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LEE(10) **Pub. No.: US 2017/0292778 A1**(43) **Pub. Date: Oct. 12, 2017**(54) **REFRIGERATOR AND DRAWER ASSEMBLY**
THEREOF*F25D 23/06* (2006.01)*F25D 11/02* (2006.01)(71) Applicant: **Dongbu Daewoo Electronics**
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(2017.01); *A47B 88/483* (2017.01)(72) Inventor: **Wang Goo LEE, Seoul (KR)**(21) Appl. No.: **15/449,156**(22) Filed: **Mar. 3, 2017**(30) **Foreign Application Priority Data**

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(57)

ABSTRACT

A refrigerator includes a refrigerator main body forming an exterior of the refrigerator, a drawer configured to contain items stored in the refrigerator; and a drawer guide assembly coupled to the drawer and configured to support and guide movement of the drawer. The drawer guide assembly includes: a first rail coupled to a side engagement portion of the drawer and operable to transfer a load from the drawer in a downward direction. The first rail includes: a first end coupled to a first end portion of the drawer, a second end coupled to a second end portion of the drawer, and a second rail disposed at a sidewall of the refrigerator main body and configured to guide movement of the first rail.

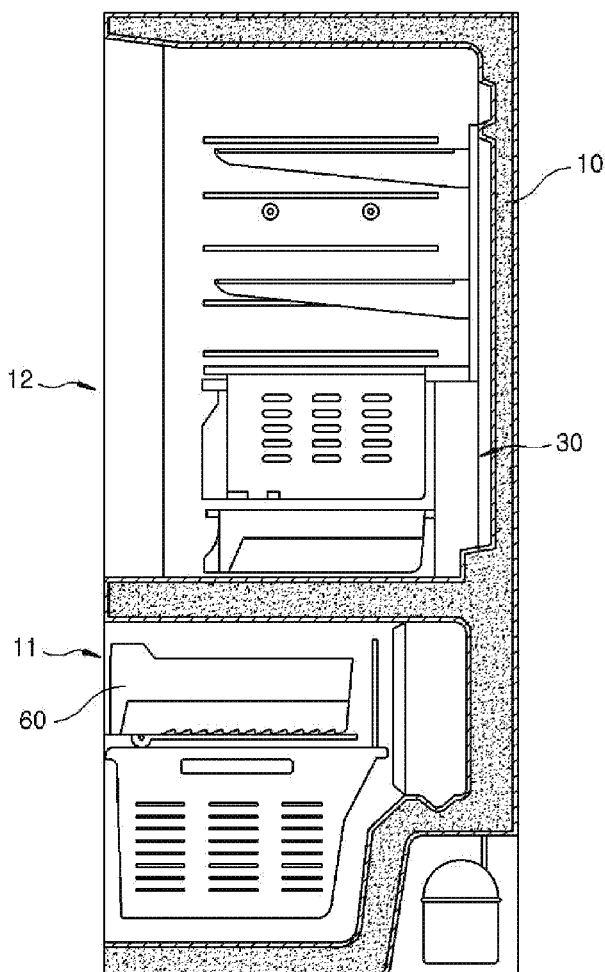


FIG. 1

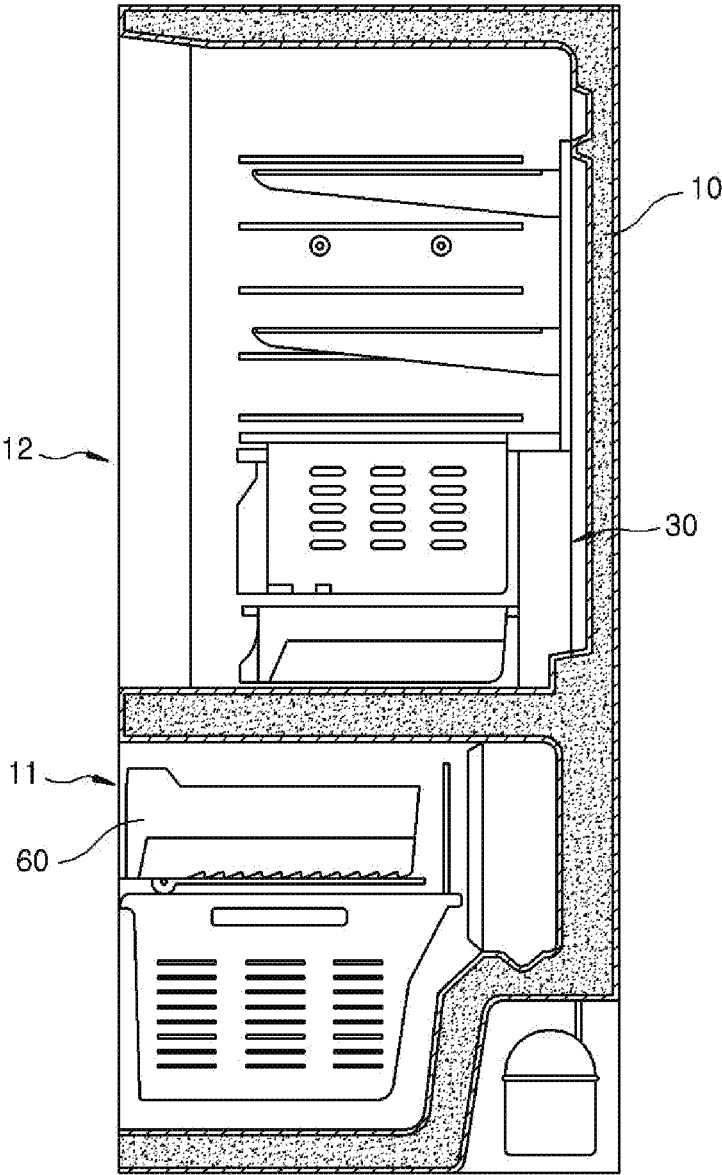


FIG. 2

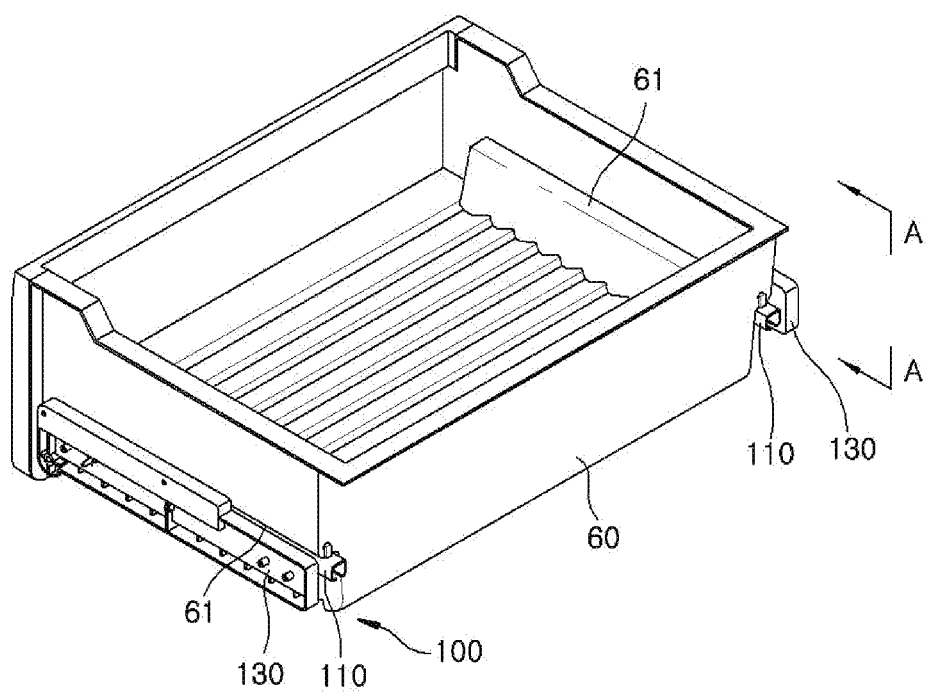


FIG. 3

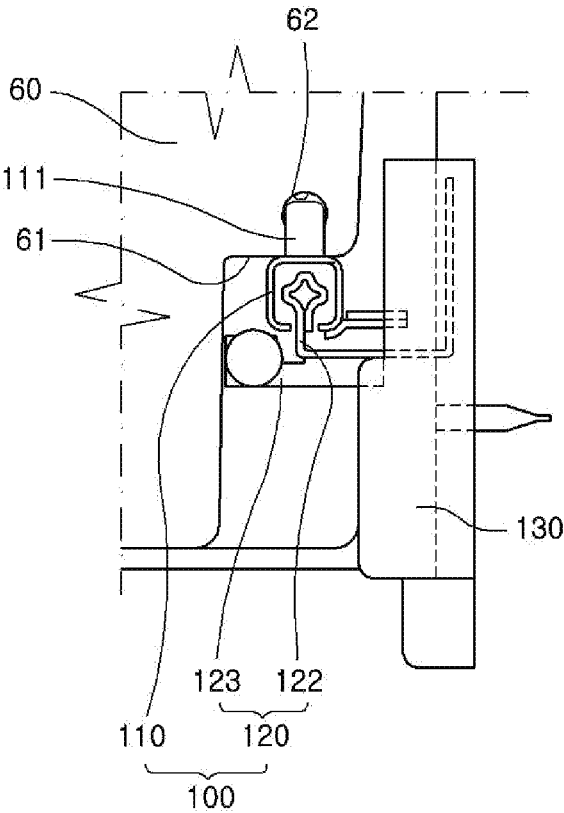


FIG. 4

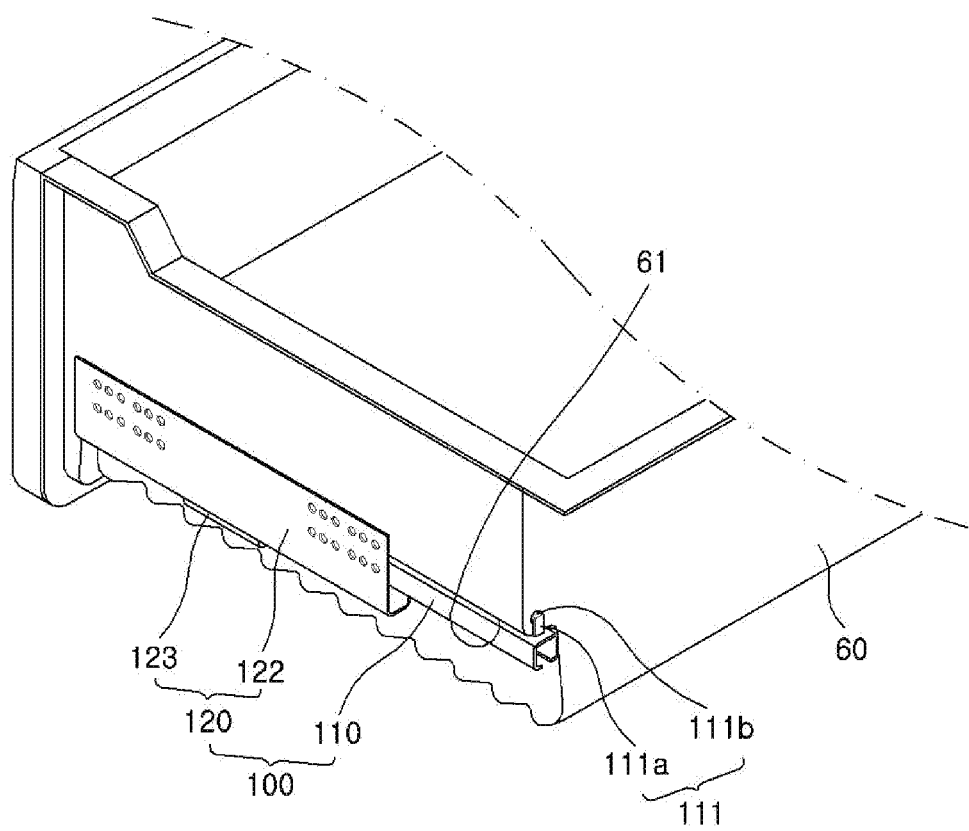
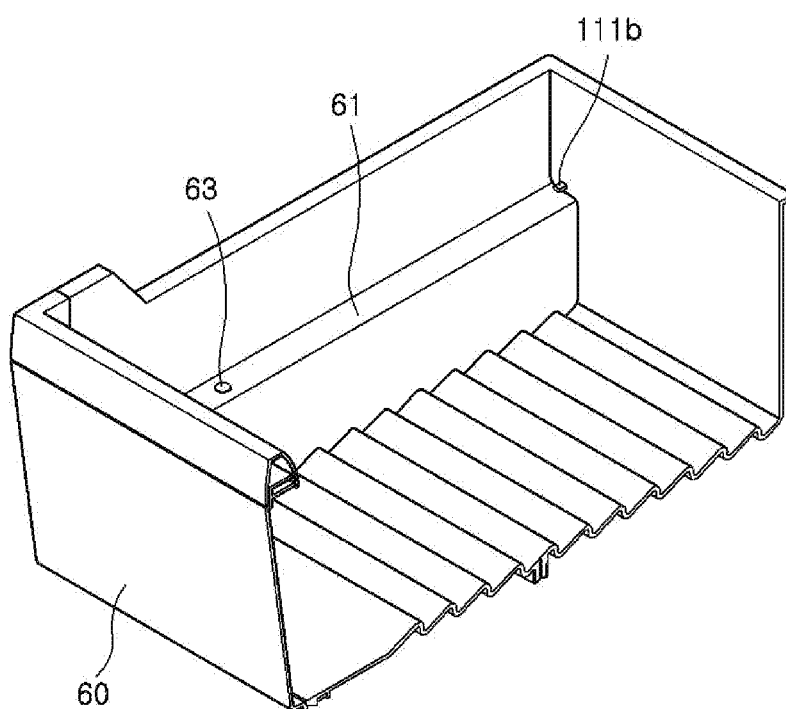


FIG. 5



REFRIGERATOR AND DRAWER ASSEMBLY THEREOF

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and claims priority from Korean Patent Application No. 10-2016-0045081, filed on Apr. 12, 2016, the disclosure of which is incorporated herein in its entirety by reference for all purposes.

TECHNICAL FIELD

[0002] The present disclosure relates to refrigerators, and more particularly, to storage drawer assemblies thereof.

BACKGROUND OF THE INVENTION

[0003] Generally speaking, a refrigerator is an appliance that can store items at a low temperature, e.g., in a frozen state or a refrigerated state.

[0004] The storage space in the refrigerator is cooled by circulation of cold air which can be continuously generated through heat exchange in a refrigeration cycle between air and a refrigerant. For example, the refrigeration cycle includes compression, condensation, expansion and evaporation.

[0005] A main body of the refrigerator may have a rectangular parallel-piped shape with an open front surface. Typically, the main body encloses a refrigeration compartment (or refrigeration compartment) and freezer compartment, each with its own door. The refrigerator may include a plurality of drawers, shelves, vegetable compartments and etc. for sorting and storing different types of items.

[0006] In a conventional refrigerator, storage drawers can be drawn out and pushed back through a sliding rail mechanism. Sometimes a user needs to perform maintenance on a drawer, e.g., for cleaning or repair. Unfortunately, it is usually difficult to separate a drawer from such a sliding rail device, thus making drawer maintenance difficult to perform.

SUMMARY OF THE INVENTION

[0007] Embodiments of the present disclosure provide a drawer guide assembly for a refrigerator that allows easy installation and removal of a storage drawer in the refrigerator.

[0008] In accordance with an embodiment of the present disclosure, a refrigerator includes a refrigerator main body forming an exterior of the refrigerator, a drawer configured to contain items stored in the refrigerator; and a drawer guide assembly coupled to the drawer and configured to support and guide movement of the drawer. The drawer guide assembly includes: a first rail coupled to a side engagement portion of the drawer and operable to transfer a load from the drawer in a downward direction. The first rail includes a first end coupled to a first end portion of the drawer, a second end coupled to a second end portion of the drawer, and a second rail disposed at a sidewall of the refrigerator main body and configured to guide movement of the first rail.

[0009] The drawer may include an engaging hole located at one end surface, and the engaging hole may be configured to receive the first end of the first rail.

[0010] The first rail may further include an engaging member fitted to the first end portion of the drawer. The

engaging member may include a supporting hook projecting in a vertical direction from the first end of the first rail, and an engaging hook extending in a horizontal direction from the supporting hook and fixed to the first end portion of the drawer.

[0011] The refrigerator may further include a freezer compartment located at a lower portion of the refrigerator main body, wherein the drawer guide assembly is disposed inside the freezer compartment, and a refrigeration compartment disposed at an upper portion of the refrigerator main body.

[0012] The second rail may include a guide rail. The guide rail may include a first end operable to support the first rail, a second end fixed to a sidewall of the refrigerator main body via a supporter, and a supporting bracket fixed to the supporter and configured to support a lower portion of the guide rail.

[0013] Embodiments of the present disclosure advantageously allow a drawer to be coupled to the rail in a vertical manner. The rail can be installed on the drawer without help of an expert and the drawers can be easily opened and closed.

[0014] Further, the embodiments of the present disclosure enable the load of the drawer to be supported in a vertical direction, so that the load of the drawer can be stably and uniformly distributed when the drawer is inserted into and withdrawn from the refrigerator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 illustrates a side cross section of an exemplary refrigerator according to an embodiment of the present disclosure.

[0016] FIG. 2 illustrates a perspective view of an exemplary drawer guide assembly of the refrigerator according to an embodiment of the present disclosure.

[0017] FIG. 3 illustrates the drawer guide assembly viewed from the A-A line of FIG. 2.

[0018] FIG. 4 illustrates a perspective view of the exemplary drawer guide assembly in FIG. 2 in a state that a supporter is removed.

[0019] FIG. 5 illustrates a partial cutout view of an exemplary drawer of the refrigerator according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0020] Hereinafter, configurations and operations of embodiments will be described in detail with reference to the accompanying drawings. The following description is one of various patentable aspects of the disclosure and may form a part of the detailed description of the disclosure. However, in describing the disclosure, detailed descriptions of known configurations or functions are omitted to avoid obscure the disclosure.

[0021] The disclosure may be variously modified and may include various embodiments. Specific embodiments will be exemplarily illustrated in the drawings and described in the detailed description of the embodiments. However, it should be understood that they are not intended to limit the disclosure to specific embodiments but rather to cover all modifications, similarities, and alternatives which are included in the spirit and scope of the disclosure.

[0022] The terms used herein, including ordinal numbers such as “first” and “second” may be used to describe, and not to limit, various components. The terms simply distinguish

the components from one another. When it is said that a component is “coupled” or “linked” to another component, it should be understood that the former component may be directly connected or linked to the latter component or a third component may be interposed between the two components. Specific terms used in the present application are used simply to describe specific embodiments without limiting the disclosure. An expression used in the singular encompasses the expression of the plural, unless it has a clearly different meaning in the context.

[0023] FIG. 1 illustrates a side cross section of an exemplary refrigerator according to an embodiment of the present disclosure. FIG. 2 illustrates a perspective view of an exemplary drawer guide assembly of the refrigerator in accordance with an embodiment of the present disclosure. FIG. 3 illustrates the drawer guide assembly viewed from A-A line of FIG. 2. FIG. 4 illustrates a perspective view of the exemplary drawer guide assembly in a state that a supporter is removed according to the embodiment. FIG. 5 illustrates a partial cutout view of an exemplary drawer of the refrigerator according to the embodiment.

[0024] As shown in FIGS. 1 to 5, the exemplary refrigerator includes a rail and a drawer 60 that can be coupled to, and decoupled from, the rail advantageously in a vertical manner and in a convenient fashion.

[0025] In this example, the refrigerator is a bottom freezer type refrigerator in which a freezer compartment 11 is located at a lower part of the refrigerator. However, it will be appreciated that the present disclosure is not limited thereto and may be applied to various other types of refrigerators.

[0026] The refrigerator may include a refrigerator main body 10 forming the exterior of the refrigerator, doors, a cold air generating unit 30 for generating cold air, and a drawer guide assembly 100 for supporting and guiding movement of the drawer 60 in and out from the refrigerator main body 10.

[0027] More specifically, the refrigerator main body 10 includes the freezer compartment 11 and the refrigeration compartment 12 which are separated by a barrier wall. For example, the freezer compartment 11 that includes the drawer guide assembly 100 may be located at a lower portion of the refrigerator main body 10, and the refrigeration compartment 12 may be located at an upper portion of the refrigerator main body 10. The freezer compartment 11 and the refrigeration compartment 12 are sealed by the doors.

[0028] The doors may include a refrigeration compartment door and a freezer compartment door. When the freezer compartment 11 is closed, its door seals a periphery of a lower front surface of the refrigerator main body 10. When the refrigeration compartment is closed, its door seals a periphery of an upper front surface of the refrigerator main body 10.

[0029] The cold air generation unit 30 can generate cold air for cooling the freezer compartment 11 and the refrigeration compartment 12. For example, the cold air generation unit 30 may include a compressor, a condenser, an expansion valve, and an evaporator coil. Air becomes cold through heat exchange with a refrigerant going through the refrigeration cycle of compression, condensation, expansion and evaporation. The refrigerant circulates through the compressor, the condenser, the expansion valve and the evaporator coil. Accordingly, the refrigerator interior can be cooled by the cold air thus produced.

[0030] The drawer guide assembly 100 may include a pair of first rails 110 coupled to the side engagement portions 61 of the drawer 60 and a pair of second rails 120 at sidewalls of the refrigerator main body 10. The second rails 120 can guide movement of the first rails 110. The side engagement portions 61 of the drawer 60 are grooves recessed at lower portions of both sides of the drawer 60. Therefore, the load of the drawer 60 can be transferred to the second rails 120 through the first rails 110.

[0031] The first rail 110 of the drawer guide assembly 100 has a movable rail structure extending along a forward/backward direction of the refrigerator. The first rail 110 may have a “∩”-shaped vertical cross section and can be supported by the second rail 120. The first rail 110 can guide the drawer 60 in and out while sliding along the second rail 120.

[0032] The first rail 110 can be easily coupled to or decoupled from the drawer 60. For example, to couple the first rail 110 to the drawer 60, a front end of the first rail 110 can be fixed to a front end portion of the drawer 60 by using a screw while a rear end of the first rail 110 is fitted to a rear end portion of the drawer 60. To disassemble the first rail 110 from the drawer 60, the front end of the first rail 110 can be separated from the front end portion of the drawer 60 by unscrewing the screw and, then, the rear end of the first rail 110 is separated from the rear end portion of the drawer 60.

[0033] An engaging member 111 may be disposed at the rear end of the first rail 110 and engaged with the rear end portion (e.g., an engaging hole 62) of the drawer 60. The engaging member 111 may include a supporting hook 111a projecting upward from one end of the first rail 110 and an engaging hook 111b extending in a horizontal direction from the supporting hook 111a. The engaging hook 111b can be coupled to (e.g., fixed to) one end portion of the drawer 60.

[0034] Thus, to couple the drawer 60 with the first rail 110, the front end of the first rail 110 is fixed to a screw hole 63 of the drawer 60 by the screw while the engaging hook 111b of the engaging member 111 is inserted to the engaging hole 62 of the drawer 60. This process is advantageously simple and convenient compared with the conventional art. By performing the reverse process, the first rail 110 can be quickly and conveniently separated from the drawer 60.

[0035] The second rail 120 has a supporting rail structure extending in the front-back direction of the refrigerator. The second rail 120 can be fixed to the sidewall of the refrigerator main body 10 via a supporter 130. The second rail 120 may include a guide rail 122 having a “U”-shaped vertical cross section and coupled to an upper portion of the supporter 130. The second rail 120 also has a supporting bracket 123 for supporting the lower portion of the guide rail 122 while being coupled to a lower portion of the supporter 130.

[0036] The first rail 110 can be supported by one side of a guide rail 122 of the second rail 120, and the other side of the guide rail 122 can be fixed to the upper portion of the supporter through a plurality of screws.

[0037] Particularly, a side portion of the guide rail 122 has a vertical cross sectional structure projecting in three directions. Therefore, when the first rail 110 slides on the second rail 120, the inner walls (e.g., upper inner wall, one side inner wall and the other side inner wall) of the first rail 110 can be supported in three directions through contact with the walls of the second rail 120.

[0038] Therefore, according to embodiments of the present disclosure, a sliding rail is coupled to a drawer in a vertical manner. This provides the advantages that the

drawer can be coupled to, and decoupled from, the rail by a user without requiring special tools. The configuration also allows the drawer to be pulled out and pushed back with little difficulty from a user. Further, since the load of the drawer (including items stored therein) is supported in the vertical direction, the load of the drawer can be stably and uniformly distributed even when the drawer moves along the rail.

[0039] 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.

1. A refrigerator comprising: a refrigerator main body forming an exterior of the refrigerator;

a drawer configured to contain items stored in the refrigerator; and

a drawer guide assembly coupled to the drawer and configured to support and guide movement of the drawer, wherein the drawer guide assembly comprises:

a first rail coupled to a side engagement portion of the drawer and operable to transfer a load from the drawer in a downward direction, wherein the first rail comprises: a first end coupled to a first end portion of the drawer; a second end coupled to a second end portion of the drawer; and an engaging member fitted to the first end portion of the drawer; and

a second rail disposed at a sidewall of the refrigerator main body and configured to guide movement of the first rail;

wherein the drawer comprises an engaging hole located at one end surface of the drawer and the engaging hole is configured to receive the engaging member,

wherein the engaging member comprises: a supporting hook projecting in a vertical direction from the first end of the first rail; and an engaging hook extending in a horizontal direction from the supporting hook and inserted into the engaging hole, and

wherein the side engagement portion is a groove recessed at a lower portion of a side of the drawer.

2.-3. (canceled)

4. The refrigerator of claim 1, further comprising a freezer compartment located at a lower portion of the refrigerator main body, wherein the drawer guide assembly is disposed inside the freezer compartment; and a refrigeration compartment disposed at an upper portion of the refrigerator main body.

5. The refrigerator of claim 1, wherein the second rail comprises:

a guide rail comprising: a first end operable to support the first rail; and a second end fixed to a sidewall of the refrigerator main body via a supporter; and

a supporting bracket fixed to the supporter and configured to support a lower portion of the guide rail.

6. A refrigerator comprising:

a drawer configured to contain items and comprising a first end surface, the first end surface comprising an engaging hole; and

a drawer guide assembly coupled to the drawer and configured to guide movement of the drawer relative to the refrigerator,

wherein the drawer guide assembly comprises:

a first rail coupled to a side engagement portion of the drawer; and

a second rail installed at an inner side wall of the refrigerator and configured to guide movement of the first rail,

wherein the first rail comprises an engaging member fitted to the first end surface of the drawer.

wherein the engaging member comprises: a supporting hook projecting in a vertical direction from a first end of the first rail; and an engaging hook extending in a horizontal direction from the supporting hook and inserted into the engaging hole, and

wherein the side engagement portion is a groove recessed at a lower portion of a side of the drawer.

7. The refrigerator of claim 6, wherein the first rail is operable to transfer a load of the drawer in a downward direction.

8. The refrigerator of claim 6, wherein the drawer guide assembly is configured to guide the drawer to slide along a front-back direction relative to the refrigerator.

9. The refrigerator of claim 6 further comprising:

a cold air generation unit configured to generate cold air for the refrigerator; and

a refrigerator main body forming an exterior of the refrigerator.

10. (canceled)

11. The refrigerator of claim 6, wherein the second rail comprises:

a guide rail comprising: a first end operable to support the first rail; and a second end coupled to the inner sidewall of the refrigerator via a supporter; and

a supporting bracket fixed to the supporter and configured to support a lower portion of the guide rail.

12. A refrigerator comprising:

a refrigerator main body forming an outer body of the refrigerator and a drawer guide assembly configured to support a drawer and guide movement of the drawer, wherein the drawer guide assembly comprises:

a first rail coupled to a side engagement portion of the drawer; and

a second rail installed at a sidewall of the refrigerator main body to guide movement of the first rail, and

wherein the first rail comprises an engaging member fitted to a first end portion of the drawer;

wherein the engaging member comprises: a supporting hook projecting in a vertical direction from a first end of the first rail; and an engaging hook extending in a horizontal direction from the supporting hook and inserted into an engaging hole located at one end surface of the drawer;

wherein the side engagement portion is a groove recessed at a lower portion of a side of the drawer; and

wherein the second rail comprises:

a guide rail comprising a first side portion operable to support the first rail and a second side portion coupled to the sidewall of the refrigerator main body via a supporter; and

a supporting bracket coupled to the supporter to support
a lower portion of the guide rail.

13.-16. (canceled)

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