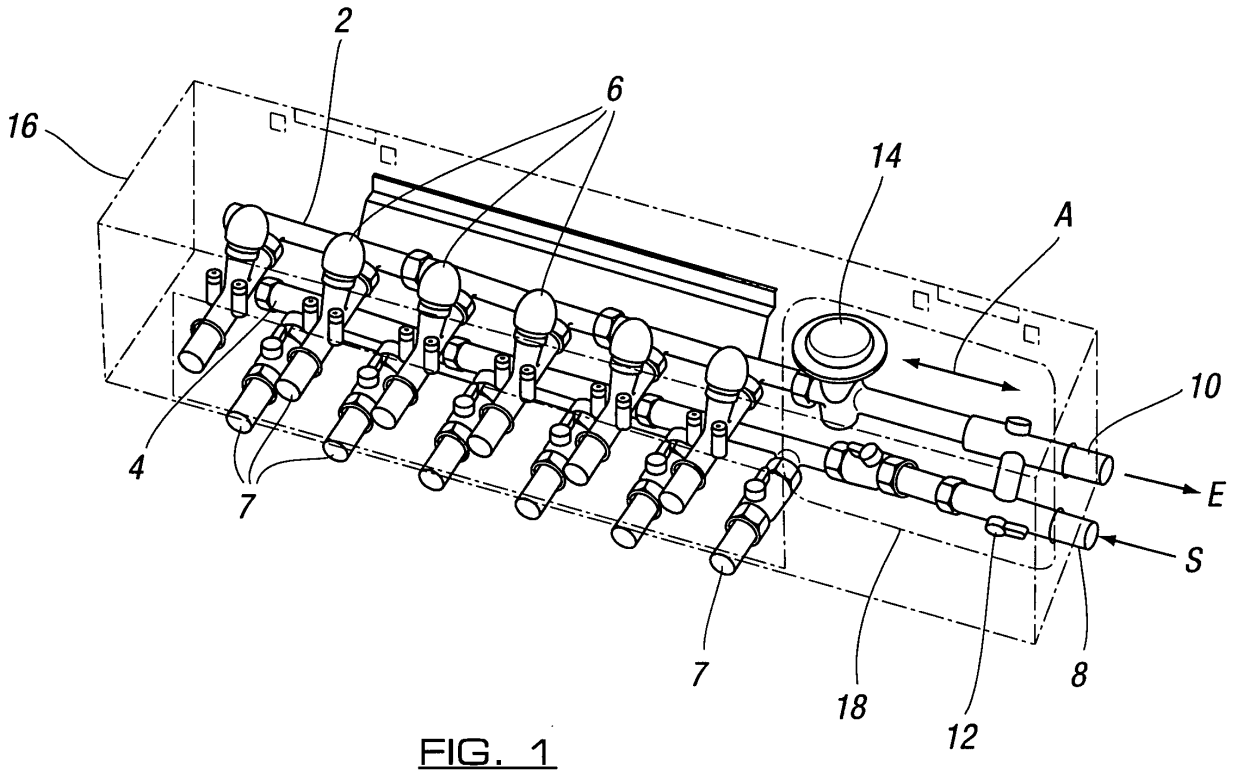

FIG. 1

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Description

[0001] The present invention relates to a fluid manifold system for fluid distribution and control, especially but not exclusively for use in air heating and cooling applications.

[0002] Existing fluid manifold systems can comprise a supply line with a series of connections to an external fluid system via external distribution lines. The external distribution lines can feed back into a further section of the supply line via a second series of connections.

[0003] Known fluid manifold systems can comprise a valve for controlling the flow through the external lines by varying a pressure difference between the supply line and the further section of the supply line.

[0004] Fluid manifold systems are often constructed and/or configured on site by fluid engineers to suit the custom requirements of the external fluid system. There are numerous disadvantages associated with on-site configuration, including a longer installation time, the difficulty of testing seals and valves before the system is commissioned and the likelihood that parts will be accidentally damaged by the installing engineer during installation.

[0005] It is an aim of the present invention to provide a fluid manifold system which can be made in advance to specified quality standards and installed on site by an engineer in less time than is needed to install existing systems. This gives the advantage that the build quality of the system can be tested and controlled before installation. Additionally this gives the advantage that the internal configuration need not be altered during installation.

[0006] It is another aim of the present invention to provide a fluid manifold system which can be fitted within a container with smaller footprint than currently available and that can be easily maintained once installed.

[0007] An additional aim of the present invention is to provide a fluid manifold system which remains substantially dry in operation and avoids the build-up of condensation.

[0008] A further aim of the present invention is to provide a system which can be installed in many situations with varying required flow rates and pressures.

[0009] A further aim of the present invention is for the flow rate in one external line to be independent of the presence or absence of further external lines.

[0010] It is a further aim of the present invention to provide a system which requires little maintenance once installed and which can easily be reconfigured if requirements change.

[0011] A further aim of the present invention is to provide system isolation means and system flushing means.

[0012] Accordingly the present invention is directed to a fluid manifold system comprising a plurality of fluid lines with at least one supply line and one exhaust line, said lines connecting to external distribution lines by way of a series of adjustable valves.

[0013] Preferably the adjustable valves can be fixed orifice double-regulating valves.

[0014] Preferably the adjustable valves can be isolating valves.

[0015] Advantageously the fluid manifold system can be constructed and configured before being installed.

[0016] Preferably the system is fitted inside a container and can be installed on site without the engineer requiring access to the inside of the container.

[0017] Advantageously the system interfaces with external supply, exhaust and distribution lines by way of connections through apertures in a wall of the container.

[0018] Preferably the container is substantially air and water tight.

[0019] Preferably the container is constructed from thermally insulating material.

[0020] Advantageously the container is constructed with replaceable panel sections with apertures in desired positions.

[0021] Preferably the container apertures can be sealed with grommets selected to fit the external lines and apertures.

[0022] Advantageously the supply line and exhaust line are arranged within the container to be substantially parallel and substantially non-co-axial.

[0023] Advantageously the supply line and exhaust line are arranged within the container to be substantially in different vertical planes.

[0024] Additionally the system includes a removable bypass assembly comprising an isolating and reversing valve and a differential pressure control valve, the isolating and reversing valve allowing the flow to be halted completely or reversed in order to flush the system out for cleaning purposes. A differential pressure control valve is chosen to meet the flow rate requirements of the external fluid system.

[0025] Advantageously the differential pressure control valve enables the user of the system to control the fluid pressure flow within the manifold system.

[0026] Preferably the differential pressure control valve can be easily changed by disconnecting it from the external and internal supply and exhaust lines and removing it from the container.

[0027] An embodiment of the present invention will now be described in relation to the accompanying drawings, in which:

Figure 1 shows a side perspective cut-away view of such a fluid manifold system; and

Figure 2 shows a side perspective view of a container for such a fluid manifold system.

[0028] Figure 1 shows a fluid manifold system with a supply line 4 and an exhaust line 2, the exhaust line 2 having a series of continuously variable fixed orifice double-regulating valves 6 to connect to external lines (not shown) and the supply line 4 having a series of isolating

valves 7 which are either fully open or fully closed. Fluid from the supply line 4 flows through the isolating valves 7 to the external lines (not shown) then returns through the fixed orifice double-regulating valves 6 to the exhaust line 2. The supply line 4 and exhaust line 2 each connect respectively to an external line 8 and 10. The supply line 4 and exhaust line 2 are isolatable from the external lines 8 and 10 by an isolating and reversing valve 12. A differential pressure control valve 14 between the external exhaust line 10 and the manifold exhaust line 2 regulates the flow through the manifold system. The fluid manifold system is enclosed within a container 16. Arrow A shows a direction of freedom of movement for a removable bypass assembly 18. Arrows S and E show the direction of fluid flow through the supply line 4 and exhaust line 2 respectively.

[0029] Figure 2 shows a sealable container 16 with sealable ports 20 for the connections between the fluid manifold system (not shown) and external lines (not shown). Direction arrows show an example of fluid flows into and out of the container 16. Grommets (not shown) inserted into the ports 20 can seal pipe connections (not shown). Access to the fluid manifold system can be gained through an access panel 22. Access panel 22 can be releasably sealed with securing means 24. A panel section 26 is releasably attached to one side of the sealable container 16. The panel section is preferably secured to the sealable container in a fluid-tight manner. The panel section 26 is configured with ports 20 in the desired positions. This enables the easy adaptation of the sealable container 16 to whatever manifold configuration is required.

[0030] Numerous variations and modifications may occur to the reader without taking the resulting construction out of the scope of the present invention.

Claims

1. A fluid manifold system comprising a plurality of fluid lines with at least one supply line (4) and one exhaust line (2), said lines connecting to external distribution lines by way of a series of adjustable valves (7).

2. A fluid manifold system according to Claim 1, **characterised in that** the adjustable valves (7) can be fixed orifice double-regulating valves.

3. A fluid manifold system according to Claim 1, **characterised in that** the adjustable valves (7) can be isolating valves.

4. A fluid manifold system according to any preceeding Claim, **characterised in that** the fluid manifold system can be constructed and configured before being installed.

5. A fluid manifold system according to any preceding Claim, **characterised in that** the fluid manifold system is fitted inside a container (16) and can be installed on site without the engineer requiring access to the inside of the container.

6. A fluid manifold system according to any preceding Claim, **characterised in that** the fluid manifold system interfaces with external supply, exhaust and distribution lines by way of connections through apertures (20) in a wall of the container (16).

7. A fluid manifold system according to any preceding Claim, **characterised in that** the container (16) is substantially air and water tight.

8. A fluid manifold system according to any preceding Claim, **characterised in that** the container (16) is constructed from thermally insulating material.

9. A fluid manifold system according to any preceding Claim, **characterised in that** the container (16) is constructed with replaceable panel sections (26) with apertures in desired positions.

10. A fluid manifold system according to any preceding Claim, **characterised in that** the container apertures (20) can be sealed with grommets selected to fit the external lines and apertures.

11. A fluid manifold system according to any preceding Claim, **characterised in that** the supply line (4) and exhaust line (2) are arranged within the container (16) to be substantially parallel and substantially non-co-axial.

12. A fluid manifold system according to any preceding Claim, **characterised in that** the supply line (4) and exhaust line (2) are arranged within the container (16) to be substantially in different vertical planes.

13. A fluid manifold system according to any preceding Claim, **characterised in that** the fluid manifold system includes a removable bypass assembly (18) comprising an isolating and reversing valve (12) and a differential pressure control valve (14), the isolating and reversing valve (12) allowing the flow to be halted completely or reversed in order to flush the system out for cleaning purposes.

14. A fluid manifold system according to Claim 13, **characterised in that** a differential pressure control valve (14) is chosen to meet the flow rate requirements of the external fluid system.

15. A fluid manifold system according to Claim 13 or Claim 14, **characterised in that** the differential pressure control valve (14) enables the user of the system to control the fluid pressure flow within the manifold

system.

16. A fluid manifold system according to any one of Claims 13 to 15, **characterised in that** the differential pressure control valve (14) can be changed by disconnecting it from the external and internal supply and exhaust lines (2, 4) and removing it from the container (16).

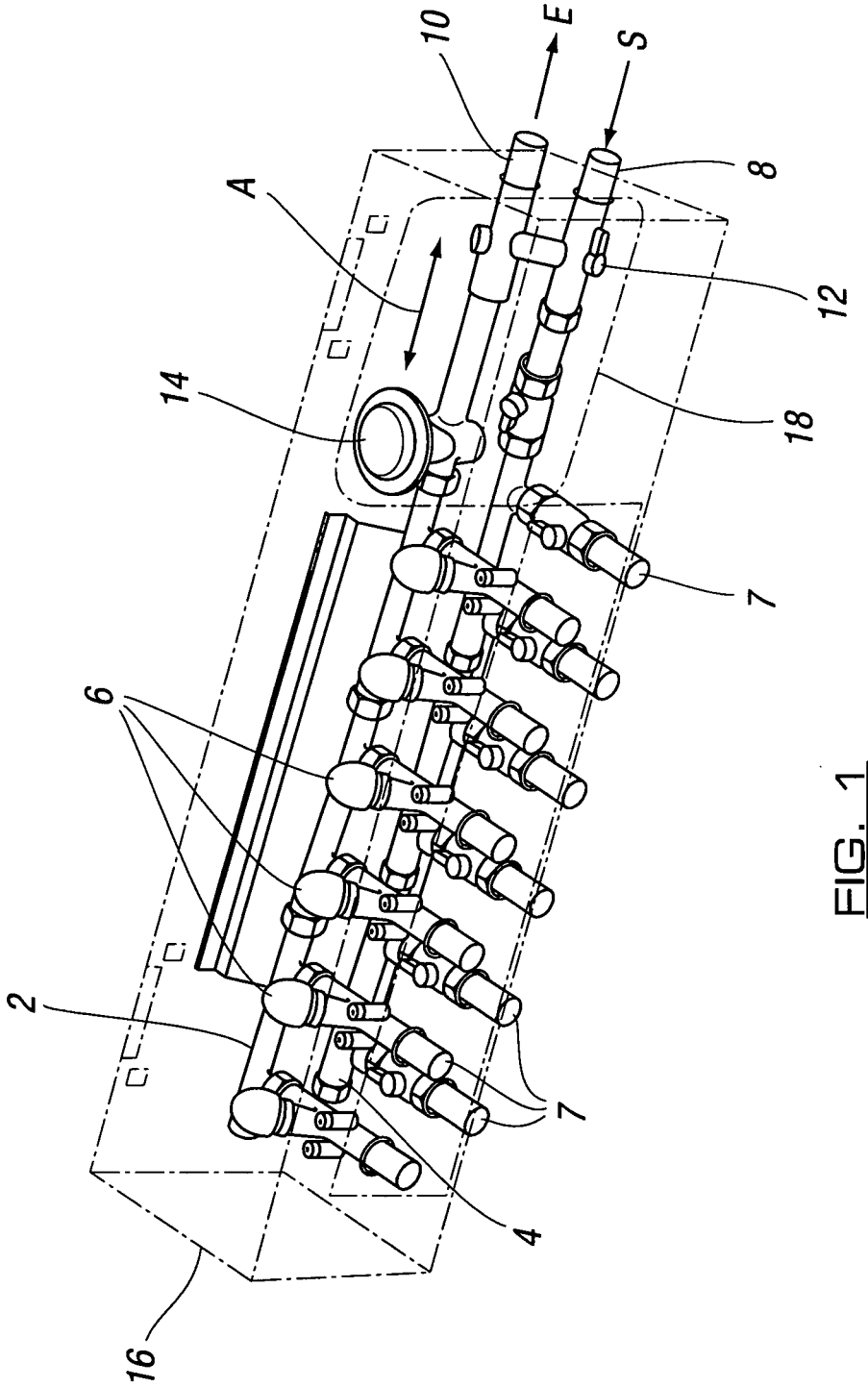

FIG. 1

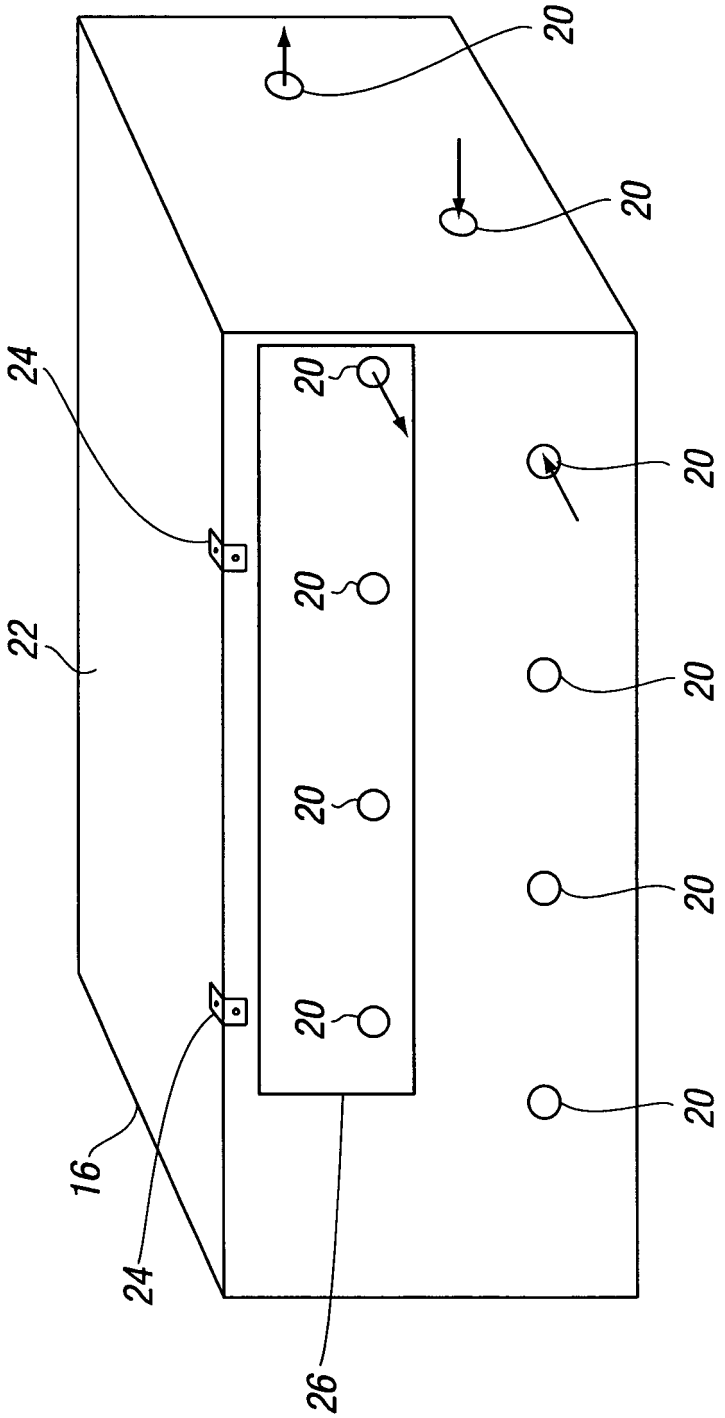

FIG. 2