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

(11) EP 3 643 642 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.04.2020 Bulletin 2020/18

(51) Int Cl.:
B65D 88/16 *(2006.01)*

(21) Application number: **18202989.2**

(22) Date of filing: **26.10.2018**

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

(71) Applicant: **Young Woo Ind Co., Ltd.**
Miryang-si, Gyeongsangnam-do 50453 (KR)

(72) Inventors:
- **CHOI, Yong Deok**
  50569 Yangsan-si (KR)
- **LEE, Jun Sik**
  50657 Yangsan-si (KR)

(74) Representative: **Beck & Rössig**
European Patent Attorneys
Cuvilliésstraße 14
81679 München (DE)

(54) PACKAGING BAG

(57) The present disclosure provides a packaging bag, in which the contents are accommodated to maintain a stable upright state and accommodate a maximum load in a packaging bag having the same size when accommodating the contents and to have improved stability when being stacked in multiple layers for loading, and the packaging bag includes a plurality of sidewalls provided to form an inner space of a quadrangular cross-section and each having both neighboring end edges connected to each other, each having an upper width and a lower width formed to be greater than a center width to form an area decreasing part at a center portion of both end edges, and each having a center portion of a lower end edge which is inwardly curved; a cover connected to an upper end portion of each of the sidewalls; and a bottom part connected to a lower end portion of each of the sidewalls, and in which a center portion of an outer end portion corresponding to the lower end edge of each of the sidewalls is inwardly curved.

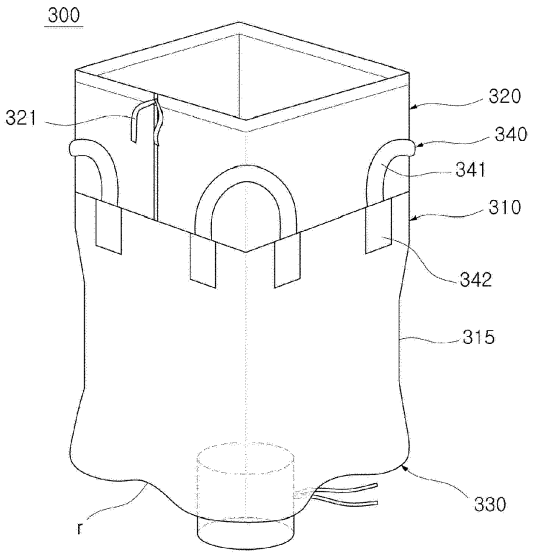

Fig. 4

EP 3 643 642 A1

Description

BACKGROUND

1. Field of the Invention

[0001] The present disclosure relates to a packaging bag, and more specifically, to a packaging bag configured to maintain a stable upright state to accommodate a maximum load in a packaging bag having the same size when accommodating the contents and having improved stability when being multiply stacked for loading.

2. Discussion of Related Art

[0002] Generally, a packaging bag also refers to a flexible intermediate bulk container (FIBC) and means an industrial sack configured to store granular materials such as a grain or synthetic resin material for transportation and keeping. The packaging bag is formed to be capable of conveniently storing and withdrawing the granular materials using a flexible material.

[0003] In this case, the packaging bag stores 500 kg to 2,000 kg of the contents such as chemicals, a mineral, a grain, a synthetic resin granular material, cement, or the like. Further, the packaging bag in which the contents are accommodated is carried by a crane, a hoist forklift, or the like to be kept in a warehouse or loaded in a truck to be transported.

[0004] Meanwhile, since international transaction is recently becoming active, traffic increases. Further, demands for a packaging bag which is stable and capable of maximizing space efficiency for reducing transportation costs and storage costs in a case of being transported by a truck or transportation vehicle or in a case of being loaded in the warehouse are increasing.

[0005] FIGS. 1 and 2 are perspective views illustrating conventional packaging bags 100 and 200, and FIG. 3 is an exemplary view illustrating a bottom part in a state in which the contents are accommodated in the conventional packaging bag.

[0006] As shown in FIGS. 1 to 3, conventional packaging bags 100 and 200 each include sidewalls 110 and 210 forming inner surfaces in which the contents are accommodated, covers 120 and 220 each configured to selectively open or close upper parts of the sidewalls 110 and 210, and bottom parts 130 and 230 each configured to selectively open or close lower parts of the sidewalls 110 and 210. Further, ring parts 140 and 240 formed from a rope or belt for transportation are each formed on upper circumferences of the sidewalls 110 and 210.

[0007] Here, the sidewalls 110 and 210 are sealed to form a cylinder or quadrangular pillar when the contents are accommodated.

[0008] Specifically, the packaging bag 100 in which the sidewalls 110 are sealed in a cylindrical shape may accommodate a great deal of contents. However, since a plurality of packaging bags 100 are not close to each other when being kept in a container box or a warehouse, available spaces are formed and porosity increases, and thus space efficiency decreases.

[0009] However, in a case of the packaging bag 200 in which the sidewalls 210 are sealed in a quadrangular pillar shape, since porosity between packaging bags decreases when being loaded in a truck or kept in a warehouse, the packaging bag 200 has greater space efficiency than that of the packaging bag 100.

[0010] However, when contents greater than or equal to a predetermined amount are accommodated in the quadrangular pillar-shaped packaging bag 200, a swell phenomenon occurs in which center portions of the sidewalls 210 protrude toward the outside due to a self-weight of the contents. That is, as shown in FIG. 3, a pressure of the contents is applied to the center portions of the sidewalls 210. Accordingly, since the contents fill the quadrangular pillar-shaped packaging bag 200, in order to have an entirely circular shape to secure a maximum area without a change in total length, the swell phenomenon occurs in a shape of a quadrangular cross-section of each of the sidewalls 210 of the quadrangular pillar-shaped packaging bag 200.

[0011] Accordingly, the packaging bag 200 are not close to a neighboring packaging bag even when formed in the quadrangular pillar shape, and thus the packaging bag 200 cannot overcome a problem in which space efficiency decreases due to a gap.

[0012] Further, when the packaging bags 200 are stacked in multiple layers to be loaded, loads of the packaging bags 200 are dispersed to a protruding part 211 of the sidewalls 210. Accordingly, since the loads cannot be concentrated toward the bottom part 230, the packaging bags 200 cannot be stably stacked. Accordingly, when the packaging bags 200 fall down, workers are severely injured, or the contents accommodated therein are damaged or lost by pouring.

[0013] Accordingly, a method of forming a reinforcing part in a vertical direction or a lateral direction of each of the sidewalls 210 is suggested to solve a problem in which stacking in multiple layers is impossible due to the swell phenomenon and thus a limited space cannot be efficiently used. However, durability of a product is sharply reduced due to an occurrence of a situation in which a close part of the reinforcing part is torn due to concentration of the load, and manufacturing costs increase due to forming the reinforcing part.

[0014] Further, a method of sewing a partition configured to connect inner side surfaces of the sidewalls 210 to reduce the swell phenomenon of the sidewalls is suggested. However, there is a problem that foreign substances generated during a manufacturing process of the partition are mixed with the contents, or an inside skin configured to protect the contents is unusable due to the partition. Further, there is a problem that a connection part of the partition is easily damaged and thus stacking stability is reduced when loading in multiple layers. In addition, since components increase in a manufacturing

process of the packaging bag 200, there is a problem that the number of manufacturing processes and manufacturing costs increase and thus productivity decreases.

SUMMARY OF THE INVENTION

[0015] The present disclosure is directed to a packaging bag configured to maintain a stable upright state to accommodate a maximum load in a packaging bag having the same size when accommodating the contents and having improved stability when being stacked in multiple layers for loading.

[0016] The present disclosure provides a packaging bag, in which the contents are accommodated and including a plurality of sidewalls provided to form an inner space of a quadrangular cross-section and each having both neighboring end edges connected to each other, each having an upper width and a lower width formed to be greater than a center width to form an area decreasing part at a center portion of both end edges, and each having a center portion of a lower end edge which is inwardly curved; a cover connected to an upper end portion of each of the sidewalls; and a bottom part connected to a lower end portion of each of the sidewalls, and in which a center portion of an outer end portion corresponding to the lower end edge of each of the sidewalls is inwardly curved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The above and other objects, features and advantages of the present disclosure will become more apparent to those of ordinary skill in the art by describing in detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

FIGS. 1 and 2 are perspective views illustrating conventional packaging bags;

FIG. 3 is an exemplary view illustrating a state in which a pressure due to a load is applied when the contents are accommodated in the conventional packaging bag;

FIG. 4 is a perspective view illustrating a packaging bag according to an embodiment of the present disclosure;

FIG. 5 is an exploded view illustrating the packaging bag according to the embodiment of the present disclosure;

FIG. 6 is a front view illustrating a state in which the contents are accommodated in the packaging bag according to the embodiment of the present disclosure;

FIG. 7 is an exemplary view illustrating a state in which a pressure due to a load is applied when the contents are accommodated in the packaging bag according to the embodiment of the present disclosure;

FIGS. 8A and 8B are exemplary views illustrating a bottom part in the packaging bag according to the embodiment of the present disclosure; and

FIG. 9 is an exemplary view illustrating a porosity difference between the packaging bag according to the embodiment of the present disclosure and the conventional packaging bag when being stacked in the state in which the contents are accommodated in the packaging bag according to the embodiment of the present disclosure.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0018] Hereinafter, a packaging bag according to an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings.

[0019] FIG. 4 is a perspective view illustrating a packaging bag according to an embodiment of the present disclosure, and FIG. 5 is an exploded view illustrating the packaging bag according to the embodiment of the present disclosure. Further, FIG. 6 is an exemplary view illustrating sidewalls in a state in which the contents are accommodated in the packaging bag according to the embodiment of the present disclosure, and FIG. 7 is an exemplary view illustrating a bottom part the state in which the contents are accommodated in the packaging bag according to the embodiment of the present disclosure. In addition, FIGS. 8A and 8B are exemplary views illustrating a bottom part in the packaging bag according to the embodiment of the present disclosure, and FIG. 9 is an exemplary view illustrating a porosity difference between the packaging bag according to the embodiment of the present disclosure and the conventional packaging bag when being stacked in the state in which the contents are accommodated in the packaging bag according to the embodiment of the present disclosure.

[0020] As shown in FIGS. 4 to 9, a packaging bag 300 according to the embodiment of the present disclosure includes sidewalls 310, a cover 320, and a bottom part 330.

[0021] Here, the packaging bag 300 may be manufactured using a flexible material. Accordingly, the packaging bag 300 may be folded to minimize a volume thereof and be kept when the contents are not accommodated therein. Further, an appearance of the packaging bag 300 may be easily changed to be filled with a great deal of contents when the contents are accommodated in a limited space.

[0022] In this case, the packaging bag 300 may be woven with a natural fiber material or a synthetic resin material such as polyvinyl chloride (PVC), polypropylene (PP), polyethylene (PE), or the like. Accordingly, the packaging bag 300 may be formed with a strength capable of maintaining an outer shape and preventing damage due to an external force. Further, an inner liner (not shown) manufactured using waterproof synthetic resin or the like may be provided in the packaging bag 300 to be used together as necessary. Accordingly, the contents

may be prevented from leakage or loss through a gap of a connection part between the sidewalls 310 when having a minute particle shape such as a granular material. Further, since contamination of the contents due to introduction of foreign substances through the gap of the connection part may be prevented, storage efficiency may be further improved.

[0023] Meanwhile, a plurality of sidewalls 310 are provided to form an inner space in which the contents are accommodated. Further, as shown in FIG. 5, the sidewalls 310 may be formed as four sidewalls 310A, 310B, 310C, and 310D to form a cross-section of the inner space as a quadrangular shape. Both neighboring end edges of the sidewalls 310 are connected to each other, and accordingly, a body part having a quadrangular shape of which vertical sides are open may be formed. Here, the cross-section having a quadrangular shape may be understood to be a rectangle or square in which angles formed by end portions of four sides connected to each other are orthogonal.

[0024] Of course, the sidewall 310 may be provided as a sheet of sidewall having a lateral width corresponding to a circumference of the inner space and may be formed as the body part by connecting both end edges thereof to each other.

[0025] Further, the cover 320 may be connected to upper end portions of the sidewalls 310. In addition, the bottom part 330 may be connected to lower end portions of the sidewalls 310. Here, the cover 320 is open so that the contents may be accommodated in the inner space, and an insertion part closeable after an accommodation process of the contents is completed may be formed. Further, a discharge part which closes the inner space and is open when discharging the contents may be formed in the bottom part 330.

[0026] In addition, referring to FIGS. 5 and 6, each of the sidewalls 310 may have an upper width A and a lower width C formed to be greater than a center portion width B, and thus area decreasing parts 315 are formed at center portions of the both end edges. Further, an upper part 311 a and a lower part 311c of each of the sidewalls 310 may be connected to the area decreasing part 315 to be sloped. Accordingly, a center cross-sectional area may be formed to be narrower than an upper cross-sectional area and a lower cross-sectional area of the inner space.

[0027] Specifically, a first expansion part 313 upwardly expanded from an upper end of the area decreasing part 315 to both sides may be formed on both ends of the upper part 311a of each of the sidewalls 310. Further, a second expansion part 314 expanded downward from a lower end of the area decreasing part 315 to both sides may be formed on both ends of the lower part 311c of each of the sidewalls 310. Here, the first expansion part 313 and the second expansion part 314 may be connected to each other by the area decreasing part 315 and grade extension parts 316a and 316b.

[0028] In this case, each of the first expansion part 313, the second expansion part 314, the area decreasing part 315, and the grade extension parts 316a and 316b configured to connect the above may be formed in a straight shape corresponding to a predetermined angle to be sloped. Further, the grade extension parts 316a and 316b may each be formed in a curved shape to connect the first expansion part 313 and the area decreasing part 315 and connect the second expansion part 314 and the area decreasing part 315.

[0029] As described above, the inner space may be formed in an hourglass shape having relatively broader upper and lower cross-sectional areas and a center cross-sectional area which becomes narrower. Accordingly, a swell phenomenon in which the center portion is further expanded to the outside may be prevented even when the sidewalls 310 expand to the outside by the load of the contents.

[0030] Specifically, in a case of a general packaging bag, the contents are stacked from a center of the bottom part 330 when the contents are accommodated in the inner space. Further, the contents stacked over a predetermined height flow to the sidewalls 310. In this case, since the general packaging bag is formed of a flexible material which is usually changeable, the general packaging bag is elastically deformed to maintain a predetermined surface area and have a maximum volume when the contents are accommodated. Accordingly, the swell phenomenon occurs in a center portion of each of the sidewalls 310 in order to have an entirely circular shape to secure a maximum area without a change in total length. Here, in the case of an upper side and a lower side of each of the sidewalls 310, expansion is relatively limited because of connection to the cover 320 and the bottom part 330. However, the center portion of each of the sidewalls 310 has relatively greater expansivity due to the load of the contents.

[0031] In this case, in the packaging bag 300 according to the present disclosure, since the area decreasing part 315 is formed in the center portion of each of the sidewalls 310, a center portion 311b is already formed in a shape narrower than the upper part 311 a and the lower part 311c. Accordingly, an expanded width is offset because the area decreasing part 315 is inwardly inserted even when the center portion 311b of each of the sidewalls 310 is expanded, and thus the swell phenomenon may be minimized.

[0032] Further, in each of the sidewalls 310, a lower cross-sectional area is formed to be greater than that of the center portion. Accordingly, since the load of the contents may be stably supported by the broad lower side when the contents are accommodated, upright propertiesmay be significantly improved.

[0033] In addition, the total load of the contents accommodated in the inner space is dispersedly supported toward the broad lower side rather than the relatively narrow center portion along both end edges of the sidewalls 310. Accordingly, the packaging bag 300 with the contents filled therein may maintain an upright state without collapsing even when lengths of the sidewalls 310 are

elongated in comparison with a conventional case.

[0034] Here, the upper width A of each of the sidewalls 310 including the first expansion part 313 and the lower width C of each of the sidewalls 310 including the second expansion part 314 may be formed to have lengths corresponding to each other. Further, each of the sidewalls 310 may have the lower width C set to be greater than the upper width B. That is, in the present disclosure, a center width B of each of the sidewalls 310 is formed to be smaller than the upper width A and the lower width C, and the lower width C may be formed to have a width corresponding to or greater than that of the upper width A.

[0035] In this case, when the upper side of each of the sidewalls 310 is formed to have a cross-sectional area corresponding to the lower side, the packaging bags 300 may be formed so that areas close to each other substantially correspond to each other when the packaging bags 300 are stacked in multiple layers. Accordingly, inclination or collapse of other packaging bags 300 which are upwardly stacked may be prevented. Further, when the lower width C of each of the sidewalls 310 is formed to be greater than the upper width A, since the load of the contents is stably dispersed and supported toward the broad lower side, upright stability may be significantly improved.

[0036] Accordingly, the packaging bags 300 in which the contents are accommodated may be stacked in the multiple layers greater than or equal to two layers when being kept in a limited space having a predetermined lateral and vertical size, such as an automated warehouse or the like. For example, since the upright state may be maintained in a 1,000 kg packaging bag 300 of which a height increases by 33.3% in comparison with that of the conventional 750 kg packaging bag 300 or a 1,500 kg packaging bag 300 of which a height increases by 100% in comparison with that of the conventional 750 kg packaging bag 300 instead of the conventional 750 kg packaging bag 300, the storage efficiency may increase in loading, and loading and transportation efficiency may be significantly improved by increasing a one-time transportable loading capacity and reducing the number of instances of transportation.

[0037] Meanwhile, an angle between the first expansion part 313 and the grade extension parts 316a and 316b, an angle between the grade extension parts 316a and 316b and the area decreasing part 315, and an angle between the second expansion part 314 and the grade extension parts 316a and 316b may be formed as obtuse angles. Accordingly, both end edges of each of the sidewalls 310 may be formed in shapes depressed toward the center portion.

[0038] Accordingly, the contents may naturally flow along smoothly sloped both end edges of each of the sidewalls 310 when being accommodated or discharged. Further, since the sidewalls 310 are bent in narrow angles to be connected, a decrease of an area in which the contents are accommodated or incomplete discharge may be prevented.

[0039] In addition, the area decreasing part 315 may be formed to have a lateral width e so that an expansion width of the center portion of each of the sidewalls 310 due to the load corresponds to the upper width A and the lower width C when the contents are accommodated in the inner space. The lateral width e of the area decreasing part 315 may be understood to correspond to intervals between end portions of the first expansion part 313 and the second expansion part 314 and the area decreasing part 315. Further, the lateral width e of the area decreasing part 315 may be understood to correspond to a lateral width of each of the grade extension parts 316a and 316b.

[0040] The lateral width e of the area decreasing part 315 may be changed according to an entire size or material of the packaging bag 300. That is, when the packaging bag 300 is manufactured using a material having high flexibility, the lateral width of the area decreasing part 315 may be formed to be large. Alternatively, when the packaging bag 300 is manufactured using a material having low flexibility, the lateral width of the area decreasing part 315 may be formed to be small.

[0041] Accordingly, when the contents are accommodated in the packaging bag 300, an overall longitudinal section shape is substantially formed in a square pillar shape or rectangular pillar shape even when the center portion of each of the sidewalls 310 is expanded by the load of the contents. Accordingly, a geometric shape may be provided which is differentiated from a conventional packaging bag before and after the contents are accommodated. That is, since a plurality of packaging bags 300 are formed in shapes in which porosity between each other may be minimized even when the packaging bags 300 are pressed against each other in front, back, left and right directions to be stored, space usability may be significantly improved. Further, since the sidewalls 310 pressed against each other of the plurality of packaging bags 300 are supported to prevent collapse, the upright stability may be significantly improved.

[0042] Meanwhile, referring to FIGS. 5 to 7, center portions of the lower end edges of the sidewalls 310 and center portions of outer end portions 331a, 331b, 331c, and 331d of the bottom part 330 corresponding to each other may correspond to predetermined intervals to be curved r1 and r2 to the inside. Further, the center portions of the lower end edges of the sidewalls 310 and the center portions of the outer end portions 331a, 331b, 331c, and 331d of the bottom part 330 may be symmetrically curved r1 and r2. In addition, when the sidewalls 310 and the bottom part 330 are connected, the center portions of the lower end edges of the sidewalls 310 and the center portions of the outer end portions 331a, 331b, 331c, and 331d of the bottom part 330 may be formed as curved surface parts r concavely depressed to the inside of the inner space.

[0043] Here, although apexes/apex parts (332a in FIG. 7) of the bottom part 330 are formed to be rounded in the drawing, the apex parts (332a in FIG. 7) may be formed at right angles in some cases, and the center portions of

the outer end portions 331a, 331b, 331c, and 331d may be formed to be inwardly curved. Meanwhile, hereinafter, the outer end portions 331a, 331b, 331c, and 331d of the bottom part 330 are understood to correspond to sides or corners of the bottom part 330 to be described later.

[0044] Specifically, the center portions of the outer end portions 331a, 331b, 331c, and 331d of the bottom part 330 correspond to the center portions of the lower end edges of the sidewalls 310 to be connected to each other so the curved surface parts r concave to the inside are formed. Accordingly, when the contents are accommodated in the packaging bag 300, lower center portions of the sidewalls 310 have shapes which are recessed inward. Accordingly, a structure in which four cylinders g virtually formed at the apexes 332a of the bottom part 330 of the packaging bag 300 are adjacent to each other is formed. That is, cross-sectional areas to which the sidewalls 310 are connected may be formed in a clover shape, and the four virtual cylinders g may be formed in four directions of a cross-section.

[0045] Here, a pressure due to the load of the contents increases toward a lower part of the packaging bag 300. The pressure is further applied to sides, that is, the outer end portions 331a, 331b, 331c, and 331d which connect the apex parts 332a of the bottom part 330 rather than to the apex parts 332a of the bottom part 330 formed in quadrangular shapes.

[0046] In this case, in the present disclosure, since the curved surface parts r are formed, tension is formed in a direction the same as a direction h shown in FIG. 7. Accordingly, the lower end portions of the packaging bag 300 may be formed in the clover shape as described above. Accordingly, a pressure applied to the inside of the sidewalls 310 in a direction opposite the direction h when the lower end portions are spaced apart from apexes 332a of the bottom part 330 may be offset. Accordingly, the center portions of the sidewalls 310 may be prevented from protruding.

[0047] That is, in the present disclosure, the center portions of the four sides 331a, 331b, 331c, and 331d to which the bottom part 330 and the lower end edges of the sidewalls 310 are connected in addition to the center portions 311b of the sidewalls 310 having the greater expansivity due to the load of the contents are concavely formed to the inside. Accordingly, since the swell phenomenon due to the load of the contents may be restrained, the packaging bag 300 may become upright by substantially maintaining the square pillar shape or the rectangular pillar shape. Accordingly, when the packaging bags 300 are stacked and kept in a transportation vehicle, a warehouse, or the like, since the porosity between the packaging bags 300 decreases, the same space may be more efficiently used.

[0048] Further, since the load of the packaging bag 300 is dispersed to bottom surfaces of the four virtual cylinders g, the stable upright state may be maintained even when a length of the packaging bag 300 is elongated in comparison with a conventional case. In addition, the packaging bag 300 may be prevented from abrasion or tearing due to frictional contact with a ground, a palette, or another packaging bag 300 even when the bottom part 330 is expanded by the load of the contents, and thus durability of a product may be significantly improved.

[0049] In this case, a reinforcing extension part 314a may also be formed downward from the second expansion part 314. Specifically, the reinforcing extension part 314a extends to a width corresponding to the lower width C and may have upper and lower ends formed to be the same width. The reinforcing extension parts 314a may be formed to correspond to or exceed intervals curved r1 to the lower end edge of the sidewalls 310. Accordingly, since the curved surface parts r are formed in a state in which the bottom part 330 is connected to the curved surface parts r, excessive pulling of the outer end portions of the sidewalls 310 may be prevented. Accordingly, since the contents accommodated in the packaging bag 300 are dispersed to the lower apex parts 323a to be accommodated, the upright stability may be significantly improved.

[0050] Further, in some cases, the curved surface parts may also be formed in center portions of the upper end edges of the sidewalls 310 and center portions of outer end portions of the cover 320. Accordingly, not only the swell phenomenon in fron, back, left and right directions but the swell phenomenon in a vertical direction may be prevented in the state in which the contents are accommodated in the packaging bag 300. Accordingly, the packaging bag 300 may substantially maintain the rectangular pillar shape or the square pillar shape while accommodating the contents therein to a maximum volume.

[0051] Meanwhile, referring to FIGS. 4, 6, and 7, the present disclosure may further include a plurality of lifting belts 340 coupled to each one surface of a pair of sidewalls 310 in which both end edges are connected to and neighbor each other among the sidewalls 310. Here, each one side of the lifting belts 340 may protrude upward from the upper end edges of the sidewalls 310 to be formed as ring parts 341.

[0052] Specifically, the lifting belts 340 may be provided as belts made of a synthetic resin material and may be formed of polypropylene. In this case, in each of the lifting belts 340, a center is folded so that one side is formed as the ring part 341, and both end portions may be connected to be provided as a ring shape. Further, since coupling parts 342 formed on end portions of the ring part 341 configured to protrude upward from the sidewalls 310 are sewn and coupled to the sidewalls 310, the lifting belts 340 may be fixed to the packaging bag 300.

[0053] For example, both end edges of the sidewalls 310 may be connected to each other to be provided in a quadrangular cross-section shape, and the lifting belts 340 may also be provided as four lifting belts 340. Further, a coupling part of one end of both ends of the lifting belt and a coupling part of the other end of both ends of the lifting belt may be coupled to one sidewall. That is, in

each of the lifting belts 340, both end portions of the ring part 341 may be coupled to a pair of outer end portions 331a and 331b which are close to each other on the basis of one apex (a location corresponding to 332a). Alternatively, in the lifting belts 340, the coupling parts 342 may be sewn and coupled to apex parts of the packaging bag 300 to which the sidewalls 310 are connected. Hereinafter, an example in which both end portions of the ring part 341 are coupled to the pair of outer end portions 331a and 331b adjacent to each other may be described.

[0054] When the lifting belts 340 are coupled like the above, lifting equipment may be inserted between a lower surface of the ring part 341 and an upper side of the cover 320, and the lifting equipment may be engaged with the ring part 341 to lift the packaging bag 300.

[0055] Here, the coupling parts 342 are connected to both ends of the ring part 341 and are coupled to both ends of the ring part 341 along a vertical direction of one sidewall and another adjacent sidewall. In this case, the coupling parts 342 may be disposed to connect two corners which are orthogonal on the basis of one apex among four apexes at which the sidewalls 310 are connected to each other. In this case, the coupling parts 342 may be coupled to centers of one side upper end edges and the other side upper end edges of the sidewalls 310 which are orthogonal on the basis of one apex among the four apexes. Alternatively, the coupling parts 342 may be coupled to the centers of the one side upper end edges and the other side upper end edges of the sidewalls 310 which are orthogonal on the basis of one apex and some parts of the apexes.

[0056] In this case, the coupling parts 342 of each of the lifting belts 340 are sewn to the one sidewall and another adjacent sidewall, and a coupling interval may be provided to be smaller than heights of the sidewalls 310. Further, the coupling interval may be each provided at 30% to 99% of the heights of the sidewalls 310. The coupling intervals may be understood as parts at which the coupling parts 342 and the sidewalls 310 are substantially sewn.

[0057] Further, the other sides of the lifting belts 340 may extend toward the lower sides of the sidewalls 310 to be formed as lower support parts 343 and may be disposed to surround the bottom part 330 in a diamond shape. Here, the ring parts 341, the coupling parts 342, and the lower support parts 343 are classifications of parts of the lifting belts 340 according to functions, and the ring part 341, the coupling part 342, and the lower support part 343 may be understood to be integrally formed.

[0058] Specifically, the lower support part 343 may be disposed to connect two corners 331a and 331b which are orthogonal on the basis of one 332a of the four apexes 332a of the bottom part 330. Further, the lower support part 343 may be provided to connect centers of the one side corner 331a and the other side corner 331b which are orthogonal on the basis of the one apex 332a. Alternatively, the lower support part 343 may be provided to connect the centers of the one side corner 331a and the other side corner 331b which are orthogonal on the basis of the one apex 332a, and some parts of the apex 332a. Further, locations in which the lower support parts 343 surround the bottom part 330 may be formed in a mirror symmetry manner on the basis of a virtual line which crosses the center of the bottom part 330 in a cross shape.

[0059] As described above, the lifting belts 340 may dispersedly support the load of the contents accommodated in the inner space through the coupling parts 342 coupled to the sidewalls 310 and the lower support parts 343 configured to surround the bottom part 330 when the packaging bag 300 is lifted through the ring parts 341. Further, since a lifting force is applied to the upper and lower parts of the sidewalls 310 at the same time, shaking of the packaging bag 300 may be minimized. Accordingly, an accident such as a fall due to the shaking of the packaging bag 300 and the like or damage of the contents may be prevented.

[0060] Further, tearing due to concentration of the load on parts to which the lifting belts 340 and the sidewalls 310 are coupled may be prevented. In addition, when the packaging bag 300 is shaken, degradation of the parts to which the lifting belts 340 and the sidewalls 310 are coupled may be minimized, thereby significantly improving the durability of the product.

[0061] In this case, the coupling parts 342 may be disposed to be close to inner surfaces of the sidewalls 310, and the lower support parts 343 may be disposed to surround an outer surface of the bottom part 330. That is, the coupling parts 342 may be coupled to the inner space in which the contents are loaded, and the lower support part 343 may be coupled to the outer surface of the bottom part 330 where the packaging bag 300 directly comes into contact with the palette or the ground.

[0062] Accordingly, the lifting belts 340 may be prevented from twisting or engaging with each other when one packaging bag 300 is taken out or inserted in a state in which the packaging bags 300 are disposed in parallel in the lateral direction and the plurality of packaging bags 300 are close to each other. Accordingly, degradation of a coupling force between the lifting belts 340 and the sidewalls 310 due to contact and friction between the lifting belts 340 may be prevented. Further, when the packaging bag 300 is lifted through the ring part 341, since the lower support parts 343 substantially support an entire area of the bottom part 330, the packaging bag 300 may be more stably lifted.

[0063] In this case, connection parts between the coupling parts 342 and the ring parts 341 may be overlappingly coupled to portions between the upper end edges of the sidewalls 310 and the outer end portions of the cover 320. Further, connection parts between the coupling part 342 and the lower support part 343 may be overlappingly coupled to portions between the lower end edges of the sidewalls 310 and the outer end portions of the bottom part 330. That is, since the lifting belts 340

are overlappingly coupled to connection parts of the cover 320, the bottom part 330, and the sidewalls 310, when the cover 320, the bottom part 330, and the sidewalls 310 are coupled, the lifting belts 340 may be more solidly coupled when sewn only once. Further, since coupling processes such as sewing and the like are simplified, productivity of the product may be significantly improved.

[0064] Meanwhile, the cover 320 extends upward along the upper end edges of the sidewalls 310 and may further include a tightening part 321 provided around the cover 320 to close the inner space.

[0065] Specifically, the cover 320 may be provided in a shape open along a vertical direction because a lower end edge circumference and an upper end edge circumference correspond to each other. Further, lower end edges of the cover 320 and upper end edges of the sidewalls 310 may be connected to each other, and the tightening part 321 may be provided along upper end edges of the cover 320. The cover 320 may be inwardly folded on the basis of the upper end edges of the sidewalls 310 to cover an upper side of the inner space.

[0066] Alternatively, the cover 320 may be formed to have a size corresponding to that of a quadrangular cross-section of the inner space, and an insertion pipe part smaller than a cross-sectional area of the cover 320 may be formed in the center portion of the cover 320. Further, since the tightening part 321 is provided around the insertion pipe part, the inner space may be selectively closed.

[0067] In addition, a discharge pipe part may be provided in the center portion of the bottom part 330, a tightening part may be further provided around the discharge pipe part, and the contents accommodated in the inner space may be discharged to the outside by tightening and releasing the tightening part.

[0068] Meanwhile, referring to FIGS. 8A and 8B, the outer end portions of the bottom parts 330A and 330B connected to the sidewalls (310 in FIG. 5) may have a width greater than lateral widths of the sidewalls (310 in FIG. 5) connected thereto to have available intervals (334a in FIG. 8a). Here, the lateral widths of the sidewalls may be understood as the lower widths of the sidewalls. Further, the apex parts 332a of each of the bottom parts 330A and 330B may be overlappingly folded in cone shapes to be connected to the sidewalls 310.

[0069] Specifically, the outer end portions of the bottom parts 330A and 330B are formed to be greater than the lower widths (C in FIG. 5) of the sidewalls (310 in FIG. 5) to have the available intervals (334a in FIG. 8A). Further, when the available intervals (334a in FIG. 8A) are folded to one side, overlapping parts 334b folded in cone shapes at apex parts 332a to overlap are formed. In addition, the bottom parts 330A and 330B are connected to the lower end edges of the sidewalls (310 in FIG. 5) in a folded state like the above.

[0070] In this case, a part in which contents are difficult to fill therein is formed at a lower end edge of the inner space due to parts which are sewn between the sidewalls (310 in FIG. 5) and the bottom parts 330A and 330B and angulate. Here, the overlapping parts 334b overlapping in cone shapes may be unfolded by the load of the contents and protrude convexly.

[0071] Accordingly, the load of the contents may be dispersed to apexes of the bottom parts 330A and 330B to be stably supported. At the same time, since center portions of the corners to which the sidewalls (310 in FIG. 5) and the bottom parts 330A and 330Ba are connected are inwardly curved and deformation due to the load of the contents is minimized, the quadrangular cross-section shape may be maintained. Accordingly, since a plurality of packaging bags which are stacked and arranged may be closely kept in a state of having porosity therebetween, the space usability may be further improved.

[0072] Meanwhile, auxiliary lifting belts (not shown) having ring shapes which restrain the ring parts 341 of a pair of lifting belts 340 disposed adjacent to each other may be further provided. In this case, the auxiliary lifting belts (not shown) may be symmetrically disposed in lateral directions or frontward and backward directions. That is, a pair of auxiliary lifting belts (not shown) may be provided to restrain a pair of lifting belts 340 disposed at a left side of the packaging bag 300 and a pair of lifting belts 340 disposed at a right side of the packaging bag 300.

[0073] Further, when lifting equipment is inserted between the auxiliary lifting belts (not shown) and the cover 320 and lifting is performed, a front side and a rear side at which the auxiliary lifting belts (not shown) are not disposed may be pulled by the lifting belts 340 restrained by the auxiliary lifting belts (not shown) to lift the packaging bag 300. Accordingly, tension applied to the packaging bag 300 when the lifting is performed may dispersed to the whole packaging bag 300 rather than both sides. Accordingly, since the tearing of the packaging bag 300 due to concentration of the load of the contents to one part is prevented, the durability of the product and lifting safety may be improved.

[0074] In this case, the auxiliary lifting belts (not shown) may be provided to circulate in the ring parts 341 of the lifting belts 340. Accordingly, when the lifting through the auxiliary lifting belts (not shown) is performed, the tension applied to the lifting belts 340 through the auxiliary lifting belts (not shown) may be uniformly distributed to the coupling parts 342.

[0075] Accordingly, in the packaging bag 300 according to the present disclosure, since the upper widths A and the lower widths C of the sidewalls 310 are formed to be greater than widths of the center portions, the area decreasing part 315 is formed on the center portions of both end edges. Accordingly, since the swell phenomenon due to the load of the contents is prevented, the quadrangular pillar shape may be substantially maintained. Accordingly, since upper sides in addition to lower sides between the packaging bags are closely supported to prevent collapse, and the porosity decreases, the storage efficiency may be significantly improved.

[0076] Further, since the lower end edges of the sidewalls 310 and center portions of the outer end portions of the bottom part 330 corresponding to each other are symmetrically curved to be connected by corresponding to predetermined intervals, the curved surface parts r which are concave to an inside of the corner center portions of the lower end portions of the packaging bag 300 are formed. Accordingly, since a floor may maintain a quadrangular shape even when the load of the contents is dispersedly supported in the apexes, the upright stability may be significantly improved.

[0077] Accordingly, as shown in FIG. 9, the packaging bag 300 according to the present disclosure substantially maintains the quadrangular pillar shape through a structure in which both ends and the lower sides of the sidewalls are concavely formed even when outwardly expanded by the load of the content. Accordingly, the sidewalls of the neighboring packaging bags in the present disclosure become substantially close in comparison with conventional packaging bags 200 having greater porosity therebetween due to an occurrence of a swell phenomenon. Accordingly, since the porosity between the packaging bags 300 significantly decreases and thus space waste is minimized, space efficiency during storage may be significantly improved.

[0078] Further, the lifting belts 340 dispersedly support the load of the contents accommodated in the inner space through the coupling parts 342 coupled to the sidewalls, and the lower support parts 343 coupled to the bottom part 330. At the same time, since a lifting force is applied to an overall exterior of the packaging bag 300 to prevent tearing of the parts to which the lifting belts 340 are connected when the packaging bag 300 is lifted, the durability of the product may be significantly improved.

[0079] A packaging bag according to the present disclosure provides the following effects through the above-described solution.

[0080] First, a center portion of each of both end edges of sidewalls is formed to be narrower than an upper width and a lower width, and the center portions in which the lower end edges of the sidewalls and outer end portions of a bottom part correspond to each other are inwardly curved. Accordingly, a swell phenomenon due to a load of the contents can be prevented to substantially maintain a quadrangular pillar shape. Accordingly, the storage efficiency can be significantly improved by providing a geometric shape in which porosity between bags can be minimized before and after the contents are accommodated unlike conventional packaging bags.

[0081] Further, since a lower width corresponds to, or is formed to be greater than, an upper width in each of the sidewalls, a seating area is maximized when the packaging bags are vertically stacked, and thus the packaging bags can be prevented from inclining or collapsing. Further, since the packaging bag is formed to be curved along the outside of the lower end portion and formed in a clover shape, the load of the contents is dispersed to apexes of the floor, and thus upright stability can be significantly improved.

[0082] In addition, the lifting belt dispersedly supports the load of the contents accommodated in an inner space through coupling parts coupled to the sidewalls and a lower support part of the bottom part. At the same time, since the lifting force is transmitted to the entire exterior of the packaging bag, the tearing of the portion to which the lifting belt is connected during lifting can be prevented, and thus the durability of the product can be significantly improved.

[0083] As described above, the present disclosure is not limited to the above-described embodiments, may be transformed by those skilled in the art without departing from the scope of the claims of the present disclosure, and the modifications are included in the scope of the present disclosure.

Claims

1. A packaging bag (300), in which contents are accommodated, comprising:

   a plurality of sidewalls (310) provided to form an inner space of a quadrangular cross-section and each having both neighboring end edges connected to each other, each having an upper width (A) and a lower width (C) formed to be greater than a center width (B) to form an area decreasing part (315) at a center portion of both end edges, and each having a center portion of a lower end edge which is inwardly curved;
   a cover (320) connected to an upper end portion of each of the sidewalls (310); and
   a bottom part (330) connected to a lower end portion of each of the sidewalls (310), and in which a center portion of an outer end portion corresponding to the lower end edge of each of the sidewalls is inwardly curved.

2. The packaging bag of claim 1, wherein:

   an upper part (311a) and a lower part (311c) of each of the sidewalls (310) are connected to the area decreasing part (315) to be sloped; and
   the area decreasing part (315) is formed to have a predetermined lateral width so that an expansion width of a center portion of each of the sidewalls (310), due to a load when the contents are accommodated in the inner space, corresponds to the upper width and the lower width.

3. The packaging bag of claim 1 or 2, wherein each of the sidewalls (310) has the lower width (C) formed to be greater than or equal to the upper width (A).

4. The packaging bag of one of claims 1 to 3, wherein the lower end edges of the sidewalls (310) and the

center portions of the outer end portions of the bottom part corresponding to each other are symmetrically curved in correspondence with predetermined intervals.

5. The packaging bag of one of claims 1 to 4, further comprising a plurality of lifting belts (340) coupled to each one side of a pair of sidewalls (310) of which both end edges are connected to and neighbor each other among the sidewalls and having one sides protruding upward from upper end edges of the sidewalls to form a ring part (341).

6. The packaging bag of claim 5, wherein other sides of the lifting belts (340) extend to surround and support the bottom part (311c).

7. The packaging bag of one of claims 1 to 6, wherein the cover (320) extends upward along the upper end edges of the sidewalls (310) and further includes a tightening part (321) provided around the cover to close the inner space.

8. The packaging bag of one of claims 1 to 7, wherein:

the outer end portions of the bottom part (330) connected to the sidewalls (310) are formed to have widths greater than lateral widths of the sidewalls connected thereto and have an available interval; and
apex parts (332a) of the bottom part (330) are folded to overlap in a cone shape to be connected to the sidewalls (310).

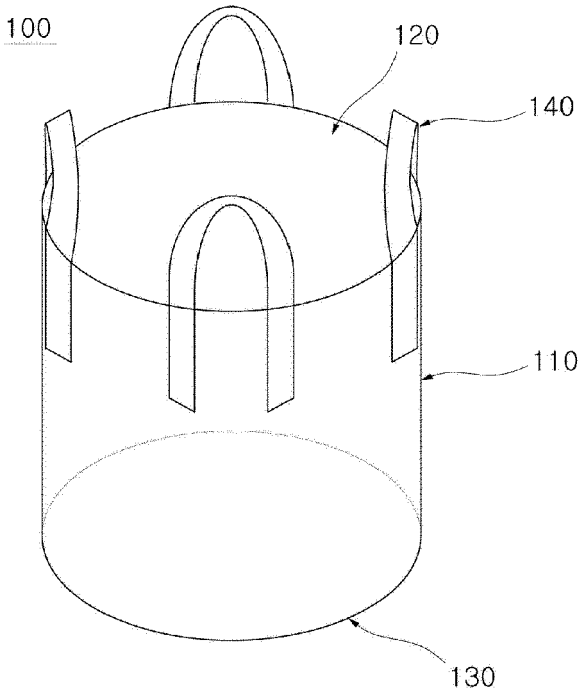

Fig. 1 - PRIOR ART

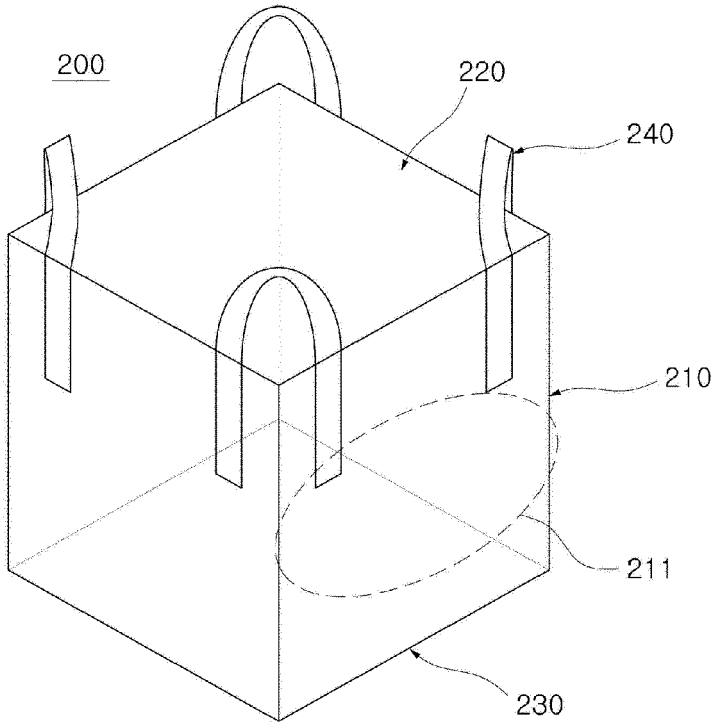

Fig. 2 - PRIOR ART

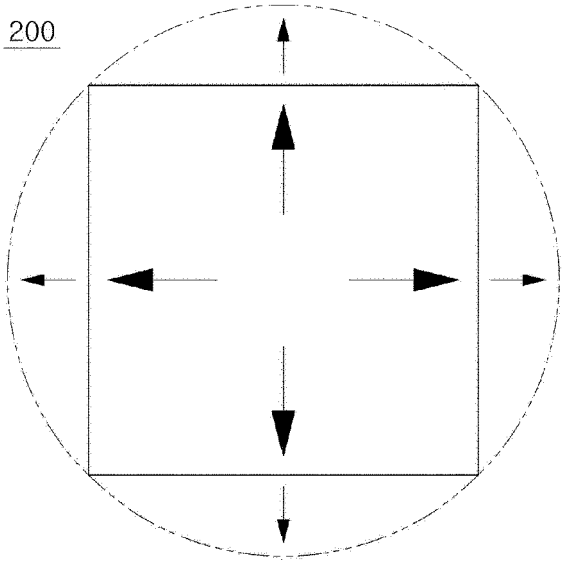

Fig. 3 - PRIOR ART

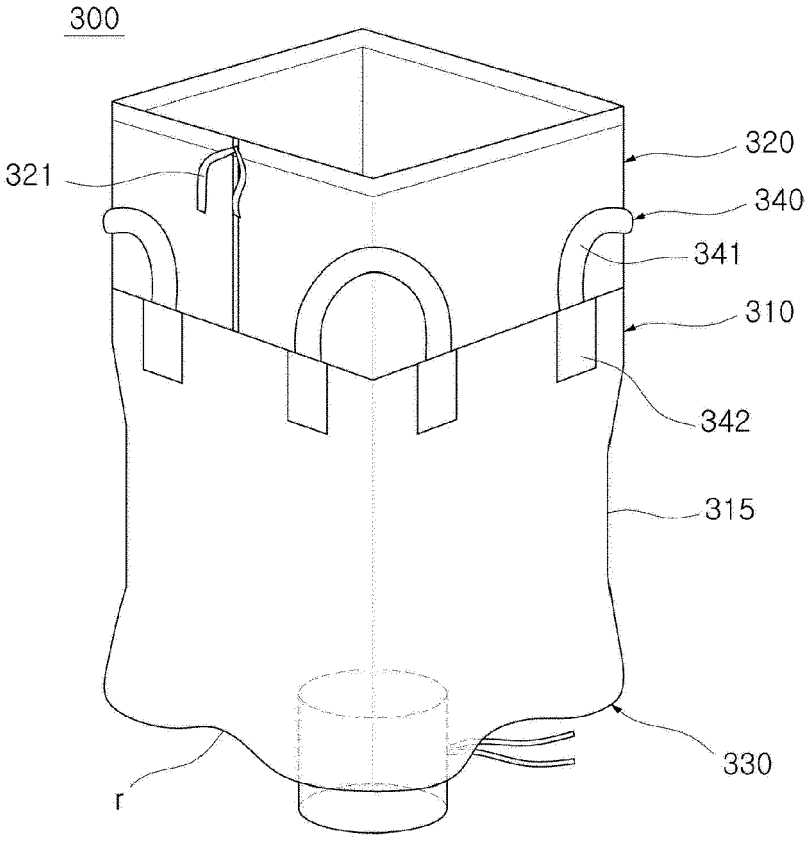

Fig. 4

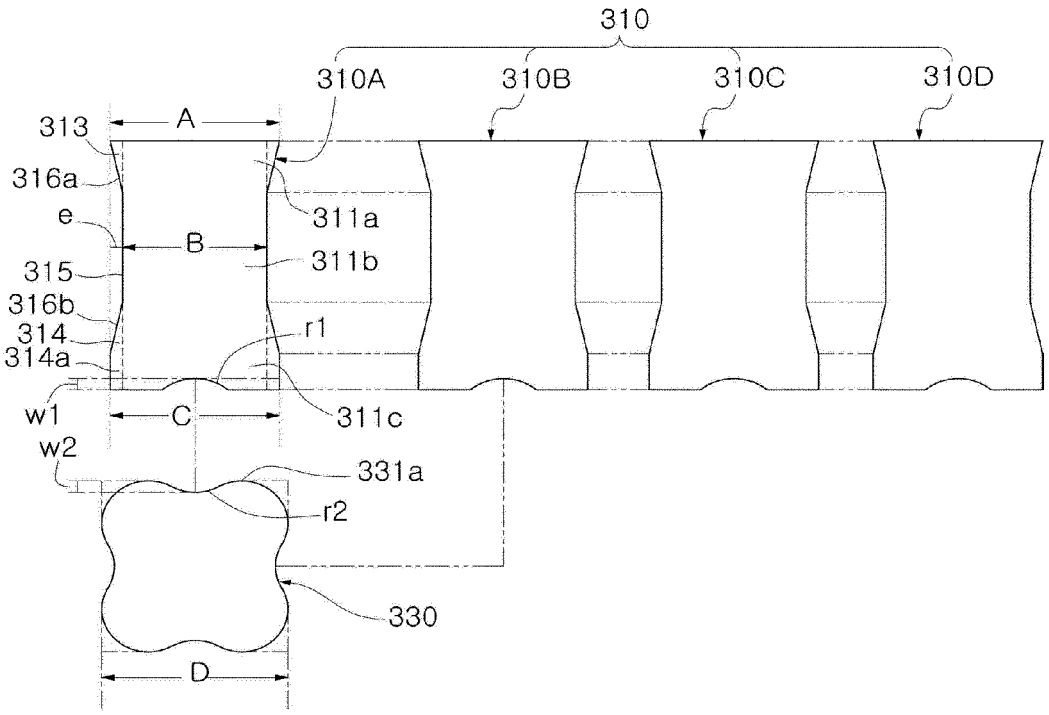
310
310A
310B
310C
310D
313
A
316a
311a
e
B
311b
315
316b
r1
314
314a
w1
C
311c
w2
331a
r2
330
D

Fig. 5

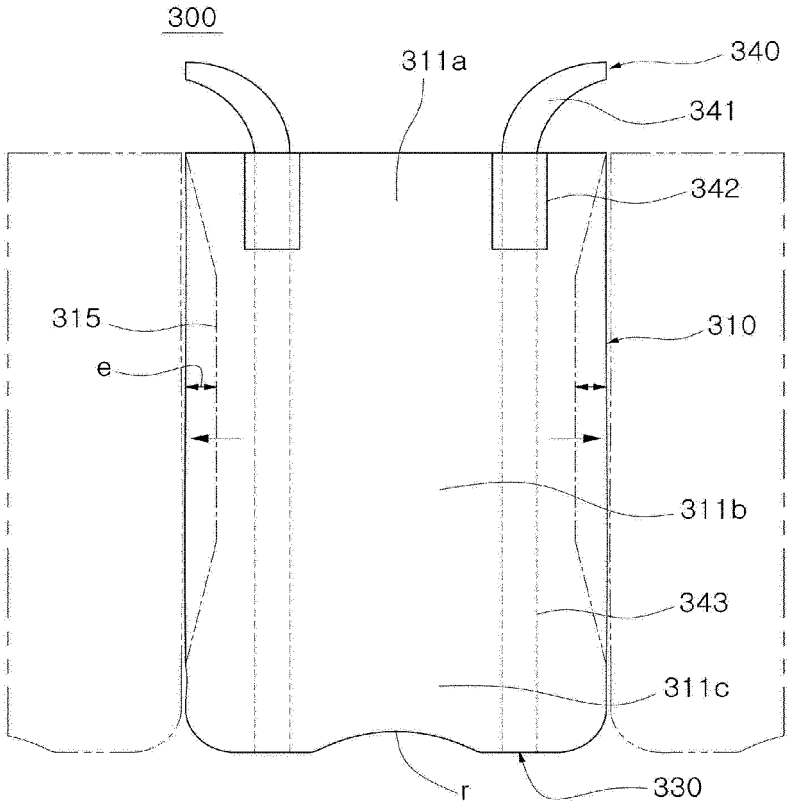
300
311a
340
341
342
315
310
e
311b
343
311c
r
330

FIG. 6

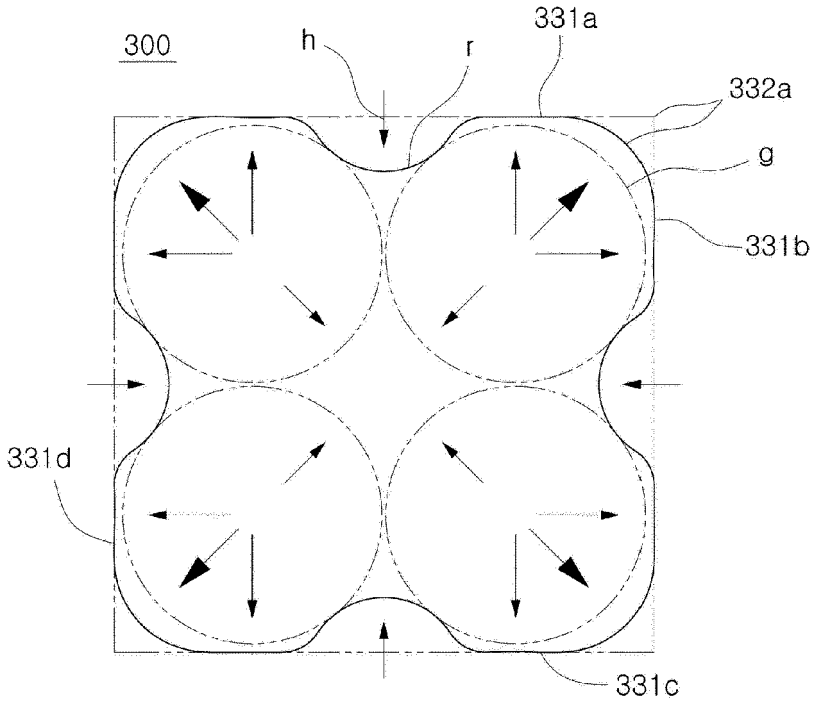

Fig. 7

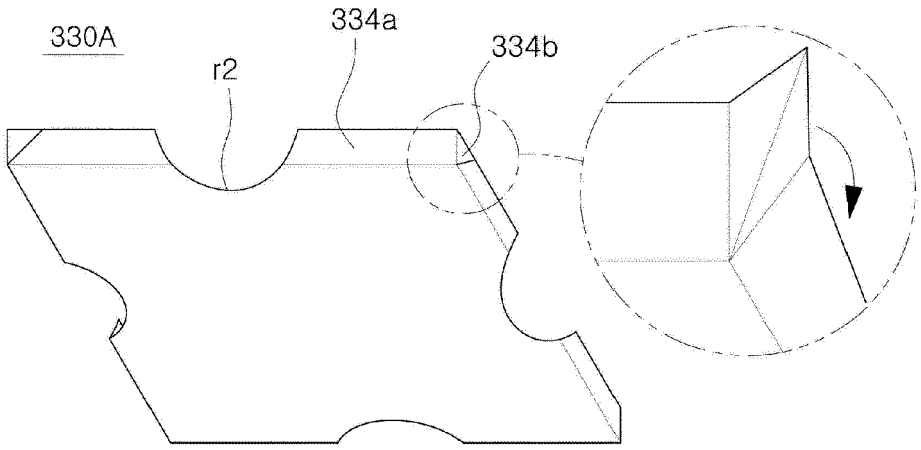

Fig. 8a

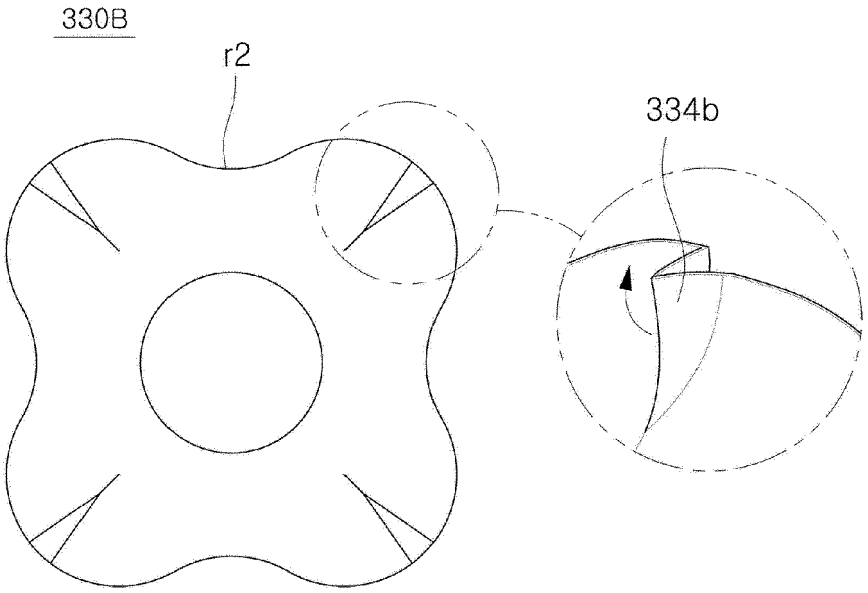

Fig. 8b

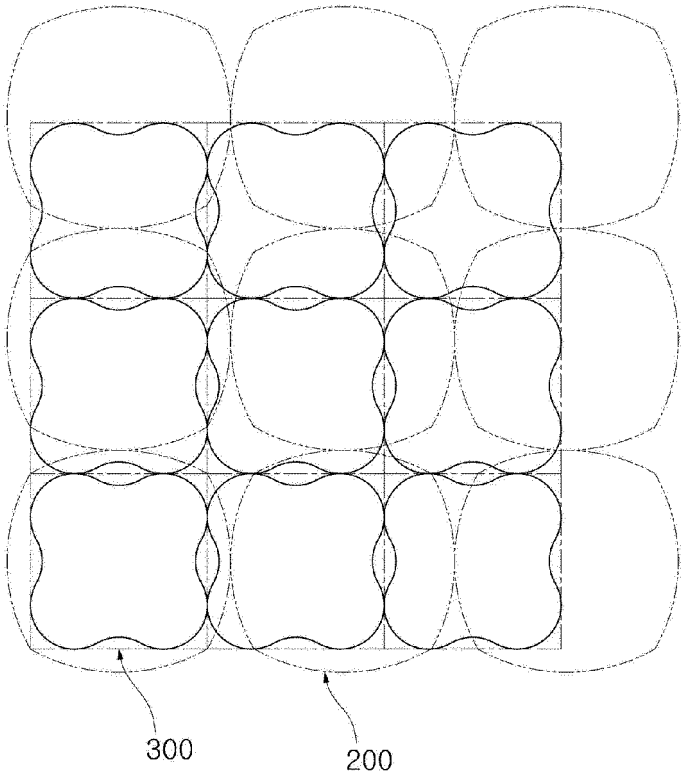

Fig. 9

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 18 20 2989

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2016/021867 A1 (CHOI YONG DEOK [KR]) 11 February 2016 (2016-02-11) * page 3, paragraph 27 - page 13, paragraph 96 * * figures 3-8c *	1-8	INV. B65D88/16
X	JP S59 84778 A (MITSUBISHI PETROCHEMICAL CO) 16 May 1984 (1984-05-16) * figures 1-5 *	1-8	
X	WO 2007/111399 A1 (JEIL INDUSTRY CO LTD [KR]; JEONG KI YOUNG [KR]) 4 October 2007 (2007-10-04) * page 6, paragraph 49 - page 12, paragraph 94 * * figures 2-15 *	1-8	
X	WO 2018/084815 A1 (BIGBAGSAN CUVAL DIKIM VE SANAYI VE TIC A S [TR]) 11 May 2018 (2018-05-11) * page 5, line 11 - page 6, line 15 * * page 6, lines 25-29 * * figures 1-3c, 5a-6 *	1-8	TECHNICAL FIELDS SEARCHED (IPC) B65D
A	CN 104 709 616 A (TIANJIN SHENGSHI PLASTIC PRODUCTS CO LTD) 17 June 2015 (2015-06-17) * figure 1 *	7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 February 2019	Piolat, Olivier

CATEGORY OF CITED DOCUMENTS

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

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

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 20 2989

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

15-02-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2016021867 A1	11-02-2016	AU 2015299917 A1	09-02-2017
		KR 101459113 B1	12-11-2014
		WO 2016021867 A1	11-02-2016
JP S5984778 A	16-05-1984	NONE	
WO 2007111399 A1	04-10-2007	AT 494242 T	15-01-2011
		AU 2006215995 A1	11-10-2007
		CN 101041388 A	26-09-2007
		EP 2001769 A1	17-12-2008
		JP 2007254024 A	04-10-2007
		KR 100678622 B1	29-01-2007
		US 2009317024 A1	24-12-2009
		WO 2007111399 A1	04-10-2007
WO 2018084815 A1	11-05-2018	NONE	
CN 104709616 A	17-06-2015	NONE	

EPO FORM P0459

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