



Description

[0001] The present invention relates to a tap system of the type specified in the preamble of Claim 1.

[0002] Tap systems are currently known.

[0003] They generally comprise water delivery and regulation means, such as nozzles, taps, mixers, spouts of various shapes and disposed in various positions, for example for a shower, or to deliver water into a bathtub, a wash-hand basin or the like.

[0004] These systems are frequently installed buried, or partly embedded or installed inside a wall, so that only the necessary elements, such as tap or mixer controls, spouts and the like, project from the wall.

[0005] Buried systems are particularly appreciated for the aesthetic qualities they achieve.

[0006] In fact, in buried systems no portions of pipes and the like which are not aesthetically pleasing are visible.

[0007] However, the aforesaid prior art presents some important drawbacks.

[0008] In fact, buried systems must be sized and structured for the type of installation required.

[0009] For example, in a bathtub with shower, diverters to a first spout to fill the tub and to a second spout for the shower are required. Currently the outlets from the mixer body are in fixed positions which oblige the installer to provide piping works to reach the spout positions desired by the Customer's project. Moreover, in many circumstances it is necessary to adapt the structure of the system to the available spaces.

[0010] In particular, at times it is necessary to interpose a corner of a wall between spout and mixer in showers.

[0011] Due to these drawbacks it is necessary to provide a plurality of different tap systems suitable for all situations.

[0012] This plurality of systems necessarily translates into considerable costs and surpluses to keep the warehouse stocked.

[0013] Moreover, the plurality of systems also gives rise to errors in the layout and installation thereof. Above all, a variation of the water systems requires significant works to replace existing systems.

[0014] In this situation the technical aim underlying the present invention is to devise a tap system suitable to be buried or embedded, capable of substantially overcoming the aforesaid drawbacks.

[0015] Within said technical aim, an important object of the invention is to obtain a tap system which facilitates different installations according to use and available spaces.

[0016] Another important object of the invention is to produce a simple and inexpensive tap system.

[0017] The technical aim and the objects specified are achieved by a tap system as claimed in the appended Claim 1.

[0018] Preferred embodiments are specified in the sub-claims.

[0019] The features and advantages of the invention are better explained below in the detailed description of a preferred embodiment of the invention, with reference to the attached drawings, wherein:

Fig. 1 shows a tap system according to the invention in a first configuration;

Fig. 2 shows a tap system according to the invention in a second configuration;

Fig. 3 shows a tap system according to the invention in a third configuration;

Fig. 4 shows a first detail of the tap system;

Fig. 5 shows a second detail of the tap system; and

Fig. 6 shows a third detail of the tap system.

[0020] With reference to the aforesaid Figures, the tap system according to the invention is indicated as a whole with the number **1**.

[0021] It comprises, in the most complete configuration thereof, a control device **2**, at least one diverter element **6**, a branching element **9** and spout means **3** suitable to deliver fluid.

[0022] The spout means **3** can be realized by a spout for a shower **3a**, for a wash-hand basin, for a bathtub **3b**, by nozzles for whirlpool baths and showers and the like.

[0023] Said elements and devices **2**, **6** and **9** are mutually composable and connectable in a plurality of different configurations adaptable for any requirement.

[0024] In particular, in some configurations some of the elements and devices **2**, **6**, and **9** can be omitted, while in others they more than one of these can be provided, as better specified below and illustrated in Figs. 1 - 3.

[0025] Moreover, they are made of materials for taps such as stainless steel, brass or the like.

[0026] Furthermore, the tap system **1** is suitable to be installed buried and defines a main extension plane **1a** substantially parallel to the extension plane of a wall **21** in which said system is disposed.

[0027] Moreover, said elements and devices **2**, **6**, **9** are mutually engageable in fluid communication along an axis of alignment **1b** lying in the extension plane **1a**.

[0028] In more detail, the control device **2** is suitable to regulate the delivery of fluid, i.e. the quantity and temperature thereof, and comprises an actuator **2a**, commonly a tap or a mixer, which extends perpendicular to the main extension plane **1a**.

[0029] Moreover, it comprises first inlet connections **4** suitable to connect, in fluid communication, the control device **2** with inlet ducts **20** suitable to supply fluid to the tap system **1**, and a plurality of first outlet connections **5** suitable to be connected, in fluid communication, to the spout means **3**.

[0030] Said connection **5** is preferably indirect, and therefore other elements are preferably interposed as described in more detail below.

[0031] Moreover, the first outlet connections **5** are oriented parallel to the main extension plane **1a**.

[0032] In the present text, the term direction of orientation of the connections is intended that said connections are suitable to allow the passage of fluid which moves in the same directions. In substance, the connections define a port whose area is perpendicular to the direction of orientation of these connections. In particular, the control device 2 comprises an inner body **2b** substantially parallelepiped in shape and suitable to be disposed inside a wall 21 and connected along a first face to the actuator 2a.

[0033] The inner body 2b comprises said inlet connections 4, realized by known pipe connections, preferably two of which are present, for hot and cold water, preferably disposed along a face perpendicular to said first face, and three outlet connections 5 each disposed along the remaining faces perpendicular to said first face, as shown in Fig. 4.

[0034] The diverter element 6 instead comprises a second inlet connection 7 suitable to be connected, in fluid communication, with a first outlet connection 5 and a second outlet connection 8 suitable to be connected to spout means 3.

[0035] Said connection 8 is preferably direct, and therefore other elements are not interposed between it and the spout means 3.

[0036] The diverter element 6 can preferably be disposed entirely inside a wall and the second inlet 7 and outlet 8 connections are preferably oriented in perpendicular directions.

[0037] The diverter element 6 is also preferably parallelepiped shaped, as shown in Fig. 5.

[0038] The branching element 9 in turn comprises a third inlet connection 10 suitable to be connected, mechanically and in fluid communication, with a first outlet connection 5, and a plurality of third outlet connections 11 each suitable to be connected, directly or indirectly, to spout means 3.

[0039] Preferably, only two third outlet connections 11 are present, oriented one in a parallel direction and one in a perpendicular direction to the third inlet connection 10.

[0040] The branching element 9 also comprises a valve 12 suitable to select at least one, and preferably only one, of the third outlet connections 11.

[0041] The valve 12 is of known type and preferably comprises a control button 12a and a valve body 12b suitable to divert the flow of the fluid.

[0042] It extends mainly in a direction perpendicular both to the direction of the third inlet connection 10 and to the directions of the third outlet connections 11. The branching element 9 also preferably comprises a main body 9a substantially parallelepiped in shape suitable to be disposed inside a wall 21 and shown in Fig. 6.

[0043] Moreover, conveniently, the third outlet connections 11 can be connected, mechanically and in fluid communication, to the second inlet connection 7. More preferably each of the second and third inlet connection 7, 10, can be connected, mechanically and in fluid commu-

nication, with one among the first, second and third outlet connections 5, 8, 11.

[0044] In this way, the system is completely modular and composable according to requirements.

[0045] Moreover, said inlet and outlet connections can preferably be connected to standard pipes 22, rigid or flexible, so that the system is even more variable. These are realized structurally in the same manner as conventional connections of pipes for fluids, i.e. comprising threaded couplings and seals, preferably compatible with standard threaded couplings and seals for water pipes.

[0046] Operation of the tap system 1, the structure of which is described above, is as follows.

[0047] The control device 2, the diverter element 6, the branching element 9, any pipes 22 and the spout means 3 are variedly composed according to spaces and needs.

[0048] Moreover, at the intersection between the wall 21 and portions projecting therefrom, such as spout means 3 or the control device 2 or yet again the valve 12, insulating plates 13, having an aesthetic function, can be provided. Moreover, the insulating plates 13, shown in Fig. 3, can be provided separate for each projecting portion or a single plate can be provided. The first solution achieves advantages of further modularity of the system.

[0049] In particular, the spout means 3 are preferably constrained to the diverter element 6, which allows the spout means 3 to be oriented directly towards the outside of the wall 21. Alternatively, pipes 22 which cover greater distances are used.

Fig. 1 shows a tap system 2 for a bathtub with shower including two spouts 3a and 3b. Therefore, a branching element 8 is provided to allow selection of the spout 3a.

[0050] Fig. 2 instead shows a system 1 for a shower including only one spout 3a.

Therefore, there is no branching element 8, which is also absent in Fig. 3 showing a system 1 for a wash-hand basin or bathtub.

[0050] Therefore, different elements and positions thereof can be used for each configuration.

[0051] Moreover, different first outlet connections 5 of the control device 2 can be used, to position the spouts in different positions.

[0052] The first outlet connections 5 can therefore be closed using specific fluid-tight caps.

[0053] It must also be specified that the diverter element 6 can have a second outlet connection 8 facing in the direction of the plane 1a, to be connected to a pipe 22 or the like, or in a direction perpendicular to the plane 1a, to be constrained directly to a spout 3a or 3b.

[0054] The correct angle is facilitated by the presence of parallelepiped shaped elements which allow simple visual coupling between parts to be produced.

[0055] For the purpose of further improving this feature, the parallelepipeds forming the diverter element 6, the branching element 9 and conveniently also the con-

trol device 2 have a square base, as shown in Fig. 1.

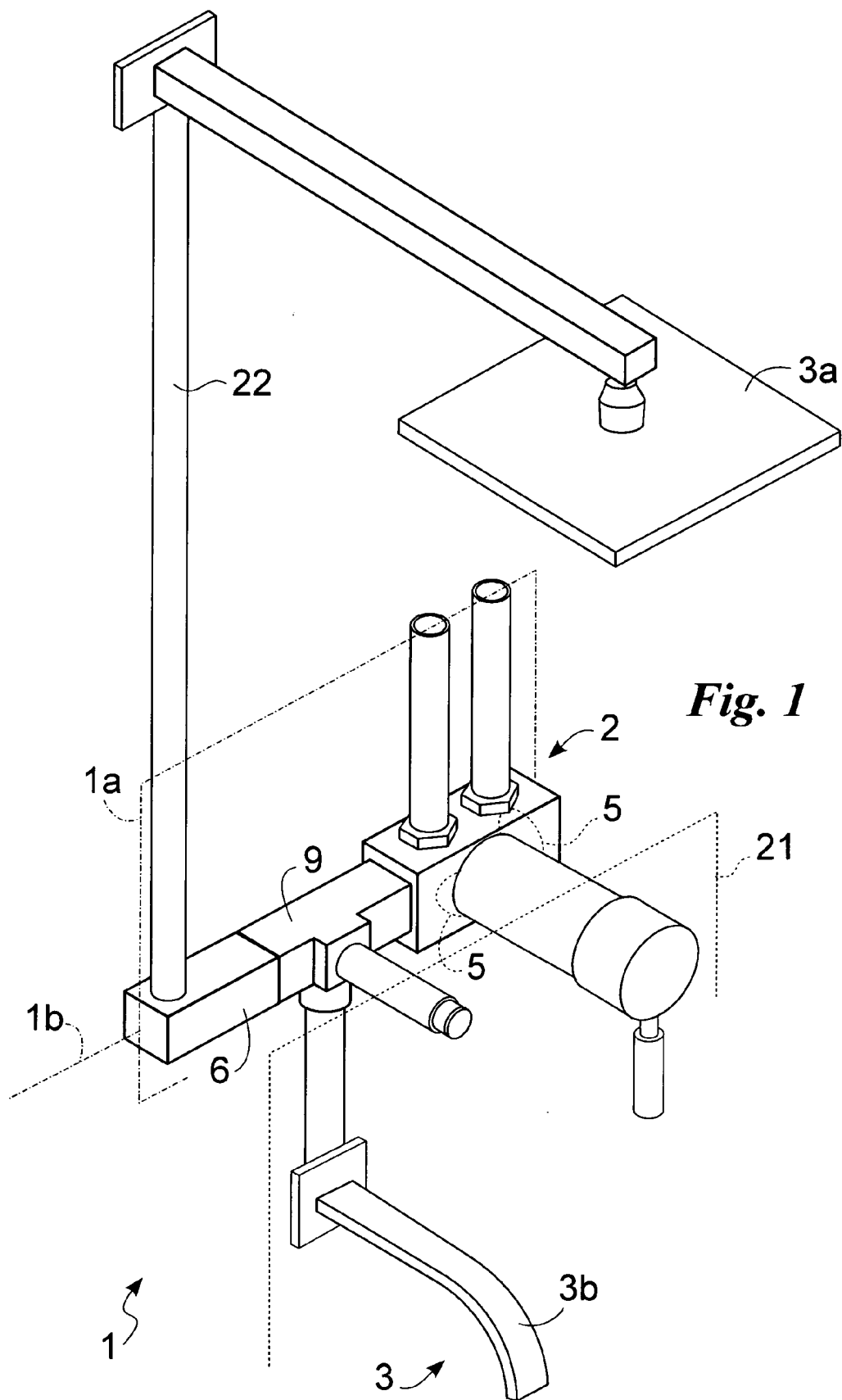
[0056] The invention achieves the objects proposed and allows important advantages. In fact, the tap system 1 allows different installations according to use and available spaces.

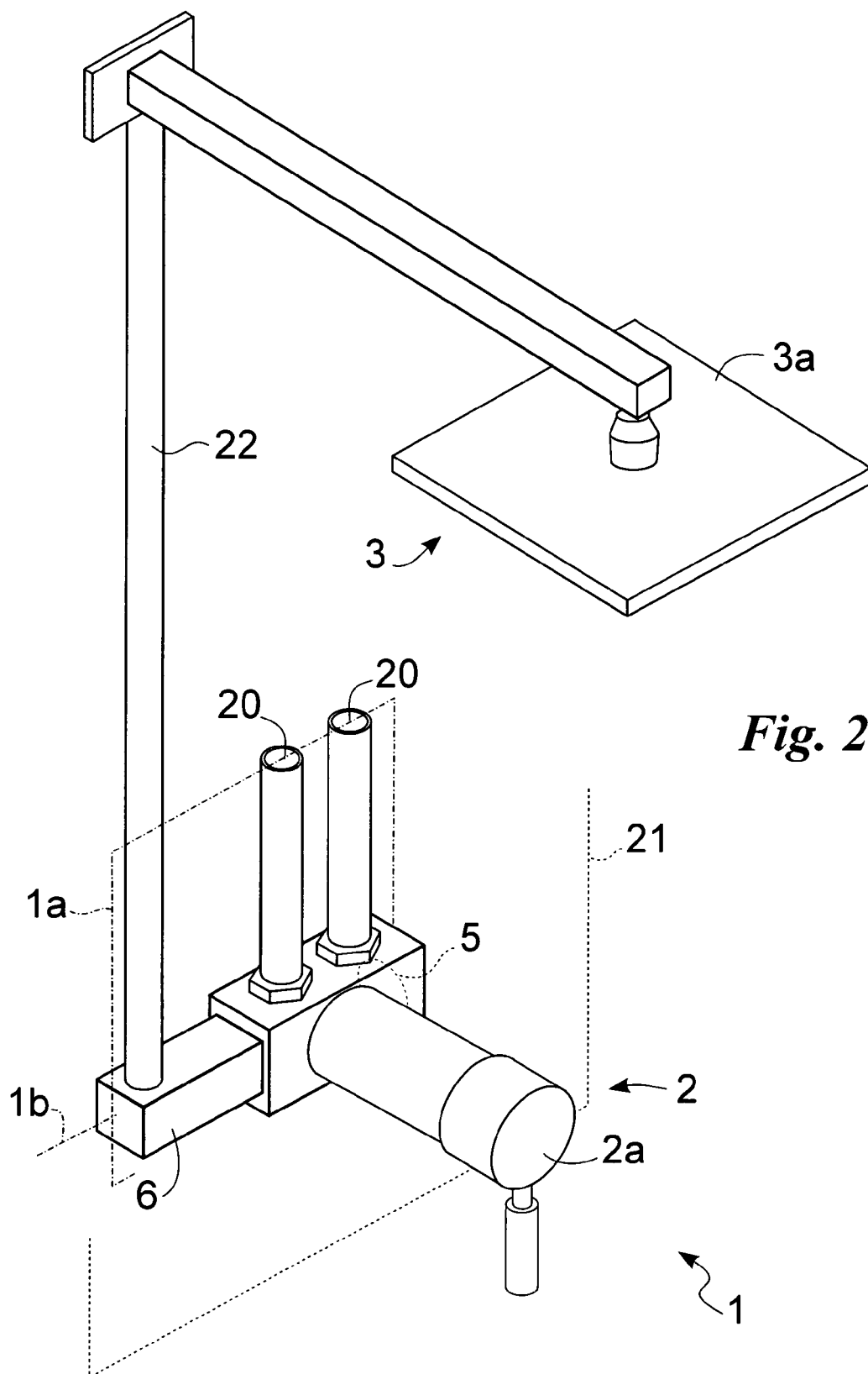
[0057] Moreover, it is simple, inexpensive and easy to install.

[0058] In fact, it is completely modular and composable according to requirements. The invention is susceptible to variants falling within the scope of the inventive concept.

Claims

1. Tap system (1) comprising: a control device (2) suitable to regulate the delivery of fluid, and comprising first inlet connections (4) suitable to connect, in fluid communication, said control device (2) with inlet ducts (20) suitable to supply said fluid to said tap system (1), spout means (3) suitable to deliver said fluid; **characterized in that** said control device (2) comprises a plurality of first outlet connections (5) suitable to be connected, in fluid communication, to said spout means (3).
2. Tap system (1) according to claim 1, wherein there is defined a main extension plane (1a) of the tap system (1) substantially parallel to the extension plane of a wall (21) in which said system is disposed and wherein said first outlet connections (5) are oriented parallel to said main extension plane (1a).
3. Tap system (1) according to claim 2, wherein said control device (2) comprises an actuator (2a) mainly extending in a direction perpendicular to said main extension plane (1 a).
4. Tap system (1) according to one or more of the preceding claims, comprising a diverter element (6) including a second inlet connection (7) suitable to be connected, in fluid communication, with one of said first outlet connections (5), and a second outlet connection (8) suitable to be connected, in fluid communication, with said spout means (3).
5. Tap system (1) according to claim 4, wherein said second inlet connection (7) is oriented perpendicular to said second outlet connection (8).
6. Tap system (1) according to one or more of the preceding claims, comprising a branching element (9) including a third inlet connection (10) suitable to be connected, in fluid communication, with one of said first outlet connections (5), a plurality of third outlet connections (11) each suitable to be connected, in fluid communication, with one of said spout means (3) and a valve (12) suitable to select at least one of said third outlet connections (11).
7. Tap system (1) according to claim 6, wherein two of said third outlet connections (11) are selectively oriented parallel and perpendicular to the direction of said third inlet connection (10) and wherein said valve (12) extends mainly in a direction perpendicular to said direction of said third inlet connection (10).
8. Tap system (1) according to claims 6 or 7 and 4 or 5, wherein said second inlet connection (7) can be connected, in fluid communication, to one of said third outlet connections (11).
9. Tap system (1) according to claim 8, wherein each of said second and third inlet connections (7, 10) can be connected, in fluid communication, to one of said first, second and third outlet connections (5, 8, 11).
10. Tap system (1) according to claim 8 or 9, wherein said branching element (9), said diverter element (6) and said control device (6) present substantially parallelepiped shaped bodies which can be aligned with one another in mutually mating positions.
11. Tap system (1) according to one or more of claims 8 - 10, wherein said branching element (9), said diverter element (6) and said control device (6) can be mutually engaged in fluid communication along an axis of alignment (1b) lying in the main extension plane (1 a) of the tap system (1).





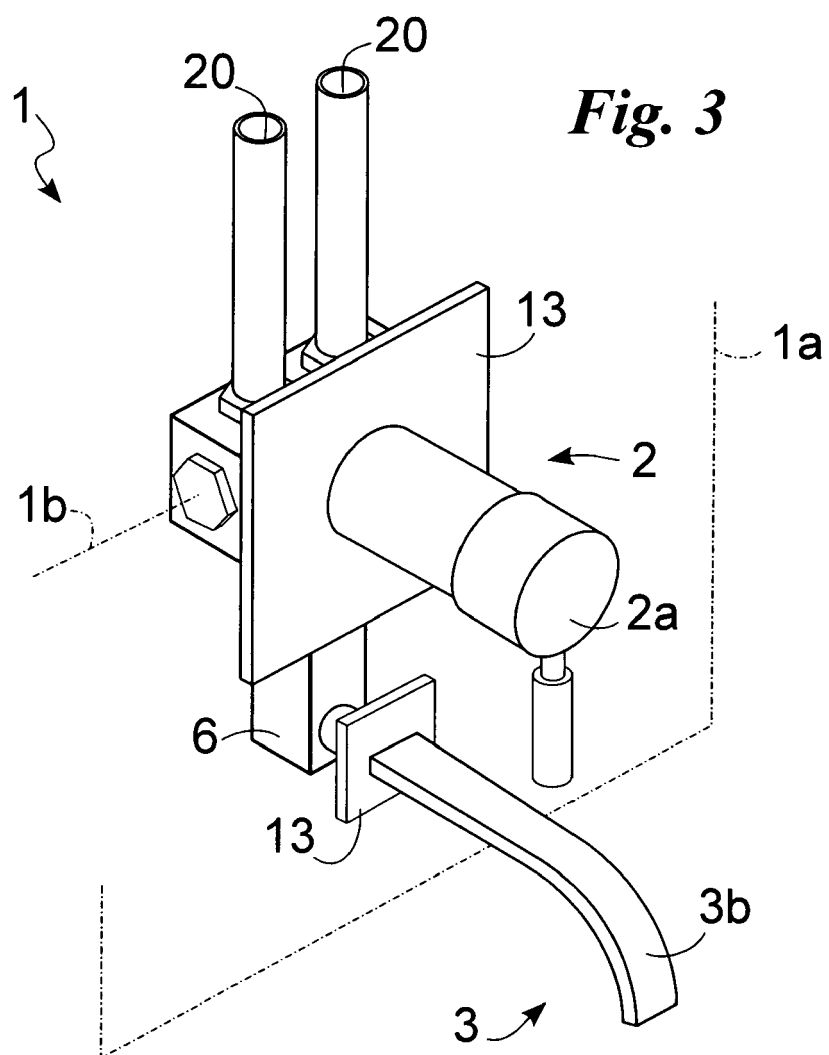


Fig. 4

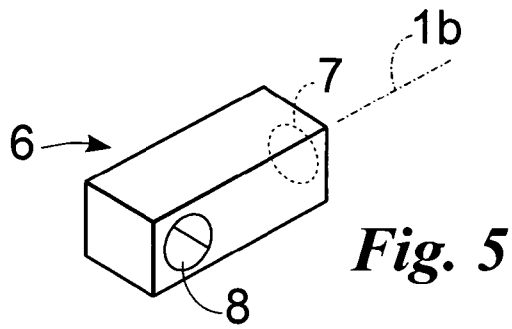
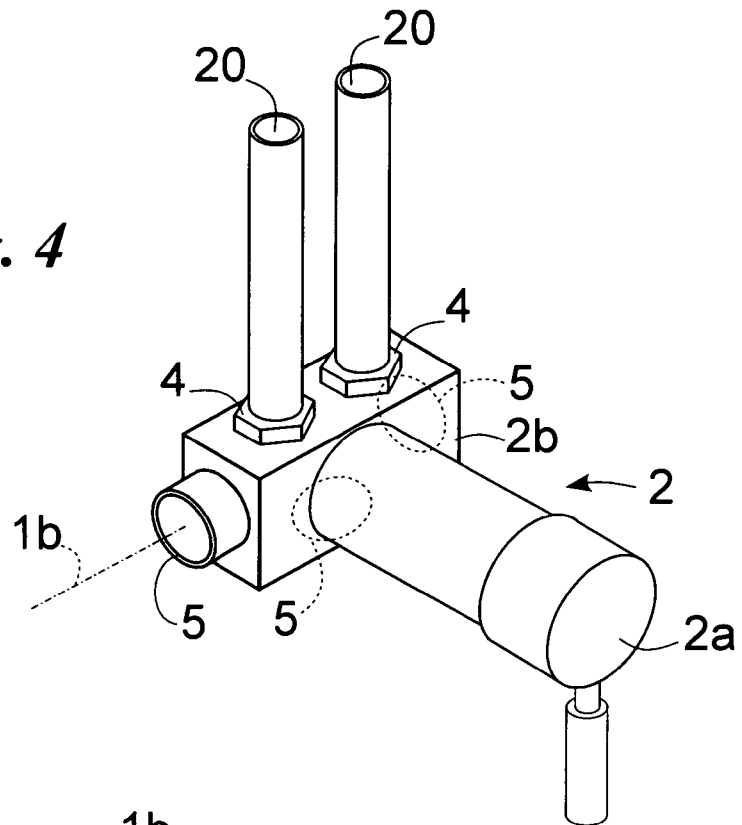


Fig. 5

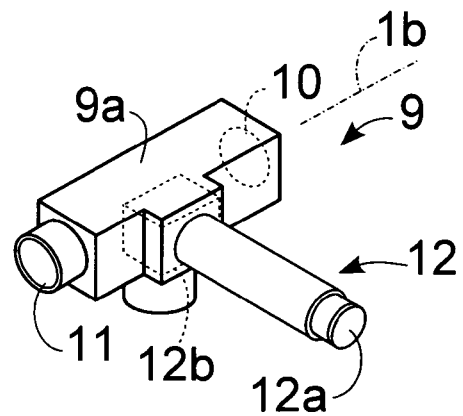


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5092

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 775 394 A1 (KLUDI GMBH & CO KG [DE]) 18 April 2007 (2007-04-18) * figure 4 *	1-5	INV. E03C1/02
X	EP 1 728 931 A2 (RBM SPA [IT]) 6 December 2006 (2006-12-06) * figure 3 *	1-3	
Y		4-5	
X	US 2006/207664 A1 (YANG TSAI C [TW] YANG TSAI CHEN [TW]) 21 September 2006 (2006-09-21) * the whole document *	1-3	
Y		4-5	
Y	DE 297 06 949 U1 (THERMCONCEPT PRODUKTE FUER HEI [DE]) 28 August 1997 (1997-08-28) * the whole document *	4-5	
Y	FR 2 794 778 A1 (HERROU PATRICK [FR]) 15 December 2000 (2000-12-15) * the whole document *	4-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			E03C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 September 2009	Examiner Geisenhofer, Michael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

3
EPO FORM 1503 03/82 (P04/C01)



Application Number

EP 09 42 5092

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1-5

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 09 42 5092

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3

details of the control device

STF: orientation of the connections and the actuator of the control device

2. claims: 4-5

details of the diverter element

STF: second inlet connection and second outlet connection, perpendicular orientation

3. claims: 6-7

details of the branching element

STF: third inlet connection and third outlet connections, valve to select one of the third outlet connections; orientation of the third inlet and outlet connections

4. claims: 8-11

details of the connection between various parts of the system

STF: connection between diverter element and branching element; parallelepiped shaped bodies that can be aligned in a main extension plane parallel to the wall surface

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 42 5092

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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30-09-2009

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EP 1775394	A1	18-04-2007	DE 102005048855 A1	19-04-2007
EP 1728931	A2	06-12-2006	NONE	
US 2006207664	A1	21-09-2006	NONE	
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FR 2794778	A1	15-12-2000	NONE	