(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 236 183 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.10.2017 Bulletin 2017/43

(51) Int Cl.:
F25C 5/00 *(2006.01)*

(21) Application number: **17166406.3**

(22) Date of filing: **13.04.2017**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **20.04.2016 KR 20160048056**

(71) Applicant: **Dongbu Daewoo Electronics Corporation**
Seoul 06194 (KR)

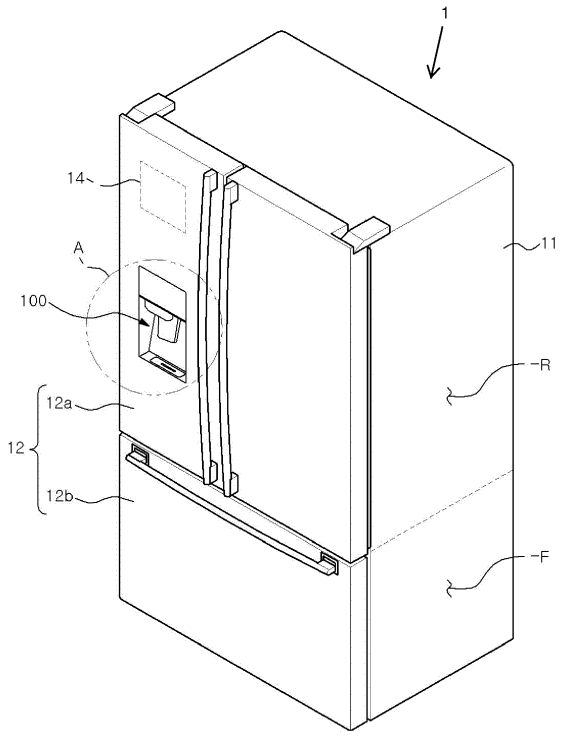
(72) Inventor: **Lee, Sung Hwan**
Seoul (KR)

(74) Representative: **Rau, Schneck & Hübner Patentanwälte Rechtsanwälte PartGmbB**
Königstraße 2
90402 Nürnberg (DE)

(54) DISPENSER MODULE

(57) Embodiments of the present disclosure provide a dispenser module and a refrigerator including the same, which are capable of preventing ice from being scattered around the refrigerator, and ensures that ice is only discharged using a specified route. A dispenser module is disclosed, including a dispenser body having a discharge port, a guide wall formed along an edge of the dispenser body so as to protrude from the dispenser body, an ice cap mounted to the guide wall and configured to be rotated by a drive unit to open or close a movement route through which ice is moved toward the discharge port. The dispenser module further includes a push lever having an end mounted to the dispenser body and extending away from the guide wall, and a switch configured to control an operation of the drive unit by sensing a rotation of the push lever.

FIG. 1



EP 3 236 183 A1

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on and claims priority from Korean Patent Application No. 10-2016-0048056, filed on April 20, 2016, the disclosure of which is incorporated herein in its entirety by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to a dispenser module.

BACKGROUND

[0003] A refrigerator is an apparatus for storing food for by keeping a refrigeration compartment and a freezing compartment at a low temperature using a heat exchange process involving a refrigerant, where a freezing cycle consisting of compression, condensation, expansion and evaporation is used to generate cold air.

[0004] In general, a refrigerator includes a refrigerator main body with a freezing compartment and a refrigeration compartment for storing food at a low temperature, and refrigerator doors mounted to a front surface of the refrigerator main body to selectively open and close the freezing compartment and the refrigeration compartment.

[0005] Top-mount refrigerators with a freezing compartment disposed above a refrigeration compartment are a common type of refrigerator. In recent years, bottom-freeze refrigerators with a freezing compartment positioned at a lower end of the refrigerator have become popular due to enhanced user convenience. However, for bottom-freeze refrigerators, the freezing compartment is positioned lower which may be inconvenient when a user wants to retrieve ice from the freezer.

[0006] In order to solve this problem, bottom-freeze refrigerator may include a dispenser disposed on a refrigeration compartment door for dispensing ice. The dispenser is installed in the refrigeration compartment door, and a user may dispense ice by placing a container on the dispenser and pressing a push member or a button, for example.

[0007] However, the ice may be scattered around in the course of dispensing the ice through the dispenser and may become lodged in other parts of the refrigerator. This may lead to sanitary problems when ice and/or water sits in areas of the refrigerator that are intended to be kept dry. Accordingly, a demand exists for a dispenser that enables ice pieces to be discharged only through a specified route without being scattered around the refrigerator.

SUMMARY

[0008] Embodiments of the present disclosure provide a dispenser module and a refrigerator including the same, which are capable of preventing ice pieces from being scattered around the refrigerator and ensure that ice is only discharged from a specified route.

[0009] According to one embodiments, an ice dispenser for a refrigerator is disclosed, including a dispenser body comprising a discharge port, a guide wall disposed on an edge of the dispenser body and protruding outward from the dispenser body, a rotatable ice cap mounted on the guide wall, wherein the rotatable ice cap is rotated by a drive unit, and rotating the rotatable ice cap selectively opens a route through which ice is moved to the discharge port, a push lever mounted to the dispenser body, where a space separates the push level from the guide wall, and a switch configured to activate the drive unit when the push lever is depressed.

[0010] According to another embodiment, a dispenser module is disclosed, including a dispenser body having a discharge port, a guide wall disposed on an edge of the dispenser body and protruding away from the dispenser body, a hinged ice cap mounted to the guide wall using a hinge and rotated by a drive unit, a hinged push lever including a first end mounted to the dispenser body using a hinge, and a second end extending outward from the guide wall, and a switch configured to activate the drive unit when rotation of the push lever is detected. The guide wall is disposed on at least a portion of the edge of the dispenser body and extends upward, and an upper end of the guide wall is above the hinged ice cap.

[0011] According to another embodiment, a refrigerator is disclosed, including a refrigerator main body, a refrigerator door mounted to the refrigerator main body and configured to rotate for selectively opening and closing the refrigerator main body, a dispenser module disposed in the refrigerator door, and an ice maker disposed on the refrigerator main body configured to produce ice and supply the ice to the dispenser module in response to a signal transmitted from the switch.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Fig. 1 is a schematic perspective view illustrating an exemplary refrigerator according to one embodiment of the present disclosure.

Fig. 2 is an enlarged view of a region of an exemplary refrigerator designated by A in Fig. 1.

Fig. 3A is a schematic perspective view of an exemplary dispenser module according to one embodiment of the present disclosure.

Fig. 3B is a schematic perspective view of the exemplary dispenser module illustrated in Fig. 3A from a second angle.

Fig. 4A is a schematic perspective view of an exemplary dispenser module with an ice cap thereof removed.

Fig. 4B is a schematic perspective view of the ex-

emplary dispenser module illustrated in Fig. 4A viewed from a second angle.

Fig. 5 is a schematic side view of an exemplary dispenser module according to one embodiment of the present disclosure.

Fig. 6 is a schematic sectional view illustrating an exemplary process for discharging ice from the dispenser module according to one embodiment of the present disclosure.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part of the description herein. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented here.

[0014] One or more exemplary embodiments of the present disclosure will be described more fully hereinafter with reference to the accompanying drawings, in which one or more exemplary embodiments of the disclosure can be easily determined by those skilled in the art. As those skilled in the art will realize, the described exemplary embodiments may be modified in various different ways, all without departing from the spirit or scope of the present disclosure, which is not limited to the exemplary embodiments described herein.

[0015] It is noted that the drawings are schematic and are not necessarily dimensionally illustrated. Relative sizes and proportions of parts in the drawings may be exaggerated or reduced in size, and a predetermined size is merely exemplary and not limiting. The same reference numerals designate the same structures, elements, or parts illustrated in two or more drawings in order to exhibit similar characteristics.

[0016] The exemplary drawings of the present disclosure illustrate ideal exemplary embodiments of the present disclosure in more detail. As a result, various modifications of the drawings are expected. Accordingly, the exemplary embodiments are not limited to a specific form of the illustrated region, and for example, include a modification of a form by manufacturing.

[0017] Embodiments of the present disclosure will now be described in detail with reference to the accompanying drawings.

[0018] Fig. 1 is a schematic perspective view illustrating an exemplary refrigerator 1 according to one embodiment of the present disclosure. Fig. 2 is an enlarged view of a region designated A in Fig. 1.

[0019] Referring to Figs. 1 and 2, an exemplary refrigerator 1 according to one embodiment of the present disclosure includes a refrigerator main body 11 configured to define an outer shell, refrigerator doors 12 (12a and 12b) coupled to the refrigerator main body 11 to selectively open and close the refrigerator main body 11, a dispenser module 100 installed in one of the refrigerator doors 12, and an ice maker 14 provided inside the refrigerator main body 11 and configured to supply ice to the dispenser module 100.

[0020] The bottom-freeze refrigerator 1 includes a freezing compartment at a lower side thereof. However, the present disclosure is not limited thereto. The present disclosure may be applicable to different types of refrigerators such as a top-mount refrigerator and other types which are widely used in the related art.

[0021] The refrigerator main body 11 may include an internal space which may be selectively opened and closed by the refrigerator doors 12. For example, the interior of the refrigerator main body 11 may be divided into a refrigeration compartment R and a freezing compartment F, which may be selectively opened and closed by a refrigeration compartment door 12a and a freezing compartment door 12b, respectively.

[0022] The dispenser module 100 may be disposed on one of the refrigerator doors 12. For example, the dispenser module 100 may be disposed on an outer surface of the refrigeration compartment door 12a. An opening 11a may be provided in the refrigeration compartment door 12a. A push lever 140 of the dispenser module 100 may be accessible through the opening 11a to enable a user to use the dispenser module 100 without having to open the refrigeration compartment door 12a.

[0023] The ice maker 14 is configured to receive water from an external water source and to produce ice, and may be provided inside the refrigeration compartment R. The ice maker 14 and the dispenser module 100 may be connected to each other by a separate connection pipe 13 (see Fig. 6). The ice produced in the ice maker 14 may be discharged through the dispenser module 100. For example, the ice maker 14 may supply the ice to the dispenser module 100 in response to a signal transmitted from a switch 150.

[0024] Fig. 3A is a schematic perspective view of an exemplary dispenser module 100 according to one embodiment of the present disclosure, and Fig. 3B is a schematic perspective view of the dispenser module 100 illustrated in Fig. 3A, viewed from a second angle. Fig. 4A is a schematic perspective view of the dispenser module 100 with an ice cap thereof removed, and Fig. 4B is a schematic perspective view of the dispenser module 100 illustrated in Fig. 4A viewed from a second angle. Fig. 5 is a schematic side view of the dispenser module 100 according to one embodiment of the present disclosure. Fig. 6 is a schematic sectional view illustrating an exemplary process for discharging ice from the dispenser module 100 according to one embodiment of the present disclosure.

[0025] Referring to Figs. 3A to 6, the dispenser module 100, according to one embodiment of the present disclosure, may be provided in the refrigerator 1 to dispense ice. For example, the dispenser module 100 may be provided on a surface of the refrigeration compartment door 12a in order to enable a user to easily obtain ice from the

refrigerator 1.

[0026] The dispenser module 100 may include a dispenser body 110, a guide wall 120, an ice cap 130, a push lever 140 and a switch 150.

[0027] The dispenser body 110 may be coupled to one of the refrigerator doors 12, and may use a shoot or pathway for discharging ice, such as discharge port 110a.

[0028] The guide wall 120 may protrude from an edge of the dispenser body 110. When the ice is discharged through the dispenser module 100, the guide wall 120 prevents the ice from being scattered outward. With regard to Fig. 6, when the ice I is supplied to the dispenser module 100, some of the ice I may not enter the discharge port 110a and may move to the outside of the discharge port 110a after colliding with the dispenser body 110. In this case, the guide wall 120 prevents the ice from being scattered outward and guides the ice toward the discharge port 110a.

[0029] For example, the guide wall 120 may surround at least a portion of the discharge port 110a. The ice cap 130 may be disposed on a portion of the discharge port 110a not covered by the guide wall 120.

[0030] The guide wall 120 may be provided along at least a portion of the edge of the dispenser body 110 and extend upward. The upper end of the guide wall 120 may be disposed above the ice cap 130.

[0031] For example, the guide wall 120 may include sidewalls 121 disposed at the opposite sides of the ice cap 130 and a rear wall portion 122 configured to interconnect the sidewalls 121 and face the ice cap 130.

[0032] In this regard, the upper ends of the sidewalls 121 and the rear wall portion 122 may be disposed on the same plane. In other words, the sidewalls 121 and the rear wall portion 122 may be provided along at least a portion of an edge of the discharge port 110a and protrude upward to guide the ice discharged from the ice maker 14 toward the discharge port 110a.

[0033] The guide wall 120 and the dispenser body 110 may be combined as a single object or provided as separate components. For example, the guide wall 120 may be manufactured using injection-molding, where the guide wall 120 and the dispenser body 110 are formed into a single component. Alternatively, the guide wall 120 may be independently manufactured and fixed to the dispenser body 110 by bonding, screw-fixing or other methods.

[0034] The ice cap 130 may be mounted to the guide wall 120 in a rotatable or hinged manner. In one example, the ice cap 130 may be mounted to the sidewalls 121 of the guide wall 120 using a hinge. The ice cap 130 may be connected to a separate drive unit 160 and may be rotated by the drive unit 160. In this regard, the drive unit 160 may rotate the ice cap 130 in response to a signal applied from the switch 150.

[0035] The ice cap 130 may include a shaft 131 mounted to the sidewalls 121 using a hinge, and a stopper 132 connected to the shaft 131 and configured to open and/or close a route through which ice is moved toward the discharge port 110a.

[0036] The sidewalls 121 may include a first insertion hole 121a and a second insertion hole 121b into which the shaft 131 is rotatably inserted. In this regard, one side of the first insertion hole 121a may include a slit or narrow opening. When the shaft 131 of the ice cap 130 is combined with the sidewalls 121, an end portion of the shaft 131 may be inserted into the second insertion hole 121b, and another end portion of the shaft 131 may be pressed into to the first insertion hole 121a.

[0037] An elastic member 133 configured to apply a restoration force to the ice cap 130 may be disposed on one end portion of the shaft 131. The elastic member 133 may be, for example, a coil spring or a torsion spring. When the ice cap 130 is rotated in one direction by the drive unit 160, the elastic member 133 may provide a rotational force for returning the ice cap 130 to an original position. When the ice cap 130 is rotated by the drive unit 160, the end portion of the ice cap 130 may make contact with the inner surface of the rear wall portion 122.

[0038] The operation of the drive unit 160 may be controlled by the switch 150 provided at one side of the dispenser body 110. The switch 150 may sense the rotation of the push lever 140 and may transmit a start signal or a stop signal to the drive unit 160.

[0039] The push lever 140 may make contact with the switch 150. When the push lever 140 is brought into contact with the switch 150, the switch 150 may transmit a signal to the drive unit 160 and the ice maker 14. Upon receiving the signal from the switch 150, the drive unit 160 rotates the ice cap 130 and opens the discharge port 110a. In this way, the ice maker 14 can supply ice to the dispenser module 100. Because the discharge port 110a is opened by a rotation of the ice cap 130, the ice supplied from the ice maker 14 can be discharged through the discharge port 110a. When discharging ice, some ice may collide with the pipe 13, which interconnects the ice maker 14 and the dispenser module 100, or the dispenser body 110. However, the guide wall 120 prevents the ice from being scattered or discharged through a route other than the route provided by the discharge port 110a.

[0040] The push lever 140 may be mounted to the dispenser body 110 in a hinged manner. For example, one end portion of the push lever 140 may be rotatably mounted to the dispenser body 110 and the other end portion of the push lever 140 may extend away from the guide wall 120. In this way, at least a portion of the push lever 140 may be exposed through the opening 11a of the refrigeration compartment door 12a. Accordingly, a user may push the push lever 140 using a cup, container (e.g., container B) or the like without having to open the refrigerator door 12.

[0041] If a user pushes the push lever 140, a switch contact projection 141 disposed at one side of the push lever 140 may be rotated to press the switch 150. As the switch contact projection 141 presses the switch 150, the ice discharge process is performed as described above.

[0042] The method of operating the switch 150 may be

changed to many different methods widely used in the related art. For example, a separate photo sensor may be installed so that a switch is operated when a container is detected by the photo sensor. Alternatively, a pressure sensor may be installed on the surface on which a container is seated, so that a switch is operated when a container is detected by the pressure sensor.

[0043] The dispenser module 100 according to one embodiment of the present disclosure includes the guide wall 120 which surrounds at least a portion of an edge of the discharge port 110a for preventing ice from being scattered in the refrigerator or moved away from the intended route. In addition, the guide wall 120 is an integral part of the dispenser module 100. Therefore, there is no need to install a separate guide member in the dispenser body 110 to prevent ice from moving away from the specified movement route.

[0044] From the foregoing, it will be appreciated that various embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. The exemplary embodiments disclosed in the specification of the present disclosure do not limit the present disclosure. The scope of the present disclosure will be interpreted by the claims below, and it will be construed that all techniques within the scope equivalent thereto belong to the scope of the present disclosure.

Claims

1. An ice dispenser for a refrigerator, the ice dispenser comprising:

a dispenser body comprising a discharge port;
a guide wall disposed on an edge of the dispenser body and protruding outward from the dispenser body;
a rotatable ice cap mounted on the guide wall, wherein the rotatable ice cap is rotated by a drive unit, and wherein rotation of the rotatable ice cap selectively opens a route through which ice is operable to be moved to the discharge port;
a push lever including one end portion rotatably mounted on the dispenser body and the other portion extending away from the guide wall; and
a switch configured to activate the drive unit when the push lever is manipulated.

2. The ice dispenser of claim 1, wherein activating the drive unit causes ice to be dispensed.

3. The ice dispenser of claim 1, wherein the guide wall is disposed on at least a portion of the edge of the dispenser body and extends upward, wherein an upper end of the guide wall is disposed above the rotatable ice cap.

4. The ice dispenser of claim 1, wherein the guide wall comprises: a first sidewall disposed at a first side of the rotatable ice cap; a second sidewall disposed at a second side of the rotatable ice cap; and a rear wall interconnecting the sidewalls, wherein the rear wall faces the rotatable ice cap, and wherein the first side and second side are opposite sides.

5. The ice dispenser of claim 4, wherein the rotatable ice cap comprises a shaft mounted to the sidewalls and a stopper connected to the shaft and configured to open or close a movement route connected to the discharge port.

6. The ice dispenser of claim 5, further comprising an elastic member, wherein the elastic member is configured to provide a restoration force to the rotatable ice cap and is mounted to a first end of the shaft, and wherein the drive unit is mounted to a second end of the shaft.

7. The ice dispenser of claim 3, wherein the rotatable ice cap comprises an end configured to contact an inner surface of the rear wall when the rotatable ice cap is rotated.

8. The ice dispenser of claim 1, wherein the refrigerator comprising:

a refrigerator main body;
a refrigerator door mounted to the refrigerator main body and configured to rotate for selectively opening and closing the refrigerator main body; and
an ice maker disposed within the refrigerator main body configured to produce ice and supply the ice to the ice dispenser in response to a signal transmitted from the switch.

9. The ice dispenser of claim 8, wherein the push lever mounted to the refrigerator door for activating the switch, and
wherein at least a portion of the push lever is exposed outside of the refrigerator.

10. The ice dispenser of claim 9, wherein the guide wall comprises: a first sidewall disposed at a first side of the ice cap; a second sidewall disposed at a second side of the ice cap; and a rear wall interconnecting the sidewalls, wherein the rear wall faces the ice cap, and wherein the first side and the second side are opposite sides.

11. The ice dispenser of claim 10, wherein the ice cap is rotatable and comprises: a shaft mounted to the first and second sidewalls; and a stopper connected to the shaft and configured to open and close a movement route for ice.

12. The ice dispenser of claim 11, further comprising: an elastic member configured to provide a restoration force to the ice cap mounted to a first end of the shaft; and a drive unit mounted to a second end of the shaft, wherein the drive unit rotates the ice cap to dispense ice.

13. The ice dispenser of claim 12, wherein the ice cap comprises an end that contacts an inner surface of the rear wall when the ice cap is rotated.

14. The ice dispenser of claim 13, wherein the ice cap is mounted to the guide wall using a hinge and comprises a stopper configured to open and close a movement route for ice.

FIG. 1

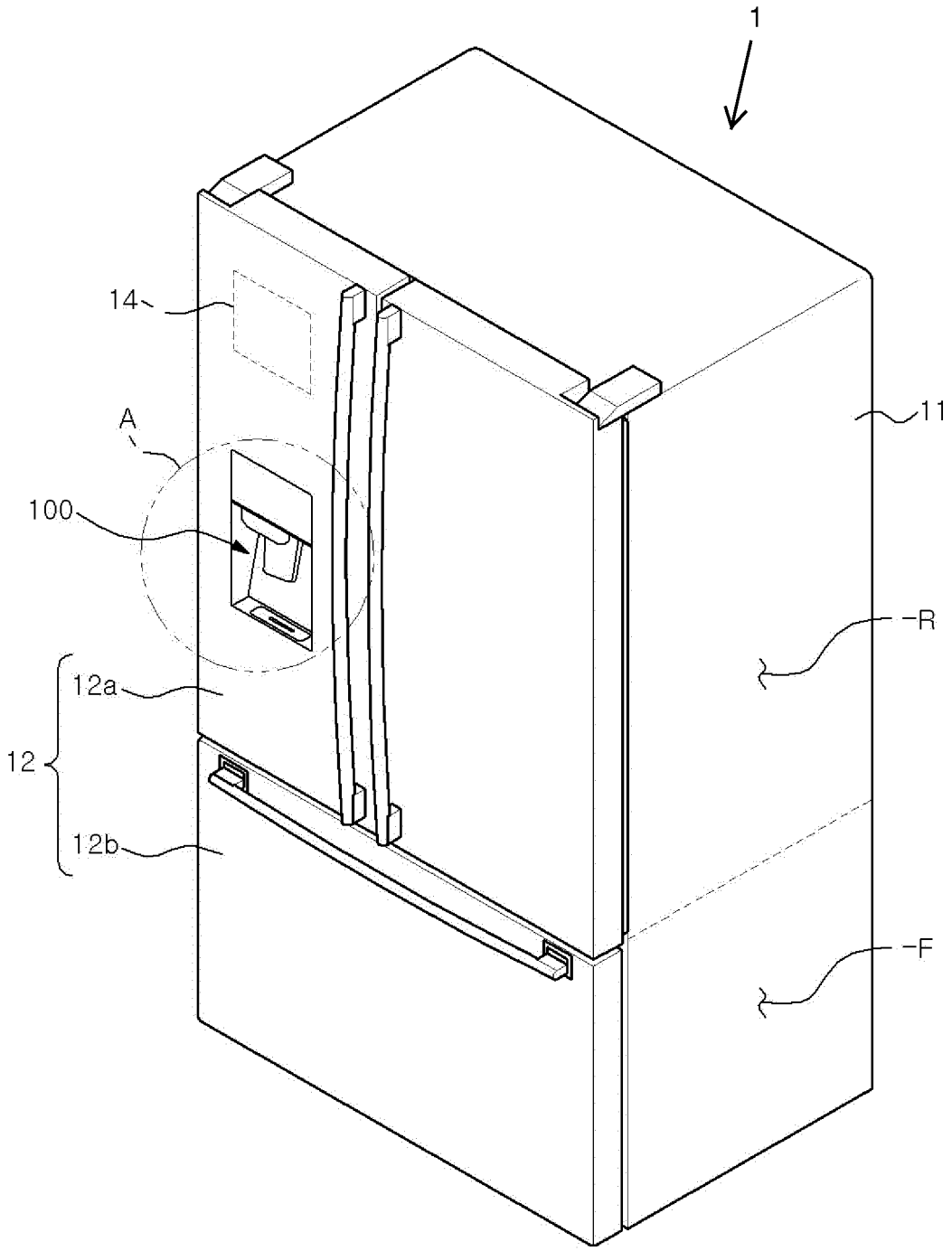


FIG.2

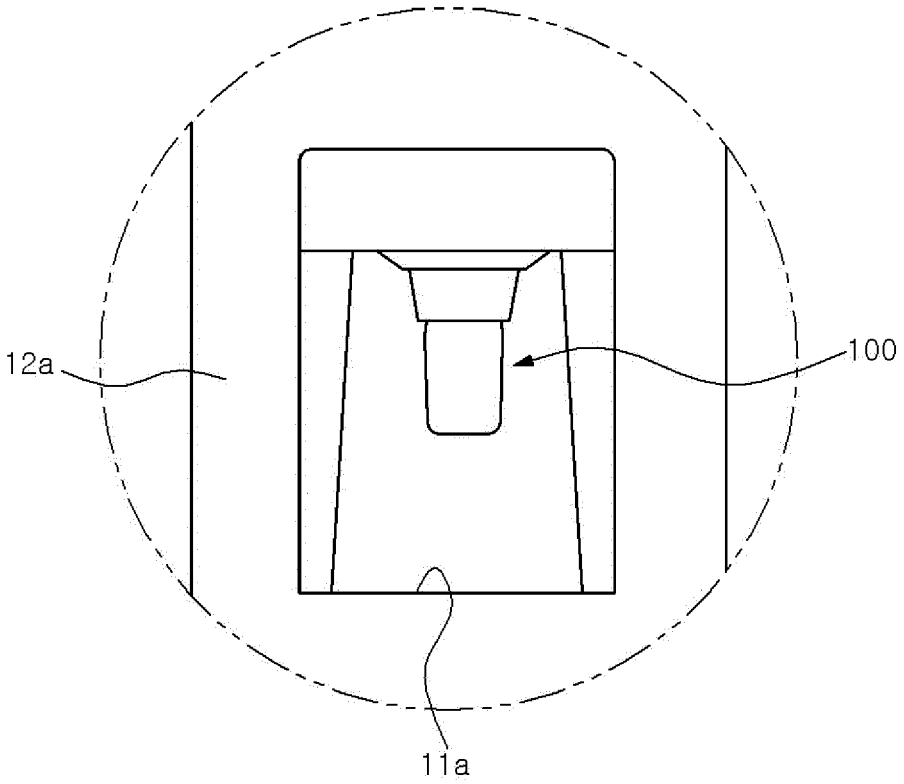


FIG.3A

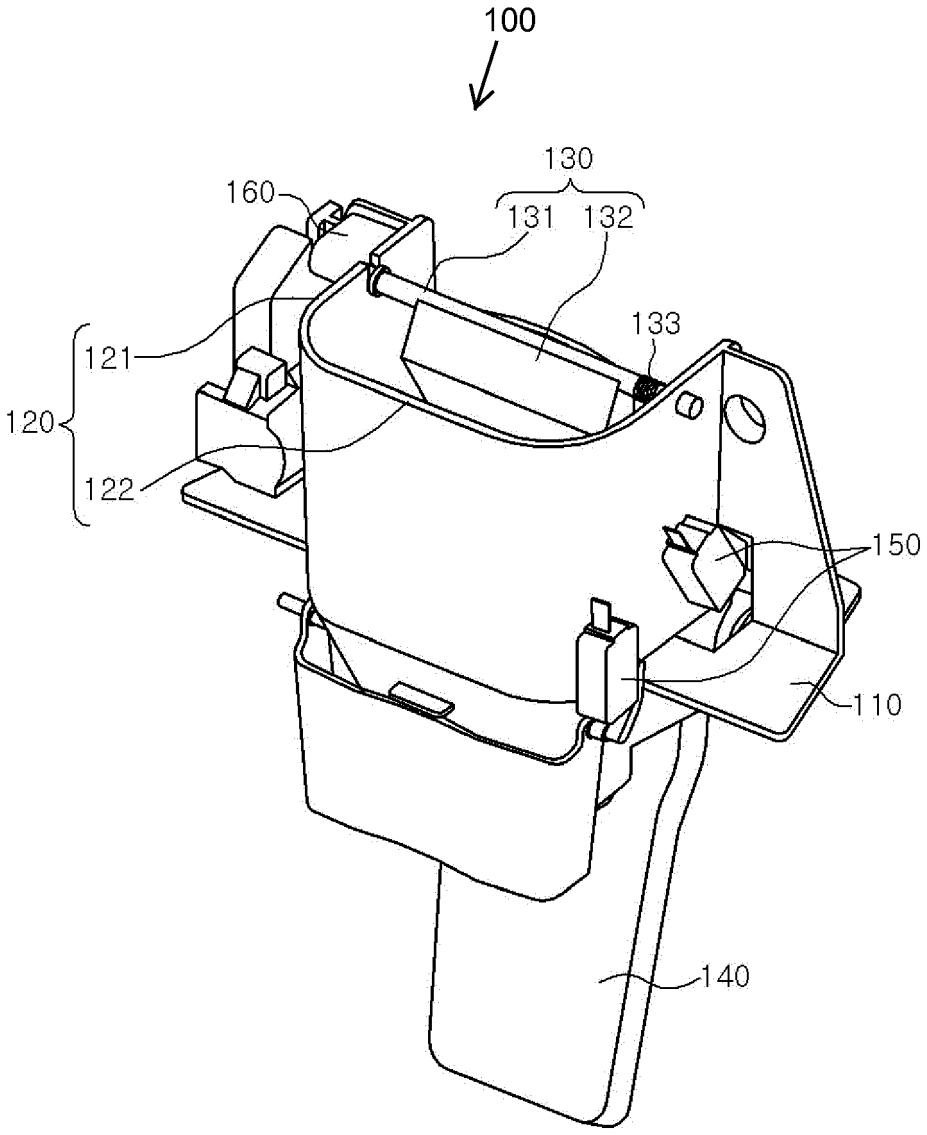


FIG.3B

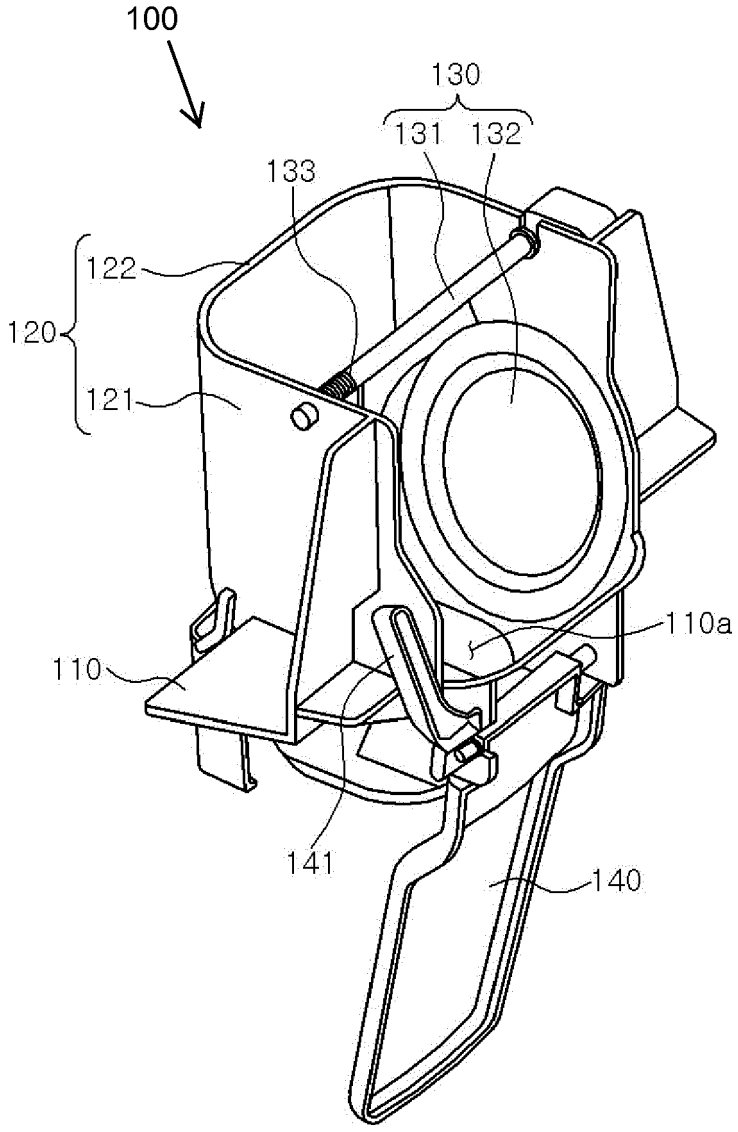


FIG. 4A

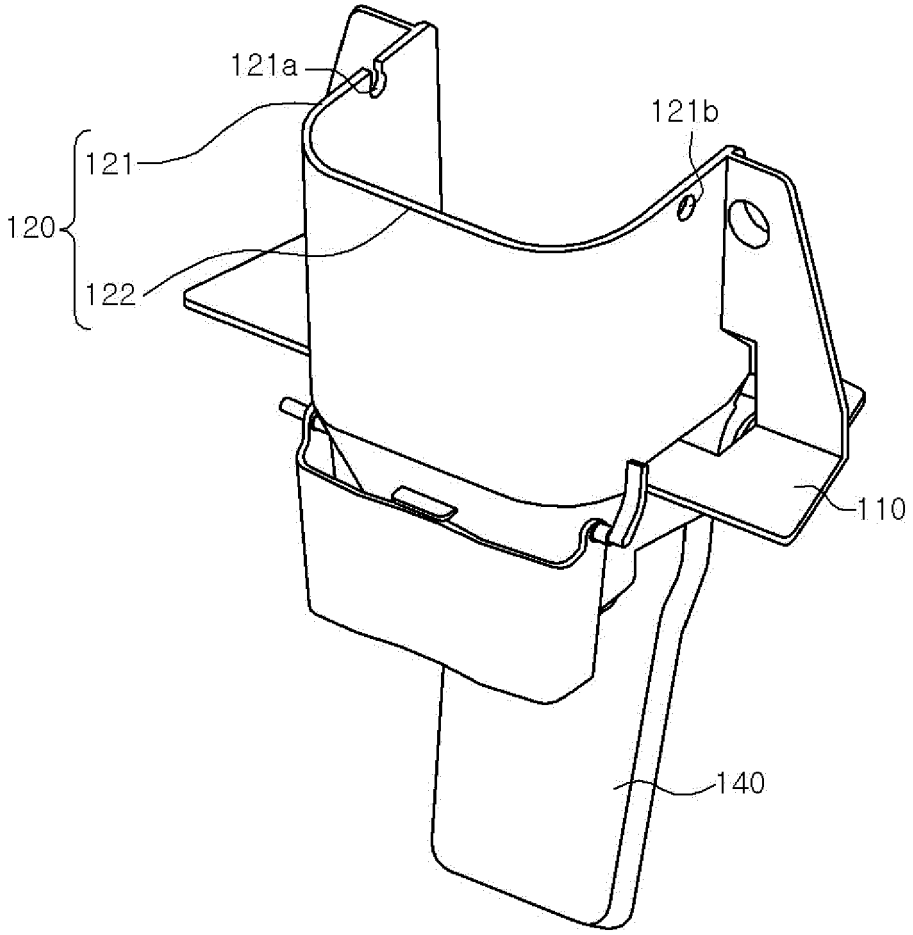


FIG.4B

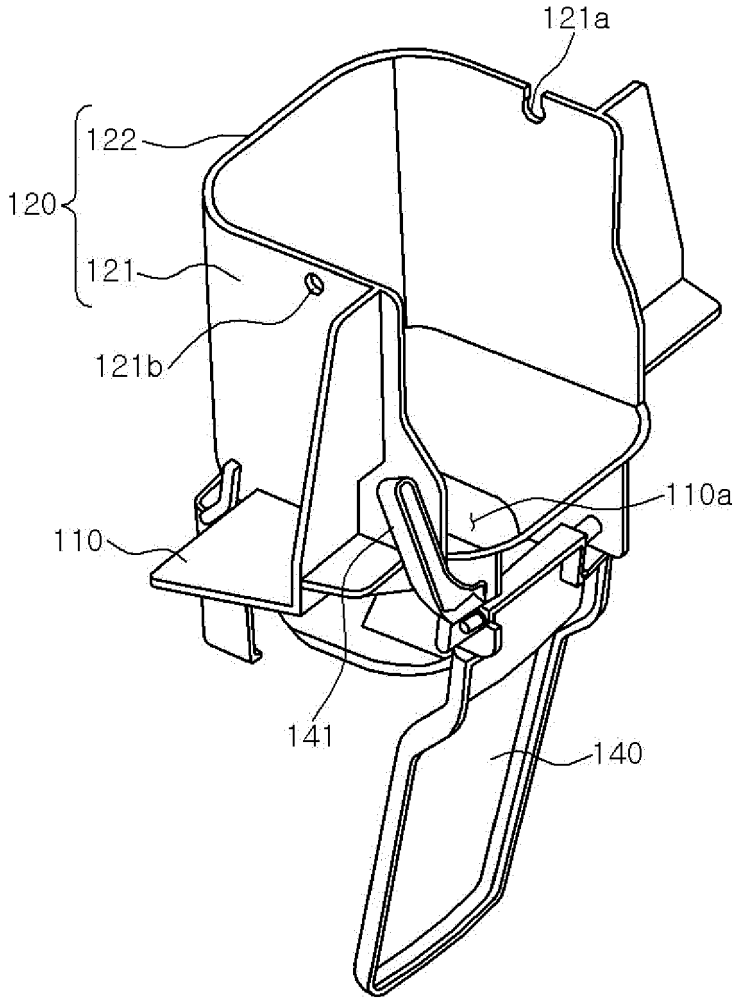


FIG.5

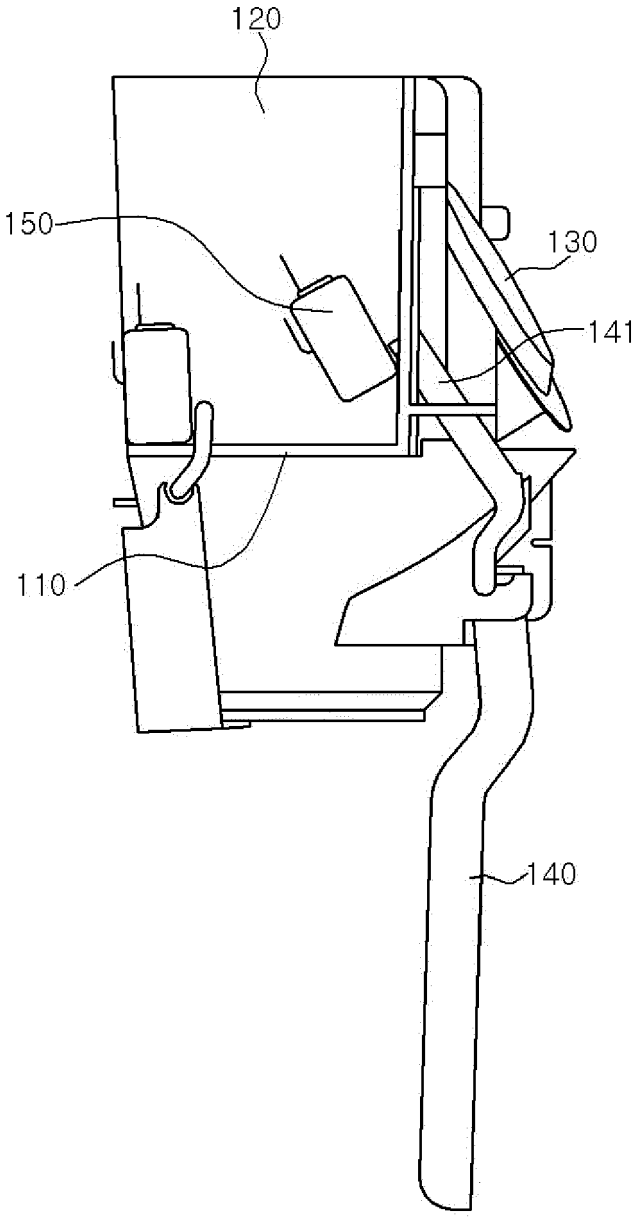
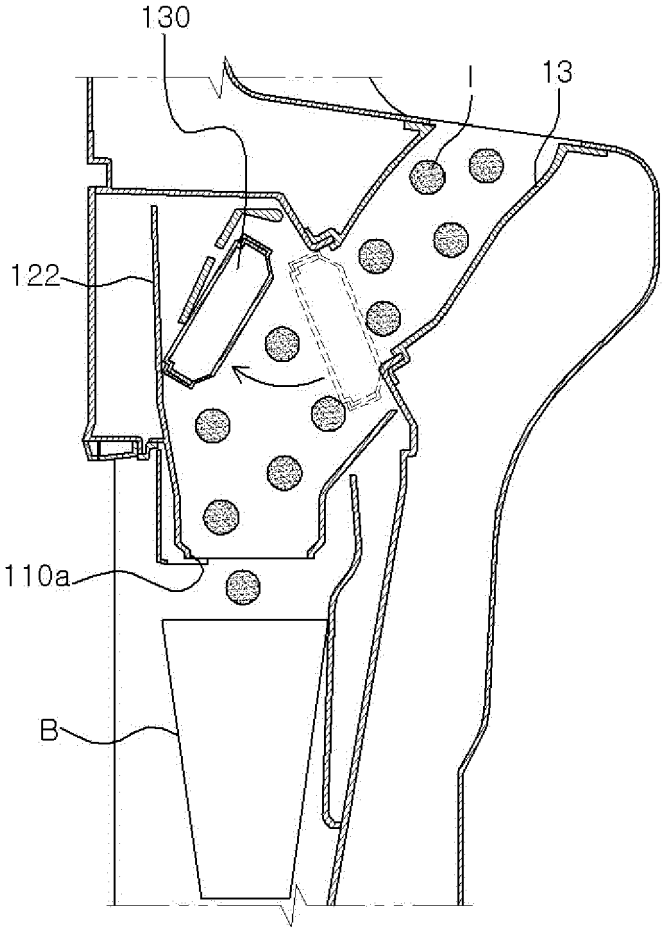


FIG. 6



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 17 16 6406

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2006/144075 A1 (BOWEN MICHAEL A [US] ET AL) 6 July 2006 (2006-07-06) * abstract; figures 10-13 * * paragraphs [0060] - [0062] *	1-14	INV. F25C5/00
X	US 2006/065007 A1 (PARK YONG P [KR] ET AL) 30 March 2006 (2006-03-30) * abstract; figures 1-5 * * paragraphs [0034] - [0068] *	1-5,8-11	
X	DE 10 2010 002103 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 23 December 2010 (2010-12-23) * abstract; figures 1-13 * * paragraphs [0060] - [0100] *	1-5,7-10	
X	US 2010/319389 A1 (YANG YUN HO [KR] ET AL) 23 December 2010 (2010-12-23) * the whole document *	1	
X	US 2012/025418 A1 (LEE JAEYOUL [KR] ET AL) 2 February 2012 (2012-02-02) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) F25C F25D
X	US 2011/167862 A1 (SHIN YOUNG SHIK [KR] ET AL) 14 July 2011 (2011-07-14) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 August 2017	Bejaoui, Amin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 16 6406

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-08-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006144075 A1	06-07-2006	US 2006144075 A1	06-07-2006
		US 2006201190 A1	14-09-2006
		US 2006201191 A1	14-09-2006
		US 2006201193 A1	14-09-2006
		US 2006201194 A1	14-09-2006
		US 2011271706 A1	10-11-2011
		US 2014352347 A1	04-12-2014
		US 2017010035 A1	12-01-2017
US 2006065007 A1	30-03-2006	NONE	
DE 102010002103 A1	23-12-2010	DE 102010002103 A1	23-12-2010
		KR 20100137378 A	30-12-2010
		US 2010319388 A1	23-12-2010
US 2010319389 A1	23-12-2010	NONE	
US 2012025418 A1	02-02-2012	CN 102441995 A	09-05-2012
		EP 2413072 A2	01-02-2012
		KR 20120011997 A	09-02-2012
		US 2012025418 A1	02-02-2012
US 2011167862 A1	14-07-2011	CN 102121782 A	13-07-2011
		EP 2351977 A2	03-08-2011
		KR 20110081704 A	14-07-2011
		US 2011167862 A1	14-07-2011

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 1020160048056 **[0001]**