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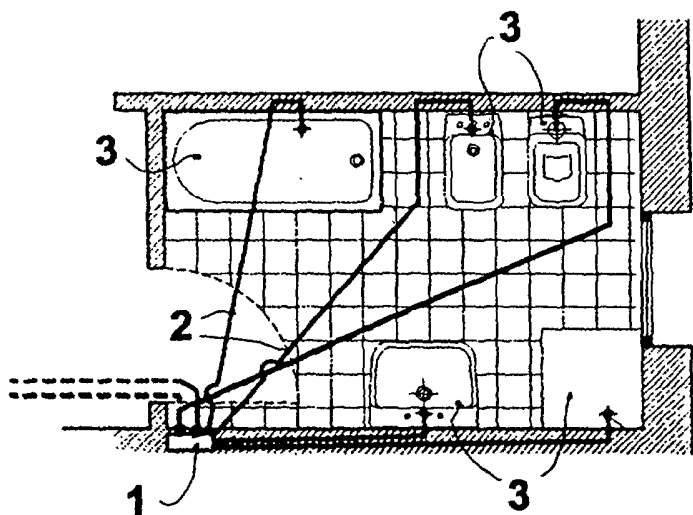
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WITHDRAWABLE SINGLE-PIPE SANITARY SYSTEM



(57) Abstract: The invention is a new sanitary system comprising a manifold-mixer, only one pipe that conveys the mixed water to each sanitary fixture and a regulator; the manifold-mixer is provided with a three-way solenoid valve that receives hot water and cold water from the system and conveys the mixed water to the feeding pipe, while the regulator controls the precise mixing position of the solenoid valve. The flexible feeding pipe in plastic material is coupled with at least two electric wires that connect the adjusting knob/lever to the solenoid valve corresponding to that feeding pipe. The adjusting knob/lever can be incorporated in an integrated with the tap or stop valve that controls the delivery of mixed water to the sanitary fixture.



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TITLE

WITHDRAWABLE SINGLE-PIPE SANITARY SYSTEM

DESCRIPTION

5 The present invention concerns the field of hydraulic systems and in particular it concerns water supply systems for sanitaryware.

Traditional water supply systems are provided with two series of pipes for the sanitary fixtures, one for hot water and the other for cold water.

10 Hot and cold water are then mixed by means of the taps and mixer taps installed on washbasins, showers, bath tubs, etc.

Said double series of pipes involves considerable costs and labour for both installers and service plumbers.

15 In fact, it is necessary to prepare the space for two different pipes, use and install two different pipes, use taps (difficult to adjust) or mixer taps (expensive) and every failure requires the demolition of the wall even if one pipe only must be replaced.

In order to overcome the drawbacks mentioned above, a new type of withdrawable single-pipe sanitary system has been designed and implemented.

20 The new withdrawable single-pipe sanitary system comprises in its main parts one or more manifold-mixers, a series of flexible pipes incorporating at least two electric wires and a series of taps with adjustment knob/lever.

25 The concept on which the invention is based consists in the mixing of hot and cold water at the source, that is, in the manifold-mixer, said hot and cold water being supplied to the tap through each single flexible pipe; the specific mixing of hot and cold water takes place through the adjusting knob/lever that controls the operation of the manifold-mixer by means of the electric wires preferably incorporated
30 in the flexible pipe.

The inside of the manifold-mixer is provided with a three-way solenoid valve and receives hot and cold water from the water supply system.

The solenoid valve power supply voltage is very low, typically 12 or 24 Volts.

A single pipe conveying mixed water to the corresponding fixture/tap branches off the valve.

5 Said mixed water feeding pipe is made of a flexible plastic material resistant to the mechanical and thermal stresses due to the pressurized water and to the maximum temperature available in the water heating system. Two or more insulated electric wires are coupled with said feeding pipe, and more precisely they are laid on
10 its surface or within its wall.

Said electric wires are connected to the solenoid valve or to the control circuit of the manifold-mixer solenoid valve, on one side, and to the adjusting knob/lever positioned in correspondence with the sanitary fixture tap, on the other side.

15 By modifying the position of the adjusting knob/lever it possible to control the position of the solenoid valve present in the manifold-mixer - by means of the electric wires present on the feeding pipe - and therefore it is possible to adjust the mixing of hot and cold water and the temperature of the water conveyed to the tap of the sanitary
20 fixture.

Therefore, it is sufficient to lay one feeding pipe only for each sanitary fixture.

Said feeding pipe should be introduced into a sheath or flexible pipe, of the type generally used for electrical systems or similar systems,
25 to be set into the wall in advance, between the place where the manifold-mixer will be installed and the position of the tap. In this way, either for the installation of the feeding pipe and for the replacement of the same in case of failures, it will be sufficient to disconnect both its ends and to withdraw it from or insert it into said
30 flexible pipe, with no need to break the wall or the wall covering (plaster, tiles, etc.).

The tap positioned on the sanitary fixture and the water temperature adjusting knob/lever can be separate or combined in a single element, for example:

- separate adjusting knob/lever, independent of the tap for the adjustment of water delivery;
- a single electric element with a lever that when rotated adjusts water temperature (solenoid valve adjusting knob/lever), while when pressed or pulled it adjusts water delivery (local solenoid valve on the sanitary fixture);
- a combined mixer tap, containing an electric regulator: by rotating the lever sideways you act on the regulator of the manifold-mixer solenoid valve, while by lifting or lowering the lever you mechanically act on the stop valve of the mixer tap itself.

The following is a practical application among many of the invention in question, illustrated in the enclosed drawings, wherein:

Figure 4 is a schematic representation of the new system, in which the manifold-mixer (1, represented in detail in Figure 1) with three sectors is positioned at the beginning of the hot and cold water supply line, typically near the boiler, with a number of flexible pipes (2) branching off said manifold-mixer, the number of said flexible pipes corresponding to the number of sanitary fixtures (3) to which water must be supplied.

The manifold-mixer is provided with a solenoid valve (1.1) for each feeding pipe (2).

Each solenoid valve (1.1) is connected to the feeding pipe (2), with the cold water pipe (1.21) and with the hot water pipe (1.22) coming from the boiler, as well as with a power supply at very low voltage (1.3).

An example of the electromechanical operation of the solenoid valve (1.1) is represented in Figure 2.

The other end of each feeding pipe (2) is connected to a tap or stop valve (4) that adjusts the delivery of mixed water, while an adjusting knob/lever (5) is positioned near the tap (4) to set the temperature of the mixed water (Figure 5). Said adjusting knob/lever (5) is electrically connected to the solenoid valve (1.1) of the manifold-mixer. For this purpose it is possible to use special feeding pipes (2),

represented in Figure 3, coupled with at least two electric wires (2.1) that are positioned on their surface or within their plastic wall.

It is also possible to design the system so that the temperature adjusting knob/lever (5) and the mixed water tap (4) constitute a

5 single element.

Numerous advantages can derive from the use of the new single-pipe sanitary system: the cost of the pipes necessary for the distribution of water is halved, less work is necessary for the laying of the sheath or flexible pipe housing the feeding pipe, it is possible to

10 completely replace any feeding pipe in a sanitary fixture with no need to demolish the wall or wall covering, hot and cold water are mixed at the beginning of the system and therefore there are no pipe sections containing unused hot water.

Therefore, with reference to the above description and to the

15 enclosed drawings, the following claims are put forth.

CLAIMS

1. Sanitary system, characterized in that it comprises a manifold-mixer that in turn comprises one or more solenoid valves connected to and adjusted by corresponding electric regulators, and wherein
5 between each solenoid valve and the corresponding sanitary fixture there is only one pipe for the supply of the water mixed by said solenoid valve.
2. Sanitary system, characterized in that it comprises a manifold-mixer, only one pipe for conveying mixed water to each sanitary
10 fixture and a regulator, and wherein said manifold-mixer is provided with a three-way solenoid valve that receives hot water and cold water from the system and conveys the mixed water to the feeding pipe, and wherein the regulator controls the precise mixing position of the solenoid valve.
- 15 3. Sanitary system according to claim 1, characterized in that the flexible feeding pipe in plastic material is provided with two electric wires that connect the adjusting knob/lever to the solenoid valve corresponding to that feeding pipe.
4. Sanitary system according to claims 1, 2, characterized in that the
20 adjusting knob/lever is incorporated in and integrated with the tap or stop valve that controls the delivery of mixed water to the sanitary fixture.

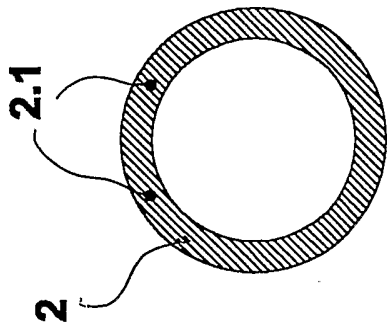


Fig. 3

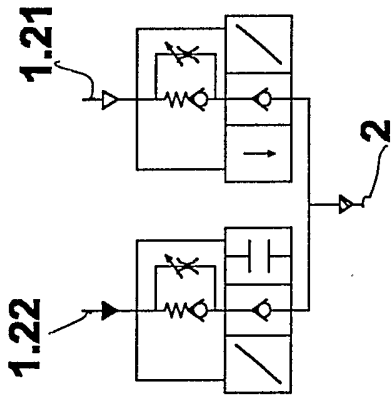


Fig. 2

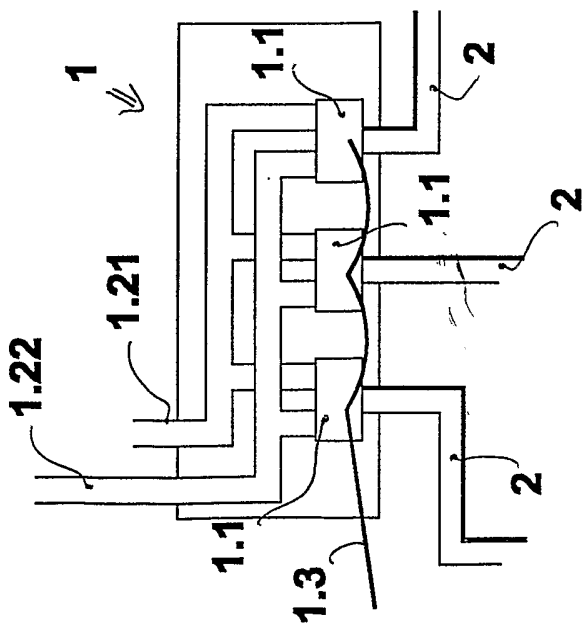


Fig. 1

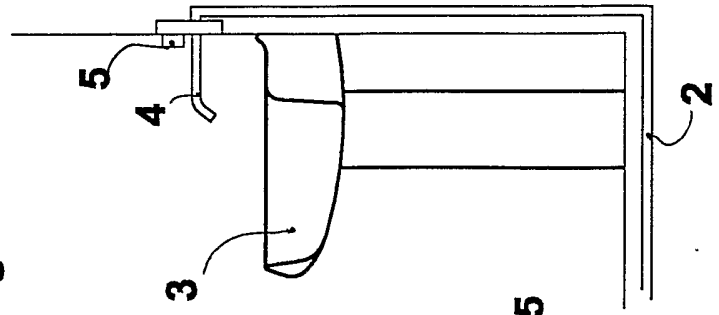


Fig. 5

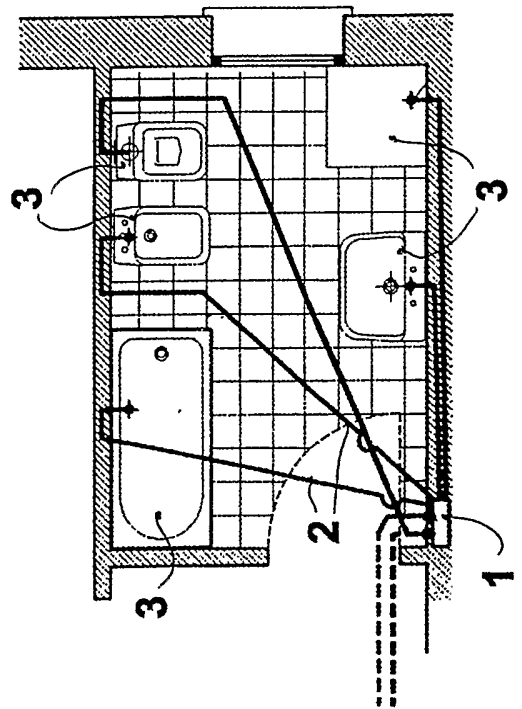


Fig. 4

INTERNATIONAL SEARCH REPORT

In national Application No

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 E03C1/02 E03C1/05

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E03C G05D F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BE 890 587 A (CEIP SRL) 1 April 1982 (1982-04-01) the whole document	1-4
X	EP 0 088 736 A (CHIARAMONTE RENZO ;PEDROTTI CARLO (IT); MASOTTO MAURIZIO (IT)) 14 September 1983 (1983-09-14) page 4, line 10 -page 7, line 14; figures	1-4
A	US 5 765 242 A (MARCIANO JOSEPH) 16 June 1998 (1998-06-16) column 5, line 42 - line 50; figure 6A	2
A	US 4 688 273 A (LYNG BJOERN) 25 August 1987 (1987-08-25) column 8, line 2 - line 36; figure 7	3

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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