Abstract: The present invention relates to a door handle assembly, a vacuum compartment and a refrigerator. The door handle assembly comprises a handle; a rotation shaft; and a jointing part connected with the handle, wherein the jointing part has a first jointing hole, the rotation shaft is inserted in the first jointing hole, and the rotation shaft is secured in the first jointing hole. In the inventive door handle assembly, the jointing part is added, and the rotation shaft is connected with the handle via the jointing part. Therefore, the inventive door handle assembly has a simpler structure and can be easily mounted. Moreover, the inventive handle is connected with the rotation shaft by a great jointing force, can endure a great torque, and is not easily damaged, which may increase the frequency of using the door handle assembly and may reduce costs.
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DOOR HANDLE ASSEMBLY, VACUUM COMPARTMENT AND REFRIGERATION DEVICE

FIELD OF THE INVENTION

The present invention relates to a refrigeration device, and more particularly to a door handle assembly in a refrigeration device, a vacuum compartment and a refrigeration device.

BACKGROUND

With the development of society and technology, refrigerators have been widely used in families and have become essential household appliances in daily life. Moreover, refrigerators have gradually developed from low-level to high-level. In the past, refrigerators are mainly embodied in single-door form. Now, however, refrigerators have developed into side-by-side, double-door and three-door forms. Furthermore, the power consumption of refrigerators is further reduced.

Seen from the development course of refrigerators for storing foods, a conventional refrigerator comprises a refrigerating compartment and a freezing compartment. With the development of refrigerators, a preservation compartment is added into the conventional refrigerator. On the basis of the refrigerating compartment, the preservation compartment can further increase the preservative degree of the foods. At present, with the further development of refrigerators, a vacuum compartment, for storing foods, is also added into the refrigerator so as to meet the requirement of food conservation.

Figure 1 schematically shows a refrigerator according to the prior art. As shown in figure 1, the refrigerator 10 according to the prior art comprises a refrigerating compartment 11 positioned in the upper portion of a body of the refrigerator; a freezing compartment 14 positioned in the lower portion of the body; as well as a preservation compartment 12 and a vacuum compartment 13 which are positioned between the freezing compartment 14 and the refrigerating compartment 11. The positions, where the refrigerating compartment 11, the freezing compartment 14, the preservation compartment 12 and
the vacuum compartment 13 are provided, are not limited to those positions shown in
the figure and can be modified as desired. The vacuum compartment 13 has an air
pressure lower than one standard atmospheric pressure and can be called as a
low-pressure storage compartment. Because the air pressure of the vacuum
compartent 13 is lower than the standard atmospheric pressure, as foods are stored in
the vacuum compartment 13, they can be stored for a longer time and the preservative
degree of the foods is further improved.

Figure 2 shows a perspective and exploded view of the vacuum compartment 13. As
shown in figure 2, the vacuum compartment 13 comprises a housing 131 and a drawer
132 slidably provided in the housing. The housing 131 has a front end face 134. The
drawer 132 has a door 133. The front end face 134 is opposed to the rear face of the
door 133. The front end face 134 has a first mating portion 135 thereon. The door 133
comprises a door handle assembly. The door handle assembly comprises a handle 136
and a rotation shaft 137 connected to the handle 136. A second mating portion 138 is
provided at each end of the rotation shaft 137. When the door 133 is closed, the handle
136 is rotated and then the rotation shaft 137 is driven and rotated by rotation of the
handle 136, such that the first mating portion 135 and the second mating portion 138
can be locked with each other, and thus the door 133 and the housing 131 are locked
with each other. The door 133 has a door seal (not shown) thereon. When the handle
136 is rotated and thus the door is locked together with the housing 131, the door seal
can be pressed and deformed, and it can be airtightly engaged with the front end face of
the housing 131 such that the vacuum compartment 13 becomes airtight. In this case,
gas in the vacuum compartment 13 is isolated with ambient gas. When the door 133 is
closed, an air pump 139 begins to draw air from the vacuum compartment 13 such that
the air pressure in the vacuum compartment reaches a predetermined air pressure. In
this way, foods can be stored at a low air pressure. When it is desired to take foods out
of the vacuum compartment, the handle 136 is rotated and thus the rotation shaft 137 is
driven and rotated by rotation of the handle 136, such that the first mating portion 135
and the second mating portion 138 can be changed from a locked state to a released
state. Because the air pressure in the vacuum compartment 13 is lower than the
ambient air pressure, i.e. because in this case the door cannot be easily opened even if
the first mating portion is released from the second mating portion, the vacuum
compartment 13 further comprises an air inlet 140 which is provided on the door 133 of
the vacuum compartment 13. The handle 136 is provided with an air valve on the rear
face (not shown) thereof, which air valve is matable with the air inlet 140. When the plane, where the handle 136 is located, is parallel with the plane where the door 133 is located, i.e. when the handle 136 is not rotated, the air valve closes the air inlet 140. When it is desired to take foods out of or put them into the vacuum compartment 13, the handle 136 is rotated and thus the air valve opens the air inlet 140, such that the ambient air can enter the vacuum compartment. In this case, the air pressure in the vacuum compartment can be identical with the ambient air pressure, such that the door 133 can be easily opened to take foods out of the vacuum compartment 13.

The conventional door handle assembly has a complicated configuration. Moreover, rotating the handle 136 to lock or release the door 133 and the housing 131 requires a greater force. Moreover, it also requires a greater force to rotate the handle such that the air valve opens the air inlet. In the prior art, the door handle assembly endures a small torque. If the torque is great, the handle 136 is prone to break down and to separate from the rotation shaft 137. Therefore, the door handle assembly, used at a small frequency, need be renewed due to damages, which increases costs.

**SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a door handle assembly which can be simply configured and can endure a greater torque.

In order to achieve the above object, the present invention provides a door handle assembly, comprising:

- a handle;
- a rotation shaft; and
- a jointing part connected to the handle, wherein the jointing part has a first jointing hole therein, the rotation shaft is inserted through the first jointing hole, and the rotation shaft is secured in the first jointing hole.

Alternatively, the handle has at least one allocation part at the rear face thereof, the allocation part has a first allocation hole, and at the position of the first allocation hole, the jointing part is fixedly connected to the handle via a self-tapping screw.

Alternatively, the jointing part comprises a first jointing portion and a second jointing
portion, the first and second jointing portions constitute a T-shaped structure, the first jointing portion has at least one second allocation hole, wherein the first allocation hole of the allocation part is matable with the second allocation hole, said self-tapping screw is passed through the second and first allocation holes so as to secure the jointing part to the handle; the first jointing hole is provided in the second jointing portion.

Alternatively, the rear face of the handle is provided with a groove, the allocation part is provided in the groove, the second jointing portion is inserted in the groove, and the groove has a second jointing hole on each of two side walls in a direction of the axis of the rotation shaft, the rotation shaft is inserted through the first and second jointing holes and secured in the first and second jointing holes.

Alternatively, the handle has an inserting hole, the second jointing portion is inserted in the inserting hole, and the first jointing hole of the second jointing portion is exposed at the front face of the handle.

Alternatively, on the rear face of the handle, a side wall is provided around the inserting hole, and the allocation part is arranged in a region surrounded by the side wall.

Alternatively, the first jointing portion has a first securing hole in the middle position, the rotation shaft has a second securing hole in the middle position, which second securing hole is matable with the first securing hole, a set screw is passed through the first and second securing holes so as to secure the rotation shaft in the first jointing hole.

Alternatively, the handle is made of plastic, the jointing part is made of metal or alloy, and the rotation shaft is made of metal or alloy.

The present invention further provides a vacuum compartment, comprising:

a housing; and

a drawer slidably provided in the housing, wherein the drawer has a door, the door is provided with a door handle assembly thereon, characterized in that said door handle assembly is the one according to any one of claims 1 to 8.

Alternatively, the housing has a front end face, the front end face is opposed to the rear face of the door, the front end face is provided with first mating portions, a second
mating portion is mounted at each of both ends of the rotation shaft, the first and second mating portions are matable with each other so as to lock or release the drawer.

Alternatively, the first mating portion is of a pillar shape and is secured on the front end face, the second mating portion is a cam matable with the pillar and is secured at each of both ends of the rotation shaft.

The present invention further provides a refrigeration device comprising a cabinet, wherein the vacuum compartment as mentioned above is provided in the cabinet.

Compared with the prior art, the present invention has the following advantages.

In the inventive door handle assembly, the jointing part is added, and the rotation shaft is connected with the handle via the jointing part. Therefore, the inventive door handle assembly has a simple structure and can be easily mounted. Moreover, in the embodiment of the present invention, the jointing part is made of metal, the rotation shaft is made of metal, and the rotation shaft is fixedly connected to the jointing part via the set screw. In this way, according to the present invention, the handle and the rotation shaft are more tightly secured with each other and endure a greater torque, which may increase the frequency that the door handle assembly is used and may reduce the cost.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 schematically shows a perspective view of a conventional refrigerator configuration;

Figure 2 shows a perspective and exploded view of a conventional vacuum compartment;

Figure 3 shows a perspective view of a door handle assembly according to a first embodiment of the present invention;

Figure 4 shows a perspective and exploded view of the door handle assembly according to the first embodiment of the present invention;
Figure 5 shows a perspective view of a door handle assembly according to a second embodiment of the present invention;

Figure 6 is a sectional view, showing first and second mating portions according to the embodiment of the present invention are at a locked state; and

Figure 7 is a sectional view, showing the first and second mating portions according to the embodiment of the present invention are at a released state.

DETAILED DESCRIPTION OF THE INVENTION

In a door handle assembly according to embodiments of the present invention, a jointing part is provided, such that a rotation shaft is connected to a handle by the jointing part. Therefore, the door handle assembly has a simple configuration and can be easily mounted. In the embodiments, both the rotation shaft and the jointing part are made of metal and are fixedly connected with each other by set screws. Therefore, according to the present invention, the handle is connected to the rotation shaft via a great jointing force, and can endure a great torque. They are not easily damaged, which may increase the frequency of using the door handle assembly and may reduce costs.

In order that the present invention may be well understood by the skilled in the art, a door handle assembly according to the embodiments of the present invention is detailedly explained in company with the drawings. Figure 3 shows a perspective view of a door handle assembly according to a first embodiment of the present invention. Figure 4 shows a perspective and exploded view of the door handle assembly according to the first embodiment of the present invention. As shown in figures 3 and 4, the door handle assembly according to the embodiment of the present invention comprises a handle 20; a rotation shaft 30, wherein the handle 20 is rotatable around the axis of the rotation shaft 30; and a jointing part 40 secured on the handle 20, wherein the jointing part has a first jointing hole 41 thereon, the handle 20 is inserted through the first jointing hole 41, and the rotation shaft 30 is secured in the first jointing hole 41. In this way, the handle 20 is rotatable, together with the rotation shaft 30, around the axis of the rotation shaft 30. The door handle assembly according to the embodiment of the present invention has a simple configuration and can be easily mounted. When the handle is rotated, the rotation shaft and the handle may endure a greater torque, which
may increase the frequency of using the door handle assembly and may reduce costs.

As shown in figures 3 and 4, in the first embodiment of the present invention, the handle 20 is of a rectangular plate shape. It should be understood that the handle may be configured in other shapes, such as a square plate shape, a hexagonal plate shape or the like. The handle 20 has at least one allocation part 21 at the rear face thereof. The allocation part 21 has a first allocation hole 25 thereon. In the embodiment of the present invention, the number of the allocation parts 21 is two. The jointing part 40 is fixedly connected with the handle 20 in the positions of the first allocation holes 25 of the allocation parts 21, for example in a screwed manner. For instance, the jointing part may be fixed on the handle 20 in the positions of the allocation parts 21 via self-tapping screws 45. Of course, they may be fixedly connected with each other in other manners. The handle 20 has an inserting hole 23. On the rear face of the handle 20, a side wall 24 is provided around the inserting hole 23. The side wall 24 encompasses the allocation parts 21. That is, the allocation parts 21 are located within a region encompassed by the side wall 24 and outside the inserting hole 23. In the embodiment of the present invention, a central line between the two allocation parts 21 is perpendicular to the rotation shaft 30. It should be noted that, the rear face of the handle 20 refers to a face of the handle opposite the door when the door handle assembly is mounted on the door, and the front face of the handle 20 refers to a face of the handle towards a user when the door handle assembly is mounted on the door. In the embodiment of the present invention, the rear face of the handle 20 is also provided with an air valve 22. When the door handle assembly according to the present invention is applied to the vacuum compartment, the air valve 22 is matable with an air inlet on the vacuum compartment so as to close the air inlet or to open the air inlet, such that the vacuum compartment is charged with air.

As shown in figures 3 and 4, in the embodiment of the present invention, the rotation shaft 30 is of a round bar shape. However, the rotation shaft 30 is not limited to this and can be of other shapes, such as a hexagonal pillar shape. The rotation shaft 30 has a spacing collar 31 near each end thereof, which spacing collar 31 is matable with an additional component such that the door handle assembly is secured on the door. This door can be a door of the vacuum compartment, as disclosed in the prior art. A second mating portion 50 is provided at each of both ends of the rotation shaft 30. A screw hole (not shown) is provided on the end face of each end of the rotation shaft 30. The second
mating portion 50 is also provided with a screw hole (not shown) thereon. A corresponding screw is screwed into the corresponding screw hole on the second mating portion 50 and the screw hole on the corresponding end face of the rotation shaft 30, such that the second mating portion 50 may be secured at each end of the rotation shaft 30. The second mating portion 50 is used to mate with a corresponding first mating portion (figure 6) on the housing of the vacuum compartment, such that the door and the housing can be locked together or released from each other.

As shown in figures 3 and 4, in the first embodiment of the present invention, the jointing part 40 comprises a first jointing portion and a second jointing portion. The first and second jointing portions constitute a T-shaped configuration. The second jointing portion is provided in the middle of the first jointing portion. The second jointing portion is insertable into a space surrounded by the side wall 24. The height of the second jointing portion is greater than that of the side wall 24. In the embodiment of the present invention, the first jointing hole 41 is provided at an end of the second jointing portion remote from the first jointing portion. The length and the width of the first jointing portion are substantially identical with the length and the width of the space surrounded by the side wall 24. As the jointing part 40 is passed through the inserting hole 23 on the handle 20, the jointing part 40 coincides with the space surrounded by the side wall 24 on the rear face of the handle 20, and the second jointing portion of the jointing part is partially exposed at its end, such that the first jointing hole 41 of the second jointing portion of the jointing part 40 is exposed. The second jointing portion of the jointing part 40 is inserted into the inserting hole 23, and the first jointing hole 41 is exposed at the front face of the handle 20.

The first jointing portion of the jointing part 40 has at least one second allocation hole 42. The first allocation hole 25 of the allocation part 21 is matable with the second allocation hole 42 of the jointing part 40. The number of the second allocation holes 42 is equal to the number of the allocation parts 21 on the handle 20. That is, in the embodiment of the present invention, the number of the second allocation holes 42 is two. These two second allocation holes are each provided on both limbs of the first jointing portion of the jointing part 40. The arrangement of these two second allocation holes 42 on the first jointing portion of the jointing part 40 corresponds to the arrangement of the allocation parts 21 on the handle 20. Therefore, the self-tapping screws is screwed into the first allocation holes 25 of the allocation parts 21 through the second allocation holes.
42, such that the jointing part 40 is fixed on the handle 20.

The first jointing portion of the jointing part 40 has a first securing hole 43 in the middle position. The first securing hole 43 is penetrated through the second jointing portion of the jointing part 40. In the middle position of the rotation shaft 30, the rotation shaft has a second securing hole 32 mateable with the first securing hole 43. A set screw 44 may be passed through the first securing hole 43 of the jointing part 40 and the second securing hole 32 of the rotation shaft 30, such that the rotation shaft 30 is secured in the first jointing hole 41 of the jointing part 40.

In the embodiment of the present invention, the handle 20 is made of plastic, the jointing part 40 is made of metal or alloy, and the rotation shaft 30 is made of metal or alloy. The jointing part 40 is made of metal, the rotation shaft 30 is made of metal, and the rotation shaft 30 is fixedly connected to the jointing part 40 via the set screw. In this way, according to the present invention, the handle 20 and the rotation shaft 30 are more tightly secured with each other and endure a great torque, which may increase the frequency of using the door handle assembly 20 and may reduce costs.

The door handle assembly can be assembled by the following steps: inserting the jointing part 40 into the inserting hole 23 of the handle 20; exposing the first jointing hole 41 of the jointing part 40 at the front face of the handle 20; aligning the second allocation holes 42 of the jointing part 40 with the allocation parts 21 of the handle 20; and screwing the self-tapping screws 45 into the allocation parts 21 of the handle 20 through the second allocation holes 42 of the jointing part 40, such that the handle 20 may be fixedly connected to the jointing part 40. Then, the rotation shaft 30 is passed through the first jointing hole of the jointing part 40, and the second securing hole 32 of the rotation shaft 30 is aligned with the first securing hole 43 of the jointing part 40, such that the set screw 44 is passed through the second securing hole 32 and the first securing hole 43 to fix the jointing part 40 together with the handle 20.

The door handle assembly according to the first embodiment of the present invention is explained above. Figure 5 is a perspective view of a door handle assembly according to a second embodiment of the present invention. As shown in figure 5, by comparing the door handle assembly according to the second embodiment of the present invention with the door handle assembly according to the first embodiment of the present
invention, it is noted that a rotation shaft 30B of the door handle assembly according to the second embodiment of the present invention is identical with the rotation shaft 30 of the door handle assembly according to the first embodiment of the present invention. In the second embodiment of the present invention, however, after the rotation shaft 30B is completely mounted, the rotation shaft 30B is located at the rear face of the handle 20, not at the front face of the handle 20, which is the biggest difference between the first and second embodiments of the present invention.

A jointing part of the door handle assembly according to the second embodiment is basically identical with the jointing part of the door handle assembly according to the first embodiment in shape. Both of them are T-shaped. They are distinguished with each other in that a second jointing portion of the T-shaped jointing part of the door handle assembly according to the second embodiment is only located on the rear face of the handle and does not pass through the handle.

The handle of the door handle assembly according to the second embodiment is different from the handle of the door handle assembly according to the first embodiment in configuration. The handle 20B according to the second embodiment, on its plate face, lacks the inserting hole as described in the first embodiment. However, there is a groove, surrounded by side walls 24B, provided on the rear face of the handle 20B. A second jointing portion of a jointing part 40B is inserted in the groove. The groove has a second jointing hole 25B on two side walls 24B in a direction of the axis of the rotation shaft 30B. The second jointing hole 25 is matable with a first jointing hole (refer to figure 4) of the jointing part 40B. The rotation shaft 30B is inserted through the first jointing hole and the second jointing hole 25B and is secured in the first jointing hole and the second jointing hole 25B. The handle 20B and the rotation shaft 30B according to the second embodiment are secured with each other in the same manner as the first embodiment. That is, a set screw is passed through a first securing hole on the T-shaped jointing part 40B and through a second securing hole on the rotation shaft 30B to secure the rotation shaft 30B in the first jointing hole of the jointing part 40B and the second jointing hole of the handle 20B (please refer to the first embodiment description for details).

In the second embodiment of the present invention, the handle 20B is made of plastic, the jointing part 40B is made of metal or alloy, and the rotation shaft 30B is made of metal or alloy. The jointing part 40B is made of metal, the rotation shaft 30B is made of
metal, and the rotation shaft 30B is fixedly connected to the jointing part 40B via the set screw. In this way, according to the present invention, the handle 20B and the rotation shaft 30B are more tightly secured with each other via a great jointing force and endure a greater torque, which may increase the frequency of using the door handle assembly and may reduce costs.

Figure 2 shows a perspective and exploded view of a conventional vacuum compartment. Because a vacuum compartment according to the present invention is obtained by replacing the conventional door handle assembly with the inventive door handler assembly, the vacuum compartment according to the present invention will be explained based on figure 2. In the embodiment of the present invention, the vacuum compartment comprises a housing 131; and a drawer 132 slidably provided in the housing 131. The drawer 132 has a door 133 on which the above-mentioned door handle assembly is provided. That is, the door handle assembly in the conventional vacuum compartment is replaced with the door handle assembly according to the present invention. That is, the handle 136, the rotation shaft 137 and the connecting manner between them are all replaced by those according to the present invention. The inventive door handle assembly is secured on the door 133 by securing devices 44. For the reason of aesthetic, the securing devices 44 are hid by cover plates 45.

In the embodiment of the present invention, the housing 131 has a front end face 134. The front end face 134 is opposed to the rear face of the door 133. The front end face 134 is provided with first mating portions 135 thereon. A second mating portion 138 is provided at each of both ends of the rotation shaft (the inventive rotation shaft). The second mating portion 138 is identical with the second mating portion 50 as shown in figures 3 to 5. The first mating portions 135 and the second mating portions 138 are matable with each other to lock or release the drawer 132, i.e. to lock the drawer 132 together with the housing 131 or release the drawer 132 from the latter.

Figure 6 is a sectional view, showing the first and second mating portions according to the embodiment of the present invention in a locked state. Figure 7 is a sectional view, showing the first and second mating portions according to the embodiment of the present invention in a released state. As shown in figures 6 and 7, in the embodiment of the present invention, the first mating portion 135 is of a pillar shape and is secured on the front end face. In company with figure 4, the second mating portion 50 is a cam
matable with said pillar and is secured at each end of the rotation shaft. The
cam-shaped second mating portion 50 comprises a lug 51. The lug 51 has a surface
opposite the pillar-shaped first mating portion 135, which surface is curved. The
pillar-shaped first mating portion 135 can be rotated and moved on the curved surface of
the lug. When the pillar-shaped first mating portion is located at the end of the curved
surface, the pillar-shaped first mating portion 135 is locked together with the cam 50, as
shown in figure 7. When the pillar-shaped first mating portion 135 is disengaged from
the curved surface of the lug 51, the pillar-shaped first mating portion 135 is released
from the cam 50 and they are in the released state as shown in figure 8.

As shown in figure 2, the inventive vacuum compartment further comprises an air pump
139 to vacuumize the vacuum compartment. An air inlet 140 is provided on the door 133.
The air valve 22 (refer to figure 4) on the rear face of the handle is matable with the air
inlet 140 to close the air inlet or to open the air inlet so as to aerate the vacuum
compartment. Moreover, the inventive vacuum compartment further comprises a door
seal (not shown) which is arranged in a groove (not shown) of the rear face of the door
133. When the drawer is closed and locked, the door 133 of the drawer 132 may form
an airtight connection with the housing 131, such that gas in the vacuum compartment
may be isolated from the ambient air and does not communicate with the latter to
maintain the vacuum compartment in a low pressure state.

The vacuum compartment is operated in the following manner: when the door 133 is
closed, the door handle assembly is rotated, such that the first mating portions 135 and
the second mating portions 138 are locked with each other; in this case, the door seal is
pressed such that the door 133 forms an airtight connection with the housing 131; and
the air inlet 140 is closed by the air valve, the air pump 139 beings to vacuumize the
vacuum compartment, such that the air pressure in the vacuum compartment reaches a
predetermined air pressure; in this way, foods may be stored at a low pressure. The air
pressure of the vacuum compartment is lower than one standard atmospheric pressure.
Thus the vacuum compartment can also be called as a low-pressure storage
compartment. Because the air pressure of the vacuum compartment is lower than one
standard atmospheric pressure, the foods may not easily be oxidized as they are stored
in the vacuum compartment. Therefore, the foods can be stored for a long time and
have an increased preservative degree. When it is desired to take the foods out of the
vacuum compartment, the door handle assembly is rotated, such that the air valve
opens the air inlet 140 to enable the ambient air to enter the vacuum compartment. In this way, the air pressure in the vacuum compartment may be identical with the atmospheric pressure, such that the door 133 may be easily opened to take the foods out of the vacuum compartment.

It requires a great force to rotate the door handle assembly so as to lock the door together with the housing or to release the door from the latter. Moreover, it also requires a great force to rotate the handle such that the air valve opens the air inlet. The inventive door handle assembly may endure a great torque, which may increase the frequency of using the door handle assembly and thus may increase the service life of the vacuum compartment.

The present invention provides a refrigeration device. More particularly, the refrigeration device can be a refrigerator or other devices. The inventive refrigeration device comprises the above-mentioned vacuum compartment.

As shown in figure 1, in the embodiment of the present invention, the inventive refrigeration device is a refrigerator. The refrigerator comprises a refrigerating compartment 11 positioned in the upper portion of a body of the refrigerator; a freezing compartment 14 positioned the lower portion of the body; as well as a preservation compartment 12 and a vacuum compartment 13, which are positioned between the freezing compartment 11 and the refrigerating compartment 14, wherein the vacuum compartment 13 is replaced with the above-mentioned vacuum compartment according to the present invention. The positions, where the refrigerating compartment 11, the freezing compartment 14, the preservation compartment 12 and the vacuum compartment 13 are arranged, are not limited to those positions shown in figures and can be modified as desired. For instance, the position of the freezing compartment 14 can be exchanged with the position of the refrigerating compartment 11.

Although the present invention has been explained based on the above preferred embodiments, they are not used to limit the present invention. Any possible modification and amendment of the technical solution of the present invention can be obtained by the skilled in the art by using the above disclosed methods and technical contents without departing from the spirit and scope of the present invention. Therefore, any simple amendment, equivalent change and modification, which are based on the above
embodiments according to the present invention, without departing from the content of the inventive technical solution, belong to the protection scope of the present invention.
CLAIMS

1. A door handle assembly, characterized in that it comprises:
   a handle;
   a rotation shaft; and
   a jointing part connected to the handle, wherein the jointing part has a first jointing hole therein, the rotation shaft is inserted through the first jointing hole, and the rotation shaft is secured in the first jointing hole.

2. The door handle assembly according to claim 1, characterized in that the handle has at least one allocation part at the rear face thereof, the allocation part has a first allocation hole, and at the position of the first allocation hole, the jointing part is fixedly connected to the handle via a self-tapping screw.

3. The door handle assembly according to claim 2, characterized in that the jointing part comprises a first jointing portion and a second jointing portion, the first and second jointing portions constitute a T-shaped structure, the first jointing portion has at least one second allocation hole, wherein the first allocation hole of the allocation part is mateable with the second allocation hole, said self-tapping screw is passed through the second and first allocation holes so as to secure the jointing part to the handle; the first jointing hole is provided in the second jointing portion.

4. The door handle assembly according to claim 3, characterized in that the rear face of the handle is provided with a groove, the allocation part is provided in the groove, the second jointing portion is inserted in the groove, and the groove has a second jointing hole on each of two side walls in a direction of the axis of the rotation shaft, the rotation shaft is inserted through the first and second jointing holes and secured in the first and second jointing holes.

5. The door handle assembly according to claim 3, characterized in that the handle has an inserting hole, the second jointing portion is inserted in the inserting hole, and the first jointing hole of the second jointing portion is exposed at the front face of the handle.

6. The door handle assembly according to claim 5, characterized in that on the rear face
of the handle, a side wall is provided around the inserting hole, and the allocation part is arranged in a region surrounded by the side wall.

7. The door handle assembly according to any one of claims 3 to 6, characterized in that the first jointing portion has a first securing hole in the middle position, the rotation shaft has a second securing hole in the middle position, which second securing hole is matable with the first securing hole, a set screw is passed through the first and second securing holes so as to secure the rotation shaft in the first jointing hole.

8. The door handle assembly according to any one of claims 1 to 6, characterized in that the handle is made of plastic, the jointing part is made of metal or alloy, and the rotation shaft is made of metal or alloy.

9. A vacuum compartment, comprising:
   a housing; and
   a drawer slidably provided in the housing, wherein the drawer has a door, the door is provided with a door handle assembly thereon, characterized in that said door handle assembly is that according to any one of claims 1 to 8.

10. The vacuum compartment according to claim 9, characterized in that the housing has a front end face, the front end face is opposed to the rear face of the door, the front end face is provided with a first mating portion, a second mating portion is mounted at each end of the rotation shaft, the first and second mating portions are matable with each other so as to lock or release the drawer.

11. The vacuum compartment according to claim 10, characterized in that the first mating portion is of a pillar shape and is secured on the front end face, the second mating portion is a cam matable with the pillar and is secured at each end of the rotation shaft.

12. A refrigeration device, comprising a cabinet, characterized in that a vacuum compartment according to claim 9 is provided in the cabinet.