A FIXTURE PREVENTING THE FLOW OF WATER UNTIL IT REACHES THE DESIRED TEMPERATURE, A SYSTEM COMPRISING SAID FIXTURE AND THE METHOD OF OPERATION FOR SAID SYSTEM

ABSTRACT: The fixture (9), which prevents cold water or water that has not yet reached the desired temperature value from being wasted until the temperature of the water to flow through said fixture reaches a certain value, comprises at least one thermostatic guide (1) and at least one thermostatic cartridge (2). The system comprising said fixture (9) additionally comprises at least one heat source (10), at least one flow sensor (13), at least one circuit board (11) and at least one circulation pump (12).

TITLE: A FIXTURE PREVENTING THE FLOW OF WATER UNTIL IT REACHES THE DESIRED TEMPERATURE, A SYSTEM COMPRISING SAID FIXTURE AND THE METHOD OF OPERATION FOR SAID SYSTEM

A FIXTURE PREVENTING THE FLOW OF WATER UNTIL IT REACHES THE DESIRED TEMPERATURE, A SYSTEM COMPRISING SAID FIXTURE AND THE METHOD OF OPERATION FOR SAID SYSTEM

DESCRIPTION

Subject of the Invention

The invention being the subject matter of the application relates to a fixture, which prevents the cold water or the water that has not yet reached the desired temperature value from being wasted until the temperature of the water to flow through said fixture reaches a certain value, to a system comprising said fixture and to the method of operation for said system.

State of the Art

In the use of the fixtures according to the state of the art, the water is wasted by a user until it reaches the desired temperature.

With the invention being the subject matter of the application, it is aimed to achieve more efficient use of the existing water resources. At the present, it takes time to heat up the water with the natural gas operated heaters or combi boilers, which are used as the source of heat by many people. For this reason, some amount of cold water is wasted until the temperature of the water reaches the desired value in cases where it is desired to obtain the flow of hot water through a fixture. The cold water flowing until the flow of hot water starts via the fixture is not used for any purpose and causes an unnecessary consumption of the natural resources. The amount of said water that goes to waste is in the range of 8-10 liters on the average. This situation is repeated every time the fixture is turned on and off and every time it is desired to obtain the flow of hot water. Prolongation of the intervals between the uses of hot water causes the hot water present in the pipes to cool down. This brings about a disadvantage in terms of water saving.

The invention being the subject matter of the application will overcome said disadvantages, ensuring that no water flow occurs through the fixture until the heat source heats the water up to the temperature value desired by the user. In this way, the cold water will be prevented from being wasted until the water reaches the temperature value desired by the
user, thereby enabling the saving of water. Owing to the invention being the subject matter of the application, the waste of water will be prevented while one waits for the flow of hot water and the saving of water will be achieved.

**Object of the Invention**

The object of the invention is to develop a fixture, which provides the saving of water by preventing the waste of the cold water or of the water that has not yet reached the desired temperature value during the period elapsing until the flow of the water with the desired temperature value after the fixture is turned on for the use of the hot water, as well as a system comprising such fixture.

**Reference Signs**

1. Thermostatic guide
   1a. Thermostatic guide nut
   1b. Thermostatic guide cover
   1c. Water inlet
1d. Water outlet
   1e. Water outlet to the thermostatic cartridge
2. Thermostatic cartridge
   2a. Thermostatic cartridge temperature setting wheel
   2b. Cold water inlet
2c. Hot water inlet
2d. Water outlet
3. Seal
   3a. Seal wheel
4. Fixture hot water inlet section
5. Fixture cold water inlet section
6. Check valve
7. Connection nipple
8. Fixture body
9. Fixture
10. Heat source
11. Circuit board
12. Circulation pump
12a. Electric cable
13. Flow sensor
14. Electric supply
15. Fixture outlet
16. Cold water line
17. Hot water line

Description of the Figures

Figure 1: Top sectional view of the fixture according to the application

Figure 2: Top closed view of the fixture according to the application

Figure 3: Perspective view of the flow sensor, the circulation pump and the circuit board in a state connected to the heat source

Detailed Description of the invention

The invention being the subject matter of the application relates to a fixture, which prevents the cold water or the water that has not yet reached the desired temperature value from being wasted until the temperature of the water to flow through said fixture reaches a certain value, to a system comprising said fixture and to the method of operation for said system.

The fixture (9) included in the system according to the application comprises at least one thermostatic guide (1) for determining the direction, in which the water coming from at least one hot water inlet (4) is to advance depending on the temperature of said coming water, and at least one thermostatic cartridge (2) for enabling the water at the temperature value desired by the user to flow from the fixture (9).

Said fixture (9) further comprises at least one water outlet (15), at least one seal (3) for enabling the fixture (9) to be turned on and off for the water flow, i.e. for guiding the water to the water outlet (15), at least one seal wheel (3a) for enabling the seal (3), and hence the fixture (9), to be turned and off, the hot water inlet section (4) for providing the input of the
hot water to the fixture (9), at least one cold water inlet section (5) for providing the input of the cold water, at least one check valve (6) positioned in the hot water inlet section (4) and enabling the hot water entering the fixture (9) to advance in a single direction and preventing the backward escape of the same, one connection nipple (7) in each of the hot water inlet section (4) and cold water inlet section (5) and at least one fixture body (8) where all the aforesaid parts are positioned.

Said thermostatic guide (1) is fixed to the fixture body (8) via at least one thermostatic guide nut (la). The thermostatic guide (1) comprises at least one water inlet (lc) and at least two water outlets. One of said water outlets is the water outlet (le) to the thermostatic cartridge, which conveys the hot water from the thermostatic guide (1) to the thermostatic cartridge (2), and the other water outlet is the water outlet (Id) to the cold water inlet with a temperature below the value determined, which sends the water not having the desired temperature value back to the water mains line from the cold water inlet (5).

Said thermostatic cartridge (2) comprises at least one temperature setting wheel (2a) for enabling to set the water temperature desired by the user, at least one thermostatic cartridge hot water inlet (2c) for enabling the hot water coming from the thermostatic guide (1) to proceed to the thermostatic cartridge (2), at least one cold water inlet (2b) for the input of the water coming from the cold water inlet (5) and at least one water outlet (2d) for guiding the water to the outlet (15) so that it may access the user.

The system comprising the fixture according to the application comprises said fixture (9), at least one heat source (10), the hot water line (17) for the hot water leading from the heat source, the cold water line (16) for the input of the water to the heat source, at least one circulation pump (12) mounted in the outlet of said heat source (10), i.e. on the hot water line (17), at least one flow sensor (13) and at least one circuit board (11).

At least one circuit board (11), at least one circulation pump (12) for providing the circulation of the water through the system and at least one flow sensor (13) are positioned on the hot water line (17) of the heat source (10) present in the system according to the application. The circulation pump (12) is connected to at least one electric supply (14) via at least one electric cable (12a).
The minimum temperature value for the water desired to flow from the fixture (9) present in the system according to the application is adjusted by the user via the thermostatic cartridge (2) by means of the thermostatic cartridge temperature setting wheel (2a).

The minimum temperature value that the hot water entering the fixture via the hot water inlet (4) should have in order to be conveyed from the thermostatic guide (1) to the thermostatic cartridge (2) is adjusted from the thermostatic guide (1). Likewise, the flow sensor (13) present in the system is set to the amount of flow it will detect. In the preferred embodiment, said settings are performed before the product reaches the user. The value could be identified according to the results of a research conducted regarding the temperature range most preferred by the users in case the use of hot water is desired.

For example, the temperature for the water to flow through the thermostatic guide (1) may be set to the range of 30-40 °C and the temperature for the water to flow from the thermostatic cartridge (2) may also be set to the range of 30-40 °C. The amount of flow to be detected by the flow sensor (13) may be set to the value of 200 ml/minute. However, the temperature value and the amount of flow to be set are not limited to those given above and it would be possible to set any value desired.

The water, which proceeds from the hot water line (17) to the hot water inlet (4) upon the flow of water being triggered by the user, is detected by the hot water flow sensor (13) wherein a signal regarding the requirement for the operation of the circulation pump (12) is sent to the circuit board (11). The hot water reaches the thermostatic guide (1) via the water inlet (Ic). If the temperature of the water entering the fixture via the hot water inlet (4) is at the temperature value previously set from the thermostatic guide (1) or is above said previously set temperature value, it proceeds from the thermostatic guide (1) to the thermostatic cartridge (2). The water exiting the thermostatic guide (1) via the water outlet (le) to the thermostatic cartridge enters, via the thermostatic cartridge hot water inlet (2c), the thermostatic cartridge (2), and from there, it reaches the fixture water outlet (15) via the thermostatic cartridge water outlet (2d). If the temperature value that the user prefers for the water he/she will use and that said user sets with the help of the thermostatic cartridge temperature setting wheel (2a) is lower than the temperature value for the water
proceeding from the thermostatic guide (1) to the thermostatic cartridge (2), also cold water, as well as the hot water enters via the cold water inlet (5), proceeds from the thermostatic cartridge cold water inlet (2b) to the thermostatic cartridge (2) and the water mixture formed here by way of mixing the hot and cold water according to certain proportions reaches the user. The temperature of the water attains the temperature value set by the user owing to the mixing of the hot and cold water and the water mixture proceeds from the thermostatic cartridge water outlet (2d) to the fixture water outlet (15) and from there, said water reaches the user.

On the other hand, owing to the system according to the invention, in case the temperature of the water entering via the fixture hot water inlet (4) has a value below the temperature value to which the thermostatic guide (1) is preset, the water entering via the hot water inlet (4), instead of proceeding to the fixture outlet (15), is sent back from the cold water inlet section (5) to the water mains line, and hence the heat source (10), via the circulation pump (12). In this way, the water entering the thermostatic guide (1) via the hot water inlet (4) is returned to the system and the circulation is provided for the same until it reaches the desired or preset temperature value.

According to the preferred use, the circulation pump (12) of the application starts to operate with a quantity of water detected by the water flow sensor (13) and continues to operate as long as there is water flow. However, it would be possible within the scope of the invention to measure, with the help of a temperature sensor positioned at the outlet of the heat source (10), the temperature of the water exiting from the hot water line (17) and stop the operation of the circulation pump (12) in case this temperature value is equal to or above the temperature value set in the thermostatic guide (1).

In order to enable the system to operate, it is possible, if desired, to add a wireless connection to the fixture (9), by means of which the circuit board (11) would transmit the necessary signals within the system. Moreover, it would be possible to dispose the circulation pump (12), the circuit board (11) and the flow sensor (13) at a position close to the fixture (9), and it would be also possible to dispose the same in a built-manner at a location close to the fixture (9).
Owing to the invention being the subject matter of the application, the water will be prevented from being wasted until it attains the temperature value desired by the user, thereby providing the saving of water. Owing to the invention being the subject matter of the application, it will be possible to enable the users to have access to the hot water at the temperature they prefer as well as preventing the waste of water while one waits for the start of the flow of hot water, thereby providing the saving of water.
CLAIMS

1. A fixture (9) preventing the waste of the cold water or the water that has not yet reached the desired temperature value characterized in that it comprises, as positioned on at least one fixture body (8),

   - at least one thermostatic cartridge (2) where the user may adjust the temperature that he/she prefers for the water to flow from at least one outlet (15) and

   - at least one thermostatic guide (1), which, depending on the temperature value of the water entering via at least one hot water inlet (4), enables said water to be conveyed

     - to said thermostatic cartridge (2) or

     - from at least one cold water inlet (5) to the mains line.

2. Fixture (9) according to Claim 1 characterized in that it comprises at least one check valve (6) positioned at the hot water inlet (4).

3. Fixture according to Claim 1 characterized in that said thermostatic cartridge (2) comprises

   - at least one temperature setting wheel (2a),

   - at least one thermostatic cartridge cold water inlet (2b),

   - at least one thermostatic cartridge hot water inlet (2c), and

   - at least one thermostatic cartridge water outlet (2d).

4. Fixture according to Claim 1 characterized in that said thermostatic guide (1) comprises

   - at least one water inlet (lc),

   - at least one water outlet (Id) that directs the water, entering via the hot water inlet (4), back to the mains line via the cold water inlet (5), and

   - another water outlet (le) that directs the water, entering via the hot water inlet (4), to the thermostatic cartridge.
5. Fixture according to Claim 1 characterized in that it comprises at least one nut (la) for enabling the thermostatic guide (1) to be fixed to the fixture body.

6. A system comprising the fixture (9) according to Claim 1 and preventing the waste of the cold water or the water that has not yet reached the desired temperature value characterized in that it further comprises
- at least one heat source (10),
- at least one heat source hot water output line (17),
- at least one circuit board (11) positioned on the hot water line (17),
- at least one circulation pump (12) positioned on the hot water line (17), and
- at least one flow sensor (13) positioned on the hot water line (17).

7. A method for the operation of the system according to Claim 6 characterized in that
- the water proceeds from the heat source hot water output line (17) to the hot water inlet (4) upon the flow of water being triggered by the user,
- the water proceeding to the hot water inlet (4) is detected by the hot water flow sensor (13) and the signal regarding the requirement for the operation of the circulation pump (12) is sent to the circuit board (11),
- the hot water reaches the thermostatic guide (1) via the water inlet (lc), and
- the water entering the fixture via the hot water inlet (4) is, depending on the temperature of said entering water, directed by the thermostatic guide (1).

8. Method according to Claim 7 characterized in that within the scope of the guiding process performed by said thermostatic guide (1),
- if the temperature of the water reaching the thermostatic guide (1) is at a value equal to the temperature value to which the thermostatic guide (1) is preset or if it is at a value above said preset temperature value, the water is directed from the thermostatic guide (1) to the thermostatic cartridge hot water inlet (2c) via the water outlet to the thermostatic cartridge (lc), and
- the water reaching the thermostatic cartridge (2) reaches the user from the fixture outlet (15), via the water outlet (2d).
9. Method according to Claim 7 characterized in that within the scope of the guiding process performed by said thermostatic guide (1),
   • if the temperature of the water reaching the thermostatic guide (1) is at a value lower than the temperature value to which the thermostatic guide is preset, the water entering via the hot water inlet (4), instead of proceeding to the fixture outlet (15), is sent, via the thermostatic guide water outlet (Id), from the cold water inlet section (5) back to the water mains line with the help of the circulation pump (12).

10. Method according to Claim 8 characterized in that if the temperature value that the user sets with the help of the thermostatic cartridge temperature setting wheel (2a) and that the user prefers for the water he/she will use is lower than the temperature value of the water to proceed from the thermostatic guide (1) to the thermostatic cartridge (2),
   • the hot water, as well as the cold water concurrently entering via the cold water inlet (5), proceeds to the thermostatic cartridge cold water inlet (2b) and the water mixture, which is enabled to attain the desired temperature by way of mixing here the hot and cold water, reaches the fixture outlet (15) via the thermostatic cartridge water outlet (2d).
**INTERNATIONAL SEARCH REPORT**

International application No
PCT/TR2016/0OQ194

A. CLASSIFICATION OF SUBJECT MATTER

INV. E03B7/Q4

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)
E03B

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Date of the actual completion of the international search
31 March 2017

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