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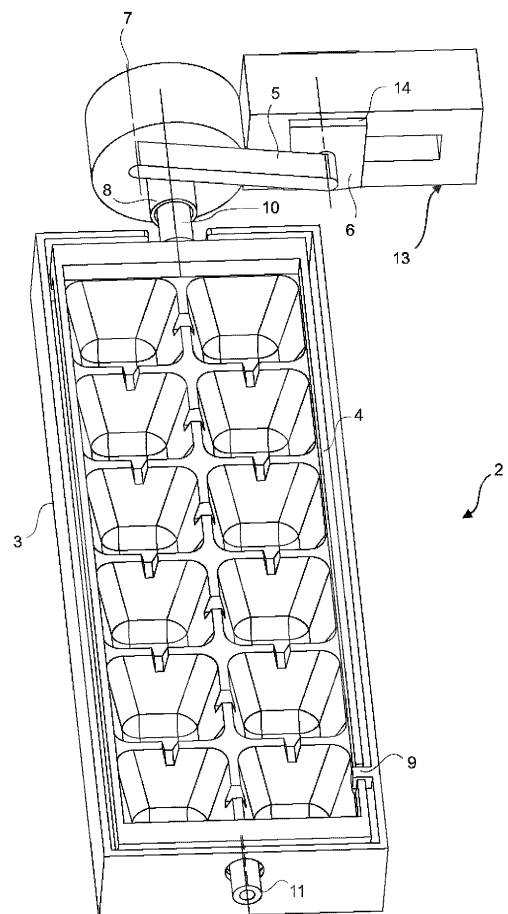
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(54) **A COOLING DEVICE COMPRISING AN ICE MAKER**

(57) The present invention relates to an ice maker (2) which is suitable to be used in cooling devices (1), comprising at least one receptacle (3) wherein the ice cubes are stored; at least one ice cube tray (4) which is placed so as to rotate on the first pin and the second pin (10 and 11) arranged in the same horizontal axis on the receptacle (3) and which has a plurality of cells; an arm (5) which moves in an axis perpendicular to the rotational axis of the ice cube tray (4); and a cylindrical intermediate member (7) which is centered with respect to the first pin (10) and which transfers the movement of the arm (5) to the first pin (10) which forms the rotational axis of the ice cube tray (4). In this embodiment of the present invention, when the arm (5) is pulled by the user in an axis perpendicular to the rotational axis of the ice cube tray (4), the intermediate member (7) rotates itself and also rotates the ice cube tray (4) which is centered with respect to the intermediate member (7).

Figure 3



Description

A COOLING DEVICE COMPRISING AN ICE MAKER

[0001] The present invention relates to a cooling device comprising an ice maker which is used for making ice cubes.

[0002] Ice makers are generally disposed in the freezing compartment. The ice makers are actuated from the front wall of the ice maker so as to be almost aligned with the eye level of the user and the ice cubes are turned upside down in the ice cube tray.

[0003] The ice makers used for making ice cubes in the cooling devices comprise ice cube trays containing ice cubes and various actuation mechanisms such as knobs, rotating arms, gears etc., enabling the ice cubes in the ice cube tray to be taken out with the actuation thereof. Thus, when the ice cube trays in the ice makers are actuated by means of a mechanism, all the ice cubes in the ice cube trays are taken out. In the state of the art ice makers, the ice cube trays are twisted by being rotated approximately by 160° and the ice cubes in the ice cube trays are enabled to be taken out. In such embodiments, the ice cube trays are actuated by means of a knob located at the upper part of the ice maker. The gears disposed at the lower part of the knob are moved by means of a gear located on the ice maker during the rotation of the knob by the user and enable the ice cubes contained in the ice maker to be taken out. However, problems are encountered in the synchronous movement of the knob and the gears mounted to the knob and in the stable positioning of the components with respect to each other.

[0004] In some of the state of the art embodiments, the actuation mechanism comprises a motor. Especially when two ice cube trays are twisted by means of a single motor to enable the ice cubes to fall down, an excessive load acts on the motor pin, which results in the damaging of the motor pin. In such embodiments, using two separate motors makes the control difficult, complicates the ice maker structure and increases the number of parts and the cost.

[0005] In the state of the art, it is disclosed that the ice cube trays are driven by means of a single driving mechanism.

[0006] In the state of the art International Patent Application No. WO2019129406, a cooling device comprising an ice maker is disclosed, wherein the ice maker is moved in two different ways. In this embodiment, the cooling device comprises an actuation mechanism which moves only the first ice cube tray with the first movement and which, with the second movement, returns the first ice cube tray to the initial position and moves the second ice cube tray.

[0007] Another state of the art embodiment is explained in the Chinese Patent Application No. CN 103712390. This document discloses the actuation of two ice cube trays at a single point, which are connected to each other by means of gears.

[0008] Another state of the art embodiment is disclosed in the Chinese Patent Application No. CN202066269. This document discloses the actuation of the ice cube trays simultaneously by means of the gears provided on the driving arm.

[0009] In the state of the art Chinese Patent Applications No. CN201503177 and CN102230705, a cooling device is disclosed, having an ice maker wherein the ice cubes contained therein is taken out by means of a knob.

[0010] In the state of the art Chinese Patent Application No. CN202166250, the ice cube trays are connected to two gears and said gears are actuated by means of a rack-pinion mechanism.

[0011] The aim of the present invention is the realization of a cooling device comprising an ice maker which provides ease of use.

[0012] The ice maker realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises an arm which rotates around an axis perpendicular to the rotational axis of the ice cube tray, and a cylindrical intermediate member which is centered with respect to the first pin and which transfers the movement of the arm to the first pin which forms the rotational axis of the ice cube tray. In this embodiment of the present invention, when the arm is pulled by the user in an axis perpendicular to the rotational axis of the ice cube tray, the intermediate member rotates itself and also rotates the ice cube tray which is centered with respect to the intermediate member. The intermediate member attached to the arm converts the linear movement of the arm to circular movement and transfers this movement to the first pin on the rotational axis of the ice cube tray and enables the ice cube tray to be rotated around the horizontal axis on which the first and the second pins forming the rotational axis of the same are provided.

[0013] By means of the present invention, the ice cubes are enabled to be taken out of the ice maker more easily by applying a smaller amount of force. Thus, by performing the twisting action by means of a separate mechanism, the ice maker is enabled to be used by the user more effectively by applying a smaller amount of force.

[0014] In an embodiment of the present invention, the arm is U-shaped and comprises two holders which have the same length and are parallel to each other, one being fixed to the intermediate member so as to be parallel to the center of the intermediate member.

[0015] In an embodiment of the present invention, the ice maker comprises a transmission member to which the other holder on the arm is fixed, and a guiding member which slides on or in the transmission member so as to enable the arm to move forwards/backwards in a direction perpendicular to the rotational axis of the ice cube tray. In this embodiment, the guiding member and the transmission member are rectangular, and the transmission member is disposed in the gap at the center of the guiding member so as to slide in the gap. At the regions

where the transmission member contacts the guiding member, there are a plurality of protrusions which prevent the transmission member from being detached from the guiding member, and said protrusions constitute a rail-like shape.

[0016] In an embodiment of the present invention, the ice maker comprises a movement pin which enables the first pin and the intermediate member to be centered and borne with respect to each other and which is attached onto the first pin at the center of the intermediate member.

[0017] In another embodiment of the present invention, the ice maker comprises a stopper which extends towards the ice cube tray from a point near the rear edge of the receptacle and that the ice cube tray hits while rotating around the horizontal axis. The ice cube tray which hits the stopper is twisted around the rotational axis thereof and the ice cubes in the ice cube tray are enabled to separate from the ice cube tray easily and quickly and fall into the receptacle.

[0018] By means of the present invention, an ice maker is realized, which is enabled to be used ergonomically by the user, comprising an intermediate member and an arm which enable the ice cube tray to be actuated effectively when moved by the user.

[0019] The cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the front view of a cooling device.

Figure 2 - is the exploded perspective view of the ice maker.

Figure 3 - is the perspective view of the ice maker in the first position.

Figure 4 - is the view of the ice maker while switching from the first position to the second position.

[0020] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Ice maker
3. Receptacle
4. Ice cube tray
5. Arm
6. Transmission member
7. Intermediate member
8. Movement pin
9. Stopper
10. First pin
11. Second pin
12. Holder
13. Guiding member
14. Protrusion

[0021] The ice maker (2) which is suitable to be used in cooling devices (1) comprises at least one receptacle (3) wherein the ice cubes are stored; at least one ice cube tray (4) which is placed so as to rotate on the first

pin and the second pin (10 and 11) arranged in the same horizontal axis on the receptacle (3) and which has a plurality of cells; an arm (5) which moves in an axis perpendicular to the rotational axis of the ice cube tray (4); and a cylindrical intermediate member (7) which is centered with respect to the first pin (10) and which transfers the movement of the arm (5) to the first pin (10) which forms the rotational axis of the ice cube tray (4). In this embodiment of the present invention, when the arm (5) is pulled by the user in an axis perpendicular to the rotational axis of the ice cube tray (4), the intermediate member (7) rotates itself and also rotates the ice cube tray (4) which is centered with respect to the intermediate member (7). The intermediate member (7) attached to the arm (5) converts the linear movement of the arm (5) to circular movement and transfers this movement to the first pin (10) on the rotational axis of the ice cube tray (4) and enables the ice cube tray (4) to be rotated around the horizontal axis on which the first and the second pins (10 and 11) forming the rotational axis of the same are provided (Figure 1 and Figure 2).

[0022] By means of the present invention, the ice cubes are enabled to be taken out of the ice maker (2) more easily by applying a smaller amount of force. Thus, by performing the twisting action by means of a separate mechanism, the ice maker (2) is enabled to be used by the user more effectively by applying a smaller amount of force.

[0023] In an embodiment of the present invention, the arm (5) is U-shaped and comprises two holders (12) which have the same length and are parallel to each other. One of the holders (12) is fixed to the intermediate member (7) so as to be parallel to the center of the intermediate member (7).

[0024] In an embodiment of the present invention, the ice maker (2) comprises a transmission member (6) to which the other holder (12) on the arm (5) is fixed, and a guiding member (13) which slides on or in the transmission member (6) so as to enable the arm (5) to move forwards/backwards in a direction perpendicular to the rotational axis of the ice cube tray (4). In this embodiment, the guiding member (13) and the transmission member (6) are rectangular, and the transmission member (6) is disposed in the gap at the center of the guiding member (13) so as to slide in the gap. At the regions where the transmission member (6) contacts the guiding member (13), there are a plurality of protrusions (14) which prevent the transmission member (6) from being detached from the guiding member (13), and said protrusions (14) constitute a rail-like shape.

[0025] In an embodiment of the present invention, the ice maker (1) comprises a movement pin (8) which enables the first pin (10) and the intermediate member (7) to be centered and borne with respect to each other. The movement pin (8) is attached onto the first pin (10) at the center of the intermediate member (7).

[0026] In the embodiment of the present invention, the arm (5) is moved by pulling the transmission member (6)

in the guiding member (13).

[0027] In another embodiment of the present invention, the ice maker (2) comprises a stopper (9) which extends towards the ice cube tray (4) from a point near the rear edge of the receptacle (3) and that the ice cube tray (4) hits while rotating around the horizontal axis. The ice cube tray (4) which hits the stopper is twisted around the rotational axis thereof and the ice cubes in the ice cube tray (4) are enabled to separate from the ice cube tray (4) easily and quickly and fall into the receptacle (3).

[0028] The ice cube tray (4) is attached onto the receptacle (3) via the first and second pins (10 and 11). In this case, the ice cube tray (4) can rotate around the horizontal axis on which the first and second pins (10 and 11) are provided. Said horizontal axis forms the rotational axis of the ice cube tray (4). The movement pin (8) is borne onto and connected to the intermediate member (7) so as to be in the same axis as the first pin (10). While one of the holders (12) on the arm (5) is attached to the intermediate member (7), the other holder (12) is attached to the transmission member (6). The transmission member (6) with one of the holders (12) of the arm (5) being attached thereon is attached to the guiding member (13) in a slidable manner. In the first position, the ice cube tray (4) is in a balanced position and supports the ice cubes (Figure 3).

[0029] When the ice cubes are needed to be taken from the ice maker (2), the transmission member (6) to which one holder (12) of the arm (5) is attached is slid right or left in the guiding member (12) and shifted to the second position, thus enabling the ice cubes in the ice cube tray (4) to fall into the receptacle (3). When the transmission member (6) is slid in the guiding member (13), the arm (5) pulled by the holder (12) also starts to move. In this case, the holder (12) which is attached to the intermediate member (7) also starts to move and rotates the intermediate member (7) around the rotational axis of the ice cube tray (4) by means of the movement pin (8) and the first pin (10). As a result of said movement of the intermediate member (7), the end of the intermediate member (7) which is attached to the movement pin (8) rotates the movement pin (8) and as a result of this movement, the first pin (10) is enabled to rotate and the ice cube tray (4) is enabled to rotate around the horizontal axis formed by the second pin (11) and the first pin (10). During this rotational movement, the opposite end of the ice cube tray (4) hits the stopper (9), enabling the ice cube tray (4) to be twisted around rotational axis thereof. The ice cube tray (4) is shifted to the second position by pulling the arm (5) in the guiding member (13) by means of the transmission member (6). The ice cube tray (4) hits the stopper (9) at around 120°, and starts to be twisted. Since the rotational movement continues, said twisting movement continues for 40°. Thus, the ice cubes in the ice cube tray (4) are enabled to separate from the ice cube tray (4) easily and quickly and fall into the receptacle (3).

[0030] By means of the present invention, an ice maker

(1) is realized, which is enabled to be used ergonomically by the user, comprising an intermediate member (7) and an arm (5) which enable the ice cube tray (4) to be actuated effectively when moved by the user.

Claims

1. An ice maker (2) which is suitable to be used in cooling devices (1), **comprising** at least one receptacle (3) wherein the ice cubes are stored and at least one ice cube tray (4) which is placed so as to rotate on the first pin (10) and the second pin (11) arranged in the same horizontal axis on the receptacle (3) and which has a plurality of cells, **characterized by** an arm (5) which moves in an axis perpendicular to the rotational axis of the ice cube tray (4) and a cylindrical intermediate member (7) which is centered with respect to the first pin (10) and which transfers the movement of the arm (5) to the first pin (10) which forms the rotational axis of the ice cube tray (4).
2. An ice maker (2) as in Claim 1, **characterized by** the arm (5) which is U-shaped and which comprises two holders (12) which have the same length and are parallel to each other.
3. An ice maker (2) as in Claim 2, **characterized by** the holders (12) one of which is fixed to the intermediate member (7) so as to be parallel to the center of the intermediate member (7).
4. An ice maker (2) as in any one of the Claims 1 to 3, **characterized by** a transmission member (6) to which the other holder (12) on the arm (5) is fixed, and a guiding member (13) which slides on or in the transmission member (6) so as to enable the arm (5) to move forwards/backwards in a direction perpendicular to the rotational axis of the ice cube tray (4).
5. An ice maker (2) as in Claim 4, **characterized by** the transmission member (6) which is rectangular and which is disposed in the gap at the center of the guiding member (13) so as to slide in the gap.
6. An ice maker (2) as in Claim 1, **characterized by** a movement pin (8) which enables the first pin (10) and the intermediate member (7) to be centered and borne with respect to each other and which is attached onto the first pin (10) at the center of the intermediate member (7).
7. An ice maker (2) as in any one of the above claims, **characterized by** a stopper (9) which extends towards the ice cube tray (4) from a point near the rear edge of the receptacle (3) and that the ice cube tray (4) hits while rotating around the horizontal axis.

Figure 1

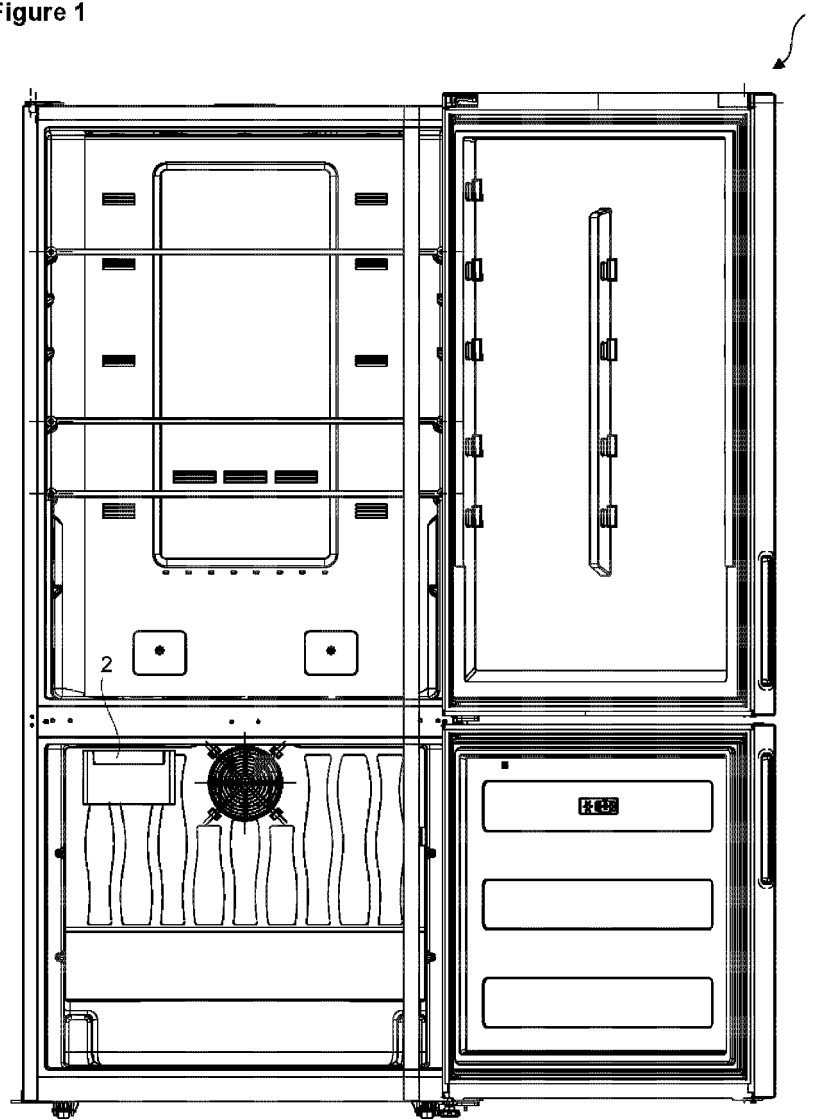


Figure 2

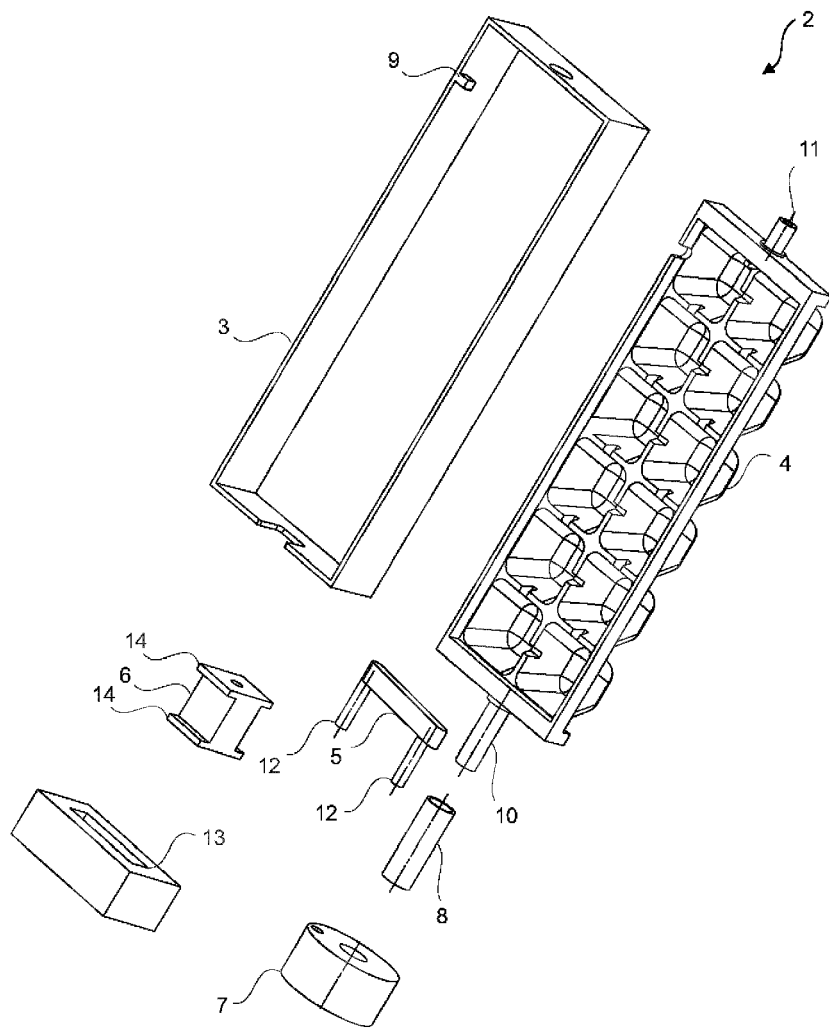


Figure 3

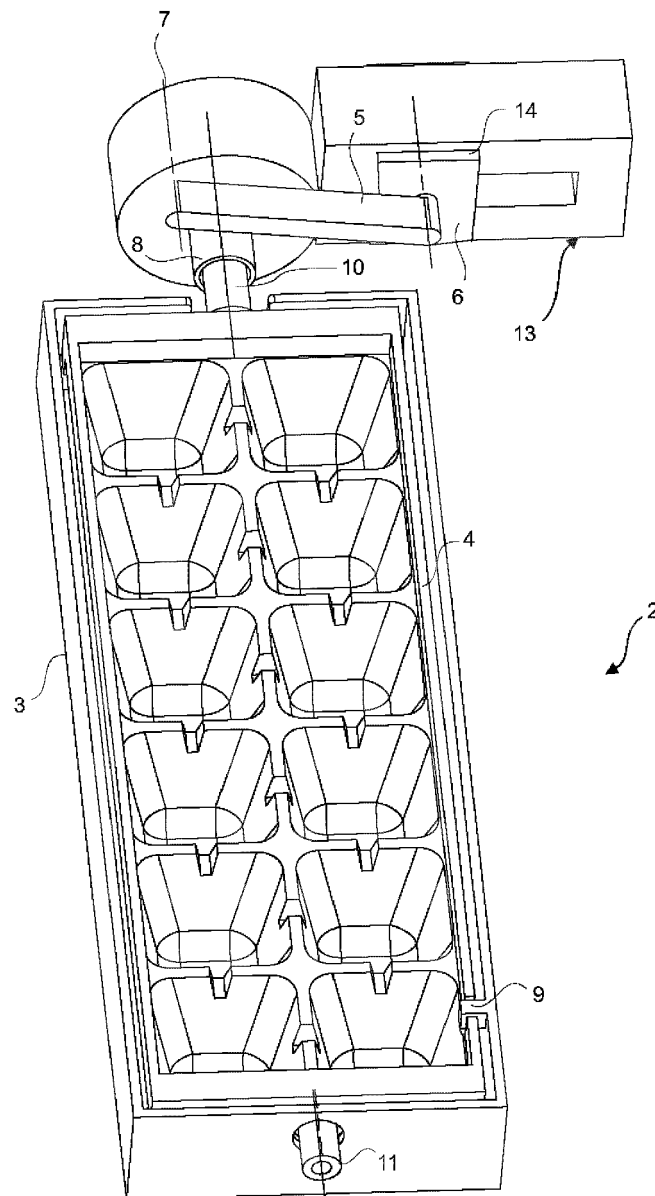
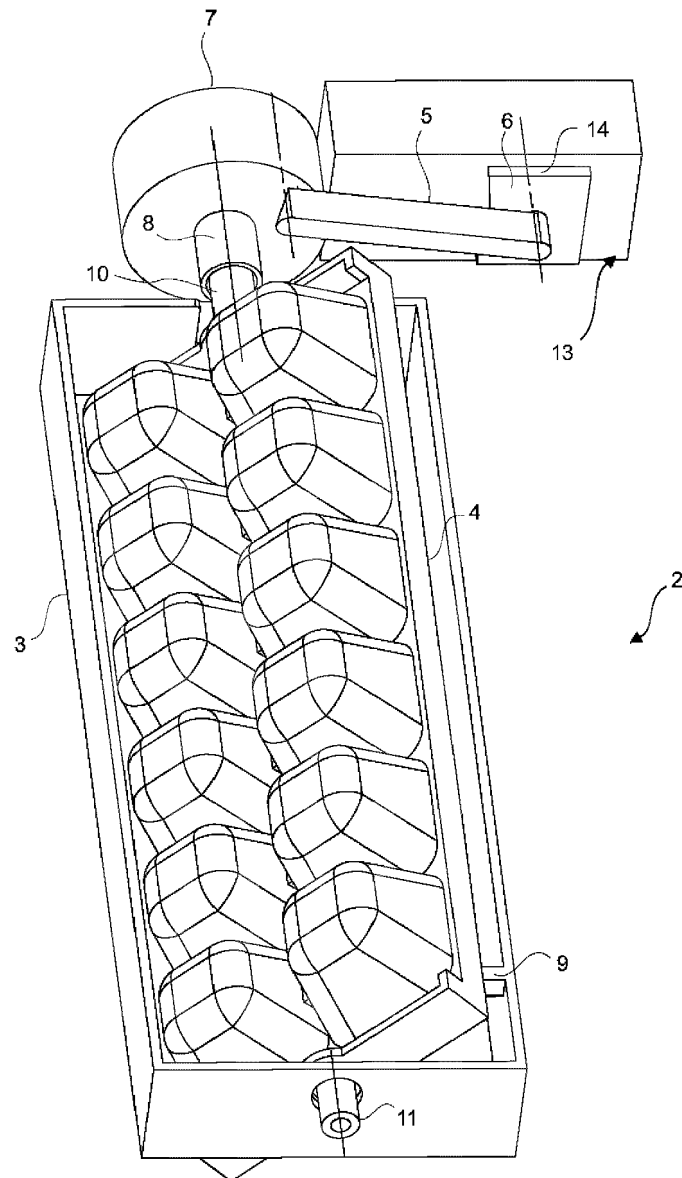


Figure 4





EUROPEAN SEARCH REPORT

Application Number
EP 20 19 9404

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		25 February 2021	Vigilante, Marco
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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