



(51) International Patent Classification:
F25D 23/12 (2006.01)

(21) International Application Number:
PCT/EP2010/056731

(22) International Filing Date:
17 May 2010 (17.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
A 2009/03974 22 May 2009 (22.05.2009) TR

(71) Applicant (for all designated States except US): **ARCELIK ANONIM SIRKETI** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KALYONCU, Hasan Basar** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **MOZA, Ahmet Onur** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **DEMIRCAN, Ozgur** [TR/TR]; E5 Ankara Asfalti Uzeri,

Tuzla, 34950 Istanbul (TR). **HACIOGLU, Mehmet Cemal** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

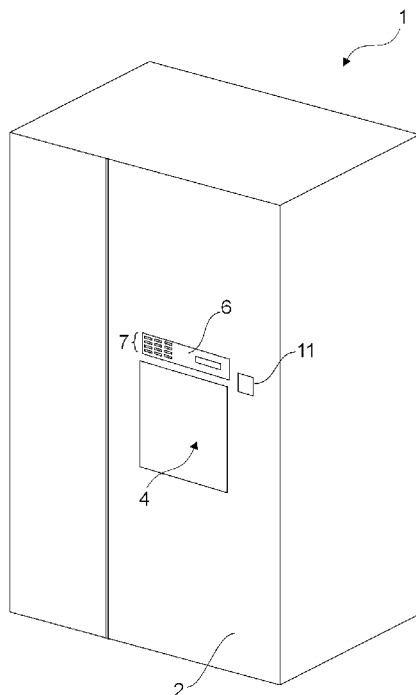
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: A COOLING DEVICE COMPRISING A WATER DISPENSER

Figure 1



(57) Abstract: The present invention relates to a cooling device (1) comprising a water dispenser (3) and a control unit (11) that provide the user to receive the desired amount of water.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). **Published:**

— *without international search report and to be republished
upon receipt of that report (Rule 48.2(g))*

Description**A COOLING DEVICE COMPRISING A WATER DISPENSER**

- [0001] The present invention relates to a cooling device comprising a water dispenser.
- [0002] In cooling devices, for example in some refrigerators, water dispensers are situated that enable the user to receive water without opening the refrigerator door. The said water dispensers comprise a tap located on the refrigerator door, and a water tank, wherein the water is stored, on the inner surface of the door. When the user desires to receive water from the water dispenser, he/she keeps the tap turned on and waits until the amount of water desired to be received is discharged. Keeping the tap turned on and waiting is not a practical way of use in terms of the user.
- [0003] In the state of the art United States Patent Document No US7201005, two different control methods are described for the water dispenser used in the refrigerator, one of which is manual and the other one is suitable for dispensing the desired amount of water. In the water dispenser wherein the user can enter the parameters such as the unit of measure, the type of container desired to be filled and the amount of water to be filled by means of a user interface display, the water valve is connected to a flow sensor.
- [0004] However, cooling devices comprising water dispensers wherein measurement devices such as flow sensor and flowmeter are used can be more expensive, and also several difficulties are encountered in the control and/or calibration of these sensitive devices. Therefore, simpler and cheaper solutions, wherein the user can predetermine the amount of water he/she will fill from the water dispenser, are needed.
- [0005] The aim of the present invention is the realization of a cooling device comprising a water dispenser that enables the user to receive the amount of water he/she determines.
- [0006] The cooling device realized in order to attain the aim of the present invention is explicated in the claims.
- [0007] The cooling device of the present invention comprises a tank having at least two independent compartments that have the water intake capacity in amounts determined by the producer. A valve, turning on and off of which

is controlled by the control unit, is connected to the outlet of each compartment. The user enters the amount of water he/she desires to receive from the water dispenser by means of the selectors on the display located on the door. The control unit determines, the sum amount of water in which compartment or compartments corresponds to the amount of water entered by means of the selectors, and accordingly provides the valves connected to the determined compartments to be turned on. Thus, the user is provided to receive the desired amount of water from the water dispenser.

- [0008] In an embodiment of the present invention, the compartments have different volumes from one another.
- [0009] In another embodiment of the present invention, a lid is located between the storage, wherein the water is stored, and the tank. Water passage from the storage to the tank is provided by the filling valves located on the lid. Thus, when any of the compartments is emptied, the filling valves are turned on and thus, the compartment is provided to be filled.
- [0010] In another embodiment of the present invention, one or more passages are situated that are located between the compartments and provide the compartments to be filled with water from above.
- [0011] In another embodiment of the present invention, the water dispenser comprises a housing located on the door, and a receptacle located between the tank and the housing. The receptacle collects the water flowing from the valves, one end of which opens into the receptacle, and provides the passage of this water to the housing.
- [0012] In another embodiment of the present invention, turning on and off of the filling valves is associated with turning on and off of the valves. When one or more of the compartments are emptied by turning on the valves, the filling valves are provided to be turned on by means of the control unit, and the amount of water in the compartments is renewed.
- [0013] By means of the present invention, the user is provided with the opportunity to receive the amount of water he/she determines from the water dispenser.
- [0014] The cooling device realized in order to attain the aim of the present

invention is illustrated in the attached figures, where:

- [0015] Figure 1 – is the perspective view of a cooling device.
- [0016] Figure 2 – is the perspective view of a cooling device when the door is open.
- [0017] Figure 3 – is the exploded perspective view of a water dispenser.
- [0018] Figure 4 – is the perspective view of the tank.
- [0019] The elements illustrated in the figures are numbered as follows:
1. Cooling device
 2. Door
 3. Water dispenser
 4. Housing
 5. Storage
 6. Display
 7. Selector
 8. Compartment
 9. Tank
 10. Valve
 11. Control unit
 12. Passage
 13. Lid
 14. Filling valve
 15. Receptacle
- [0020] The cooling device (1) comprises at least one door (2) which isolates the cooling compartment from the outer environment, a display (6) located on the door (2), one or more selectors (7) which are located on the display (6) and which serve the user to enter the amount of water he/she desires to receive, and at least one water dispenser (3) which is located on the inner surface of the door (2) and which enables the user to receive water without requiring to open the door (2) (Figure 1).
- [0021] The water dispenser (3) of the present invention comprises a tank (9) having at least two independent compartments (8), and a valve (10) connected to each compartment (8) (Figure 3).
- [0022] The cooling device (1) of the present invention, furthermore, comprises a

control unit (11) that determines from which compartments (8) water will be discharged in order to provide the amount of water entered by means of the selectors (7), and that accordingly controls the valves (10), which are connected to the said compartments (8), being independently turned on and off and thus, that provides the user to receive the desired amount of water.

[0023] When the user desires to receive water from the water dispenser (3), he/she enters the amount of water desired to be received, by means of the selectors (7). The value entered by means of the selectors (7) is transmitted to the control unit (11). The water intake capacity of the compartments (8) is preset in the control unit (11) by the producer. The control unit (11) calculates, which compartment (8) or compartments' (8) sum of water volume corresponds to the amount of water entered by the user. For example, if the tank (9) has 8 compartments (8) each having a volume of 100 ml and the user desires to receive 300 ml of water, the control unit (11) calculates that the desired amount of water can be provided by the sum of the volumes of three compartments (8). In order that the user can receive the desired amount of water, the control unit (11) provides the water in the compartments (8) to be discharged by turning on the three different valves (10) connected to the said three compartments (8). Thus, by means of the water dispenser (3) having a simple design that is realized by using the principle of communicating vessels, the user is provided to receive the desired amount of water.

[0024] In an embodiment of the present invention, the tank (9) comprises more than one compartment (8) having different volumes from one another. For example, 3 compartments (8) of 100 ml, 2 compartments (8) of 200 ml, 1 compartment (8) of 500 ml and 1 compartment (8) of 1000 ml are situated inside the tank (9). Thus, the number of combinations calculated by the control unit (11) for the user to receive the desired amount of water is increased.

[0025] In another embodiment of the present invention, the water dispenser (3) comprises a storage (5) which is located on the inner surface of the door (2) and wherein the water is stored, a lid (13) located between the storage

(5) and the tank (9), and at least one filling valve (14) which is located on the lid (13) and provides the water passage from the storage (5) to the tank (9). Thus, when any of the compartments (8) is emptied, water is transmitted from the storage (5) to the tank (9) by means of the filling valve (14), and hence the emptied compartment (8) is provided to be refilled.

[0026] In another embodiment of the present invention, the tank (9) comprises one or more passages (12) which are located on the inner walls separating the compartments (8) from each other, and which provide the water to pass from one compartment (8) to another compartment (8) by flowing thereon and thus, the emptied compartment (8) to be filled. Thus, when any of the compartments (8) is emptied, all of the compartments (8) are provided to be filled with water by providing water passage from one compartment (8) to another compartment (8) by means of the passages (12).

[0027] In another embodiment of the present invention, the water dispenser (3) comprises a housing (4) located on the door (2), and a receptacle (15) which is located between the tank (9) and the housing (4) and which provides the water discharged from the valves (10) to be collected and passed to the housing (4). One end of the valves (10) is connected to the compartment (8) base and the other end to the receptacle (15).. When more than one valve (10) connected to more than one compartment (8) are turned on by the control unit (11) in accordance with the user request, the water flowing from each valve (10) is collected in the receptacle (15) and its passage from the receptacle (15) to the housing (4) is provided. The user can receive the desired amount of water by means of a container such as a glass he/she can dispose into the housing (4).

[0028] In another embodiment of the present invention, the control unit (11) provides the filling valve (14) to be turned on when at least one of the compartments (8) is emptied and thus, provides the emptied compartment (8) or compartments (8) to be filled with water. Thus, the process of turning on and off the filling valve (14) is associated with turning on and off of the valves (10) and thus, all of the compartments (8) inside the tank (9) are provided to be filled with water all the time.

- [0029] By means of the cooling device (1) of the present invention, the user is provided to receive the desired amount of water from the water dispenser (3). The water dispenser (3) of the present invention provides a cost advantage by means of its ease of design and production.
- [0030] It is to be understood that the present invention is not limited to the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A cooling device (1) **comprising** at least one door (2), a display (6) located on the door (2), one or more selectors (7) which are located on the display (6) and which serve the user to enter the amount of water he/she desires to receive, and a water dispenser (3) which is located on the inner surface of the door (2), **characterized by** the water dispenser (3) that has a tank (9) having at least two independent compartments (8), and a valve (10) connected to each compartment (8), and a control unit (11) that determines from which compartments (8) water will be discharged in order to provide the amount of water entered by means of the selectors (7), and that accordingly controls the valves (10), which are connected to the said compartments (8), being independently turned on and off and thus, that provides the user to receive the desired amount of water.
2. A cooling device (1) as in Claim 1, **characterized by** compartments (8) that have different volumes from one another.
3. A cooling device (1) as in Claim 1 or 2, **characterized by** the tank (9) that comprises one or more passages (12) which are located on the inner walls separating the compartments (8) from each other, and which provide the water to pass from one compartment (8) to another compartment (8) by flowing thereon and thus, the emptied compartment (8) to be filled.
4. A cooling device (1) as in any one of the above Claims, **characterized by** the water dispenser (3) that comprises a storage (5) which is located on the inner surface of the door (2) and wherein the water is stored, a lid (13) located between the storage (5) and the tank (9), and at least one filling valve (14) which is located on the lid (13) and provides the water passage from the storage (5) to the tank (9).
5. A cooling device (1) as in any one of the above Claims, **characterized by** the water dispenser (3) that comprises a housing (4) located on the door (2), and a receptacle (15) which is located between the tank (9) and the housing (4) and which provides the water discharged from the valves (10) to be collected and passed to the housing (4).
6. A cooling device (1) as in Claim 4, **characterized by** the control unit (11) that provides the filling valve (14) to be turned on when at least one of the

compartments (8) is emptied and thus, provides the emptied compartment (8) or compartments (8) to be filled with water.

Figure 1

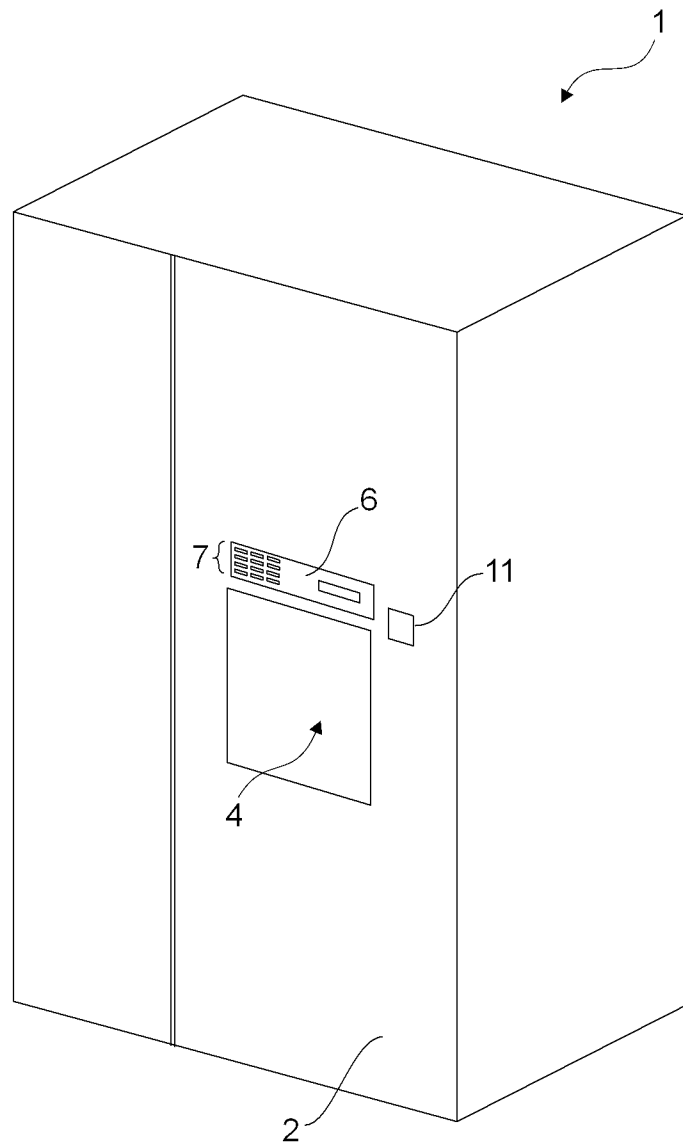
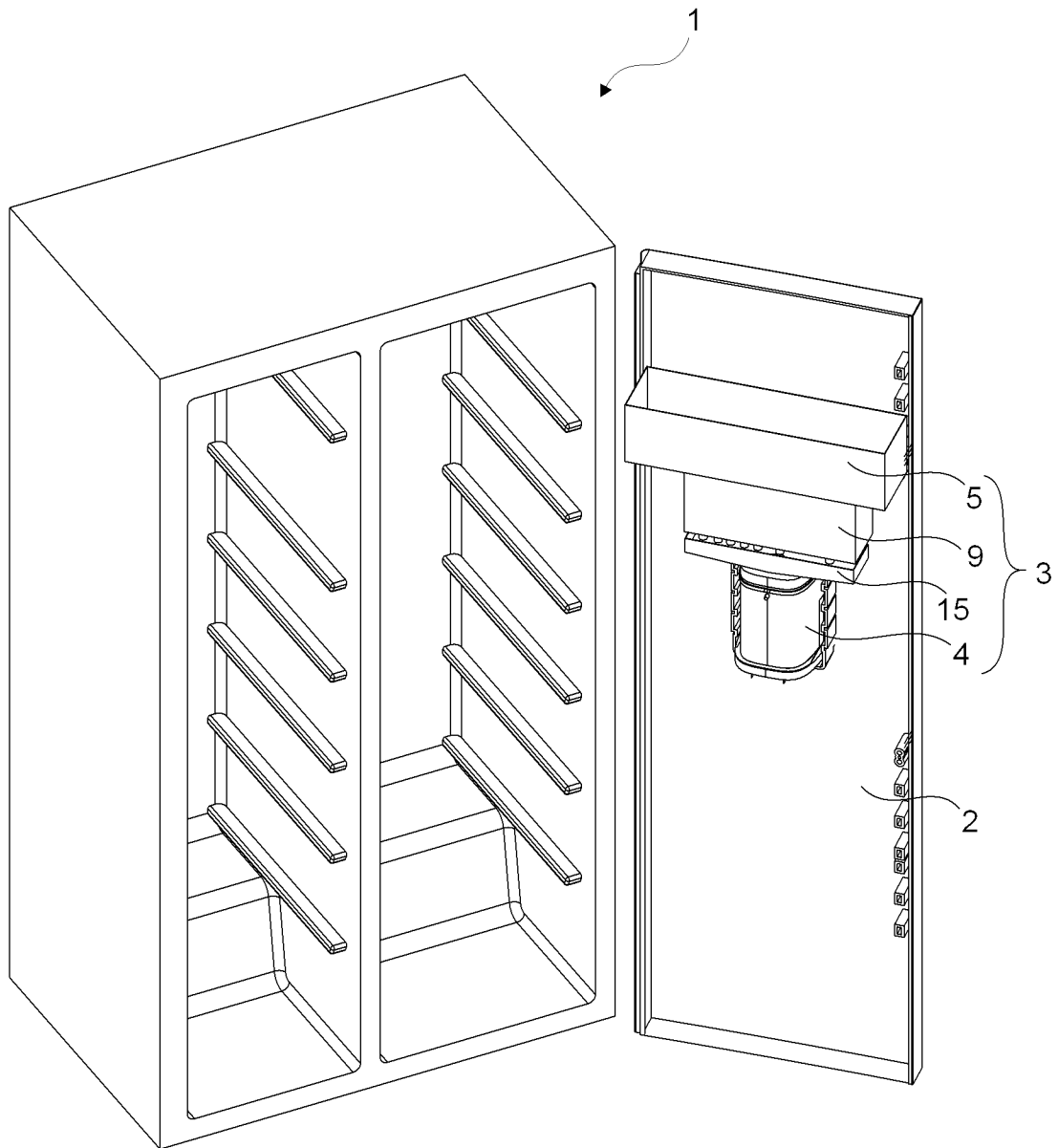


Figure 2



3/4

Figure 3

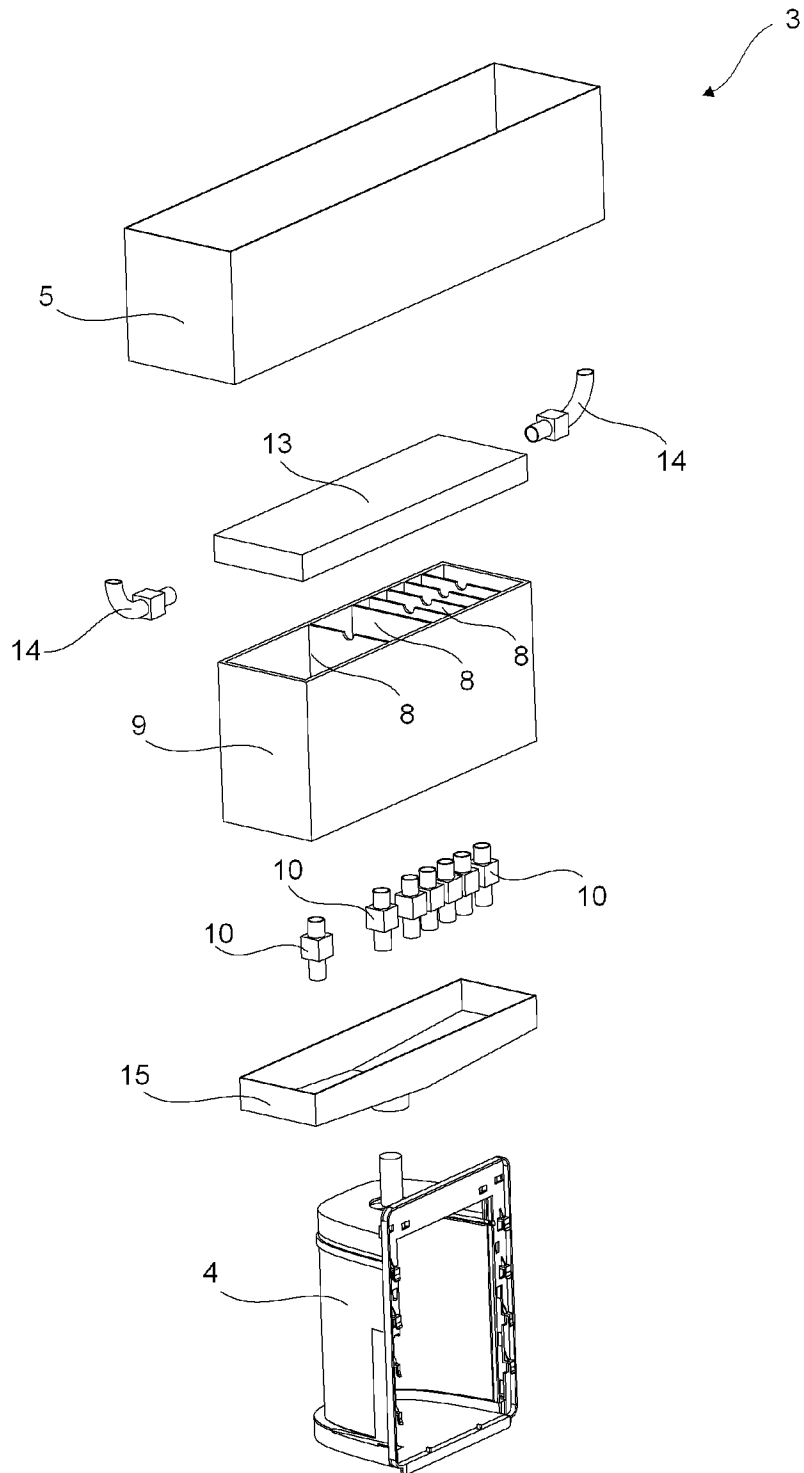


Figure 4

