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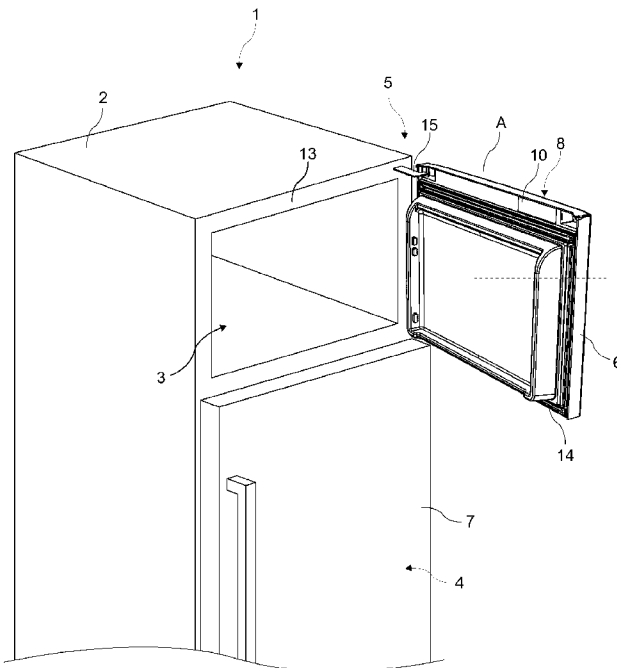
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(54) Title: REFRIGERATION APPLIANCE HAVING STORAGE FOR STORING A DOOR-REVERSAL KIT

Fig. 1



(57) Abstract: The present invention relates a refrigeration  
appliance (1), in particular a domestic refrigerator, com-  
prising: a main body (2) including one or more compart-  
ments (3, 4) each for refrigerating articles, a hinge system  
(5) for selectively mounting one or more doors (6, 7) to the  
main body (2) for either left-hand or right-hand swing and  
one or more doors (6, 7) each pivotally connected to the  
main body (2) via the hinge system (5), for opening and  
closing one or more corresponding compartments (3, 4).  
The refrigeration appliance (1) according to the present in-  
vention further comprises an integrated concealed storage  
(8) for exclusively storing a door-reversal kit (9) for revers-  
ing the swing direction of said one or more doors (6, 7).

**Description****REFRIGERATION APPLIANCE HAVING STORAGE FOR STORING A  
DOOR-REVERSAL KIT**

- [0001] The present invention relates to a refrigeration appliance in particular a refrigerator for domestic use, which has at least one pivotally mounted door whose swing direction can be reversed for either left-hand or right-hand swing by using a corresponding door-reversal kit.
- [0002] It is common practice in the field of refrigeration to provide a refrigeration appliance such as a domestic refrigerator with a hinge system that allows a customer to selectively mount the pivotally mounted door to a main body of the appliance for either left-hand or right-hand swing. When a customer purchases a domestic refrigerator, the swing direction of the door thereof may not always conform with the customer's kitchen layout. Nevertheless, the customer may change, by virtue of the aforementioned hinge system, the swing direction of the door prior to installing the refrigerator at its designated location in the kitchen such that the door opens and closes in conformity with the kitchen layout.
- [0003] In some domestic refrigerators, elements like the reversible hinges, the plugs, the covers, the washers, and the spacers are all rendered transferrable from one side of the main body to an opposite side of the main body when reversing the swing direction of the door. Thereby, the customer is enabled to easily reverse a swing direction of the door without the need of extra elements.
- [0004] The customer generally removes any plugs concealing the demountable elements of the hinge system in order to change the swing direction of the door. Subsequently, the customer demounts the reversible hinges including any washers and spacers from their current position on the main body and re-mounts the same to an opposite position on the main body.
- [0005] US 3389424 (A) discloses a refrigerator with a reversible hinge system including elements which can be selectively located at a right-hand position and a left-hand position to respectively configure a right-hand or a left-hand door swing arrangement.
- [0006] However, rendering elements like the hinges, the plugs, the covers, the

washers, and the spacers all transferrable from one side of the main body to an opposite side of the main body for reversing the swing direction of the door imposes several restrictions on a design of the refrigerator.

Hence, a manufacturer may instead alternatively provide the customer with a door-reversal kit which includes, for example, elements like plugs, covers, washers and the like which are essentially needed when reversing the swing direction of the door. Such a door-reversal kit is generally delivered in a plastic bag which is put into the refrigerator cabinet.

[0007] In a notable number of cases, the customer does not need to change the swing direction of the refrigerator door as the door already opens and closes in conformity with the customer's kitchen layout. In such cases, the customer usually takes the door-reversal kit out of the refrigerator cabinet and stows it in a remote place, for example, in a stowage room or a cellar and the like. Once the door-reversal kit is removed out of the refrigerator cabinet, the door-reversal kit is very likely to get lost. This has consequences: When the same customer eventually decides to renovate the kitchen wherein a change of the swing direction of the door is involved, the customer must order a new door-reversal kit from the supplier or the manufacturer. This ordering does not only incur additional costs but is also time consuming and may retard any running renovation work in progress.

[0008] An objective of the present invention is to provide a refrigeration appliance which overcomes the aforementioned problems of the prior art, and improves customer satisfaction in a cost-effective way by enabling a trouble-free reversal of a swing direction of an appliance door.

[0009] This objective has been achieved by the refrigeration appliance according to claim 1. Further developments are given in the dependent claims.

[0010] The refrigeration appliance according to the present invention comprises an integrated concealed storage for exclusively storing a door-reversal kit for reversing the swing direction of one or more appliance doors, wherein the storage has a void portion with physical dimensions which are substantially equal to the physical dimensions of the door-reversal kit such that the reversal kit can be properly put into and taken out of the void portion. Thereby, the door-reversal kit can be securely stowed in the

concealed storage which is integrated into the refrigeration appliance. The customer takes the door-reversal kit out of the storage not before it is needed for reversing a swing direction of the pivotally mounted door.

Hence, any danger of losing the door-reversal kit is effectively eliminated.

[0011] The storage for storing the door-reversal kit can be integrated into any part of the refrigeration appliance including an inner and an outer lining of the main body as well as a lining of the door of a freezing compartment and a cooling compartment. The storage is concealed such that it is evenly and smoothly integrated into a surrounding lining of the refrigeration appliance.

[0012] In a preferred embodiment, the storage for storing the door-reversal kit is integrated into the door of the freezing compartment and is concealed with an openable/closable lid which is only accessible from an inner side of the freezer door. Alternatively, the storage for storing the door-reversal kit can be integrated into the door of the cooling compartment in the same way.

[0013] When the customer decides to change a swing direction of a door, the customer takes the door-reversal kit out of the storage, and performs the demounting and mounting steps as specified by the supplier or the manufacturer while using the pieces of the door-reversal kit. The installation instructions for reversing the swing direction of the door may also be delivered together with the door-reversal kit.

[0014] Additional advantages of the refrigeration appliance of the present invention will now become apparent with the detailed description of the preferred embodiments with reference to the accompanying drawings in which:

[0015] Figure 1 - is a schematic perspective view of a refrigeration appliance according to a preferred embodiment of the present invention.

[0016] Figure 2 - is an enlarged schematic perspective view of the encircled detail A of Fig. 1, showing an integrated concealed storage for exclusively storing a door-reversal kit.

[0017] Figure 3 - is an exploded enlarged schematic perspective view of the encircled detail A of Fig. 1, showing a lid prior to concealing the integrated storage.

[0018] Figure 4 - is a schematic perspective view of a door-reversal kit prior to

packing into a plastic bag according to a preferred embodiment of the present invention.

[0019] Figure 5 - is an exploded enlarged schematic perspective view of the encircled detail A of Fig. 1, showing the door-reversal kit stored in a void portion of the integrated storage, and the lid prior to concealing the integrated storage.

[0020] The reference signs appearing on the drawings relate to the following technical features.

1. Refrigeration appliance
2. Main body
3. Freezing compartment
4. Cooling compartment
5. Hinge system
6. Freezing compartment door
7. Cooling compartment door
8. Storage
9. Door-reversal kit
10. Lid
11. Projecting portion
12. Groove portion
13. Doorframe
14. Gasket
15. Reversible hinge

[0021] The refrigeration appliance (1) comprises a main body (2) including one or more compartments (3, 4) each for refrigerating articles, a hinge system (5) for selectively mounting one or more doors (6, 7) to the main body (2) for either left-hand or right-hand swing and one or more doors (6, 7) each pivotally connected to the main body (2) via the hinge system (5), for opening and closing one or more corresponding compartments (3, 4) (Fig. 1).

[0022] The refrigeration appliance (1) according to the present invention further comprises an integrated concealed storage (8) for exclusively storing a door-reversal kit (9) for reversing the swing direction of said one or more

doors (6, 7), wherein the storage (8) has a void portion with physical dimensions which are substantially equal to the physical dimensions of the door-reversal kit (9) such that the reversal kit (9) can be properly put into and taken out of the void portion (Fig. 5).

- [0023] The void portion of the storage (8) has a volume which is precisely sufficient for accommodating a door-reversal kit (9). A size of the door-reversal kit (9) may vary depending on the model of the refrigeration appliance (1). Therefore, the exact physical dimensions of the void portion is to be determined in accordance with the shape and volume of the door-reversal kit (9) of interest.
- [0024] Fig. 1 is a schematic perspective view of the refrigeration appliance (1) according to a preferred embodiment of the present invention. The refrigeration appliance (1) is preferably a domestic refrigerator having two separate compartments (3, 4) arranged one above the other for respectively freezing and cooling the articles. The present invention is applicable to a refrigeration appliance with any number of doors (6, 7) and compartments (3, 4). As shown in Fig. 1, the storage (8) is preferably integrated into one of said one or more doors (6, 7) respectively corresponding to said one or more compartments (3, 4). Thereby, the storage (8) can be unrestrictedly accessed by a customer even when the refrigeration appliance (1) is installed between the kitchen cabinets and integrated with the kitchen furniture.
- [0025] In an embodiment of the present invention, the storage (8) is concealed by an openable/closable lid (10) accessible from an inner side of the door (6, 7). Thereby, the storage (8) is rendered inconspicuous to the customer. Moreover, the storage (8) is integrated into the door (6, 7) such that it does not interfere with other parts of the main body (2).
- [0026] In an embodiment of the present invention, the lid (10) is configured to conceal the storage (8) flush with a surface of the door (6, 7) (Fig. 2).
- [0027] In another embodiment of the present invention, the lid (10) is configured to detachably mounted to the door (6, 7) (Fig. 2).
- [0028] In another embodiment of the present invention, the lid (10) has at least one resilient projecting portion (11) configured to snap-fittingly engage with

a corresponding groove portion (12) formed in the door (6, 7) (Fig. 3).

- [0029] In another embodiment of the present invention, the void portion is formed into an inner lining of the door (6, 7). As shown in Fig. 2, the lid (10) conceals the void portion by evenly matching with the lining surrounding the void portion (Fig. 3).
- [0030] In another embodiment of the present invention, an upper surface of the lid (10) is flat. The void portion has a rectangular cross section (Fig. 3).
- [0031] In another embodiment of the present invention, the storage (8) is integrated into the door (6, 7) at a location frontally facing a doorframe (13) when the door (6, 7) is in a closed state. Thereby, sufficient installation area for storage bins for receiving articles to be refrigerated can be secured on an inner side of the doors (6, 7) (Fig. 1).
- [0032] The refrigeration appliance (1) further comprises a gasket (14) fastened along an entire perimeter of the door (6, 7) facing the doorframe (13), for hermetically sealing the compartment (3, 4). In another embodiment of the present invention, the storage (8) is preferably integrated into the door (6, 7), at a location which lies outside the region encircled by the gasket (14).
- [0033] In another embodiment of the present invention, the storage (8) is integrated into the door (6, 7), at a location which lies between the gasket (14) and an upper edge of the door (6, 7).
- [0034] In an embodiment of the present invention, the storage (8) is integrated into the door (6) corresponding to the freezing compartment (3).
- [0035] In another embodiment of the present invention, the storage (8) is integrated into the door (7) corresponding to the cooling compartment (4).
- [0036] In another embodiment of the present invention, the hinge system (5) includes reversible hinges (15) each selectively installable on the main body (2) for either left-hand or right-hand swing of said one or more doors (6, 7).
- [0037] In another embodiment of the present invention, the refrigeration appliance (1) comprises a text and/or image (not shown) provided on the storage (8), in particular on the lid (10), indicative of the therein stored door-reversal kit (9).
- [0038] As shown in Fig. 5, the refrigeration appliance (1) according to the present

invention comprises the door-reversal kit (9) stored in the storage (8), for reversing the swing direction of said one or more doors (6, 7).

## Claims

1. A refrigeration appliance (1), in particular a domestic refrigerator, comprising a main body (2) including one or more compartments (3, 4) each for refrigerating articles, a hinge system (5) for selectively mounting one or more doors (6, 7) to the main body (2) for either left-hand or right-hand swing and one or more doors (6, 7) each pivotally connected to the main body (2) via the hinge system (5), for opening and closing one or more corresponding compartments (3, 4), **characterized in that** an integrated concealed storage (8) for exclusively storing a door-reversal kit (9) for reversing the swing direction of said one or more doors (6, 7), wherein the storage (8) has a void portion with physical dimensions which are substantially equal to the physical dimensions of the door-reversal kit (9) such that the reversal kit (9) can be properly put into and taken out of the void portion.
2. The refrigeration appliance (1) according to claim 1, **characterized in that** the storage (8) is integrated into one of said one or more doors (6, 7) respectively corresponding to said one or more compartments (3, 4) and **in that** the storage (8) is concealed by a lid (10) accessible from an inner side of the door (6, 7).
3. The refrigeration appliance (1) according to claim 2, **characterized in that** the lid (10) is configured to conceal the storage (8) flush with a surface of the door (6, 7).
4. The refrigeration appliance (1) according to claim 2 or 3, **characterized in that** the lid (10) is detachably mounted to the door (6, 7).
5. The refrigeration appliance (1) according to any one of claims 2 to 4, **characterized in that** the lid (10) has at least one resilient projecting portion (11) configured to snap-fittingly engage with a corresponding groove portion (12) formed in the door (6, 7).
6. The refrigeration appliance (1) according to any one of claims 2 to 5, **characterized in that** the void portion is formed into an inner lining of the door (6, 7) and the lid (10) conceals the void portion by evenly matching with the lining surrounding the void portion.
7. The refrigeration appliance (1) according to any one of claims 2 to 6, **characterized in that** the void portion has a rectangular cross section and **in that** an upper surface of the lid (10) is flat.

8. The refrigeration appliance (1) according to any one of claims 2 to 7, **characterized in that** the storage (8) is integrated into the door (6, 7) at a location frontally facing a doorframe (13) when the door (6, 7) is in a closed state.
9. The refrigeration appliance (1) according to claim 8, **characterized in that** a gasket (14) fastened along an entire perimeter of the door (6, 7) facing the doorframe (13), and **in that** the storage (8) is integrated into the door (6, 7), at a location which lies outside the region encircled by the gasket (14).
10. The refrigeration appliance (1) according to claim 9, **characterized in that** the storage (8) is integrated into the door (6, 7), at a location which lies between the gasket (14) and an upper edge of the door (6, 7).
11. The refrigeration appliance (1) according to any one of claims 2 to 10, **characterized in that** one of said one or more compartments (3, 4) is a freezing compartment (3) for freezing articles and **in that** the storage (8) is integrated into the door (6) corresponding to the freezing compartment (3).
12. The refrigeration appliance (1) according to any one of claims 2 to 10, **characterized in that** one of said one or more compartments (3, 4) is a cooling compartment (4) for cooling articles and **in that** the storage (8) is integrated into the door (7) corresponding to the cooling compartment (4).
13. The refrigeration appliance (1) according to any one of claim 1 to 12, **characterized in that** the hinge system (5) includes reversible hinges (15) each selectively installable on the main body (2) for either left-hand or right-hand swing of said one or more doors (6, 7).
14. The refrigeration appliance (1) according to any one of claim 2 to 13, **characterized in that** a text and/or image is provided on the storage (8) indicative of the availability of a door-reversal kit (9).
15. The refrigeration appliance (1) according to according to any one of claims 1 to 14, **characterized in that** a door-reversal kit (9) stored in the storage (8), for reversing the swing direction of said one or more doors (6, 7).

Fig. 1

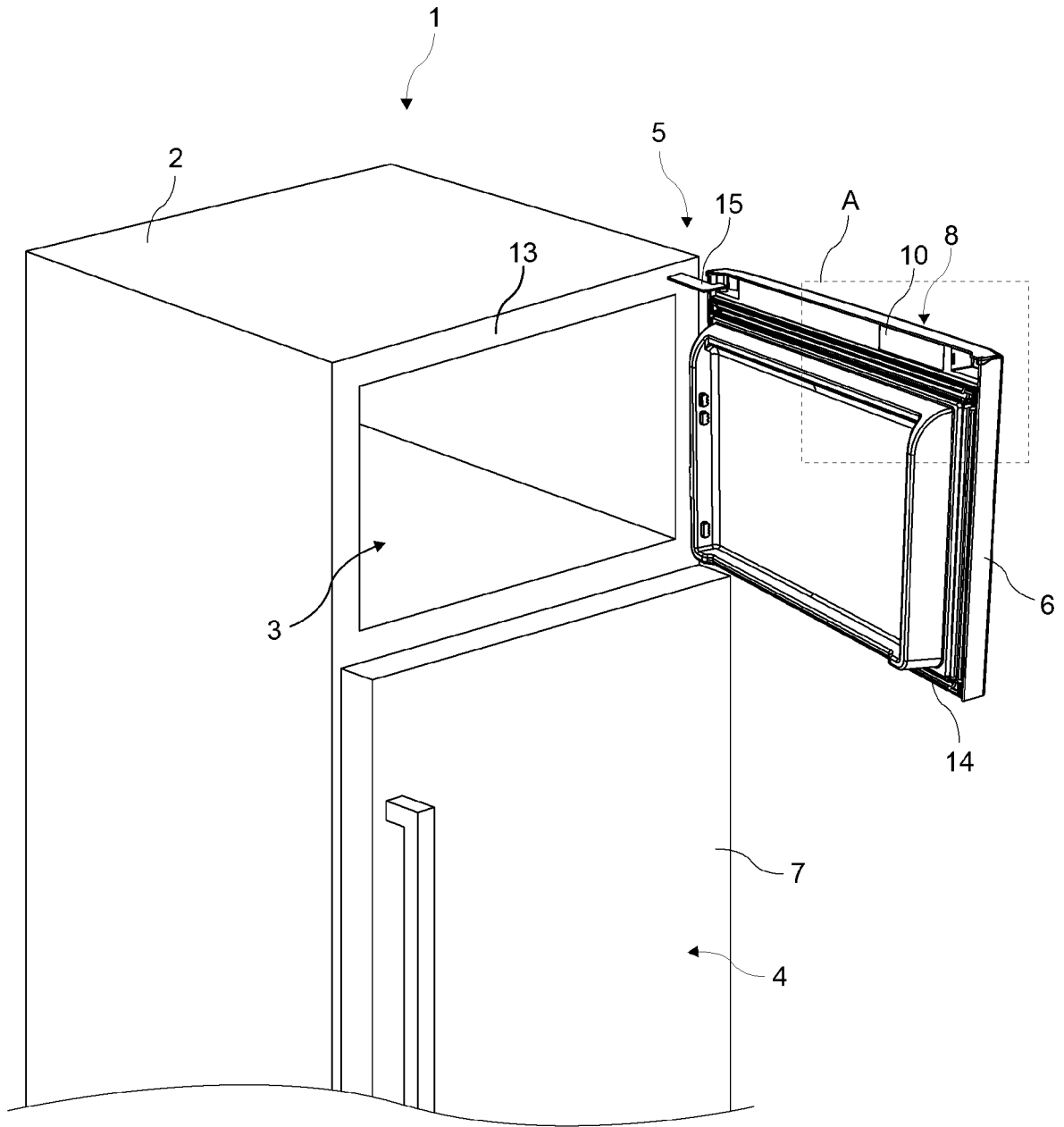


Fig. 2

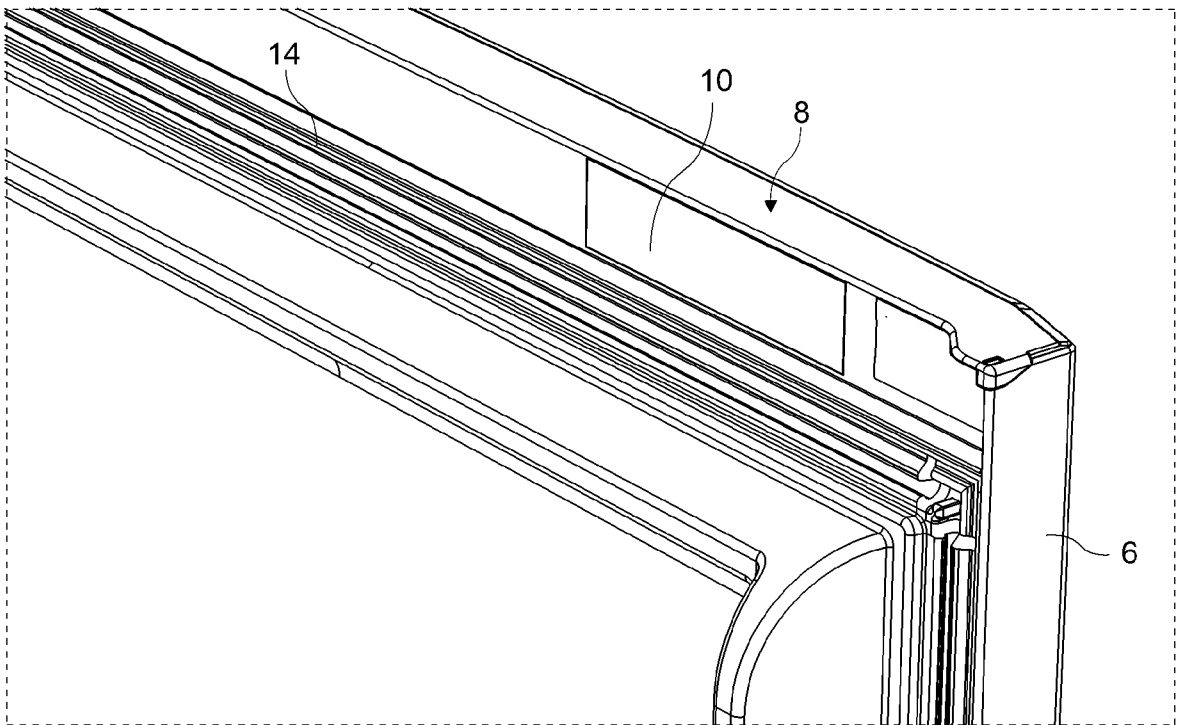


Fig. 3

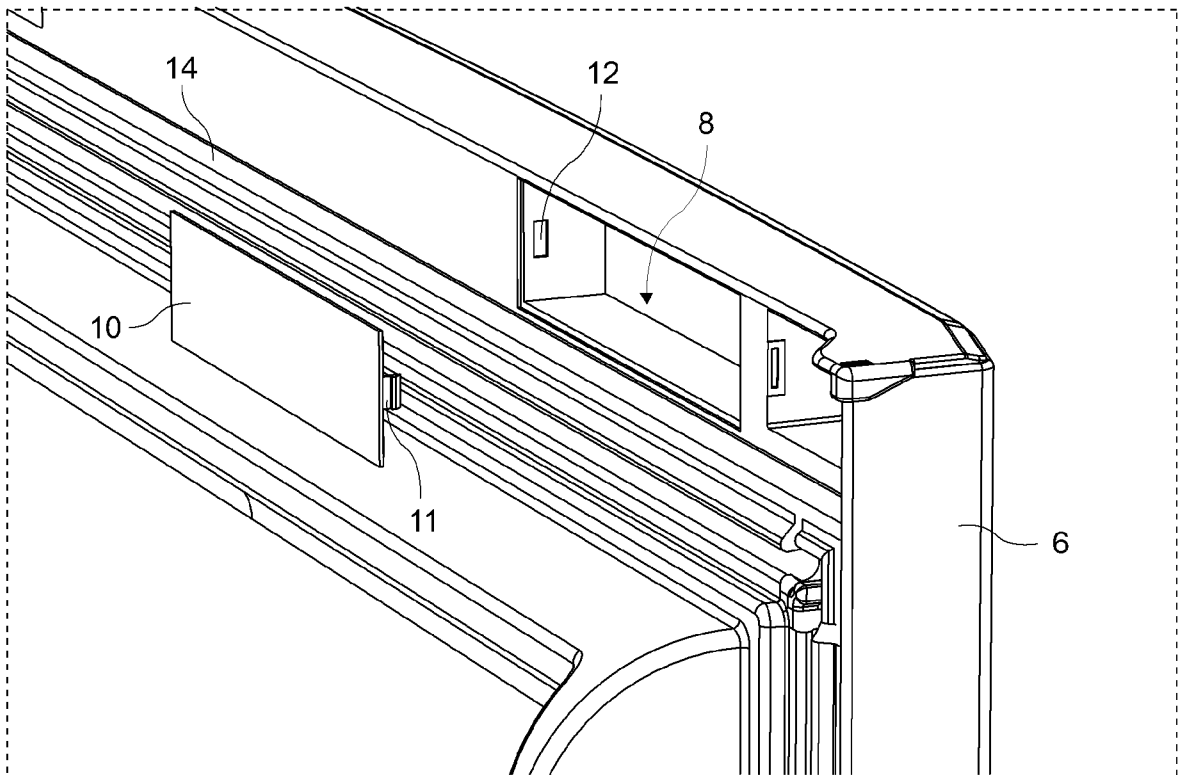


Fig. 4

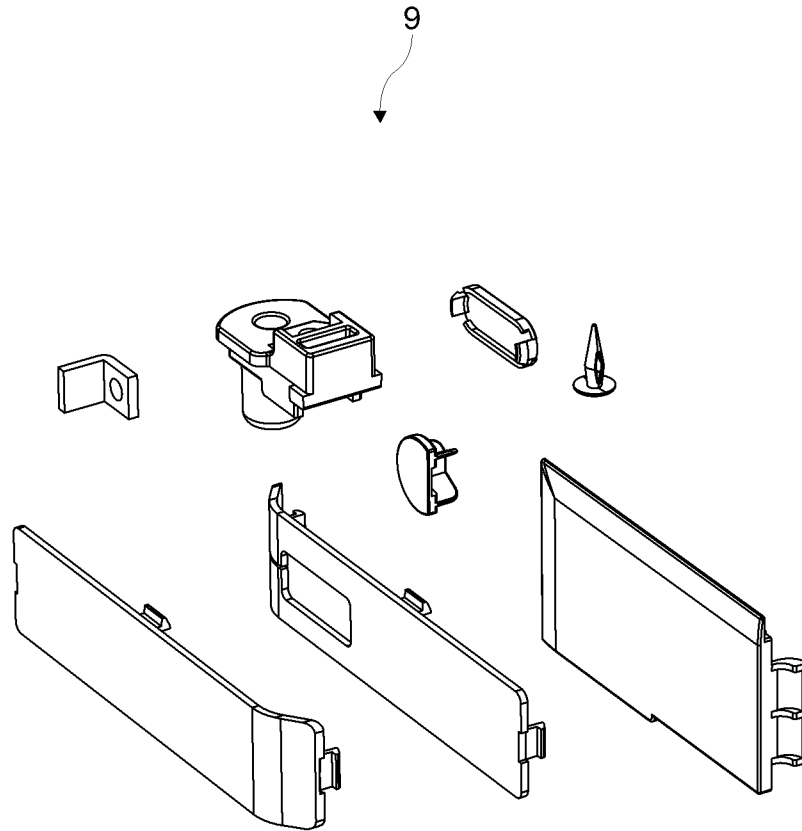
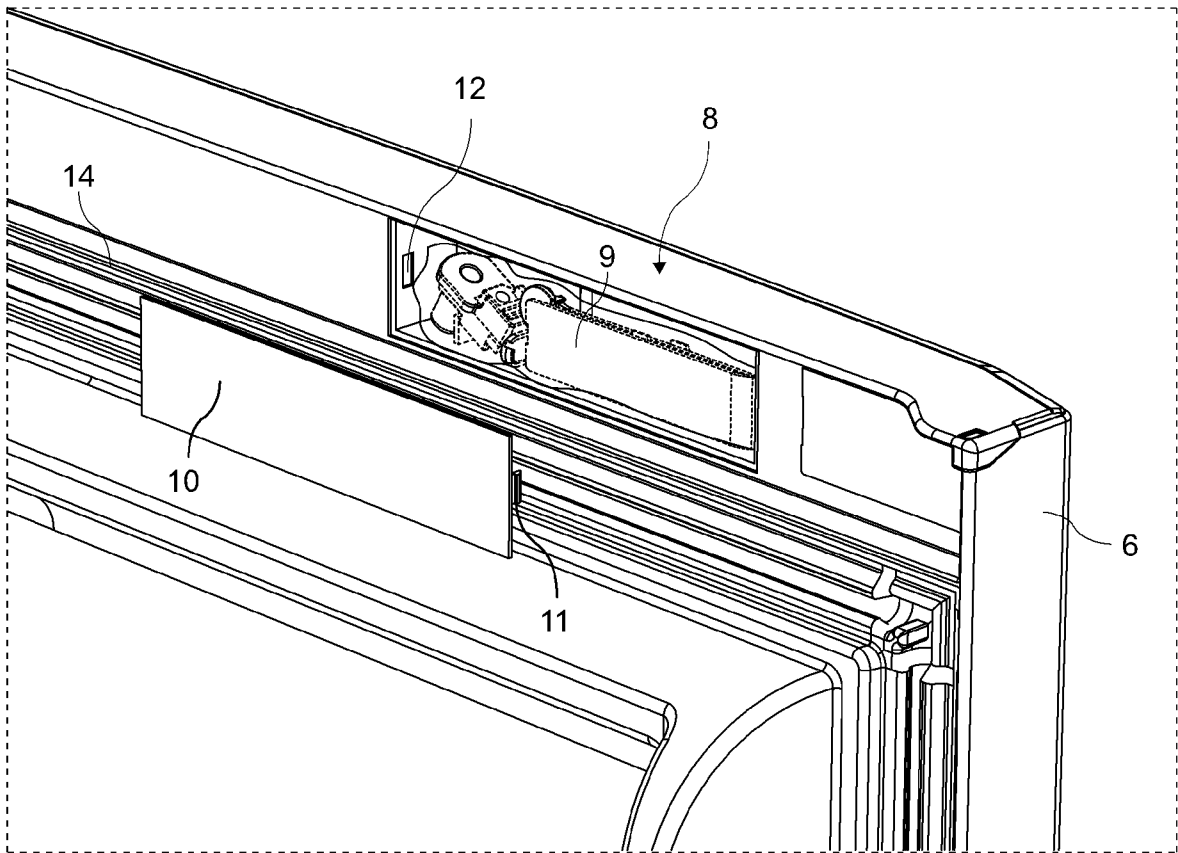


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No  
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A. CLASSIFICATION OF SUBJECT MATTER  
INV. F25D23/02  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
F25D  
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010/029094 A2 (ARCELIK AS [TR]; GULBAS FERKAN [TR]; DOGRUYOL TEVFIK FIKRET [TR]; OZDE) 18 March 2010 (2010-03-18) paragraph [0022] - paragraph [0031]; figure 1	1-15
X	US 2005/284159 A1 (KIM IK-KEUN [KR]) 29 December 2005 (2005-12-29) abstract; figure 3	1
X	EP 1 830 144 A2 (WHIRLPOOL CO [US]) 5 September 2007 (2007-09-05) abstract; figure 1	1

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

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- "O" document referring to an oral disclosure, use, exhibition or other means
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Date of the actual completion of the international search <b>13 February 2014</b>	Date of mailing of the international search report <b>24/02/2014</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Jessen, Flemming</b>
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2013/061683
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