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(54) Arrangement for a urinal

(57) The present invention relates to an arrangement for a urinal for vacuum application comprising a shell portion (1), operational means, and vacuum discharge means. In order to achieve a streamlined arrangement the shell portion (1) comprises a substantially unitary body, whereby the operational means comprise a level sensor means (32) and a vacuum operated discharge valve means (33) in fluid communication with a pipe system (34). The shell portion (1) is arranged to support the operational means within the shell portion (1).

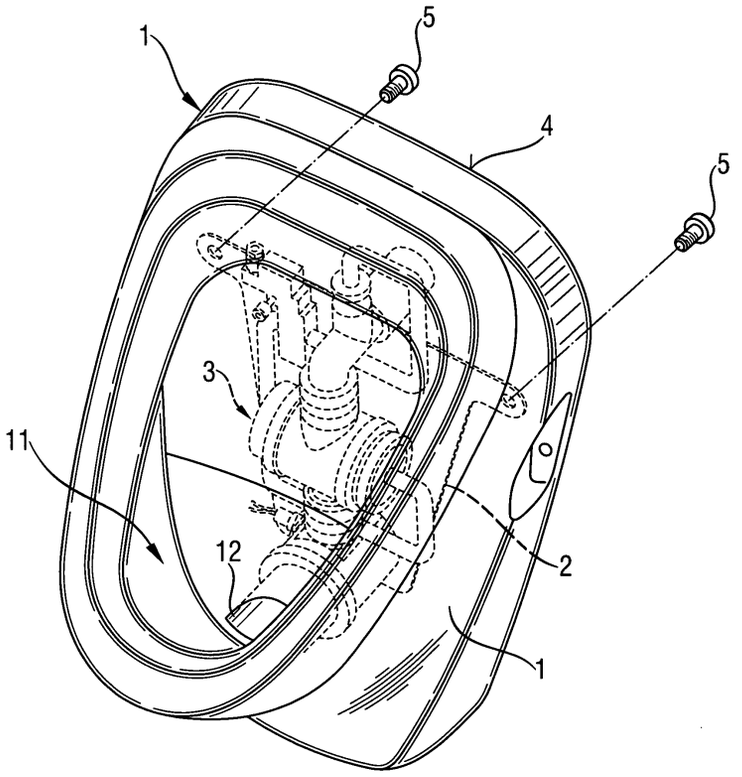

Fig: 1

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Description

[0001] The invention relates to an arrangement for a urinal for vacuum application according to the preamble of claim 1.

[0002] Previously known solutions usually comprise a complex structure including a multipartite shell and having a number of operational components on the back side of a wall supporting the urinal shell. Another possibility has been to have a separate box or enclosure beside the urinal shell for the operational means. Furthermore, known urinals are also provided with a water trap within the urinal shell. Consequently, known urinal arrangements require relatively much place and the assembly and mounting of such urinals is laborious and time consuming, whereby also any maintenance or corresponding measures are made overly difficult.

[0003] An object of the present invention is to avoid said disadvantages and to achieve a streamlined urinal assembly providing a reliable function. This object is attained by an arrangement for a urinal according to claim 1.

[0004] The basic idea of the invention is to provide an arrangement for a urinal wherein a set of operational means can be enclosed and supported within a substantially unitary shell portion of the urinal, comprising a bowl portion and a discharge opening in the bowl portion, whereby the operational means comprise a level sensor means and a vacuum operated discharge valve means in fluid communication with a pipe system. In this manner the urinal can be mounted and supported on a wall, whereby the urinal basically only requires an outside vacuum sewer discharge connection, connectable to the pipe system, and a power supply connection.

[0005] The discharge opening is preferably arranged in fluid communication with a sensor chamber provided with the level sensor means, whereby the sensor chamber is in fluid communication with the vacuum operated discharge valve means.

[0006] An advantageous embodiment of the urinal arrangement further comprises a rinse water means supported within the shell portion.

[0007] The operational means are advantageously mounted on a back plate fastenable to the shell portion.

[0008] The vacuum operated discharge valve means is advantageously operated by vacuum derivable from the pipe system through a first vacuum supply valve means.

[0009] Vacuum is provided to the pipe system by way of a vacuum generation means and vacuum sewer piping.

[0010] In order to facilitate operation of the urinal arrangement the operational means are connected to a control unit provided with an activator means.

[0011] In the following the present invention is described more in detail, by way of example only, with reference to the attached schematic drawings, in which:

Fig.1 shows a urinal shell portion,

Fig. 2 shows a first embodiment of a set of operational means,

Fig. 2 shows a second embodiment of a set of operational means, and

Fig. 4 shows a general flow chart of the arrangement for the urinal.

[0012] The present invention relates to an arrangement for a urinal for vacuum application, the operation of which is discussed in connection with Fig. 4.

[0013] In the figures the shell portion of the urinal is generally indicated by reference numeral 1. The shell portion 1, which according to the invention comprises a substantially unitary body, e.g. of a ceramic or steel material, is mounted against a wall or the like (not shown) in a conventional manner.

[0014] The operational means 3 are mounted on a back plate 2, which is fastened to the back side 4 of the shell portion 1 by fastening means, such as screws 5 or the like, whereby the operational means 3 are enclosed within the outer boundaries formed by the shell portion 1 and the back plate 2. The shell portion comprises a urinal bowl portion 11 with a discharge opening 12 approximately at the bottom of the bowl portion 11. The back plate could of course be fastened to the same wall portion as the shell portion.

[0015] In the embodiment shown in Fig. 2 the operational means 3 comprise a sensor chamber 31, a level sensor 32 for monitoring the flush operation through the sensor chamber, a vacuum operated discharge valve 33 and a pipe system 34, which is arranged to be connected to a vacuum sewer piping 90 (Fig. 4) by a discharge connection (not shown) at the location of the urinal.

[0016] The operational means 3 further comprise a first vacuum supply valve 35 that is in fluid communication with the pipe system 34 through a suction line 36 that taps into the pipe system 34 and respectively with the vacuum operated discharge valve 33 through a valve line 37. Partial vacuum is created in the pipe system 34 by an intermittently operated vacuum generating means 100 (Fig. 4). The partial vacuum is used to operate the vacuum operated discharge valve 33 by way of said first vacuum supply valve 35 and the suction and valve lines 36,37.

[0017] The second embodiment of the operational means 3 shown in Fig. 3 corresponds to the one disclosed in connection with Fig. 2 and further comprises a rinse water means 38 provided with a rinse water supply line 39. The rinse water means 38 provides rinse water to the urinal bowl portion 11 during a flush sequence. The rinse water means 38 is preferably operated by vacuum by way of a second vacuum supply valve 40, to which control vacuum is provided through vacuum line 41 from the vacuum generation means 100.

[0018] The operation of the urinal arrangement is discussed in the following, mainly in connection with Fig. 4.

[0019] When the urinal has been used and disposable

waste has been received in the urinal bowl portion 11, an activator means, for example a flush button 6, is activated by a user in order to commence the flush sequence, whereby a signal is sent via a control unit 7 to the vacuum generation means 100, e.g. an ejector means. This activates the intermittently operated vacuum generation means 100 creating a given partial vacuum, e.g. from about -18 kPa up to about -35 kPa, in the vacuum sewer piping 90, optionally including a retention tank 91, and the pipe system 34. The partial vacuum level is controlled by a vacuum switch 71 connected to the control unit 7. The operation of the vacuum generation means 100 is shut off when the desired vacuum level has been reached. Reference numeral 8 indicates a power supply connection for the control unit 7.

[0020] When the given partial vacuum level has been reached the control unit 7 activates the rinse water means 38, by way of a second vacuum supply valve 40 connected by vacuum line 41 to the vacuum generation means 100, whereby the urinal bowl portion 11 is flushed, e.g. by a given rinse water amount, e.g. of about 0.2 to 0.3 litres. At the same time, the control unit 7 activates the first vacuum supply valve 35 so that partial vacuum is directed towards the vacuum operated discharge valve 33, from the pipe system 34 through the suction line 36, said first vacuum supply valve 35 and the valve line 37. This opens the discharge valve 33, whereby the disposable waste is discharged from the urinal bowl portion 11, through the discharge opening 12 and further through the sensor chamber 31 and the discharge valve 33 into the pipe system 34 which leads to the vacuum sewer piping 90 and the retention tank 91.

[0021] After the flush sequence has been carried out, the control unit 7, provided with a time control, will close the partial vacuum connection through the first vacuum supply valve 35 in order to close the discharge valve 33.

[0022] Alternatively the flush sequence may be activated by the level sensor means 32 provided in the sensor chamber 31. The level sensor means is preferably made responsive to a given amount of disposable waste, e.g. about 0.15 to 0.20 litres of fluid, collecting in the urinal bowl portion 11 and the discharge opening 12. The level sensor means 32 is connected to the control unit 7 and is arranged to provide a signal to the same in a corresponding manner as the flush button 6 described above for commencing the flush sequence.

[0023] The drawings and the description related thereto are only intended for clarification of the basic idea of the invention. The invention may vary in further detail within the scope of the ensuing claims.

Claims

1. Arrangement for a urinal for vacuum application comprising a shell portion (1), operational means (3), and vacuum discharge means,
characterised in that the shell portion (1) comprises a substantially unitary body,
the operational means (3) comprise a level sensor means (32) and a vacuum operated discharge valve means (33) in fluid communication with a pipe system (34),
and **in that**
the shell portion (1) is arranged to support the operational means (3) within the shell portion.

2. Arrangement according to claim 1, **characterised in that** the shell portion (1) comprises a bowl portion (11) with a discharge opening (12).

3. Arrangement according to claim 2, **characterised in that** the discharge opening (12) is in fluid communication with a sensor chamber (31), provided with the level sensor means (32), and **in that** the sensor chamber (31) is in fluid communication with the vacuum operated discharge valve (33).

4. Arrangement according to claim 1, **characterised in that** the operational means (3) further comprises a rinse water means (38) supported within the shell portion (1).

5. Arrangement according to claim 1 or 4, **characterised in that** the operational means (3) are mounted on a back plate (2), which is arranged to be fastened to the back side (4) of the shell portion (1).

6. Arrangement according to claim 1, **characterised in that** the vacuum operated discharged valve means (32) is in fluid communication with the pipe system (34) through a first vacuum supply valve means (35).

7. Arrangement according to claim 6, **characterised in that** the fluid communication is established through a suction line (36) between the pipe system (34) and the first vacuum supply valve means (35) and a valve line (37) between the first vacuum supply valve means (35) and the vacuum operated discharge valve means (33).

8. Arrangement according to claim 1, **characterised in that** the pipe system (34) is arranged to be set in fluid communication with a vacuum generation means (100) through vacuum sewer piping (90).

9. Arrangement according to claim 8, **characterised in that** the vacuum sewer piping (90) comprises a retention tank (91).

10. Arrangement according to claim 8, **characterised in that** the rinse water means (38) is vacuum operated and **in that** the rinse water means (38) is connected to the vacuum generation means (100) by way of a second vacuum supply valve means (40)

and a vacuum line (41).

11. Arrangement according to claim 1, **characterised in that** the arrangement is provided with a control unit (7) provided with an activator means (6).

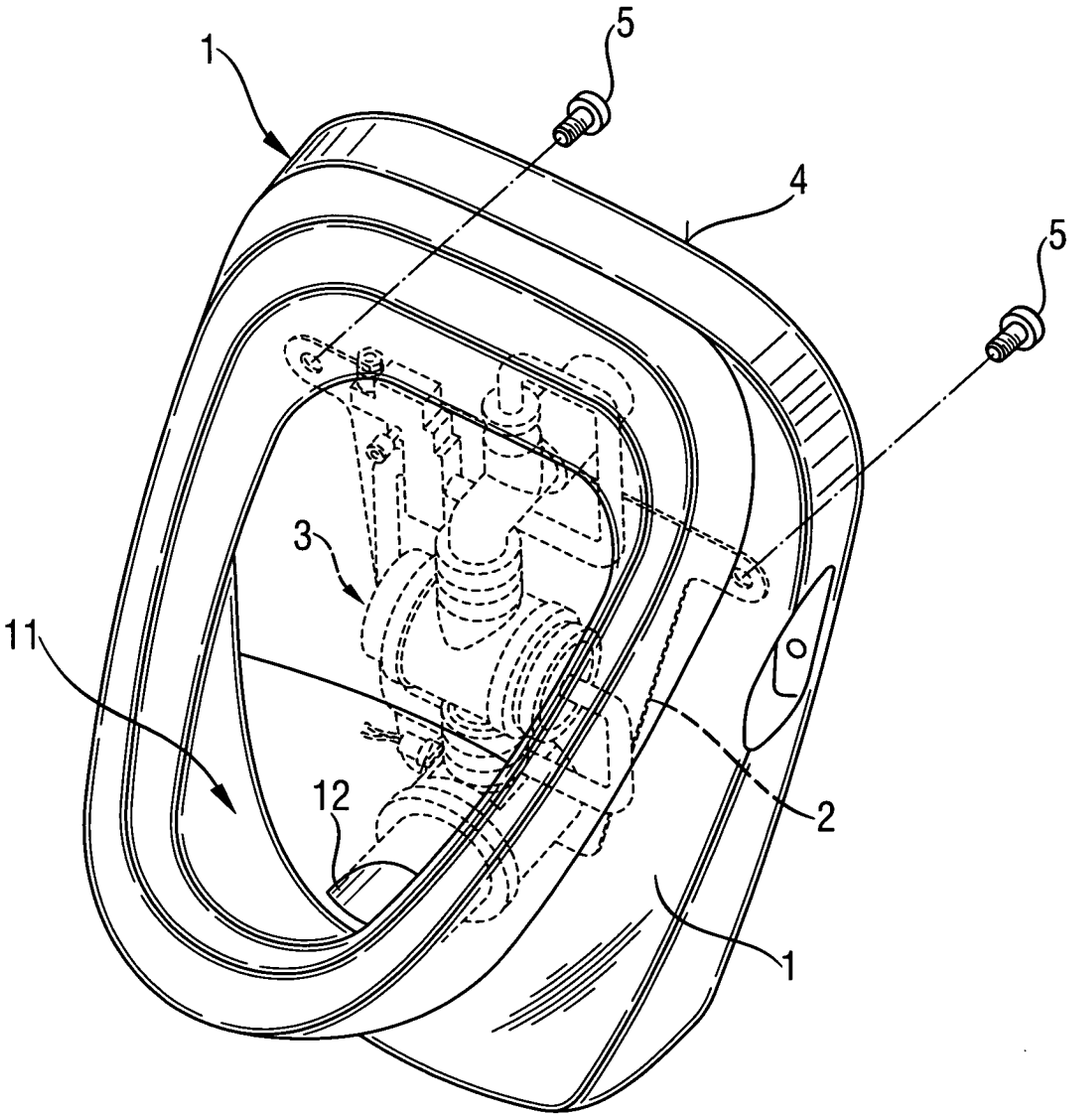

Fig. 1

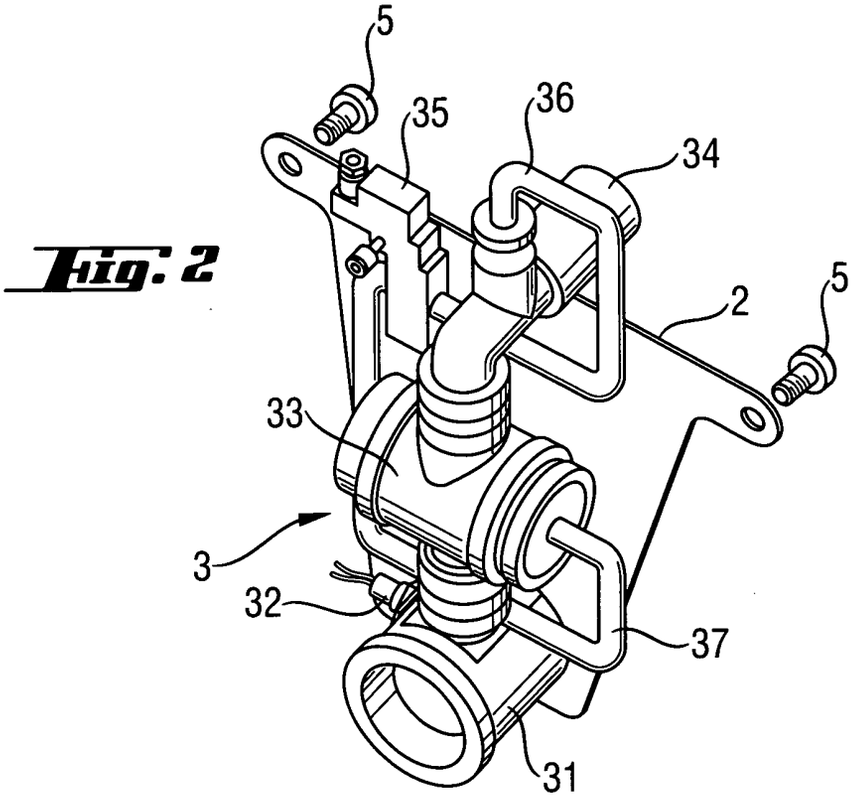

Fig. 2

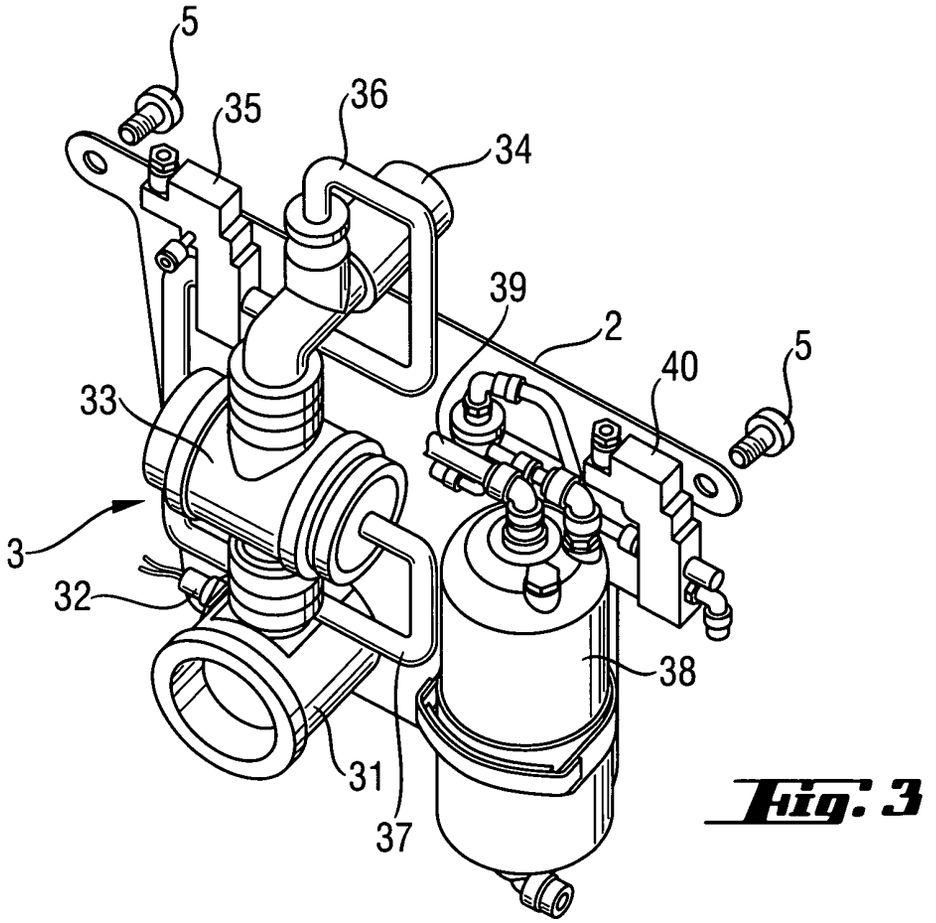

Fig. 3

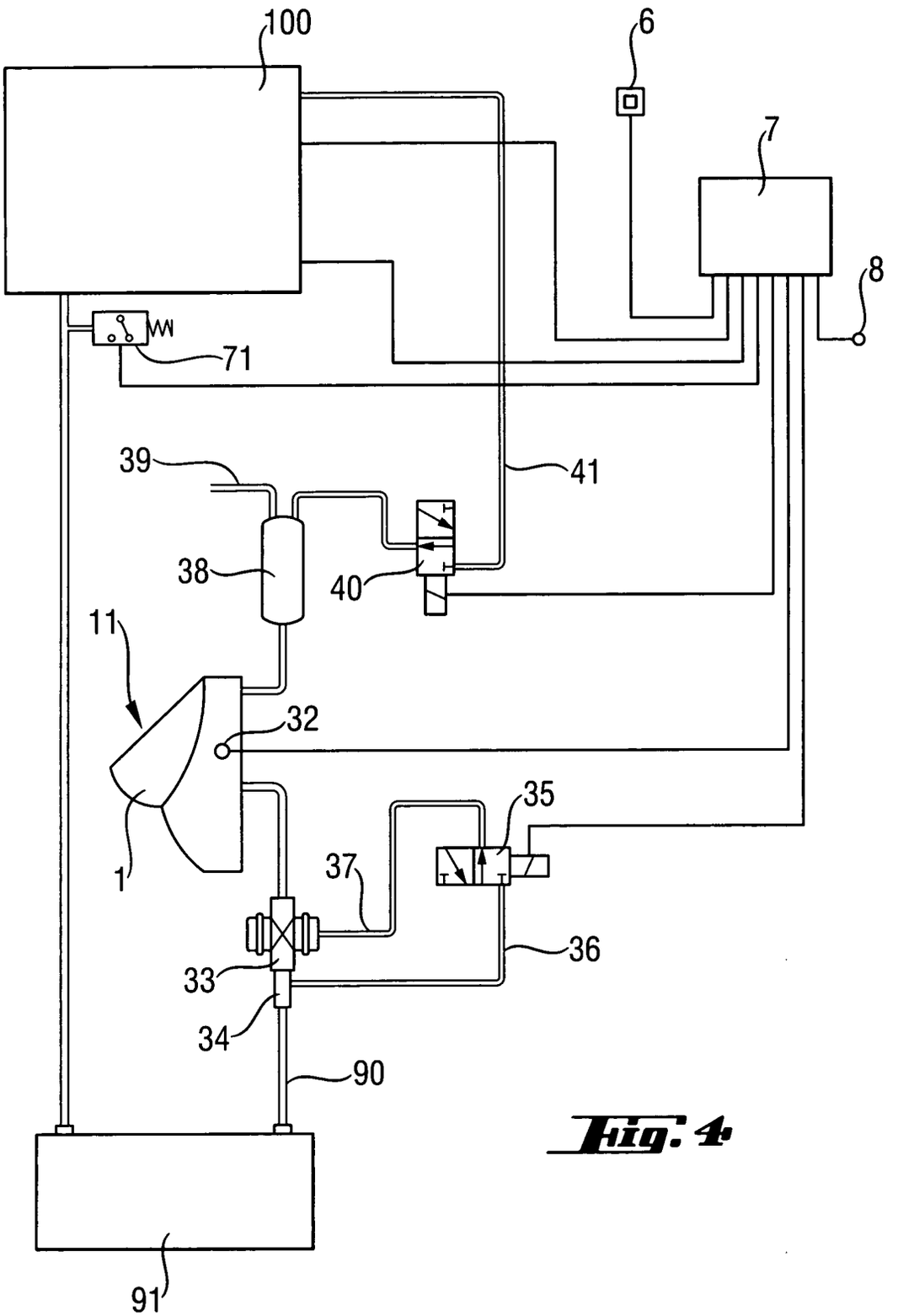

Fig. 4

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Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	30 April 2003	Flygare, E

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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 1955

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The present search report has been drawn up for all claims

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