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(54) **A ICE BANK FIXATION DEVICING FOR REFRIGERATOR AND A REFRIGERATOR COMPRISING THE SAME**

EISSPEICHERBEFESTIGUNGSVORRICHTUNG FÜR KÜHLVORRICHTUNG UND KÜHLVORRICHTUNG DAMIT

DISPOSITIF DE FIXATION DE BAC À ACCUMULATION DE GLACE POUR RÉFRIGÉRATEUR ET RÉFRIGÉRATEUR AINSI ÉQUIPÉ

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Description

Technical Field

[0001] Embodiments relate to a refrigerator including the ice bank fixation device.

Background Art

[0002] Generally, refrigerators are used to keep food at a low temperature. Such a refrigerator includes a body in which a storage chamber is formed, and a door attached to the body for opening/closing the storage chamber.

[0003] An icemaker and an ice bank can be provided in the storage chamber for making and storing ice. The ice bank includes an ice carriage lever and an ice carriage motor. The ice carriage lever is driven by the ice carriage motor for moving the ice stored in the ice bank to a dispenser.

[0004] In this case, the storage capacity of the storage chamber may be reduced due to the ice bank. Moreover, the ice stored in the ice bank can be discharged only through the dispenser using the ice carriage lever. That is, a user cannot eject the ice directly from the ice bank. A refrigerator comprising an ice bank is known from US6442954.

Disclosure of Invention

Technical Problem

[0005] Embodiments provide a refrigerator including the ice bank fixation device so that a storage chamber of the refrigerator can be less occupied by an ice bank.

[0006] Embodiments also provide a refrigerator including the ice bank fixation device that allows a user to take ice automatically or manually from an ice bank.

Technical Solution

[0007] The solution to the problem is a refrigerator according to claim 1.

Advantageous Effects

[0008] According to embodiments, the ice bank is attached to the backside of the refrigerator door so that the ice bank may occupy less of a storage chamber of the refrigerator, and thus more food can be stored in the storage chamber.

[0009] In addition, the ice bank can be attached to and detached from the refrigerator door more easily owing to the ice bank fixation device, and thus a user can take ice automatically from the ice bank through a dispenser or manually from the ice bank after detaching the ice bank from the backside of the refrigerator door.

Brief Description of the Drawings

[0010] Embodiments can be understood more clearly from the accompanying drawings.

Fig. 1 is a perspective view illustrating an ice bank detached from a refrigerator door according to a first embodiment.

Figs. 2 to 4 are views for explaining how the ice bank is detached from the refrigerator door.

Fig. 5 is a perspective view illustrating an ice bank detached from a refrigerator door according to a second embodiment, not forming part of the present invention.

Fig. 6 is a perspective view illustrating an ice bank detached from a refrigerator door according to a third embodiment, not forming part of the present invention.

Fig. 7 is a perspective view illustrating an ice bank detached from a refrigerator door according to a fourth embodiment, not forming part of the present invention.

Fig. 8 is a perspective view illustrating an ice bank detached from a refrigerator door according to a fifth embodiment, not forming part of the present invention.

Mode for the Invention

[0011] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings.

[0012] Fig. 1 is a perspective view illustrating an ice bank 60 detached from a refrigerator door 50 according to a first embodiment, and Figs. 2 to 4 are views for explaining how the ice bank 60 is detached from the refrigerator door 50.

[0013] Referring to Figs. 1 to 4, the refrigerator door 50 of the current embodiment includes a dispenser 51. The dispenser 51 allows a user to get water or ice without opening the refrigerator door 50 (i.e., without opening a storage space of a refrigerator).

[0014] An outer door 53 is formed on a front outer portion of the refrigerator door 50. A door liner 55 is coupled to an inner surface of the outer door 53 to form the backside of the refrigerator door 50. Supports 56 are formed on both sides of the backside of the refrigerator door 50. The supports 56 extend backward from the door liner 55 and have a vertically elongated shape.

[0015] At least one pair of second coupling parts 57 is formed at mutually facing surfaces of the supports 56. The second coupling parts 57 are formed for receiving first coupling parts 71 (described later). The second coupling parts 57 are formed at corresponding positions of the mutually facing surfaces of the supports 56. The second coupling parts 57 may be recesses formed in the mutually facing surfaces of the supports 56.

[0016] A receiving surface 58 is formed at the backside

of the refrigerator door 50. The receiving surface 58 is formed by backwardly extending a portion of the door liner 55 located between the supports 56. The receiving surface 58 extends backward more than the supports 56.

[0017] The receiving surface 58 includes an opening 59. Ice stored in an ice storage space 60S (described later) of the ice bank 60 is carried to the dispenser 51 through the opening 59.

[0018] The ice bank 60 and an icemaker 40 are detachably coupled to the backside of the refrigerator door 50. The icemaker 40 is disposed above the ice bank 60.

[0019] When the ice bank 60 is coupled to the backside of the refrigerator door 50, both sides of the ice bank 60 make tight contact with the mutually facing surfaces of the supports 56, and a bottom surface of the ice bank 60 makes contact with the receiving surface 58. Therefore, the ice bank 60 can be first fixed in lateral direction by the supports 56.

[0020] Ice produced by the icemaker 40 is stored in the ice storage space 60S of the ice bank 60. The ice storage space 60S has an opened top portion.

[0021] The ice stored in the ice storage space 60S of the ice bank 60 is carried to the dispenser 51 and discharged to a user through the dispenser 51.

[0022] In detail, the ice bank 60 includes an ice outlet 63 in a bottom surface for discharging ice. The ice outlet 63 is formed at a position corresponding to the position of the opening 59 of the receiving surface 58. An icebreaker 61 is disposed in the ice bank 60 for breaking the ice stored in the ice storage space 60S into parts having a predetermined size and carrying the broken ice to the dispenser 51. The icebreaker 61 is disposed above and close to the ice outlet 63.

[0023] An icebreaker motor (not shown) drives the icebreaker 61. The icebreaker motor is disposed at a side of the icebreaker 61. Alternatively, the icebreaker motor can be disposed at the refrigerator door 50 and connected to the icebreaker 61 through an additional linkage member.

[0024] The ice outlet 63 is closed or opened according to the operation of the icebreaker 61. In detail, when the icebreaker 61 operates, ice stored in the ice storage space 60S is carried to the dispenser 51 through the ice outlet 63 and the opening 59. When the icebreaker 61 does not operate, the ice outlet 63 is substantially closed by the icebreaker 61.

[0025] The icebreaker 61 includes a window 65. The window 65 is formed of a transparent or semitransparent material. Therefore, a user can check the amount of ice stored in the ice storage space 60S through the window 65.

[0026] Rotation spaces 67 are formed in both sides of the ice bank 60 to allow rotation of the first coupling parts 71. The rotation spaces 67 may be recesses formed in both sides of the ice bank 60.

[0027] The number of the first coupling parts 71 of the ice bank 60 is at least two (a pair), and the first coupling parts 71 are rotatably disposed in the rotation spaces 67,

respectively. When the ice bank 60 is attached to the backside of the refrigerator door 50, the first coupling parts 71 are coupled to the second coupling parts 57 so that the ice bank 60 can be stably locked on the backside of the refrigerator door 50.

[0028] Both ends of each of the first coupling parts 71 can be rotated about a shaft 71H that is vertically disposed in the rotation space 67. Alternatively, shafts can be integrally formed on the first coupling parts 71, respectively, and insertion holes can be formed in the ice bank 60 for receiving the shafts.

[0029] Coupling tabs 73 extend outward from front ends of the first coupling parts 71 that are adjacent to the backside of the refrigerator door 50. The coupling tab 73 can be inserted into the second coupling parts 57 by rotating the first coupling parts 71 about the shafts 71H. Guide surfaces 74 are formed on outer surfaces of the coupling tabs 73, respectively. When the ice bank 60 is coupled to the backside of the refrigerator door 50, the coupling tab 73 can be smoothly inserted into the second coupling parts 57 owing to the guide surfaces 74. The guide surfaces 74 can have a rounded shape.

[0030] Levers 75 are formed on rear ends of the first coupling parts 71. A user can pull the levers 75 to rotate the first coupling parts 71 on the shafts 71H. For example, the levers 75 can be curved from the rear ends of the first coupling parts 71 away from the ice bank 60 so as to be placed outside the rotation spaces 67. When the ice bank 60 is coupled to the refrigerator door 50, the levers 75 are protruded outward from the ice bank 60 so that a user can pull the levers 75.

[0031] Torsion springs 77 are disposed at the shafts 71H, respectively. One end of the torsion spring 77 is supported by a side of the ice bank 60, and the other end of the torsion spring 77 is supported by a side of the first coupling part 71. When the first coupling part 71 is coupled to the second coupling part 57, the torsion spring 77 elastically forces the coupling tab 73 to rotate into the second coupling part 57. For example, one end of the torsion spring 77 can be supported by the ceiling of the rotation space 67, and the other end of the torsion spring 77 can be supported by the front end of the first coupling part 71.

[0032] Hereinafter, an ice bank fixation device, a refrigerator including the ice bank fixation device, and how the ice bank 60 is attached/detached to/from the refrigerator will be described in detail with reference to the accompanying drawing.

[0033] Referring to Fig. 2, when the ice bank 60 is coupled to the backside of the refrigerator door 50, the coupling tabs 73 are inserted into the second coupling parts 57. The coupling tabs 73 can be stably held in the second coupling parts 57 owing to the torsion springs 77.

[0034] Therefore, the ice bank 60 is not unintentionally detached from the backside of the refrigerator door 50.

[0035] In this state, when a user manipulates the dispenser 51, the icebreaker 61 operates to discharge ice stored in the ice storage space 60S of the ice bank 60 to

the outside through the dispenser 51. Therefore, the user can get ice without opening the refrigerator door 50.

[0036] Meanwhile, the ice bank 60 can be detached from the refrigerator door 50 by disengaging the first coupling parts 71 from the second coupling parts 57 as shown in Fig. 3. In detail, a user pulls the levers 75 away from the ice bank 60. That is, the user pulls the levers 75 to rotate the right-side first coupling part 71 counterclockwise and the left-side first coupling part 71 clockwise about the shafts 71H, respectively. Then, the coupling tabs 73 are disengaged from the second coupling parts 57, and thus the first coupling parts 71 are disengaged from the second coupling parts 57.

[0037] In this state, the ice bank 60 can be detached from the backside of the refrigerator door 50 by pulling the ice bank 60 away from the backside of the refrigerator door 50 as shown in Fig. 4. Therefore, a user can take ice directly from the ice storage space 60S of the ice bank 60.

[0038] After the ice bank 60 is detached from the refrigerator door 50, the first coupling parts 71 can rotate to their original positions by releasing the levers 75. Since the ice outlet 63 of the ice bank 60 is screened by the icebreaker 61, ice is not undesirably discharged through the ice outlet 63.

[0039] Meanwhile, the detached ice bank 60 can be attached to the backside of the refrigerator door 50 again by repeating the above-described procedures in a reverse order. In this case, it is not necessary to pull the levers 75.

[0040] In the current embodiment, the ice bank 60 is directly attached to the backside of the refrigerator door 50. However, other structures can be used for attaching the ice bank 60 to the refrigerator door 50. For example, an additional accommodation member can be disposed to the backside of the refrigerator door 50, and the ice bank 60 and the icemaker 40 can be attached to the accommodation member.

[0041] In addition, the second coupling parts 57 are formed at the refrigerator door 50, and the first coupling parts 71 are formed at the ice bank 60 in the current embodiment. However, the second coupling parts 57 can be formed at the ice bank 60, and the first coupling parts 71 can be formed at the refrigerator door 50.

[0042] Fig. 5 is a perspective view illustrating an ice bank 60 detached from a refrigerator door 50 according to a second embodiment, not forming part of the present invention.

[0043] Referring to Fig. 5, an ice bank fixation device of the current embodiment includes a plurality of coupling protrusions 81 formed on the refrigerator door 50 and a plurality of protrusion insertion holes 82 formed in the ice bank 60 for coupling with the coupling protrusions 81.

[0044] In detail, the coupling protrusions 81 are formed on supports 56. The coupling protrusions 81 can be vertically arranged on the supports 56. The protrusion insertion holes 82 are formed in the ice bank 60 at positions corresponding to those of the coupling protrusions 81.

[0045] When the ice bank 60 is attached to the refrigerator door 50, the coupling protrusions 81 are inserted into the protrusion insertion holes 82 so that the ice bank 60 can be fully fixed to the refrigerator door 50.

[0046] In the current embodiment, the coupling protrusions 81 are formed on the refrigerator door 50, and the protrusion insertion holes 82 are formed in the ice bank 60. However, the coupling protrusions 81 can be formed on the ice bank 60, and the protrusion insertion holes 82 can be formed in the refrigerator door 50.

[0047] Fig. 6 is a perspective view illustrating an ice bank 60 detached from a refrigerator door 50 according to a third embodiment, not forming part of the present invention.

[0048] Referring to Fig. 6, an ice bank fixation device of the current embodiment includes a plurality of first coupling parts 85 formed on the ice bank 60, and a plurality of second coupling parts 86 formed on supports 56 of the refrigerator door 50 for coupling with the first coupling part 85 by sliding.

[0049] In detail, the first coupling parts 85 can have a horizontally elongated shape and arranged in a vertical direction. The second coupling parts 86 can have a horizontally elongated recess shape and arranged in a vertical direction.

[0050] Therefore, the first coupling parts 85 can slide into the second coupling part 86 by pushing the ice bank 60 toward the refrigerator door 50 after aligning the first coupling parts 85 with the second coupling parts 86. In this way, the ice bank 60 can be coupled to the refrigerator door 50.

[0051] The first coupling parts 85 have a size corresponding to that of the second coupling parts 86, and the first and second coupling parts 85 and 86 are arranged in a vertical direction. Therefore, after the ice bank 60 is coupled to the refrigerator door 50, the ice bank 60 is not readily detached from the refrigerator door 50 when the refrigerator door 50 is opened and closed.

[0052] Fig. 7 is a perspective view illustrating an ice bank 60 detached from a refrigerator door 50 according to a fourth embodiment, not forming part of the present invention.

[0053] Referring to Fig. 7, an ice bank fixation device of the current embodiment includes at least one magnetic member 91 disposed at the ice bank 60 and a metal member 92 disposed at the refrigerator door 50 for coupling with the magnetic member 91.

[0054] In detail, the magnetic member 91 can be disposed on at least one portion of the ice bank 60. In Fig. 7, for example, two magnetic members 91 are disposed on bottom and front surfaces of the ice bank 60. The metal member 92 is disposed at a position corresponding to that of the magnetic member 91.

[0055] According to the current embodiment, a structure for attaching the ice bank 60 to the refrigerator door 50 is not exposed to the outside for aesthetical improvement.

[0056] When the ice bank 60 is attached to the refrig-

erator door 50, the ice bank 60 makes contact with a door liner 55 of the refrigerator door 50. Thus, in the case where the door liner 55 is formed of a material to which the magnetic member 91 can be magnetically attached, the metal member 92 can be omitted from the refrigerator door 50.

[0057] Alternatively, the metal member 92 can be disposed at a bottom surface of an icemaker 40. In this case, the magnetic member 91 may be disposed on a top portion of the ice bank 60. Therefore, the refrigerator door 50 can be placed on a receiving surface 58 and firmly held at that position by a magnetic force between the metal member 92 of the icemaker 40 and the magnetic member 91 of the ice bank 60.

[0058] Fig. 8 is a perspective view illustrating an ice bank 60 detached from a refrigerator door 50 according to a fifth embodiment, not forming part of the present invention.

[0059] Referring to Fig. 8, an ice bank fixation device of the current embodiment includes a latch hook 95 formed on the ice bank 60 and a latch slot 96 formed in the refrigerator door 50 for receiving the latch hook 95. The latch hook 95 may be formed at a front side of the ice bank 60 for easy coupling with the latch slot 96.

[0060] The latch hook 95 can be coupled to the latch slot 96 by pushing the latch hook 95 against the latch slot 96, and the latch hook 95 can be released from the latch slot 96 by pushing the latch hook 95 against the latch slot 96 again. Since this coupling structure is well known, a detailed description thereof will be omitted.

[0061] Meanwhile, alternatively, the latch slot 96 can be formed in the ice bank 60, and the latch hook 95 can be formed on the refrigerator door 50.

Industrial Applicability

[0062] According to embodiments, an ice bank can be detachably attached to a refrigerator door using the ice bank fixation device. Therefore, a user can take ice automatically from the ice bank through a dispenser or manually from the ice bank after detaching the ice bank from the backside of the refrigerator door, and thus the refrigerator including the ice bank fixation device can be used in various industrial fields.

Claims

1. A refrigerator comprising an ice bank fixation device, the ice bank fixation device comprising:

a first coupling part formed at an ice bank (60);
a second coupling part configured to keep the ice bank (60) at a position attached to a backside of a refrigerator door (50) by an interlocking motion with the first coupling part; and
an elastic member applying an elastic force to the first coupling part to rotate the first coupling

part (71) for coupling with the second coupling part (57),
the second coupling part (57) comprising recesses formed in supports (56) extending backward from both sides of the backside of the refrigerator door,
the first coupling part (71) being rotatable on the ice bank,
the refrigerator door (50) comprising said supports (56) formed on both sides of the backside thereof, the second coupling part (57) being formed at mutually facing surfaces of the supports,
the ice bank (60) comprising a rotation space (67) allowing rotation of the first coupling part, the first coupling part comprising an end extending from a rotation center of the first coupling part for coupling with the second coupling part (57) and a lever (75) on the other end thereof for handling the first coupling part,
the lever (75) being curved from the rear end of the first coupling part (71) away from the ice bank so as to be placed outside the rotation space (67).

2. A refrigerator according to claim 1, wherein the ice bank fixation device further comprises a shaft (71H) on which the first coupling part rotates, and the first coupling part comprises an end extending away from the shaft and insertable into the second coupling part.
3. A refrigerator according to claim 1, wherein the second coupling part is a portion of a door liner (55) forming a backside of the refrigerator door.

Patentansprüche

1. Kühlschrank, der eine Eiskwürfelbehälterbefestigungsvorrichtung aufweist, wobei die Eiskwürfelbehälterbefestigungsvorrichtung aufweist:

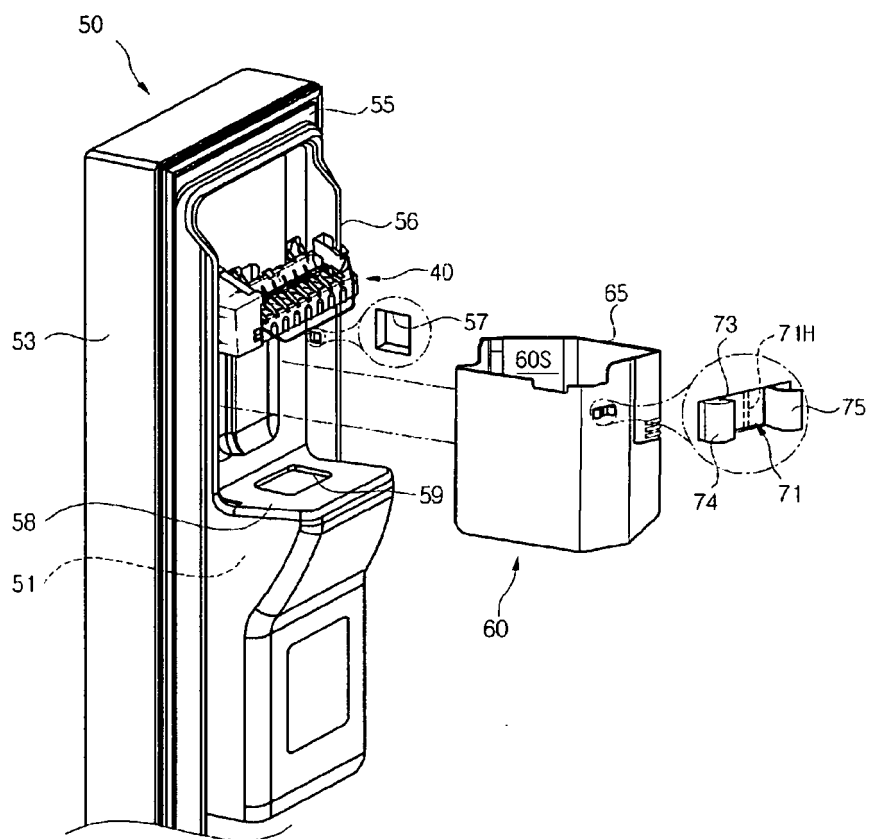
einen ersten Verbindungsteil, der an einem Eiskwürfelbehälter (60) ausgebildet ist,
einen zweiten Verbindungsteil, der so ausgebildet ist, dass der Eiskwürfelbehälter (60) in einer Lage gehalten wird, in der er über eine Verriegelungsbewegung mit dem ersten Verbindungsteil an einer Rückseite einer Kühlschranktür (50) befestigt ist, und
ein elastisches Element, das auf den ersten Verbindungsteil eine elastische Kraft ausübt, um den ersten Verbindungsteil (71) zum Verbinden mit dem zweiten Verbindungsteil (57) zu drehen, wobei
der zweite Verbindungsteil (57) in Haltern (56) ausgebildete Aussparungen aufweist, die sich

- von beiden Seiten der Rückseite der Kühlschrantüre nach hinten erstrecken, der erste Verbindungsteil (71) an dem Eiskwürfelbehälter gedreht werden kann, die Kühlschrantüre (50) die Halter (56) aufweist, die an beiden Seiten ihrer Rückseite ausgebildet sind, der zweite Verbindungsteil (57) an einander zugewandten Oberflächen der Halter ausgebildet ist, der Eiskwürfelbehälter (60) einen Rotationsraum (67) umfasst, der ein Drehen des ersten Verbindungsteils ermöglicht, der erste Verbindungsteil ein Ende aufweist, das sich von einem Rotationszentrum des ersten Verbindungsteils zum Verbinden mit dem zweiten Verbindungsteil (57) weg erstreckt, und einen Hebel (75) an dessen anderem Ende zur Betätigung des ersten Verbindungsteils, der Hebel (71) vom hinteren Ende des ersten Verbindungsteils (71) ausgehend von dem Eiskwürfelbehälter weg gekrümmt ist, sodass er außerhalb des Rotationsraums (67) angeordnet ist.
2. Kühlschrank nach Anspruch 1, worin die Eiskwürfelbehälterbefestigungsvorrichtung ferner eine Achse (71 H) aufweist, an der der erste Verbindungsteil rotiert, und der erste Verbindungsteil ein Ende aufweist, das sich von der Achse weg erstreckt und in den zweiten Verbindungsteil eingesetzt werden kann.
3. Kühlschrank nach Anspruch 1, worin der zweite Verbindungsteil Teil einer Türfüllung (55) ist, die eine Rückseite einer Kühlschrantüre bildet.
- côtés de la face arrière de la porte du réfrigérateur, la première partie de couplage (71) pouvant tourner sur le bac à glace, la porte du réfrigérateur (50) comprenant lesdits supports (56) formés sur les deux côtés de sa face arrière, la deuxième partie de couplage (57) étant formée au niveau de surfaces mutuellement opposées des supports, le bac à glace (60) comprenant un espace de rotation (67) permettant la rotation de la première partie de couplage, la première partie de couplage comprenant une extrémité s'étendant à partir d'un centre de rotation de la première partie de couplage pour se coupler avec la deuxième partie de couplage (57) et un levier (75) sur son autre extrémité pour la manipulation de la première partie de couplage, le levier (75) étant incurvé à partir de l'extrémité arrière de la première partie de couplage (71) loin du bac à glace de façon à être placé à l'extérieur de l'espace de rotation (67)
2. Réfrigérateur selon la revendication 1, dans lequel le dispositif de fixation de bac à glace comprend en outre un arbre (71H) sur lequel la première partie de couplage tourne, et la première partie de couplage comprend une extrémité s'étendant loin de l'arbre et pouvant être insérée dans la deuxième partie de couplage.
3. Réfrigérateur selon la revendication 1, dans lequel la deuxième partie de couplage est une partie d'une contre-porte (55) formant une face arrière de la porte du réfrigérateur.

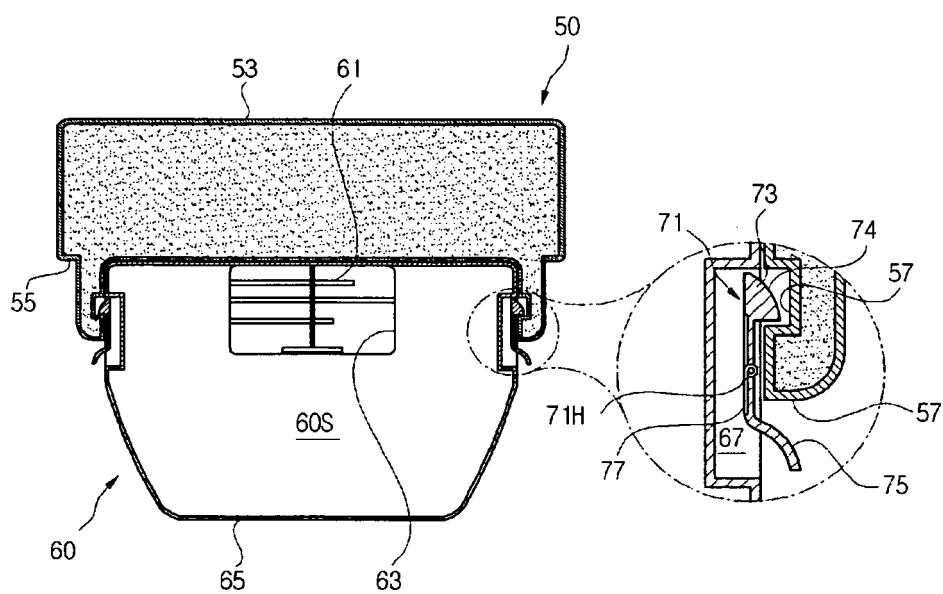
Revendications

1. Réfrigérateur comprenant un dispositif de fixation de bac à glace, le dispositif de fixation de bac à glace comprenant :
- une première partie de couplage formée au niveau d'un bac à glace (60) ;
- une deuxième partie de couplage configurée pour garder le bac à glace (60) à une position fixée à la face arrière d'une porte de réfrigérateur (50) par un mouvement de verrouillage avec la première partie de couplage ; et
- un élément élastique appliquant une force élastique à la première partie de couplage pour faire tourner la première partie de couplage (71) afin de la coupler avec la deuxième partie de couplage (57),
- la deuxième partie de couplage (57) comprenant des évidements formés dans des supports (56) s'étendant vers l'arrière à partir des deux

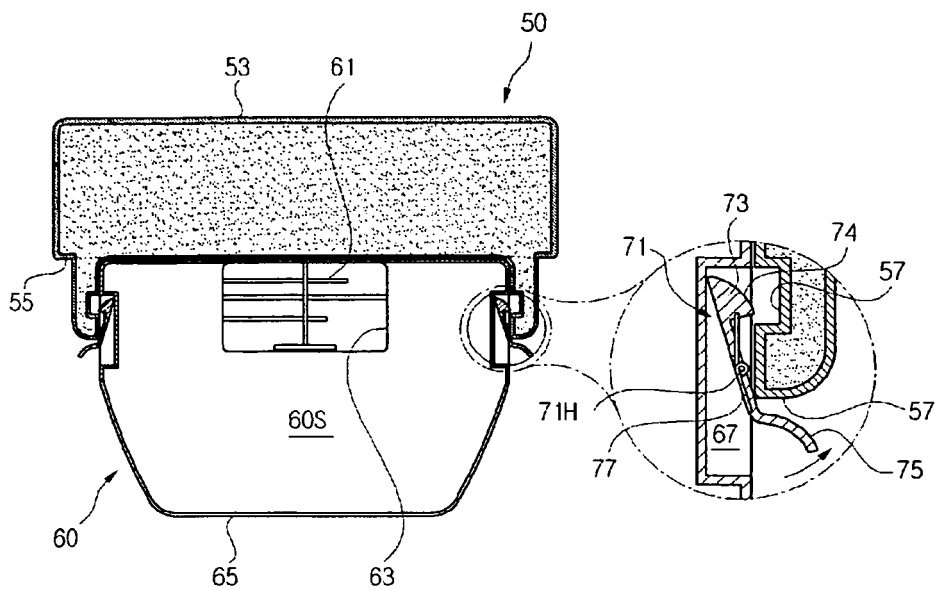
[Fig. 1]



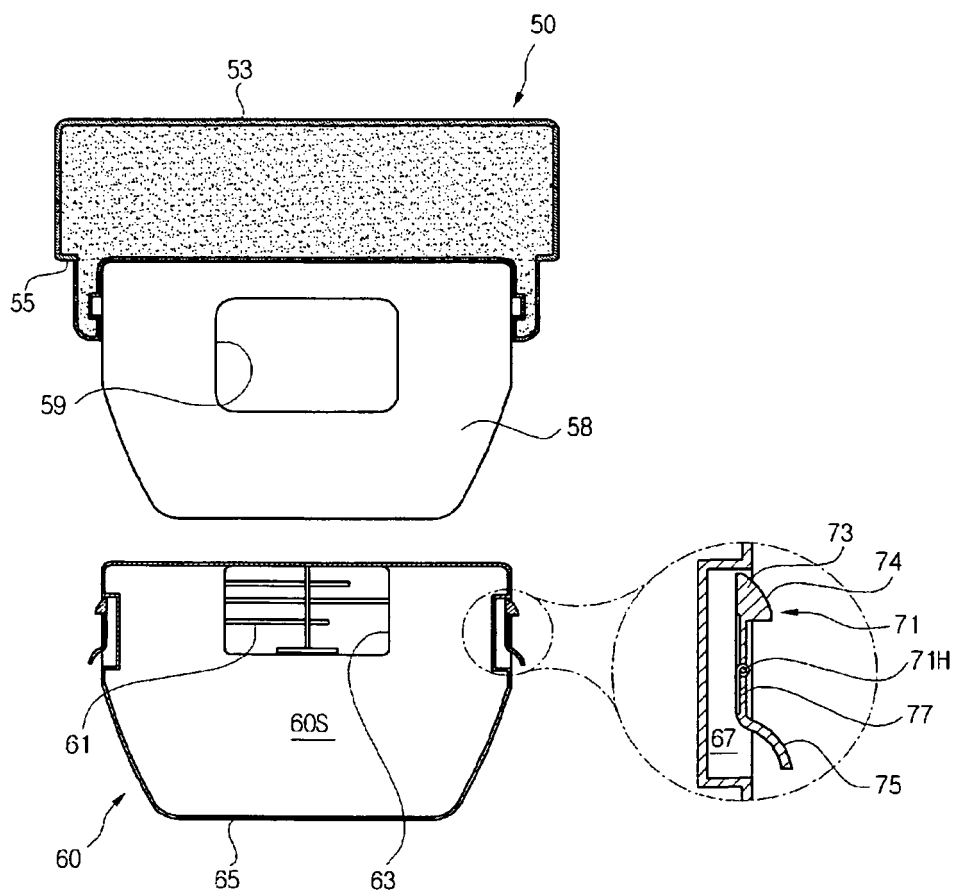
[Fig. 2]



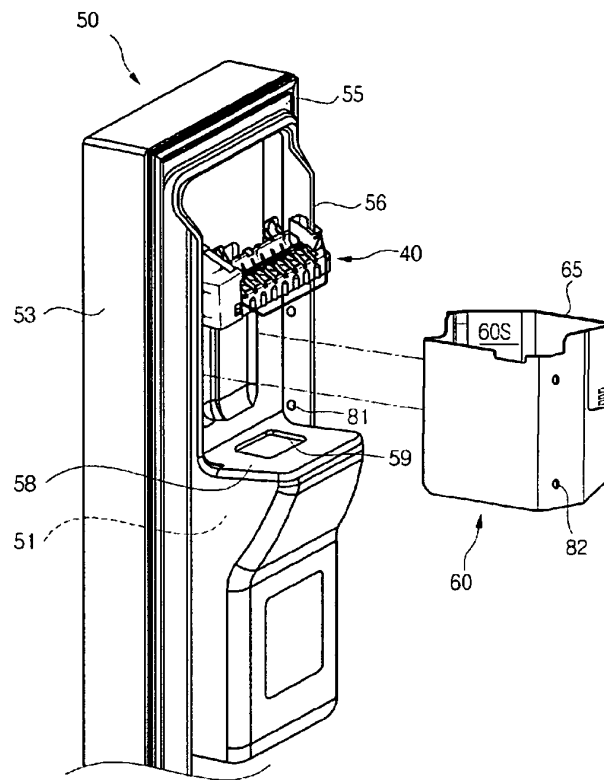
[Fig. 3]



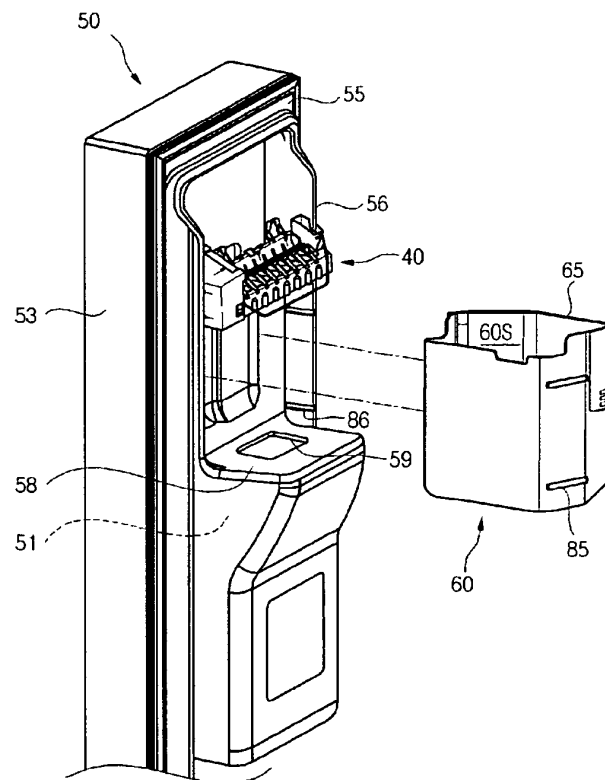
[Fig. 4]



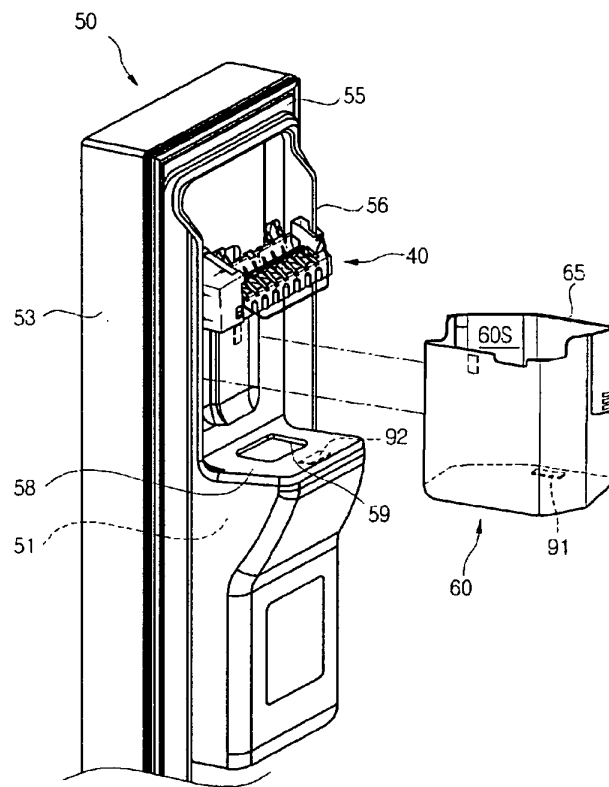
[Fig. 5]



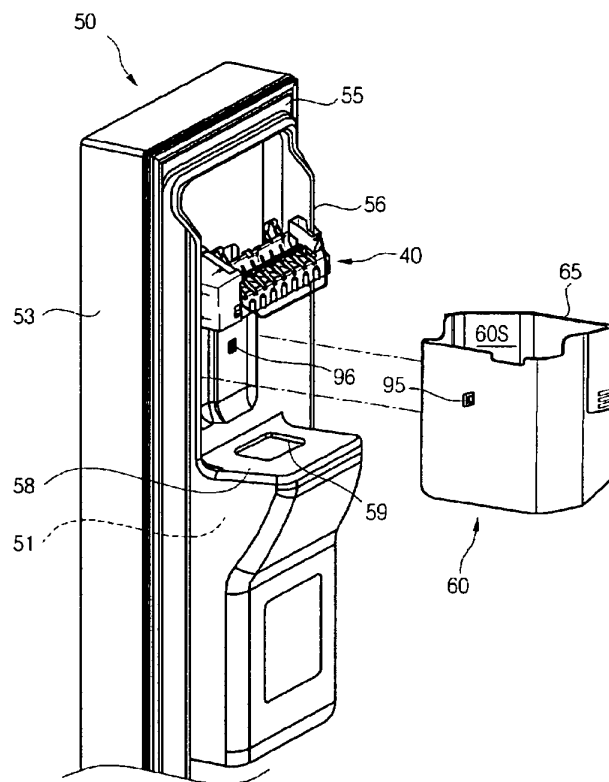
[Fig. 6]



[Fig. 7]



[Fig. 8]



REFERENCES CITED IN THE DESCRIPTION

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