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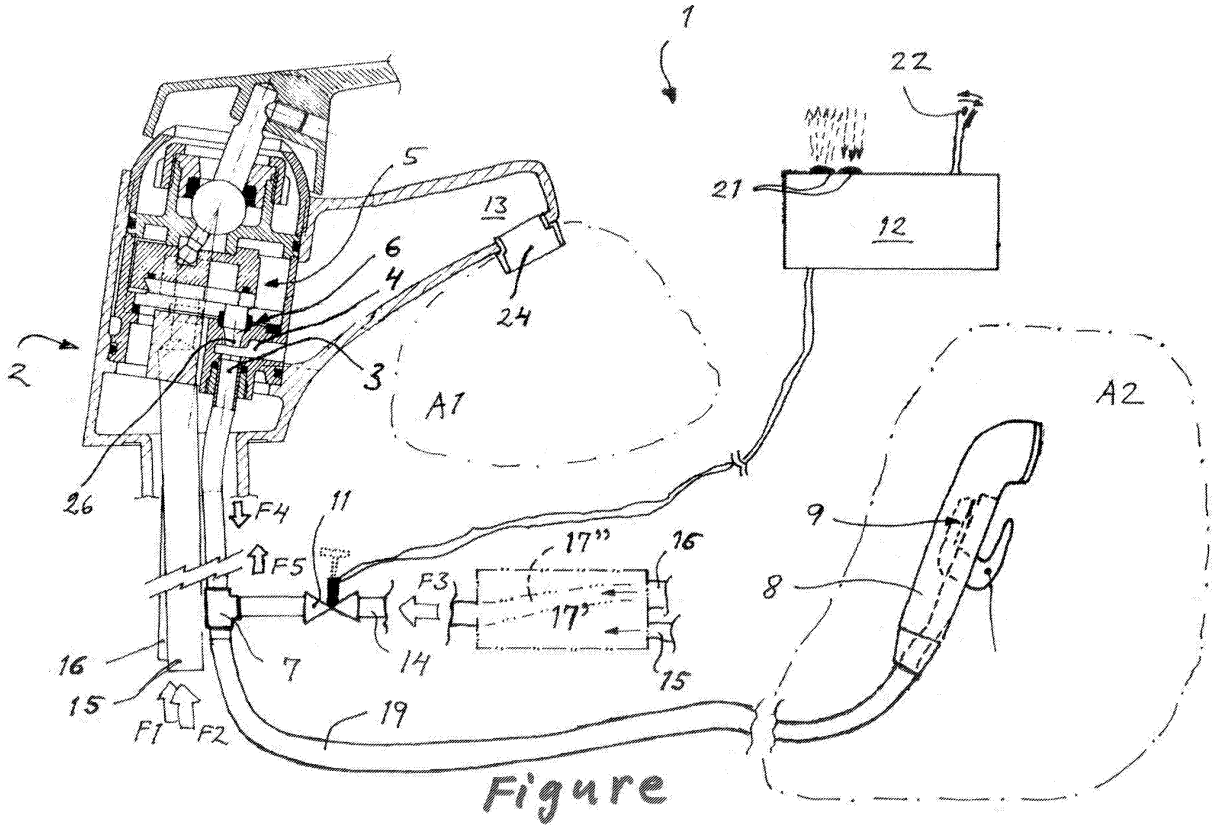
(54) Faucet with additional discharge port

(57) The invention relates to a faucet combination (1) based on a manually operated mixing faucet assembly. The mixing faucet assembly (2) comprises: mixing closing-opening elements (5), feed water pipes (15, 16) and ejector elements (6) provided with an extension flow channel (3). A side flow channel (4) leads to the first target of usage, and a conduit (19) leads to a second target of usage through a closing-opening member (9). In addition, the faucet combination comprises an additional water pipe (14) that is in flowing connection with said conduit (19), through a branching element (7), and a controlled valve arranged in said additional water pipe.



Figure

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Description

[0001] The invention relates to a faucet combination based on a manually operated mixing faucet assembly, said mixing faucet assembly comprising: mixing closing-opening-elements, feed water pipes leading thereto and ejector elements following the feed water pipes in the flowing direction, said ejector elements being provided with an extension flow channel and a side flow channel leading to the first usage target; as well as a conduit that is in flow connection with said extension flow channel, said conduit being provided with an closing-opening-element for the second usage target.

[0002] Conventionally, the water needed in various targets of usage is taken from the pipeline network by using separate and independent faucets or valves, in which case the faucets or valves are coupled in parallel. This means that if water is needed in one target, exactly the faucet or faucets leading to said target are opened, and again closed after the use is terminated, whereas all other faucets leading to other targets may be closed or open completely irrespective of said first target. The mixing faucet assembly mentioned above in the introduction constitutes a clear exception to this common and general principle. In this assembly, known as such, the cold and hot water obtained from the feed water pipes can be mixed when lifting the lever of the manually operated lever faucet, i.e. when the lever faucet is in the open position. Now the mixed water flows to the ejector elements of the faucet. If the closing-opening member of the handshower element is closed, water flows in the lever faucet through the side flow channel to the supply pipe space and further to the wet area, for instance to a hand washing basin. On the other hand, if the closing-opening member of the handshower element is open, water flows through the extension flow channel of the lever faucet to the conduit and further to the handshower element to its area of operation, whereas water does not flow through the side flow channel anymore. Here water needed in two different targets is thus extracted from faucets arranged in cooperation, which faucets are interconnected through a conduit independent of the pipeline network. Consequently, the arrangement includes, in the lever structure itself, mixing closing-opening elements that are common for both targets of usage, as well as a closing-opening member for selecting the target in which the water is finally fed. In this case the closing-opening elements and the closing-opening member are thus coupled in series.

[0003] It is also known to start the flowing of water to a desired target by intermediation of an electric or electronic device. In these arrangements, the electric energy given by the electric or electronic device opens and respectively closes valves provided with electric actuators, thus resulting in the flowing of water in the target and then in stopping the flow. This kind of electric or electronic device receives the excitation for opening and closing the valves either through push-buttons or by means of sensors, such as photocells or the like, positioned at suitable locations. One of several different photocell sensors is described in the publication US 6,294,786, and a push-button solution for feeding water into a washing machine is explained in the publication EP-0 387 396.

[0004] The object of the invention is to realize an arrangement by which the taking of water needed in two different targets from cooperating faucets that are interconnected through a conduit independent of the pipeline network can be controlled in a way specifically designed for the usage in question, either mechanically, electrically or electronically from outside. A second object of the invention is to realize such an arrangement, where a possible excitation for electric or electronic control can be generated in a location chosen in each case. A third object of the invention is to realize such an arrangement, where already existing structures can be utilized to a maximum degree.

[0005] Said objects can be achieved by means of the faucet combination according to the invention, which is characterized by what is set forth in the characterizing part of claim 1.

[0006] It has surprisingly been found out that the controlling of the feeding of water to two targets, for example to a wash basin and a handshower, can be arranged in a simple and effective way by using a mixing faucet assembly provided with an ejector, including a handshower element provided with a closing-opening element, and by adding in this arrangement only one electrically or electronically controlled or manual-mechanically controlled, i.e. manually operated valve. In this arrangement, the sensor element and/or operating switch of the electric or electronic control circuit of the valve can be located at any desired spot.

[0007] The invention is explained with more detail below, with reference to the appended drawing depicting a preferred embodiment of the invention, where the mixing faucet assembly is illustrated in longitudinal section, so that the mixing closing-opening elements and connected ejector elements provided with the respective channels can be seen; the handshower element and the conduit are described as seen from the side, the closing-opening member of the handshower element is indicated by dotted lines, and the electric/electronic parts are illustrated schematically.

[0008] The manually operated mixing faucet assembly 2 that serves as the starting point first of all comprises mixing closing-opening elements 5 to which the feed water pipes 15, 16 lead in regular flowing directions F1, F2. The feed water pipes are a hot water pipe 15 and a cold water pipe 16, and in this embodiment, the closing-opening elements 5 are lever faucet elements. It should be understood that said closing-opening elements 5 can also be for instance corresponding valve elements of thermostat faucets, or elements of separate hot and cold water closing valves. Thus the employed closing-opening elements 5 can constitute any kind of known or new faucet structure that is suited in the purpose, by which

faucet structure the connection to the feed water pipes can be opened and the mixing of hot and cold water can be realized. Both the lever faucets and the thermostat faucets, as well as separate hot and cold water faucets, are known as such and shall not be explained in more detail. In the mixing faucet assembly 2, after the closing-opening elements 5, there are provided, in the flowing direction, ejector elements 6, also including an extension flow channel 3 and a side flow channel 4. The ejector elements comprise an ejector nozzle 26 proper, so that said extension flow channel 3 is arranged in parallel and as an extension to it. In between the ejector nozzle 26 and the extension flow channel 3, there is arranged said side flow channel 4, so that a small aperture is left between the ejector nozzle and the extension flow channel. Moreover, the mixing faucet assembly 2 includes a conduit 19 that is in flowing connection with the extension flow channel 3, and a closing-opening member 9 arranged at the outer end of said conduit. When the closing-opening member 9 is closed and the closing-opening elements 5 of the assembly are open, water flows through the closing-opening elements to the ejector elements, more precisely through the ejector nozzle 26 to the side flow channel 4 - because the flow into the extension flow channel 3 is blocked, when the closing-opening member 9 is closed - and further to the supply pipe space 13 and via the outlet nozzle 24 to the user, i.e. to the first target of usage. When the closing-opening member 9 is open and the closing-opening elements 5 of the assembly are open, water flows through the closing-opening elements to the ejector elements, more precisely via the ejector nozzle 26 to the extension flow channel 3 - because the flow resistance in that direction is smaller than in the direction of the side flow channel, where a sudden bend is required - and thence to the conduit 19 and further out through the closing-opening member 9, i.e. to the second target of usage. In said first usage mode, water has the flowing direction F4 in the conduit 19. For the second target of usage, the assembly may contain for instance a handshower element 8 or other water intake point, inside which the closing-opening member 9 is located. The sole purpose of the closing-opening member 9 is the closing and opening function, which means that he employed closing-opening member can be any known or new valve or faucet that is suitable in said purpose. Therefore it is now explained in more detail.

[0009] According to the invention, the faucet combination 1 includes, in addition to said mixing faucet assembly 2, a branching element 7 arranged in the conduit 19. The branching element 7 can be for instance a regular T-branching, where the straight part belongs to the conduit in the way illustrated in the drawing, and the side branch is in flowing connection to the additional water pipe 14. The additional water pipe 14 is not used for intaking water, but for feeding additional water to the mixing faucet assembly 2 of the faucet combination 1, as is indicated by arrow F3 in the drawing. For controlling the additional water feed, the additional water pipe 14 is provided with a controlled valve 11. In a simpler embodiment, the controlled valve 11 is used directly manually, i.e. it is a simple manually operated valve, as is indicated by dotted lines in the drawing. In a preferred embodiment, the faucet combination 1 also comprises an electric control unit 12 provided with a sensor element 21 and/or a switch 22, and said control unit 12 is connected to the controlled valve 11 for its closing-opening function. In this case the controlled valve can be controlled from a planned/designed area and distance and with a planned/designed excitation. When the mixing closing-opening elements 5 are closed, and likewise the closing-opening member 9 is closed, water can be conducted to enter the first target of usage via the supply pipe space 13 and through the outlet nozzle 24 to the first target of usage by opening the controlled valve 11 without the user needing to touch the closing-opening elements 5 of the mixing faucet assembly 2. In this second usage mode, water has the flowing direction F5 in the conduit 19, which direction is thus opposite to the flowing direction F4 of the first usage mode. Precisely the above explained situation, i.e. that both the closing-opening elements 5 and the closing-opening member 9 are closed, and the feeding of water is controlled by the controlled valve 11, is the most essential feature of the invention. It should be understood that the opening of the closing-opening member 9 makes the additional water flow also to the second target of usage. The faucet combination 1 according to the invention functions with several types of closing-opening elements and closing-opening members, as long as the mixing faucet assembly includes ejector elements, and the closing-opening elements and the closing-opening member are coupled in series.

[0010] The sensor element 21 of the control element 12, such as a user-identifying photocell arrangement or some other sensor arrangement, can be located to be activated in the wet area A1 of the outlet nozzle, but preferably the sensor element 21 is placed in some other location, i.e. arranged to be activated in some other area than the water area A1 of the first target of usage, i.e. of the outlet nozzle 24. This wet area means the area where the user may move his hands while washing them in the water flow supplied through the outlet nozzle 24. In similar fashion, the switch 22 is advantageously placed nearer to the wet area A2 of the second target of usage, such as the handheld area of the handshower element 8, than the mixing faucet assembly 2. In that case the user may open the controlled valve 11 either by touching the switch 22 or by moving something without contact in the detection area of the sensor element 21. The closing of the controlled valve 11 can be carried out by a timer arranged in the control unit 12, or by some other action of the user.

[0011] In addition, the faucet combination 1 may comprise, in said additional water pipe 14 prior to the controlled valve 11, a mixing faucet 17' that has a standard mixing ratio, or is operated thermostatically or in a corresponding fashion, in which case in said faucet 17', there is brought both a hot water pipe 15 and a cold water pipe

16. As an alternative, the additional water pipe 14 is connected 17" to either one of the feed water pipes 15, 16, preferably to the cold water pipe 16, in which case the whole structure is remarkably simple. The use of cold water can be defended, because in most situations a short-time water intake is in any case not sufficient for bringing water having the correct temperature from the pipework. The above described functions of the mixing faucet assembly 2, controlled by the closing-opening elements 5 and closing-opening member 9, remain in their original form.

Claims

1. A faucet combination (1) based on a manually operated mixing faucet assembly, said mixing faucet assembly (2) comprising:

   - mixing closing-opening elements (5), feed water pipes (15, 16) leading thereto, and in succession after them, in the downstream direction, ejector elements (6) provided with an extension flow channel (3) and a side flow channel (4) leading to a first usage target; as well as
   - a conduit (19) that is in flow connection with said extension flow channel, and a closing-opening member (9) arranged in said conduit for a second usage target,

   characterized in that the faucet combination (1) further comprises an additional water pipe (14) that is in flow connection to said conduit (19) through a branching element (7), and a controlled valve (11) in said additional water pipe (14).

2. A faucet combination according to claim 1, **characterized in that** it further comprises an electric control unit (12) with a sensor element (21) and/or with a switch (22), which control unit is connected to the controlled valve (11) for its closing-opening function.

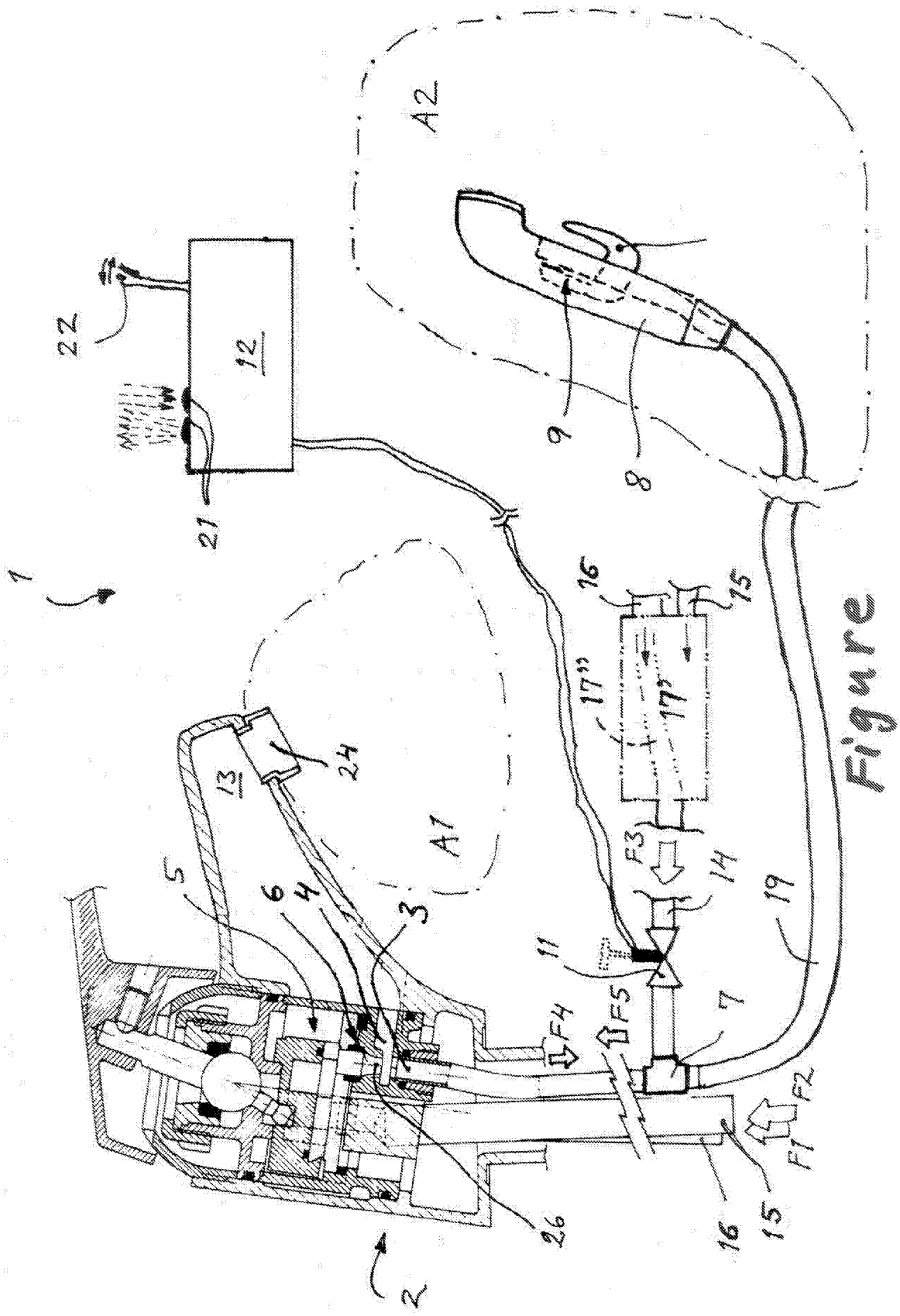
3. A faucet combination according to claim 2, **characterized in that** the mixing faucet (2) has a supply pipe (13) provided with an outlet nozzle (24), and that said sensor element (21) is arranged in a location other than in the wet area (A1) of the outlet nozzle.

4. A faucet combination according to claim 2, **characterized in that** said switch (22) is placed nearer to the wet area (A2) of the second usage target than the mixing faucet assembly (2).

5. A faucet combination according to claim 1, **characterized in that** it further comprises a mixing faucet (17') that is connected from the feed water pipes (15, 16) to the additional water pipe (14), prior to said controlled valve (11).

6. A faucet combination according to claim 1, **characterized in that** said additional water pipe (14) is connected (17") to either one of the feed water pipes (15, 16).

7. A faucet combination according to claim 1, **characterized in that** said closing-opening member (9) is arranged in the handshower element (8).


A2
22
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Figure