

DESCRIPTION

Title of Invention

PACKING MATERIAL

Technical Field

5 [0001]

The present invention relates to a packing material, and more particularly, to a packing material having a configuration to be used when the packing material is carried.

Background Art

[0002]

10 A proposed existing packing material is provided with a box-shaped outer packing material formed of corrugated cardboard and a cushioning material provided at a bottom portion of the outer packing material (see, for example, Patent Literature 1). At a lower portion of a peripheral surface of the outer packing material, grips are formed in such a manner as to allow hands to be inserted when the packing material is carried. The
15 grips are formed in the shape of a quadrate having rounded corners.

Citation List

Patent Literature

[0003]

20 Patent Literature 1: Japanese Unexamined Patent Application Publication No. 2005-154007

Summary of Invention

Technical Problem

[0004]

25 The following description is made by referring to by way of example the case where an object to be packed is a refrigerator. Generally, the width of a front surface of a refrigerator in the lateral direction of the refrigerator and the width of a back surface of the refrigerator in the lateral direction are smaller than the width of a side surface of the refrigerator, that is, the width of the refrigerator in a direction along the depth of the refrigerator. Therefore, the space for carrying the refrigerator is limited. For example,
30 in the case where the carrier passes through, for example, a corridor, while carrying the

refrigerator, the carrier may carry the refrigerator, with the front surface or the back surface of the refrigerator located to face a floor surface of the corridor, and side surfaces of the refrigerator located to face wall surfaces of the corridor. In this case, it is possible to prevent a packing material from being brought into contact with the wall surfaces of the corridor. Furthermore, in the case where the carrier carries the refrigerator in a location where the space for carrying the refrigerator can be easily secured, the carrier may also carry the refrigerator, with a side surface of the refrigerator located to face the floor surface. In such a manner, the carrier may change the orientation of the packing material in accordance with the location.

[0005]

The packing material described in Patent Literature 1 is provided with a plurality of grips. However, the longitudinal directions of the grips are the same as each other. Therefore, when the carrier changes the orientation of the packing material, he or she holds part of the packing material that is other than the grips, such as corner portions of the packing material. If the carrier holds the corner portions of the packing material, his or her fingers may get caught between the packing material and the floor surface when the carrier places the packing material on the floor surface. In view of this point, it is conceivable as another method to further form, at the packing material, second grips whose longitudinal direction is different from the longitudinal direction of the first grips as described in Patent Literature 1, in addition to the first grips of the packing material. However, in the case where a first grip and a second grip are formed at the packing material, the smaller the distance between the first and second grips, the smaller the width of corrugated cardboard present between the first grip and the second grip. That is, in the method of forming second grips separate from first grips, there is a case where the width of part of the corrugated cardboard is small, thus reducing the strength of the packing material.

[0006]

The present invention has been made to solve the above problems, and an object of the invention is provide a packing material that can reduce a decrease in the strength of the packing material.

Solution to Problem

[0007]

Packing material according to an embodiment of the present invention includes a plate-shaped element made of corrugated cardboard and including a first area and a second area where respective grips are allowed to be freely formed. In the plate-shaped element, a first cut portion, a second cut portion, and a third cut portion are formed, the first cut portion linearly extend from a beginning point to a first end point, the second cut portion linearly extending from the beginning point to a second end point, the third cut portion linearly extending from the beginning point to a third end point. In a peripheral area of the first area, the first cut portion and the second cut portion are formed, and in a peripheral area of the second area, the first cut portion and the third cut portion are formed.

Advantageous Effects of Invention

[0008]

According to the embodiment of the present invention, the first cut portion is formed in the peripheral area of the first area and the peripheral area of the second area. That is, the first area and the second area are provided opposite to each other, with the first cut portion interposed between the first and second areas. Therefore, according to the embodiment of the present invention, the decrease in the strength of the packing material can be reduced.

Brief Description of Drawings

[0009]

[Fig. 1] Fig. 1 is a perspective view of a packing material 100 according to Embodiment 1.

[Fig. 2] Fig. 2 is a diagram illustrating a state in which an outer packing material 2 is removed from the packing material 100 as illustrated in Fig. 1.

[Fig. 3] Fig. 3 is a top view of a bottom case 6 provided at the packing material 100 according to Embodiment 1.

[Fig. 4] Fig. 4 is an enlarged view of part of the bottom case 6 as illustrated in Fig. 1.

[Fig. 5] Fig. 5 is a top view of a cut portion 10A.

[Fig. 6] Fig. 6 is a top view of a cut portion 8A.

[Fig. 7] Fig. 7 is a top view of a cut portion 9A.

[Fig. 8] Fig. 8 is a perspective view illustrating a state in which a plate element 21
5 is bent at a bending portion 31.

[Fig. 9] Fig. 9 is a perspective view illustrating a state in which a plate element 22
is bent at a bending portion 32.

[Fig. 10] Fig. 10 is a perspective view illustrating a state in which the plate
element 21 and the plate element 22 are bent.

10 [Fig. 11] Fig. 11 schematically illustrates a state in which the packing material 100
is carried by a carrier hm1 and a carrier hm2.

[Fig. 12] Fig. 12 is an explanatory diagram indicating holding positions of the
carrier hm1 in the state illustrated in Fig. 11.

15 [Fig. 13] Fig. 13 is an explanatory diagram indicating holding positions different
from those indicated in Fig. 12.

[Fig. 14] Fig. 14 schematically illustrates a state in which the packing material 100
is carried by the carrier hm1 and the carrier hm2, while the carrier hm2 stands at a
lower position than the carrier hm1.

20 [Fig. 15] Fig. 15 is an explanatory diagram indicating holding positions of the
carrier hm1 in the state illustrated in Fig. 14.

[Fig. 16] Fig. 16 is an explanatory diagram of a packing material 100 according to
Modification 1.

[Fig. 17] Fig. 17 is an explanatory diagram of a packing material 100 according to
Modification 2.

25 [Fig. 18] Fig. 18 is a top view of a bottom case 206 provided at a packing material
according to Embodiment 2.

[Fig. 19] Fig. 19 is a top view of a cut portion 210A.

[Fig. 20] Fig. 20 is a perspective view illustrating a state in which a plate element
21b is bent at a bending portion 31b.

30 [Fig. 21] Fig. 21 is a perspective view illustrating a state in which the plate

element 22 is bent at the bending portion 32 and the plate element 21b is bent at a bending portion 21b1.

[Fig. 22] Fig. 22 is a top view of a bottom case 306 provided at packing material according to Embodiment 3.

5 [Fig. 23] Fig. 23 is a top view of a cut portion 310A.

[Fig. 24] Fig. 24 is a perspective view illustrating a state in which a plate element 21 is bent at a bending portion 31c.

10 [Fig. 25] Fig. 25 is a perspective view illustrating a state in which a plate element 21c2 is bent at the bending portion 31c and the plate element 22 is bent at the bending portion 32.

Description of Embodiments

[0010]

Embodiment 1

15 Embodiments of the present invention will be described with reference to the drawings. It should be noted that in the following figures including Fig. 1, relationships between sizes of components may be different from actual ones.

[0011]

<Configuration of Embodiment 1>

20 Fig. 1 is a perspective view of a packing material 100 according to Embodiment 1. Fig. 2 is a diagram illustrating a state in which an outer packing material 2 is removed from the packing material 100 as illustrated in Fig. 1. As illustrated in Fig. 2, the packing material 100 is a box-shaped material that accompanies an object 1 to be packed. In Embodiment 1, the object 1 is a refrigerator. The object 1 may be an object other than a refrigerator. As illustrated in Figs. 1 and 2, the packing material 100 includes the outer packing material 2 that is open on a bottom side thereof, a bottom case 6 that supports the object 1, and cushioning materials 3 that are located above the object 1. The outer packing material 2 covers peripheral surfaces and an upper surface of the object 1. Bands 2A are wound around the outer packing material 2 and the bottom case 6, and the outer packing material 2 and the bottom case 6 are provided as a single body. The outer packing material 2 includes cut portions 2B. Each of

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30

parts of the outer packing material 2 where the cut portions 2B are formed serves as a grip after being bent. The outer packing material 2 is made of corrugated cardboard, and the cushioning materials 3 are each made of foam polystyrene.

[0012]

Fig. 3 is a top view of the bottom case 6 provided at the packing material 100 according to Embodiment 1. Fig. 4 is an enlarged view of part of the bottom case 6 as illustrated in Fig. 1. Fig. 5 is a top view of a cut portion 10A. An X direction indicated in Fig. 3 is a width direction of the bottom case 6, and a Y direction indicated in Fig. 3 is a longitudinal direction of the bottom case 6. The bottom case 6 includes a quadrate plate-shaped element 6A made of corrugated cardboard, a frame element 6B provided at a peripheral portion of the plate-shaped element 6A, a cushioning material 6C1 provided on the plate-shaped element 6A, and a cushioning material 6C2 provided on the plate-shaped element 6A and side by side with the cushioning material 6C1.

[0013]

As illustrated in Fig. 3, the plate-shaped element 6A includes the cut portion 10A, a cut portion 10B that is shaped such that the cut portions 10A and 10B are symmetrical, a cut portion 8A, a cut portion 8B that has the same shape as the cut portion 8A, a cut portion 9A, and a cut portion 9B that is shaped such that the cut portions 9A and 9B are symmetrical. Parts of the plate-shaped element 6A where the cut portions 10A, 10B, 8A, 8B, 9A, and 9B are formed serve as grips after these parts are bent. As illustrated in Fig. 5, the cut portion 10A includes a cut portion 11, a cut portion 12, and a cut portion 13.

[0014]

The frame element 6B is formed at the peripheral portion of the plate-shaped element 6A. The cushioning materials 6C1 and 6C2 are provided inward of the frame element 6B. The frame element 6B includes a frame element 6B1 that linearly extends, and a frame element 6B2 that linearly extends perpendicular to the frame element 6B1. Also, the frame element 6B further includes a frame element 6B3 that linearly extends perpendicular to the frame element 6B2 and parallel to the frame element 6B1, and a frame element 6B4 that linearly extends perpendicular to the frame

element 6B3 and the frame element 6B4 and parallel to the frame element 6B2.

[0015]

As illustrated in Figs. 3 and 4, in the cushioning material 6C1, a recessed portion 41A, a recessed portion 42A, and a recessed portion 43A are formed, the recessed portions 41A, 42A and 43A being located to face the cut portions 10A, 8A, and 9A, respectively. As illustrated in Fig. 4, in the recessed portion 41A, a grasp surface sf1 and a grasp surface 42A are provided; and the grasp surface sf1 is raised from the plate-shaped element 6A, and the grasp surface sf2 is also raised from the plate-shaped element 6A and located perpendicular to the grasp surface sf1. Also, in the recessed portions 42A and 43A, surfaces raised from the plate-shaped element 6A are provided. In the cushioning material 6C2, a recessed portion 41B, a recessed portion 42B, and a recessed portion 43B are formed, the recessed portions 41B, 42B and 43B being located to face the cut portions 10B, 8B, and 9B, respectively. Also, in the recessed portion 41B, grasp surfaces are formed, one of the grasp surfaces having a similar configuration to that of the grasp surface sf1 as described regarding the recessed portion 41A, the other of the grasp surfaces having a similar configuration to that of the grasp surface sf2 as described regarding the recessed portion 41A. Furthermore, in the recessed portions 42B and 43B, surfaces raised from the plate-shaped element 6A are also formed.

[0016]

The plate-shaped element 6A has areas where respective grips can be freely formed. To be more specific, in a peripheral area of an area Rg1 of the plate-shaped element 6A, the cut portions 11 and 12, which are linear through holes, are formed. Also, in a peripheral area of an area Rg2 of the plate-shaped element 6A, the cut portions 11 and 13, which are linear through holes, are formed. The area Rg1 corresponds to a first area, and the area Rg2 corresponds to a second area. Furthermore, the cut portion 11 corresponds to a first cut portion, the cut portion 12 corresponds to a second cut portion, and the cut portion 13 corresponds to a third cut portion. The plate-shaped element 6A includes a bendable plate element 21 and a bendable plate element 22 that is adjacent to the bendable plate element 21, with the

cut portion 11 interposed between the bendable plate elements 21 and 22. The plate element 21 is provided in the area Rg1, and the plate element 22 is provided in the area Rg2.

[0017]

5 The cut portion 11 extends from a beginning point to an end point. As illustrated in Fig. 5, the end point of the cut portion 11 is located at a position P1, and the beginning point of the cut portion 11 is located at a position P2. The cut portion 12 extends from its beginning point to its end point. As illustrated in Fig. 5, the end point of the cut portion 12 is located at a position P3, and the beginning point of the cut portion 12 is located at the position P2. The cut portion 13 extends from its beginning point to its end point. As illustrated in Fig. 5, the end point of the cut portion 13 is located at a position P4, and the beginning point of the cut portion 13 is located at the position P2. That is, the cut portions 11, 12, and 13 are joined to each other at the position P2. Furthermore, the cut portions 11, 12, and 13 radially extend from the position P2. The cut portions 11 and 12 are perpendicular to each other at the position P2, and the cut portions 12 and 13 are perpendicular to each other at the position P2.

[0018]

 The end point of the cut portion 11 corresponds to a first end point. The end point of the cut portion 12 corresponds to a second end point. The end point of the cut portion 13 corresponds to a third end point.

[0019]

 As illustrated in Fig. 5, the cut portion 11 includes a curved cut portion 11-1, a linear cut portion 11-2 continuous with the cut portion 11-1, a curved cut portion 11-3 continuous with the cut portion 11-2, and a linear cut portion 11-4 continuous with the cut portion 11-3. The cut portion 12 includes a curved cut portion 12-1, a linear cut portion 12-2 continuous with the cut portion 12-1, a curved cut portion 12-3 continuous with the cut portion 12-2, and a linear cut portion 12-4 continuous with the cut portion 12-3. The cut portion 13 includes a curved cut portion 13-1, a linear cut portion 13-2 continuous with the cut portion 13-1, a curved cut portion 13-3 continuous with the cut portion 13-2, and a linear cut portion 13-4 continuous with the cut portion 13-3. The

cut portion 12-4 is longer than the cut portion 11-4. Furthermore, the cut portion 11-4 and the cut portion 12-4 are provided in the same straight line. Furthermore, the cut portions 11-4 and 13-2 are parallel to each other. The cut portions 11-4 and 13-4 are perpendicular to each other. The cut portions 11-2 and 13-4 are parallel to each other, and the cut portions 11-2 and 12-2 are parallel to each other.

[0020]

As illustrated in Figs. 3 to 5, the plate-shaped element 6A includes a bending portion 31 located in a straight line connecting the beginning point of the cut portion 11 and the end point of the cut portion 12, and a bending portion 32 located in a straight line connecting the end point of the cut portion 13 and part of the cut portion 11 that is located between the beginning point and end thereof. The area Rg1 is surrounded by the cut portions 11 and 12 and the bending portion 31. The area Rg2 is surrounded by the cut portions 11 and 13 and the bending portion 32. It should be noted that as illustrated in Fig. 5, the part of the cut portion 11 that is located between the beginning point and end point thereof is located at a position P5. The position P5 is a position at which the cut portions 11-2 and 11-3 are continuous with each other. That is, the bending portion 31 is provided from the position P1 to the position P3, and the bending portion 32 is provided from the position P4 to the position P5. The grasp surface sf1 is formed along the bending portion 32, and the grasp surface sf2 is formed along the bending portion 31. The bending portion 31 corresponds to a first bending portion, and the bending portion 32 corresponds to a second bending portion. Furthermore, the grasp surface sf2 corresponds to a first grasp surface, and the grasp surface sf1 corresponds to a second grasp surface. It is preferable that parts of the plate-shaped element 6A where the bending portions 31 and 32 be formed to have, for example, a small thickness such that the bending portions 31 and 32 can be easily bent.

[0021]

Fig. 6 is a top view of the cut portion 8A. The cut portion 8A will be described with reference to Figs. 6 and Figs. 3 and 4 referred to above. The cut portion 8A is formed in a peripheral area of an area Rg3 of the plate-shaped element 6A. The area Rg3 corresponds to a third area. Furthermore, the cut portion 8A corresponds to a

fourth cut portion. A plate element 23A is provided in the area Rg3. The cut portion 8A is a linear through hole. The plate-shaped element 6A includes a bending portion 33A located in a straight line connecting both end points of the cut portion 8A. The bending portion 33A corresponds to a third bending portion. The area Rg3 is
5 surrounded by the cut portion 8A and the bending portion 33A. The bending portion 33A is provided in parallel to the bending portion 31. One of the end points of the cut portion 8A is located at a position P6, and the other end point of the cut portion 8A is located at a position P7. The cut portion 8A is formed as a perforated portion. To be more specific, piece portions 23A1 are provided at the plate-shaped element 6A, and
10 the cut portion 8A is formed to have discontinuous portions between both end points of the cut portion 8A.

[0022]

Where an imaginary line that divides the area of the plate-shaped element 6A into two equal areas and that is parallel to a first edge portion 6A1 and a second edge
15 portion 6A2 is an area division line DL, and of the areas into which the area of the plate-shaped element 6A is divided by the area division line DL, an area where the first edge portion 6A1 is located is a first divided area D1, and an area where the second edge portion 6A2 is located is a second divided area D2, the first divided area D1 includes the areas Rg1, Rg2, and Rg3, and the distance between the area Rg3 and the first edge
20 portion 6A1 is greater than that between the area Rg1 and the first edge portion 6A1.

[0023]

Fig. 7 is a top view of the cut portion 9A. The cut portion 9A will be described with reference to Fig. 7 and Figs. 3 and 4 referred to above. The cut portion 9A is formed in a peripheral area of an area Rg4 of the plate-shaped element 6A. A plate
25 element 24A is provided in the area Rg4. The cut portion 9A is a linear through hole. The plate-shaped element 6A includes a bending portion 34A located in a straight line connecting both end points of the cut portion 9A. The area Rg4 is surrounded by the cut portion 9A and the bending portion 34A. One of the end points of the cut portion 9A is located at a position P9, and the other end point of the cut portion 9A is located at a
30 position P10. The cut portion 9A is formed as perforated portions. That is, piece

portions 24A1 are provided at the plate-shaped element 6A, and the cut portion 9A is formed to have discontinuous portions between both end points of the cut portion 9A. The area Rg4 is included in the second divided area D2.

[0024]

5 It should be noted that the cut portions 10A and 10B are symmetrical with respect to a straight line that divides the first edge portion 6A1 into two equal parts and extends parallel to the Y direction. Similarly, the cut portions 8A and 8B are symmetrical with respect to the straight line that divides the first edge portion 6A1 into two equal parts and extends parallel to the Y direction. Also, the cut portions 9A and 9B are
10 symmetrical with respect to the straight line that divides the first edge portion 6A1 into two equal parts and extends parallel to the Y direction. Therefore, the cut portion 10B is a structural element corresponding to the first cut portion, the second cut portion, the third cut portion, the first bending portion, and the second bending portion. The cut portion 8B is a structural element corresponding to the fourth cut portion. The cut
15 portion 9B is a structural element corresponding to a fifth cut portion.

[0025]

<Operation in Embodiment 1>

Fig. 8 is a perspective view illustrating a state in which the plate element 21 is bent at the bending portion 31. A carrier can form an opening Op1 in the plate-shaped
20 element 6A by bending the plate element 21 at the bending portion 31. The carrier can insert his or her hand or fingers into the opening Op1 and hold the packing material 100. In such a manner, the carrier can form a grip in the packing material 100 by bending the plate element 21 at the bending portion 31. Furthermore, when the carrier carries the packing material 100, with his or her hand or fingers inserted in the opening Op1, his or
25 her hand or fingers are in contact not only with the bending portion 31, but with the plate element 21. At this time, the plate element 21 and the grasp surface sf2 are in contact with each other. Therefore, when the carrier carries the packing material 100, with his or her hand or fingers inserted in the opening Op1, the weight of the packing material 100 is distributed on the bending portion 31 and the grasp surface sf2, that is, it is
30 distributed on the plate-shaped element 6A and the cushioning material 6C1.

[0026]

Fig. 9 is a perspective view illustrating a state in which the plate element 22 is bent at the bending portion 32. The carrier can form an opening Op2 in the plate-shaped element 6A by bending the plate element 22 at the bending portion 32. The carrier can insert his or her hand or fingers in the opening Op2. In such a manner, the carrier can form a grip in the packing material 100 by bending the plate element 22 at the bending portion 32. Furthermore, when the carrier carries the packing material 100, with his or her hand or fingers inserted in the opening Op2, his or her hand or fingers are in contact not only with the bending portion 32, but with the plate element 22. At this time, the plate element 22 and the grasp surface sf1 are in contact with each other. Therefore, when the carrier carries the packing material 100, with his or her hand or fingers inserted in the opening Op2, the weight of the packing material 100 is distributed on the bending portion 32 and the grasp surface sf1, that is, it is distributed on the plate-shaped element 6A and the cushioning material 6C1.

[0027]

Fig. 10 is a perspective view illustrating a state in which the plate element 21 and the plate element 22 are bent. The carrier may bend the plate element 21 at the bending portion 31, and bend the plate element 22 at the bending portion 32. In the state illustrated in Fig. 10, two grips are formed at the packing material 100.

[0028]

Fig. 11 schematically illustrates a state in which a carrier hm1 and a carrier hm2 carry the packing material 100. Fig. 12 is an explanatory diagram indicating holding positions at which the carrier hm1 holds the packing material 100 in the state illustrated in Fig. 11. It should be noted that as illustrated in Fig. 11, the distance between the center of gravity of the packing material 100 and a floor surface in a height direction is H1, and the distance between the cut portion 10A and the cut portion 10B and the floor surface in the height direction is h1. The carrier hm1 forms grips at the cut portion 10A and the cut portion 10B, and holds a lower portion of the packing material 100. In a state illustrated in Fig. 12, the opening Op1 is formed at the cut portion 10A. The carrier hm2 holds an upper portion of the packing material 100. It should be noted that

the frame element 6B1 is shorter than the frame element 6B2. Furthermore, the frame element 6B1 is located on a front side of the refrigerator, and the frame element 6B2 is located on a lateral side of the refrigerator. Referring to Fig. 12, the frame element 6B1 is located above the frame elements 6B2 and 6B4, and thus in the state illustrated in

5 Fig. 12, the back surface of the refrigerator faces the floor surface. In the state illustrated in Fig. 12, it is possible to easily secure space between the frame element 6B2 and a wall Wa, and also space between the frame element 6B4 and another wall Wa.

[0029]

10 Furthermore, in the state illustrated in Figs. 11 and 12, the cut portions 8A and 8B are located lower than the cut portions 10A and 10B. Thus, even if the carrier hm1 stretches his or her hands or fingers, the hands or fingers cannot easily reach the cut portions 8A and 8B. Therefore, in the state illustrated in Figs. 11 and 12, if the carrier hm1 holds the grips at the cut portions 8A and 8B, there is a possibility that the load on

15 the legs and loins of the carrier hm1 will be increased. Therefore, the carrier hm1 holds the grips at the cut portions 10A and 10B.

[0030]

Fig. 13 is an explanatory diagram of holding positions different from those in Fig. 12. Referring to Fig. 13, the carrier hm1 forms grips at the cut portions 9A and 10A, and holds a lower portion of the packing material 100. In the state illustrated in Fig. 13,

20 the opening Op2 is formed at the cut portion 10A. Although it is not illustrated, the carrier hm2 holds an upper portion of the packing material 100 as in the state illustrated in Fig. 11. In the state illustrated in Fig. 13, a side surface of the refrigerator faces the floor surface. The openings Op1 and Op2 can be both freely formed in the plate-

25 shaped element 6A, thus enabling the carrier to hold the packing material 100 in the state illustrated in Fig. 12 or in the state illustrated in Fig. 13.

[0031]

Fig. 14 schematically illustrates a state in which the carriers hm1 and hm2 carry the packing material 100 while the carrier hm2 stands at a lower position than the

30 carrier hm1. Fig. 15 is an explanatory diagram indicating holding positions of the

carrier hm1 in the state illustrated in Fig. 14. It is assumed that the state of the carriers hm1 and hm2 changes from the state illustrated in Fig. 11 to that illustrated in Fig. 14. It should be noted that as illustrated in Fig. 14, the distance between the center of gravity of the packing material 100 and the floor surface in the height direction is H2, which is greater than H1. Furthermore, the distance between the cut portions 8A and 8B and the floor surface in the height direction is h2, which is nearly equal to h1, and the distance between the cut portions 10A and 10B and the floor surface in the height direction is h3, which is greater than h1.

[0032]

As illustrated in Fig. 14, the carrier hm2 stands on the bed of a truck. In this state, the carrier hm2 stands at a higher position than the carrier hm1. Therefore, when the carrier hm2 tries to hold the packing material 100 from the bed of the truck, while maintaining an angle θ_1 of the packing material 100 that is indicated in Fig. 11, the carrier hm2 needs to bend his or her knees. Therefore, as illustrated in Fig. 14, the carriers hm1 and hm2 raise the packing material 100, as a result of which the angle of the packing material 100 is changed from the angle θ_1 of the packing material 100 as indicated in Fig. 11 to an angle θ_2 of the packing material 100 that is smaller than the angle θ_1 of the packing material 100.

[0033]

Furthermore, since the level of the center of gravity of the packing material 100 is changed to a higher level such that the distance H1 is changed to the distance H2, the level of the cut portions 10A and 10B is also changed to a higher level such that the distance h1 is changed to h3. Therefore, when the carrier hm1 holds the grips at the cut portions 10A and 10B, he or she must hold the packing material 100 while raising his or her upper arms upwards, thus increasing the load on the carrier. Accordingly, the carrier hm1 holds the grips at the cut portions 8A and 8B, not the grips at the cut portions 10A and 10B. That is, when the state illustrated in Fig. 11 is changed to the state illustrated in Fig. 14, the carrier hm1 changes the part to be held by his or her hands or fingers.

[0034]

<Advantages of Embodiment 1>

The cut portion 11 is formed in the peripheral area of the area Rg1 and the peripheral area of the area Rg2. That is, the areas Rg1 and Rg2 are provided opposite to each other, with the cut portion 11 interposed between the areas Rg1 and Rg2.

5 Therefore, in the packing material 100, strip-shaped corrugated cardboard is not present between the peripheral area of the area Rg1 and the peripheral area of the area Rg2. If the cut portion 11 were not interposed between the areas Rg1 and Rg2, and the areas Rg1 and Rg2 were separated from each other, strip-shaped corrugated cardboard could be present between the peripheral areas of the areas Rg1 and Rg2. It
10 should be noted that the smaller the distance between the peripheral areas of the areas Rg1 and Rg2, the thinner the strip-shaped corrugated cardboard. If the strip-shaped cardboard is thin, the strength of the packing material is reduced. In Embodiment 1, the areas Rg1 and Rg2 are provided opposite to each other, with the cut portion 11 interposed between the areas Rg1 and Rg2, whereby such strip-shaped cardboard is
15 not present. In such a manner, strip-shaped cardboard is not present in the packing material 100, and the decrease in the strength of the packing material 100 is thus reduced, while the packing material 100 has a grip structure that achieves the state illustrated in Fig. 12 at which the back surface of the refrigerator faces the floor surface, and a grip structure that achieves the state illustrated in Fig. 13 at which the side
20 surface of the refrigerator faces the floor surface.

[0035]

Before grips are formed at the packing material 100, the opening Op1 is not formed in the area Rg1, nor is the opening Op2 formed in the area Rg2. Thus, before grips are formed in the packing material 100, neither insects nor dust easily enters the
25 packing material 100.

[0036]

The cut portions 11 and 13 are perpendicular to each other at the position P2. It is therefore possible to prevent the openings Op1 and Op2 from being narrowed. The carrier can thus reliably insert his or her hands or fingers into the openings Op1 and
30 Op2. Furthermore, the cut portions 12 and 13 are perpendicular to each other at the

position P2. If the cut portions 12 and 13 are formed such that the angle between the cut portions 12 and 13 is obtuse, the opening area of the opening Op1 is reduced. By contrast, if the cut portions 12 and 13 are formed such that the angle between the cut portions 12 and 13 is acute, part of the plate-shaped element 6A that is sandwiched between the cut portions 12 and 13 is narrow. As a result, the strength of the plate-shaped element 6A is reduced. Since the cut portions 12 and 13 are perpendicular to each other at the position P2, it is possible to prevent the opening Op1 of the packing material 100 from being narrowed, and also reduce the decrease in the strength of the plate-shaped element 6A of the packing material 100.

[0037]

The plate-shaped element 6A includes the bending portion 31 as a portion at which the plate element 21 is bent, and the bending portion 32 as a portion at which the plate element 22 is bent. Therefore, even if the carrier bends the plate element 21 at the bending portion 31, the plate element 21 does not come off the plate-shaped element 6A, and also, even if the carrier bends the plate element 22 at the bending portion 32, the plate element 22 does not come off the plate-shaped element 6A. It is therefore possible to prevent the plate elements 21 and 22 from dropping on the floor surface, and thus also prevent them from being scattered on the floor surface.

[0038]

Although an advantage of the cut portion 10A is described above, the same advantage as described above regarding the cut portion 10A can be obtained by the cut portion 10B, since the cut portion 10B has the same configuration as the cut portion 10A.

[0039]

The packing material 100 includes the cushioning material 6C1 where the grasp surfaces sf1 and sf2 are provided. As illustrated in Fig. 8, in the case where the carrier holds the packing material 100, with his or her hand or fingers inserted in the opening Op1, the plate element 21 and the grasp surface sf2 are in contact with each other. Therefore, in the case where the carrier holds the packing material 100, with his or her hand or fingers inserted in the opening Op1, the weight of the packing material 100 is

distributed on the bending portion 31 and the grasp surface sf2, that is, it is distributed on the plate-shaped element 6A and the cushioning material 6C1. If the grasp surface sf2 is not formed at the cushioning material 6C1, the weight of the packing material 100 is supported only by the bending portion 31, that is, it is supported only by the plate-shaped element 6A. Thus, the plate-shaped element 6A may be torn when the carrier holds the packing material 100, although whether it is torn or not depends on the weight of an object to be packed. Furthermore, as another method, it can be conceived that a reinforcing wood having a function corresponding to that of the grasp surface sf2 is provided on the plate-shaped element 6A. However, in this method, since the reinforcing wood is provided in addition to the cushioning material 6C1, not only the manufacturing cost, but the amount of waste at the time of discarding the packing material is increased. In Embodiment 1, since the packing material 100 includes the cushioning material 6C1 where the grasp surfaces sf1 and sf2 are provided, the probability that the plate-shaped element 6A will be torn can be reduced, and the manufacturing cost and the amount of waste are not increased. It should be noted that the cushioning material 6C2 has the same configuration as the cushioning material 6C1, and can thus the same advantage as the cushioning material 6C1 described above.

[0040]

As illustrated in Fig. 3, the first divided area D1 includes the areas Rg1, Rg2, and Rg3. Furthermore, the distance between the area Rg3 and the first edge portion 6A1 is greater than that between the area Rg1 and the first edge portion 6A1. The carrier can form grips at both the areas Rg1 and Rg3. In the case of carrying the packing material 100 in the state illustrated in Fig. 11, the carrier can hold the grip at the area Rg1, and in the case of carrying the packing material 100 in the state illustrated in Fig. 14, the carrier can hold the grip at the area Rg3. In such a manner, the carrier can change the grip to be held between an upper one of the grips of the packing material 100 and a lower one of the grips thereof, and the workload on the carrier holding the packing material 100 is reduced. It should be noted that although the above description refers to the advantages of the cut portions 10A and 8A, the cut portions 10B and 8B can also obtain the same advantages as the cut portions 10A and 10B,

since the cut portions 10B and 8B have the same configuration as the cut portions 10A and 8A, respectively.

[0041]

<Modification 1>

5 Fig. 16 is an explanatory diagram of a packing material 100 according to Modification 1. A cut portion 10AA of the packing material according to Modification 2 is formed as a perforated portion. To be more specific, piece portions 10A1 are formed at the plate-shaped element 6A, and the cut portion 10AA is formed to have discontinuous portions between both end points of the cut portion 10AA. The packing
10 material 100 according to Modification 1 can obtain the same advantages as the packing material 100 according to embodiment 1.

[0042]

<Modification 2>

15 Fig. 17 is an explanatory diagram of a packing material 100 according to Modification 2. Cut portions 510 are formed at an outer packing material 500 of the packing material according to Modification 2. More specifically, the outer packing material 500 includes a first surface 500A and a second surface 500B parallel to the first surface 500A, and the cut portions 510 are formed at the first surface 500A and the second surface 500B. The cut portions 510 have the same configuration as the cut
20 portion 10A as described regarding Embodiment 1. The packing material according to Modification 2 can obtain the same advantages as that according to Embodiment 1.

[0043]

Embodiment 2

25 In Embodiment 2, components that are the same as those in Embodiment 1 will be denoted by the same reference signs, and their descriptions will thus be omitted. Embodiment 2 will be described by referring mainly to the differences between Embodiments 1 and 2.

[0044]

<Construction in Embodiment 2>

30 Fig. 18 is a top view of a bottom case 206 provided at the packing material

according to Embodiment 2. Fig. 19 is a top view of a cut portion 210A. As illustrated in Fig. 18, the cut portion 210A and a cut portion 210B are formed at the bottom case 206. The cut portions 210A and 210B are symmetrically formed, and thus in the following, only the cut portion 210A is described. As illustrated in Fig. 19, the cut portion 210A includes a cut portion 11b that is a linear through hole, a cut portion 12b that is a linear through hole, and the cut portion 13 as described above regarding Embodiment 1. The cut portions 11b, 12b, and 13 are formed in the peripheral area of the area Rg1 of the plate-shaped element 6A. The cut portion 11b includes an end point and a beginning point that as illustrated in Fig. 19, are located at positions P1b and P2, respectively. The cut portion 12 includes an end point and a beginning point that as illustrated in Fig. 19, are located at positions P3b and P2, respectively.

[0045]

The cut portion 11b includes a cut portion 11b-1 that linearly extends and a cut portion 11b-2 that linearly extends and is continuous with the cut portion 11b-1.

Furthermore, the cut portion 11b includes a cut portion 11b-3 that is curved and continuous with the cut portion 11b-2, and a cut portion 11b-4 that linearly extends and is continuous with the cut portion 11b-3. The cut portion 12 includes a cut portion 12b-1 that linearly extends, a cut portion 12b-2 that is curved and continuous with the cut portion 12b-1, and a cut portion 12b-3 that linearly extends and is continuous with the cut portion 12b-2. The cut portion 12b-3 is longer than the cut portion 11b-4. Furthermore, the cut portions 11b-4 and 12b-3 are located in the same straight line. Furthermore, the cut portions 11b-4 and 11b-1 are parallel to each other, and the cut portions 11b-4 and 13-2 are also parallel to each other. The cut portions 11b-4 and 13-4 are perpendicular to each other. The cut portions 11b-2 and 13-4 are parallel to each other, and the cut portions 11b-2 and 12b-1 are parallel to each other.

[0046]

The plate-shaped element 6A includes a bending portion 31b located in a straight line connecting the end point of the cut portion 11b and the end point of the cut portion 12b, and the bending portion 32 located in a straight line connecting the end point of the cut portion 13 and part of the cut portion 11b that is located between the beginning point

and the end thereof. The area Rg1 is surrounded by the cut portions 11b and 12b and the bending portion 31b. The area Rg2 is surrounded by the cut portions 11b and 13 and the bending portion 32. Furthermore, the plate-shaped element 6A includes a bending portion 21b1 located in a straight line connecting the beginning point and the end point of the cut portion 11b. The bending portion 21b1 corresponds to a fourth bending portion. Preferably, part of a plate element 21b where the bending portion 21b1 is located should be formed, for example, thin, such that it can be easily bent. Furthermore, a folding line may be formed at the part of the plate element 21b where the bending portion 21b1 is located.

[0047]

<Operation in Embodiment 2>

Fig. 20 is a perspective view illustrating a state in which the plate element 21b is bent at the bending portion 31b. The carrier can form an opening Op21 in the plate-shaped element 6A by bending the plate element 21b at the bending portion 31b. The carrier can insert his hand or fingers into the opening Op21 and then hold the packing material. In such a manner, the carrier can form a grip at the packing material by bending the plate element 21b at the bending portion 31b.

[0048]

Fig. 21 is a perspective view illustrating a state in which the plate element 22 is bent at the bending portion 32, and the plate element 21b is bent at the bending portion 21b1. The carrier can form in the plate-shaped element 6A, an opening Op22 whose area is larger than that of the opening Op2, by bending the plate element 22 at the bending portion 32 and further bending the plate element 21b at the bending portion 21b1. The carrier can insert his or her hand or fingers into the opening Op22 and hold the packing material. In such a manner, the carrier can form a grip in the packing material by bending the plate element 22 at the bending portion 32 and further bending the plate element 21b at the bending portion 21b1.

[0049]

<Advantages of Embodiment 2>

In Embodiment 2, it is possible to obtain the same advantages as that according

to Embodiment 1 and further the following advantages. It should be noted that in the area Rg1, the bending portion 21b1 is provided. Therefore, the carrier can increase the area of the opening through which the carrier inserts his or her hand or fingers into the plate-shaped element 6A, by bending the plate element 21b at the bending portion 21b1, even if the carrier does not bend the plate element 21b at the bending portion 31b. The length of the bending portion 21b1 is smaller than that of the bending portion 31b. Therefore, the force required to bend the plate element 21b at the bending portion 21b1 is smaller than that required to bend the plate element 21b at the bending portion 31b. Therefore, in Embodiment 2, the carrier can easily increase the area of the opening through which the carrier inserts his or her hand or fingers into the plate-shaped element 6A.

[0050]

Embodiment 3

In Embodiment 3, components that are the same as or similar to those regarding Embodiments 1 and 2 will be denoted by the same reference signs, and Embodiment 3 will be described by referring mainly to the differences between Embodiment 3 and Embodiments 1 and 2.

[0051]

<Configuration in Embodiment 3>

Fig. 22 is a top view of a bottom case 306 provided at a packing material according to Embodiment 3. Fig. 23 is a top view of a cut portion 310A. As illustrated in Fig. 22, the cut portion 310A and a cut portion 310B are formed at the bottom case 306. The cut portions 310A and 310B are symmetrically formed. Thus, in the following descriptions, only the cut portion 310A will be described. As illustrated in Fig. 19, the cut portion 310A includes a cut portion 11c that is a linear through hole, the cut portion 12b as described in Embodiment 2, and the cut portion 13 as described regarding Embodiments 1 and 2. Unlike the cut portion 11b described regarding Embodiment 2, the cut portion 11c does not include the cut portion 11b-1. Therefore, an end point of the cut portion 11c is located at a position P1c. Furthermore, in the area Rg1, a cut portion 15 is formed to linearly extend from a beginning point of the cut

portion 11c to a bending portion 31c. The cut portion 15 corresponds to a fifth cut portion. The cut portion 15 linearly extends from the position p2 to the bending portion 31c. The cut portions 15 and 13 are provided in a same straight line. The cut portion 15 is perpendicular to the cut portions 11b-4 and 12b-3. Also, the cut portion 15 is parallel to the cut portions 11b-2 and 12b-1.

[0052]

The plate element 21c is divided into two by the cut portion 15. That is, the plate element 21c includes a plate element 21c1 where the cut portions 12b and 15 are provided at a peripheral portion of the plate element 21c1, and a plate element 21c2 where the cut portion 12c and the cut portion 15 are provided at a peripheral portion of the plate element 21c2.

[0053]

<Operation in Embodiment 3>

Fig. 24 is a perspective view illustrating a state in which the plate element 21 is bent at the bending portion 31c. The carrier can form an opening Op31 in the plate-shaped element 6A by bending the plate element 21c at the bending portion 31c. The carrier can insert his or her hand or fingers into the opening Op31 and hold the packing material. In such a manner, the carrier can form a grip in the packing material by bending the plate element 21c at the bending portion 31c.

[0054]

Fig. 25 is a perspective view illustrating a state in which the plate element 21c2 is bent at the bending portion 31c, and the plate element 22 is bent at the bending portion 32. The carrier can form in the plate-shaped element 6A, an opening Op32 whose area is larger than the opening Op2, by bending the plate element 22 at the bending portion 32 and further bending the plate element 21c2 at the bending portion 31c. The carrier can insert his or her hand or fingers in the opening Op32 and hold the packing material. In such a manner, the carrier can form a grip in the packing material by bending the plate element 22 at the bending portion 32 and further bending the plate element 21c2 at the bending portion 31c.

[0055]

<Advantages of Embodiment 3>

In Embodiment 3, it is possible to obtain the same+ advantages as in Embodiments 1 and 2.

Reference Signs List

5 [0056]
1 object to be packed, 2 outer packing material, 2A band, 2B cut
portion, 3 cushioning material, 6 bottom case, 6A plate-shaped element,
6A1 first edge portion, 6A2 second edge portion, 6B frame element,
6B1 frame element, 6B2 frame element, 6B3 frame element, 6B4
10 frame element, 6C1 cushioning material, 6C2 cushioning material, 8A
cut portion, 8B cut portion, 9A cut portion, 9B cut portion, 10A cut portion,
10A1 piece portion, 10AA cut portion, 10B cut portion, 11 cut
portion, 11-1 cut portion, 11-2 cut portion, 11-3 cut portion, 11-4
cut portion, 11b cut portion, 11b-1 cut portion, 11b-2 cut portion, 11b-3
15 cut portion, 11b-4 cut portion, 11c cut portion, 12 cut portion, 12-1 cut
portion, 12-2 cut portion, 12-3 cut portion, 12-4 cut portion, 12b cut
portion, 12b-1 cut portion, 12b-2 cut portion, 12b-3 cut portion,
12c cut portion, 13 cut portion, 13-1 cut portion, 13-2 cut portion,
13-3 cut portion, 13-4 cut portion, 15 cut portion, 21 plate element,
20 21b plate element, 21b1 bending portion, 21c plate element,
21c1 plate element, 21c2 plate element, 22 plate element, 23A
plate element, 23A1 piece portion, 24A plate element, 24A1 piece
portion, 31 bending portion, 31b bending portion, 31c bending portion,
32 bending portion, 33A bending portion, 34A bending portion, 41A
25 recessed portion, 41B recessed portion, 42A recessed portion, 42B recessed
portion, 43A recessed portion, 43B recessed portion, 100 packing material,
206 bottom case, 210A cut portion, 210B cut portion, 306
bottom case, 310A cut portion, 310B cut portion, 500 outer
packing material, 500A first surface, 500B second surface, 510 cut portion,
30 D1 first divided area, D2 second divided area, DL area division line,

Op1 opening, Op2 opening, Op21 opening, Op22 opening,
Op31 opening, Op32 opening, Rg1 area, Rg2 area, Rg3 area,
Rg4 area, Wa wall, hm1 carrier, hm2 carrier, sf1 grasp surface,
sf2 grasp surface, $\theta 1$ angle, $\theta 2$ angle

CLAIMS

[Claim 1]

Packing material comprising:

5 a plate-shaped element formed of corrugated cardboard and including a first area and a second area where respective grips are allowed to be freely formed, the second area being different from the first area,

10 wherein the plate-shaped element includes a first cut portion, a second cut portion and a third cut portion, the first cut portion linearly extending from a beginning point to a first end point, the second cut portion linearly extending from the beginning point to a second end point, the third cut portion linearly extending from the beginning point to a third end point,

wherein the first cut portion and the second cut portion are formed in a peripheral area of the first area,

15 wherein the first cut portion and the third cut portion are formed in a peripheral area of the second area, and

wherein the plate-shaped element is provided with a fourth bending portion located in a straight line connecting the beginning point of the first cut portion and the first end point of the first cut portion.

[Claim 2]

20 The packing material of claim 1, wherein

the first cut portion and the third cut portion are perpendicular to each other at the beginning point, and

the second cut portion and the third cut portion are perpendicular to each other at the beginning point.

[Claim 3]

25 The packing material of claim 1 or 2, wherein the plate-shaped element is provided with a first bending portion located in a straight line connecting the first end point of the first cut portion and the second end point of the second cut portion, and a second bending portion located in a straight line connecting the third end point of the third cut portion and part of the first cut portion that is located between the beginning
30

point and the first end point.

[Claim 4]

The packing material of claim 3, further comprising a cushioning material provided on the plate-shaped element,

5 wherein the cushioning material includes a first grasp surface formed along the first bending portion, and a second grasp surface formed along the second bending portion.

[Claim 5]

The packing material of claim 3 or 4, wherein

10 the plate-shaped element further includes a third area where a grip is allowed to be freely formed, the third area being different from the first area and the second area,

the third area includes, in a peripheral area of the third area, a fourth cut portion that linearly extends and has end points, and a third bending portion that is
15 located in a straight line connecting the end points of the fourth cut portion,

the third bending portion is located in parallel to the first bending portion,

the plate-shaped element is formed in a shape of a quadrate including a first edge portion and a second edge portion parallel to the first edge portion, and

where an imaginary line that divides an area of the plate-shaped element into
20 two equal areas and that is parallel to the first edge portion and the second edge portion is an area division line, and of the areas into which the area of the plate-shaped element is divided by the area division line, an area where the first edge portion is located is a first divided area, and an area where the second edge portion is located is a second divided area, the first divided area includes the first area, the
25 second area, and the third area, and the distance between the third area and the first edge portion is greater than that between the first area and the first edge portion.

[Claim 6]

The packing material of any one of claims 3 to 5, wherein the plate-shaped element includes a fifth cut portion that linearly extends from the beginning point of
30 the first cut portion to the first bending portion.