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• Girelli, Agostino
00123 Roma (IT)

(72) Inventors:

• Ciana, Giulio
28877 Ornavasso (Verbania) (IT)
• Girelli, Agostino
00123 Roma (IT)

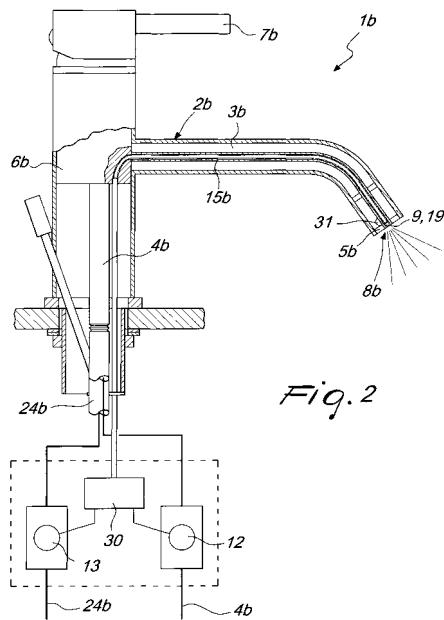
(71) Applicants:

• Ciana, Giulio
28877 Ornavasso (Verbania) (IT)

(74) Representative: Alagem Modiano, Lara S. et al
Modiano & Associati
Via Meravigli, 16
20123 Milano (IT)

(54) **Water dispenser device with lighting means powered by first and second electric current generators in the hot and cold water supply ducts**

(57) A dispenser device for plumbing systems, particularly of the type of a faucet, shower head or the like. The device comprises a dispenser device body in which there is a passage (3b) for the water which leads outside through at least one dispensing outlet (5b) and can be connected to a first hot water supply duct (4b) and to a second cold water supply duct (24b). The device comprises lighting means (8b), which are adapted to emit at least one beam of light proximate to the dispensing outlet (5b). The lighting means (8b) comprise at least one light source (9, 19), which is supplied with electric power by electric power supply means, which comprise a first electric current generator (12) arranged along the first water supply duct (4b) and a second electric current generator (13) arranged along the second water supply duct (24b). Each one of the electric current generators (12, 13) is driven by the flow of water along the corresponding water supply duct (4b, 24b).



Description

[0001] The present invention relates to a dispenser device for plumbing systems, particularly of the type of a faucet, shower head or the like.

5 [0002] Various kinds of dispensers for sanitary plumbing systems, such as for example faucets, shower heads or the like, are known.

[0003] Over time, these plumbing components have become increasingly important in the furnishing of a room, such as for example a bathroom, in which they are installed.

10 [0004] This importance has led to an increasing care for the aesthetic styling of these components and to an incentive to seek new functionalities aimed at further increasing the value of these objects.

[0005] In addition to furnishing requirements, very often the need is felt to improve the visual conditions in the region where these plumbing components dispense water.

15 [0006] The aim of the present invention is to meet these requirements by providing a dispenser for plumbing systems, particularly of the type of a faucet, shower head or the like, which has additional functionalities with respect to conventional ones, further achieving an aesthetically pleasant result.

[0007] Within this aim, an object of the invention is to provide a dispenser device which ensures optimum lighting conditions in the water dispensing region regardless of the lighting conditions of the room in which it is arranged.

20 [0008] Another object of the invention is to provide a dispenser device which gives maximum assurance of safety during use.

25 [0009] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a dispenser for plumbing systems, particularly of the type of a faucet, shower head or the like, which comprises a dispenser device body in which there is a passage for the water which leads outside through at least one dispensing outlet and can be connected to a first hot water supply duct and to a second cold water supply duct, characterized in that it comprises lighting means which are adapted to emit at least one beam of light proximate to said dispensing outlet; said lighting means comprising at least one light source which is supplied with electric power by electric power supply means, which comprise a first electric current generator arranged along said first water supply duct and a second electric current generator arranged along said second water supply duct, each one of said electric current generators being driven by the flow of water along the corresponding water supply duct.

30 [0010] Further characteristics and advantages of the invention will become better apparent from the description of some preferred but not exclusive embodiments of the dispenser device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional schematic view of the dispenser device according to the invention in a first embodiment, constituted by a faucet;

35 Figure 2 is a partially sectional schematic view of the dispenser device according to the invention in a second embodiment, constituted by a faucet;

Figure 3 is a partially sectional schematic view of the dispenser device according to the invention in a third embodiment, constituted by a faucet;

40 Figure 4 is a partially sectional schematic view of the dispenser device according to the invention in a fourth embodiment, constituted by a shower head;

Figure 5 is a bottom plan view of the shower head of Figure 4;

Figure 6 is a schematic view of a possible circuit for the electric power supply of the lighting means;

Figure 7 is a schematic view of another possible circuit for supplying electric power and driving the lighting means.

45 [0011] With reference to the figures cited above, the dispenser device according to the invention, generally designated by the reference numerals 1a, 1b, 1c, 1d in the various embodiments, comprises a dispenser device body 2a, 2b, 2c, 2d, in which there is a passage 3a, 3b, 3c, 3d, which leads outside through at least one dispensing outlet 5a, 5b, 5c, 5d for the water. The passage 3a, 3b, 3c, 3d can be connected to a first hot water supply duct 4a, 4b, 4c, 4d and to a second cold water supply duct 24a, 24b, 24c, 24d, for example by means of a mixer 6a, 6b, 6c, 6d controlled by an actuation knob 7a, 7b, 7c, 7d.

[0012] In the first three embodiments shown in Figures 1 to 3, which refer to a dispenser constituted by a faucet, the mixer 6a, 6b, 6c is arranged within the body of the dispenser device 2a, 2b, 2c, while in the fourth embodiment shown in Figures 4 and 5, which refers to a shower head, the mixer 6d is separate from the body of the dispenser device 2d.

55 [0013] According to the invention, the dispenser device comprises lighting means 8a, 8b, 8c, 8d, which are adapted to emit at least one beam of light proximate to the dispensing outlet 5a, 5b, 5c, 5d. Said lighting means 8a, 8b, 8c, 8d comprise at least one light source, which is supplied with electric power by electric power supply means which comprise a first electric current generator 12, such as a turbine or Pelton-wheel or flow-controlled generator, which is arranged along the first supply duct 4a, 4b, 4c, 4d, and a second electric current generator 13, such as for example a turbine or

Pelton-wheel or flow-controlled generator, which is arranged along the second supply duct 24a, 24b, 24c, 24d. Each one of the two electric current generators 12, 13 is driven by the flow of water along the corresponding water supply duct so that when the dispenser is opened, electric power is generated and can be used to supply the light source or sources of the lighting means 8a, 8b, 8c, 8d.

5 [0014] Preferably, the lighting means 8a, 8b, 8c, 8d comprise at least two light sources 9, 19, preferably of the LED type, which are adapted to emit light beams of mutually different colors and can be supplied with power by means of the electric current generated by the current generators 12, 13 cited above. Optionally, the two light sources 9, 19 can be arranged in a single lighting body, such as for example a known type of RGB LED or the like. The embodiments illustrated in the drawings refer to a solution of this type.

10 [0015] Each of the two light sources can be powered by one of the two electric current generators by means of its own electric power supply circuit 11, 21, of the type shown schematically in Figure 6. In this case, if the dispenser is operated in order to dispense only cold water or hot water, only one of the two light sources 9, 19 is powered and emits a beam of light of the corresponding color, while if the dispenser device is operated to dispense hot water mixed with cold water, both light sources 9, 19 are powered and each one emits a beam of light of the corresponding color, obtaining 15 a light beam which is the result of the combination of the two light beams, optionally with a higher luminous intensity for the light beam produced by the light source 9 or 19 powered by means of the current generator 12 or 13 arranged on the supply duct 4a, 4b, 4c, 4d or 24a, 24b, 24c, 24d that provides a greater flow-rate of water. In this manner, the coloring of the light beam produced by the combination of the two light beams gives an indication as to the temperature of the water that is being dispensed.

20 [0016] As an alternative, the two electric current generators 12, 13, as shown schematically in Figure 7, can be connected to the two light sources 9, 19 by means of a control and monitoring element 30 of the electronic type, which is capable of modulating the electric power supply of the two light sources 9, 19 and is connected to means for detecting the temperature of the water dispensed by the dispenser device through the dispensing outlet 5a, 5b, 5c, 5d. The means for detecting the temperature of the dispensed water can be constituted by a temperature sensor 31, which is arranged 25 in the passage 3a, 3b, 3c, 3d preferably proximate to the dispensing outlet 5a, 5b, 5c, 5d and is connected in input to the control and monitoring element 30. In practice, depending on the temperature of the dispensed water, detected by the temperature sensor 31, the control and monitoring element 30 adjusts the luminous intensity of the two light sources 9, 19 so that the coloring of the light stream produced by the combination of the two light streams emitted by the light sources 9, 19 corresponds, in this case also, to the temperature of the water that is being dispensed.

30 [0017] The electric power supply of the lighting means 8a, 8b, 8c, 8d, performed by means of the control and monitoring element 30, shown in detail only in Figure 2 with reference to the second embodiment of the dispenser device, may also be used for the other embodiments of the dispenser device.

[0018] In the figures, the position of the temperature sensor 31 is merely an example, since it can vary according to the assembly and space occupation requirements of the dispenser device.

35 [0019] The lighting means 8a, 8b, 8c, 8d are preferably arranged so that they are adapted to emit the beam of light in the same direction in which the water is dispensed through the dispensing outlet 5a, 5b, 5c, 5d, and according to requirements said beam of light can be substantially parallel to the direction in which the water is dispensed through the dispensing outlet 5a, 5b, 5c, 5d or can be oriented along a direction which is incident to the jet of water dispensed through the dispensing outlet 5a, 5b, 5c, 5d or can be emitted within the jet of water dispensed through the dispensing outlet 5a, 40 5b, 5c, 5d.

45 [0020] In the first embodiment of the dispenser device according to the invention, shown in Figure 1, in which the dispenser device is provided as a faucet, the lighting means 8a preferably comprise two light sources 9, 19, constituted by light bulbs or LEDs, which are applied externally to the body 2a of the faucet proximate to the dispensing outlet 5a and are oriented so as to emit a beam of light along a direction which is substantially parallel or incident with respect to the direction of the jet of water dispensed by the dispensing outlet 5a.

[0021] In the second embodiment of the dispenser device according to the invention, illustrated in Figure 2, in which the dispenser device is provided as a faucet, the lighting means 8b preferably comprise two light sources 9, 19, constituted by light bulbs or LEDs, which are arranged inside the body 2b of the faucet proximate to the dispensing outlet 5b. Preferably, in this case the light sources 9, 19 are arranged at the center of the dispensing outlet 5b.

50 [0022] In the third embodiment of the dispenser device according to the invention, shown in Figure 3, in which the dispenser device is again provided as a faucet, the lighting means 8c preferably comprise two light sources 9, 19, constituted by light bulbs or LEDs, which are arranged in a remote region with respect to the dispensing outlet 5c. The light emitted by the light sources 9, 19 is transmitted to a region which is proximate to the dispensing outlet 5c by virtue of light transmission means, which can be constituted by an optical fiber 10c, which has an initial end which faces the light sources 9, 19 and an opposite end or terminal end, which is arranged proximate to the dispensing outlet 5c.

[0023] Preferably, the optical fiber 10c lies at least partially within the body 2c and even more preferably, at least in its final portion, lies coaxially with respect to the dispensing outlet 5c, and ends indeed at the dispensing outlet 5c.

[0024] In the fourth embodiment of the dispenser device according to the invention, illustrated in Figures 4 and 5, in

which the dispenser device is provided as a shower head, the lighting means 8d preferably comprise two light sources 9, 19, constituted by light bulbs or LEDs, which are arranged in a block 20 which is connected to the body 2d. The light emitted by the light sources 9, 19 is transmitted to a region which lies proximate to the dispensing outlets 5d, which are multiple outlets since this is a shower head, through light transmission means, which can be constituted by optical fibers 10d, which lie at least partially in the passage 3d and have an initial end which faces the light sources 9, 19 and an opposite end, or final end, which is arranged at each dispensing outlet 5d.

[0025] In the second embodiment, the electric wires for supplying power to the light sources 9, 19 and, in the third embodiment, the optical fiber 10c, as well as the electric wires which connect the temperature sensor 31 to the control and monitoring element 30, can be accommodated within a tube 15b, 15c, which is arranged inside the passage 3b, 3c and is already available, though for other purposes, in some types of commercially available faucets.

[0026] Conveniently, it is also possible to provide a lamp which emits UVC rays in addition to, or as an alternative to, the light source or sources described above. Said UVC-ray emitting lamp is located proximate to the dispensing outlet 5a, 5b, 5c, 5d, so as to emit a beam of light proximate to the dispensing outlet 5a, 5b, 5c, 5d and can be supplied with electric power autonomously, for example by connection to the electric mains, or by means of said electric current generators 12, 13.

[0027] Operation of the dispenser device according to the invention is as follows.

[0028] When the dispenser device is opened, the light sources 9, 19 are switched on automatically and, either directly or by means of the optical fiber 10c, 10d or optical fibers, emit one or more light beams in the water dispensing region.

[0029] The emitted light beam, in addition to obtaining a particular aesthetic effect, lights the region below the dispensing outlet 5a, 5b, 5c, 5d and therefore makes it easier to use the dispenser device even in case of poor lighting of the room in which such device is installed.

[0030] Moreover, if the lighting means comprise, as described, two light sources 9, 19 adapted to emit light beams with mutually different colors, the coloring of the light beam gives the user an indication as to the temperature of the water being dispensed.

[0031] If a UVC-ray emitting lamp is provided, its activation performs a sanitizing function both on the dispensed water and on the objects that face the dispensing outlet 5a, 5b, 5c, 5d and are being washed.

[0032] In the examples of embodiments described above, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other examples of embodiments.

[0033] In practice it has been found that the dispenser device according to the invention fully achieves the intended aim, since it achieves a particular aesthetic effect, improves the visibility conditions in the region where the jet of water is dispensed and, if two light sources adapted to emit light beams with mutually different colors are used, it provides an indication as to the temperature of the water being dispensed.

[0034] Another advantage of the dispenser device according to the invention is that it can be derived, by means of modifications which are simple to perform, from plumbing components which are already commercially available.

[0035] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may further be replaced with other technically equivalent elements.

[0036] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0037] The disclosures in Italian Patent Application no. MI2005A000292, from which this application claims priority, are incorporated herein by reference.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

45 Claims

1. A dispenser device for plumbing systems, particularly of the type of a faucet, shower head or the like, comprising a dispenser device body in which there is a passage for the water which leads outside through at least one dispensing outlet and can be connected to a first hot water supply duct and to a second cold water supply duct, **characterized in that** it comprises lighting means which are adapted to emit at least one beam of light proximate to said dispensing outlet; said lighting means comprising at least one light source which is supplied with electric power by electric power supply means, which comprise a first electric current generator arranged along said first water supply duct and a second electric current generator arranged along said second water supply duct, each one of said electric current generators being driven by the flow of water along the corresponding water supply duct.
2. The device according to claim 1, **characterized in that** said lighting means comprise at least two light sources which emit respective light beams of mutually different colors.

3. The device according to claim 1, **characterized in that** said at least one light source comprises at least one LED.

4. The device according to one or more of the preceding claims, **characterized in that** it comprises means for detecting the temperature of the water dispensed through said dispensing outlet.

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5. The device according to one or more of the preceding claims, **characterized in that** said water temperature sensing means are functionally connected to said at least one light source in order to activate said light source as a function of the temperature of the water dispensed through said dispensing outlet.

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6. The device according to one or more of the preceding claims, **characterized in that** it comprises a control and monitoring element, which is connected to said electric power supply means, to said sensing means and to said two light sources in order to supply one or the other or both of said two light sources as a function of the temperature of the water dispensed through said dispensing outlet.

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7. The device according to one or more of the preceding claims, **characterized in that** said control and monitoring element is adapted to vary the luminous intensity of each one of said two light sources as a function of the value of the temperature detected by said sensing means.

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8. The device according to one or more of the preceding claims, **characterized in that** said lighting means are arranged so as to emit said at least one light beam in the same direction in which the water is dispensed through said dispensing outlet.

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9. The device according to one or more of the preceding claims, **characterized in that** said lighting means are arranged so as to emit said at least one beam of light substantially parallel to the direction in which the water is dispensed through said dispensing outlet.

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10. The device according to one or more of the preceding claims, **characterized in that** said lighting means are arranged so as to emit said at least one beam of light along a direction which is incident to the jet of water dispensed through said dispensing outlet.

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11. The device according to one or more of the preceding claims, **characterized in that** said lighting means are arranged so as to emit said at least one light beam within the jet of water dispensed through said dispensing outlet.

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12. The device according to one or more of the preceding claims, **characterized in that** said lighting means comprise at least one light source, which is applied externally with respect to said device body proximate to said dispensing outlet.

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13. The device according to one or more of the preceding claims, **characterized in that** said lighting means are arranged inside said device body proximate to said dispensing outlet.

14. The device according to one or more of the preceding claims, **characterized in that** said lighting means comprise at least one light source arranged remotely with respect to said dispensing outlet, means being provided for transmitting the light emitted by said at least one light source to a region which is proximate to said at least one dispensing outlet.

15. The device according to one or more of the preceding claims, **characterized in that** said light transmission means comprise at least one optical fiber, which has an initial end which faces said at least one light source and the opposite end or terminal end which is arranged proximate to said at least one dispensing outlet.

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16. The device according to one or more of the preceding claims, **characterized in that** said optical fiber lies at least partially inside said device body.

17. The device according to one or more of the preceding claims, **characterized in that** said optical fiber lies coaxially to said dispensing outlet at least in its final portion.

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18. The device according to one or more of the preceding claims, **characterized in that** it comprises a lamp which emits UVC rays and is adapted to emit at least one beam of light proximate to said dispensing outlet.

19. The device according to one or more of the preceding claims, **characterized in that** said UVC-ray emitting lamp is connected to said electric power supply means.

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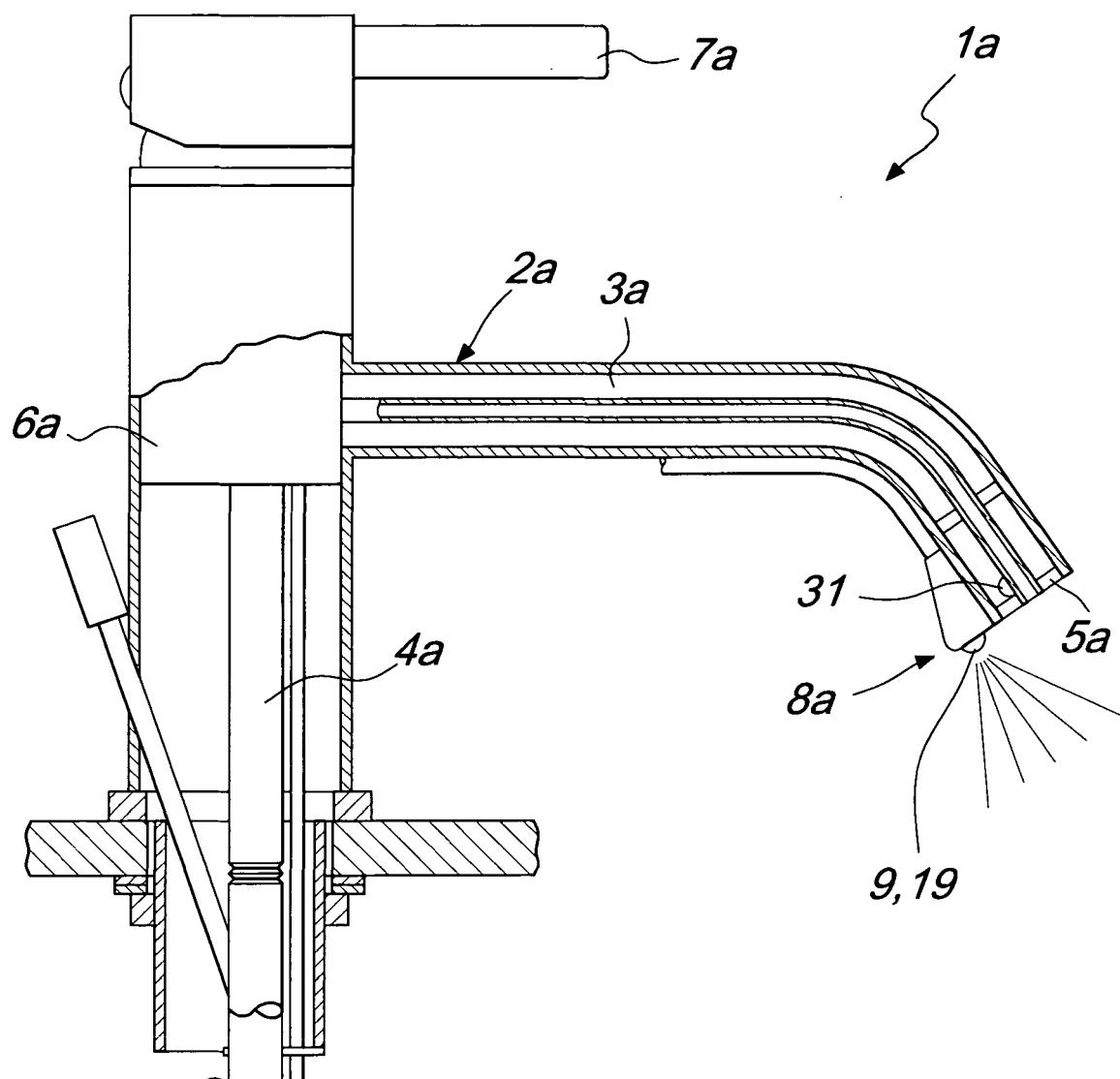


Fig. 1

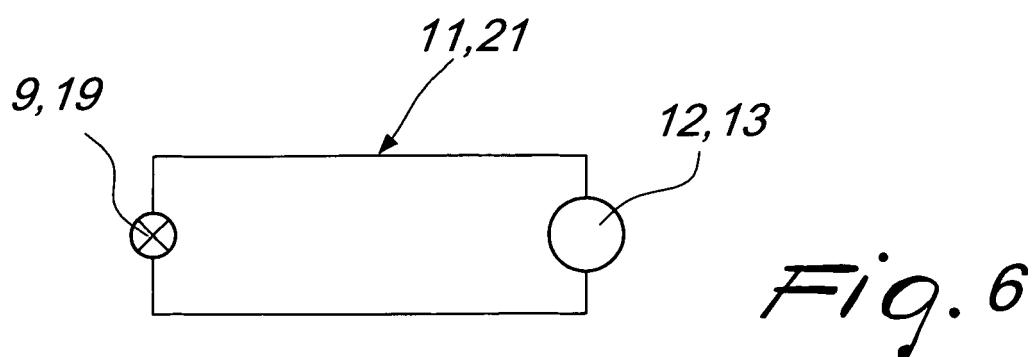
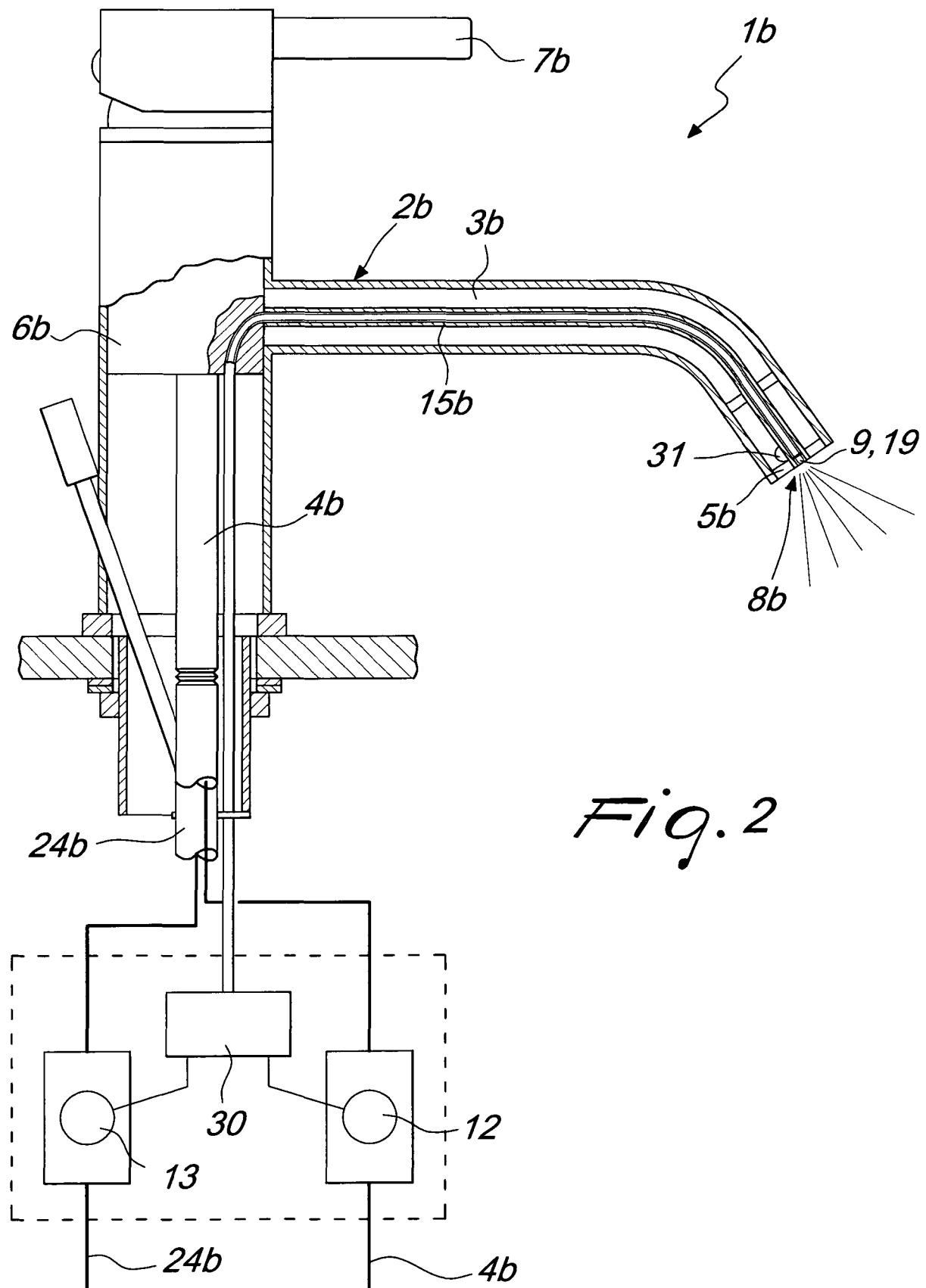


Fig. 6



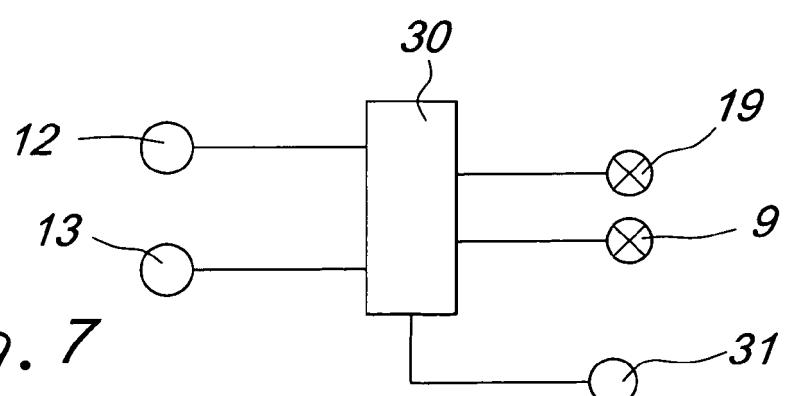
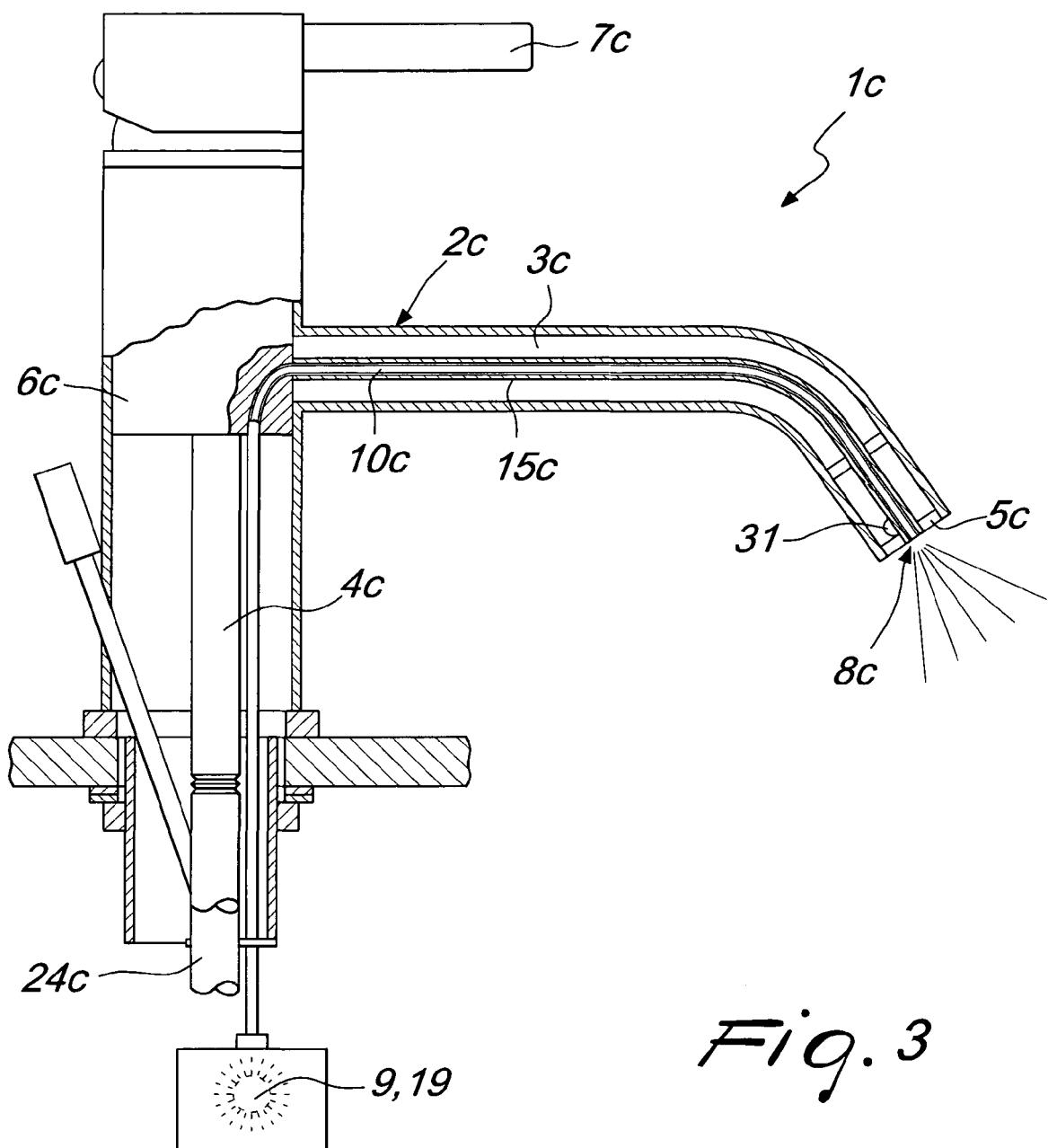


Fig. 4

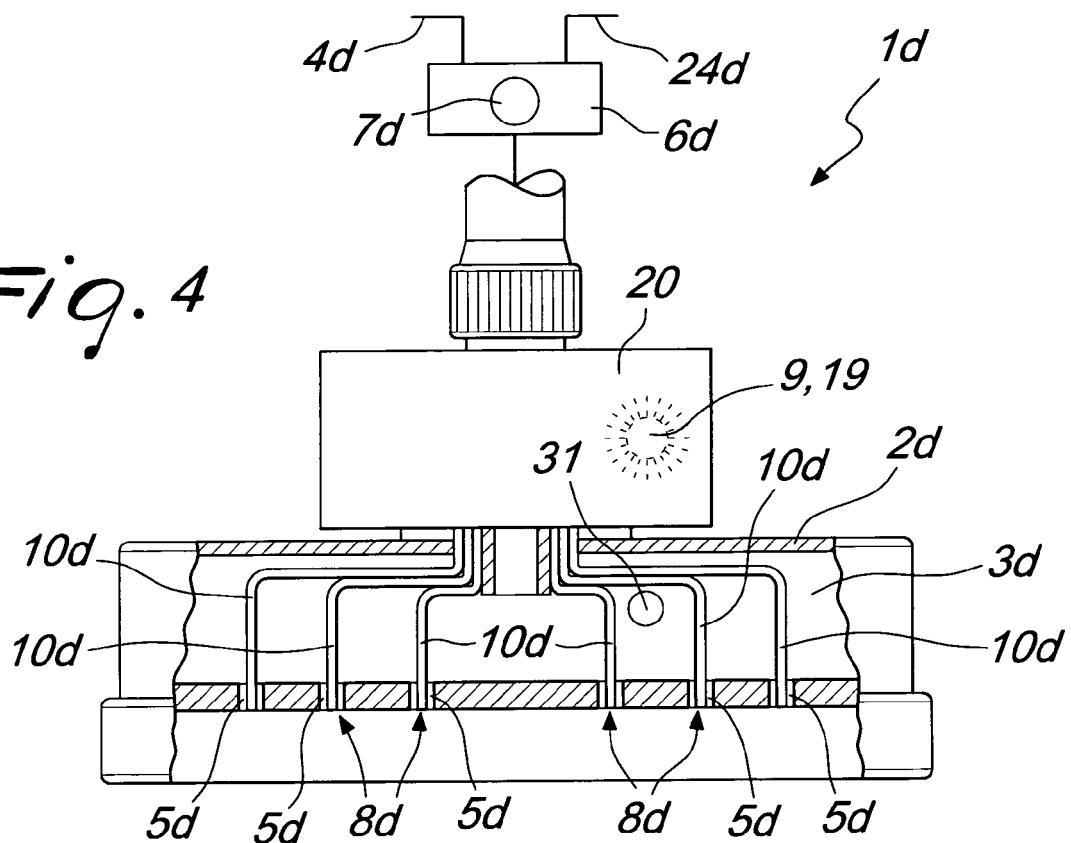
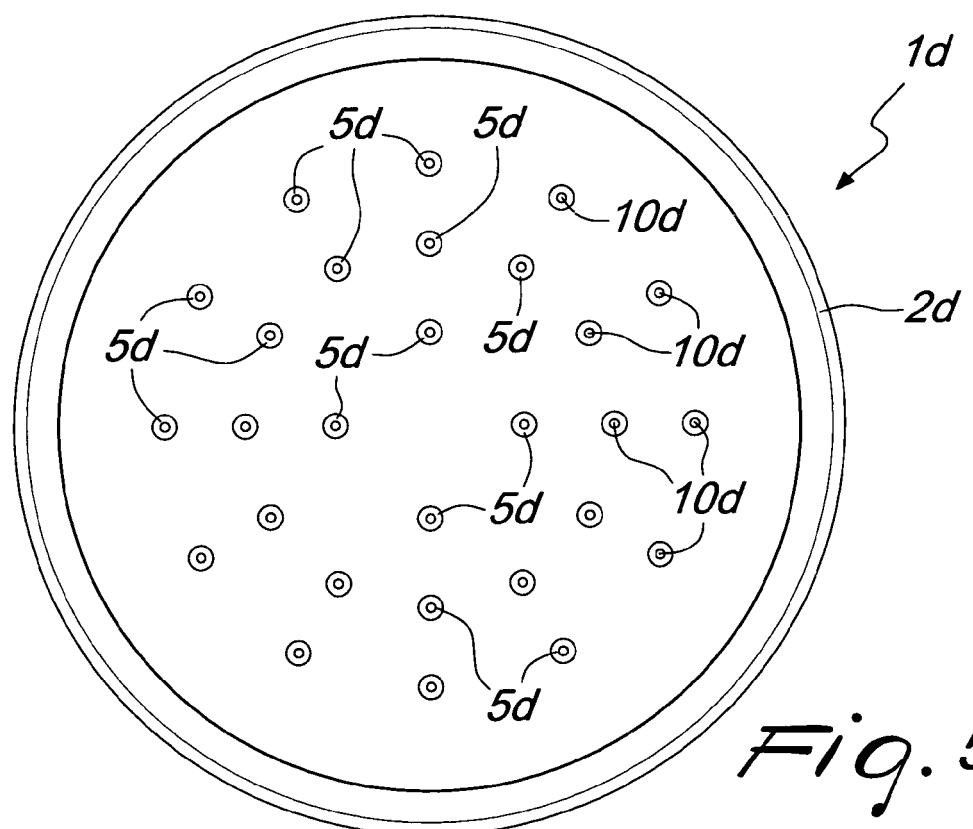


Fig. 5





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| Place of search | | Date of completion of the search | Examiner |
| Munich | | 17 May 2006 | Geisenhofer, M |
| CATEGORY OF CITED DOCUMENTS | | | |
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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