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A TROLLEY CASE

(57) The present application relates to a trolley case comprising an upper cover 100 and a lower cover 200 which is openable and connectable to the upper cover 100, an inner side of the upper cover 100 is provided continuously or intermittently with an upper reinforcing strip 110, an inner part of the upper reinforcing strip 110 is a first hollow structure, the upper reinforcing strip 110 is defined at an inner periphery of a side of the upper cover 100 adjacent to the lower cover 200; an inner side of the lower cover 200 is provided continuously or intermittently with a lower reinforcing strip 210, an inner part of the lower reinforcing strip 210 is a second hollow structure, the lower reinforcing strip 210 is defined at an inner periphery of a side of the lower cover 200 adjacent to the upper cover 100, the upper reinforcing strip 110 and the lower reinforcing strip 210 forms a support region S for preventing deformation of the upper cover 100 and the lower cover 200 and co-supporting the trolley case when the upper cover 100 and the lower cover 200 are closed. The trolley case provided by the application not only prevents deformation of the trolley case, load-bearing ability is strong, the structure is simple, a production process is simple and a production cost is low.

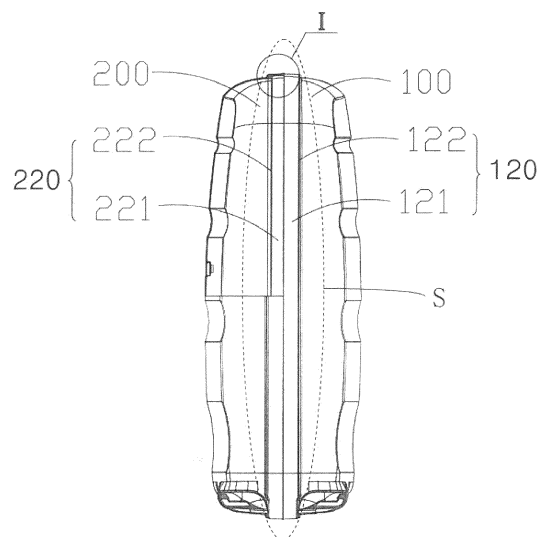


Fig. 2

Description

[0001] The present invention relates to a field of a suitcase, and more particularly relates to a trolley case.

[0002] In the prior art, the trolley case is easily deformed under an action of gravity or an external force, and in particular, a case cover is recessed and deformed inwardly. By order to prevent the deformation of the trolley case, in a production of the trolley case, a steel ring is defined in the trolley case or a support frame is defined outside the trolley case to maintain the shape of the trolley case, it not only results in a complex production process, increased costs, but also results in increasing weight of the trolley, affecting the appearance of the trolley case.

[0003] Technical problems are solved in the present invention by providing a simple structure, support reliable, lightweight and anti-deformation trolley case, aiming at defects in the prior art of a complex production process, the heavy weight and unsightly appearance of the anti-deformation trolley case.

[0004] Technical solutions of the present application for solving the technical problems are as follows:

The present invention provides a trolley case comprising an upper cover and a lower cover which is openable and connectable to the upper cover, characterized in that an inner side of the upper cover is provided continuously or intermittently with an upper reinforcing strip, an inner part of the upper reinforcing strip is a first hollow structure, the upper reinforcing strip is defined at an inner periphery of a side of the upper cover adjacent to the lower cover; an inner side of the lower cover is provided continuously or intermittently with a lower reinforcing strip, an inner part of the lower reinforcing strip is a second hollow structure, the lower reinforcing strip is defined at an inner periphery of a side of the lower cover adjacent to the upper cover, the upper reinforcing strip and the lower reinforcing strip form a support region for preventing deformation of the upper cover and the lower cover and co-supporting the trolley case when the upper cover and the lower cover are closed.

[0005] In the trolley case provided in the present invention, the upper reinforcing strip comprises a first outer surface and a first inner surface, a first gap is defined between the first outer surface and the first inner surface, the first hollow structure is formed in the first gap, the lower reinforcing strip comprises a second outer surface and a second inner surface, a second gap is defined between the second outer surface and the second inner surface, and the second hollow structure is formed in the second gap.

[0006] In the trolley case provided in the present invention, a cross section of the first hollow structure and the second hollow structure is in a honeycomb shape, a stepped shape, a lattice shape, or a wavy shape.

[0007] In the trolley case provided in the present in-

vention, the upper cover comprises an upper cover side surface and an upper cover surface, the lower cover comprises a lower cover side surface and a lower cover surface, and the upper cover surface and the lower cover surface are both provided with a horizontal recess, and a support block is further provided on the lower cover surface.

[0008] In the trolley case provided in the present invention, an edge of the upper cover adjacent to the lower cover protrudes outwardly to form a first buffer step, the first buffer step comprises a first buffer surface and a first reinforcing surface, one end of the first buffer surface is defined at the edge of the upper cover close to the lower cover, the other end of the first buffer surface extends in a direction opposite to the lower cover and is connected to the first reinforcing surface, the first reinforcing surface forms a first angle with the first buffer surface, the upper reinforcing strip is defined on the first reinforcing surface; an edge of the lower cover adjacent to the upper cover protrudes outwardly to form a second buffer step, the second buffer step comprises a second buffer surface and a second reinforcing surface, one end of the second buffer surface is defined at the edge of the lower cover close to the upper cover, the other end of the second buffer surface extends in a direction opposite to the upper cover and is connected to the second reinforcing surface, the second reinforcing surface forms a second angle with the second buffer surface, the lower reinforcing strip is defined on the second reinforcing surface, when the upper cover and the lower cover are closed, the first buffer surface is abutted against the second buffer surface to form the support region, the first reinforcing surface defines at least one upper reinforcing strip; the second reinforcing surface defines at least one lower reinforcing strip, the upper reinforcing strip and the lower reinforcing strip are made of plastic materials.

[0009] In the trolley case provided in the present invention, the upper reinforcing strip is integrally molded with the upper cover, and the lower reinforcing strip is integrally molded with the lower cover.

[0010] In the trolley case provided in the present invention, the first hollow structure and the second hollow structure comprise a plurality of straight lines and oblique lines, when the first hollow structure and the second hollow structure have a cross-sectional shape in a stepped shape, the straight lines are composed of first straight line segments and second straight line segments, the first straight line segments are straight line segments extending from the first outer surface toward the first inner surface or straight line segments extending from the second outer surface toward the second inner surface; the second straight line segments are straight line segments extending from the first inner surface toward the first outer surface or straight line segments extending from the second inner surface toward the second outer surface, a ratio between a length of each of the straight line segments and a straight distance of the first outer surface to the first inner surface or the second outer surface to the

second inner surface is 1:8; one oblique line is connected between one end of one first straight line segment and one end of one second straight line segment, an angle between adjacent oblique lines is a fourth angle, wherein the fourth angle is in a range of 60 ° to 90 °.

[0011] In the trolley case provided in the present invention, the first hollow structure and the second hollow structure comprise a plurality of triangles when a cross-sectional shapes of the first hollow structure and the second hollow structures are in the wavy shape, a vertical line segment perpendicular to the first outer surface or the second outer surface is provided at a vertex of one triangle, each of the triangles is an isosceles triangle, an angle of the vertex of the isosceles triangle is in a range of 60° to 120.

In the trolley case provided in the present invention, when the first hollow structure and the second hollow structure have a cross-sectional shape in the honeycomb shape, a ratio of the number of honeycomb cells comprised in the first hollow structure or the second hollow structure to a length of the first reinforcing surface or the second reinforcing surface is 1-1.5/cm.

[0012] In the trolley case provided in the present invention, the upper cover comprises an upper cover side surface and an upper cover surface, the lower cover comprises a lower cover side surface and a lower cover surface, an edge of the upper cover adjacent to the lower cover protrudes outwardly to form a first buffer step, the first buffer step comprises a first buffer surface and a first reinforcing surface, one end of the first buffer surface is defined at the edge of the upper cover close to the lower cover, the other end of the first buffer surface extends in a direction opposite to the lower cover and is connected to the first reinforcing surface, a part of the first reinforcing surface is recessed along the upper cover side surface to form a first inner groove, the upper reinforcing strip is defined in the first inner groove; an edge of the lower cover adjacent to the upper cover protrudes outwardly to form a second buffer step, the second buffer step comprises a second buffer surface and a second reinforcing surface, one end of the second buffer surface is defined at the edge of the lower cover close to the upper cover, the other end of the second buffer surface extends in a direction opposite to the upper cover and is connected to the second reinforcing surface, a part of the second reinforcing surface is recessed along the lower cover side surface to form a second inner groove, the lower reinforcing strip is defined in the second inner groove; A height of the first inner groove is smaller than or equal to a height of the first buffer surface, a thickness of the first buffer surface is larger than a thickness of the upper cover side surface; a recessed height of the second inner groove is smaller than or equal to a height of the second buffer surface, a thickness of the second buffer surface is larger than a thickness of the lower cover side surface.

[0013] Technical solutions of the present application have the following advantages: The trolley case provided by the present invention is provided with the upper rein-

forcing strip and the lower reinforcing strip on the periphery of the upper cover and the lower cover close to the opening to prevent the trolley case from being deformed, strength of the reinforcing strips is enhanced through a pattern set of a cross-section of the upper reinforcing strip and the lower reinforcing strip, the structure is simple, and the reinforcing strips is made of the plastic materials, so that an overall weight of the trolley case to reduce, and the reinforcing strips can be integrally molded with the upper cover and the lower cover, the production process is simple, and it does not affect the appearance of the trolley case.

[0014] Further advantages, features and potential applications of the present invention may be gathered from the description which follows, in conjunction with the embodiments illustrated in the drawings.

[0015] Throughout the description, the claims and the drawings, those terms and associated reference signs will be used as are notable from the enclosed list of reference signs. In the drawings is shown:

- Fig. 1 a schematic view of an external structure of the trolley case provided by the present invention;
- Fig. 2 a schematic view of a construction of the upper cover and the lower cover of the trolley case provided by the present invention;
- Fig. 3 a part schematic view of an internal part of the upper cover of the trolley case provided by the present invention;
- Fig. 4 a schematic view of an internal part of the lower cover of the trolley case provided by the present invention;
- Fig. 5 a partial enlarged view of part II in Fig. 4;
- Fig. 6 a partial enlarged view of part L in Fig. 5 provided for the first embodiment;
- Fig. 7 a partial enlarged view of part L in Fig. 5 provided for the second embodiment;
- Fig. 8 a partial enlarged view of part L in Fig. 5 provided for the third embodiment;
- Fig. 9 a partial enlarged view of part L in Fig. 5 provided for a preferred embodiment;
- Fig. 10 a partial enlarged view of part L in Fig. 5 provided for a preferred embodiment;
- Fig. 11 a partial enlarged view of part L in Fig. 5 provided for a preferred embodiment, and
- Fig. 12 a partial enlarged view of part I in Fig. 2 pro-

vided for a preferred embodiment.

[0016] The present invention will be described in further detail with reference to the accompanying drawings and embodiments, in order to make the technical purpose, technical solution and advantages of the present invention clear. It is to be understood that the specific embodiments described herein are merely illustrations of the present invention and are not intended to limit the present invention.

[0017] As shown in Fig. 1, a trolley case provided in the present invention comprises an upper cover 100 which can be seen in Fig. 2, a lower cover 200 which is openable and connectable to the upper cover 100 and a lever (not shown) telescopically connected to the lower cover 200, as the lever is a prior art, it is not described in details here. The upper cover 100 and the lower cover 200 are made of plastic materials, for example, PP, ABS, and so on. The trolley case provided in the present invention comprises an upper cover 100 and a lower cover 200 which is openable and connectable to the upper cover 100, an inner side of the upper cover 100 is provided continuously or intermittently with an upper reinforcing strip 110 which can be seen in Fig. 3, an inner part of the upper reinforcing strip 110 is a first hollow structure, the upper reinforcing strip 110 is defined at an inner periphery of a side of the upper cover 100 adjacent to the lower cover 200 and is defined by extending toward a side portion of the inner periphery of the upper cover 100; an inner side of the lower cover 200 is provided continuously or intermittently with a lower reinforcing strip 210, an inner part of the lower reinforcing strip 210 is a second hollow structure, the lower reinforcing strip 210 is defined at an inner periphery of a side of the lower cover 200 adjacent to the upper cover 100 and is defined by extending toward a side portion of the inner periphery of the upper cover 200.

[0018] As illustrated by Fig. 2, an edge of the upper cover 100 adjacent to the lower cover 200 protrudes outwardly to form a first buffer step 120, the first buffer step 120 comprises a first buffer surface 121 and a first reinforcement surface 122, one end of the first buffer surface 121 is defined at the edge of the upper cover 100 close to the lower cover 200, the other end of the first buffer surface 121 extends in a direction opposite to the lower cover 200 and is connected to the first reinforcing surface 122, the first reinforcing surface 122 forms a first angle A with the first buffer surface 121, the first angle A is an angle larger than or equal to 90° . When the upper cover is subjected to an external pressure, the first buffer surface 121 can buffer the pressure and prevent the upper cover from being deformed. Similarly, an edge of the lower cover 200 adjacent to the upper cover 100 protrudes outwardly to form a second buffer step 220, the second buffer step 220 comprises a second buffer surface 221 and a second reinforcement surface 222, one end of the second buffer surface 221 is defined at the edge of the lower cover 200 close to the upper cover 100, the other

end of the second buffer surface 221 extends in a direction opposite to the upper cover 100 and is connected to the second reinforcing surface 222, the second reinforcing surface 222 forms a second angle (not shown) with the second buffer surface 221, a configuration of the second angle is similar to that of the first angle, and the second angle is an angle larger than or equal to 90° . When the upper cover 100 and the lower cover 200 are closed, the first buffer surface 121 is abutted against the second buffer surface 221 to form a support region S for preventing deformation of the upper cover 100 and the lower cover 200 and co-supporting the trolley case.

[0019] As shown in Fig. 3, an inner side of the upper cover 100 is provided continuously or intermittently with the upper reinforcing strip 110 for preventing deformation of the upper cover 100, the upper reinforcing strip 110 is defined at an inner periphery of a side of the upper cover 100 adjacent to the lower cover 200, namely is defined on an inner sidewall of the first reinforcing surface 122 and is defined by extending toward in a direction toward the lower cover 200 from the upper cover 100. Preferably, the first angle is 90° , the first buffer surface 121 is parallel to a upper cover side surface 101. A maximum height of the first buffer surface 121 may be substantially equal to a height of the upper cover side surface 101, that is, the first buffer surface 121 may extend to a position in a maximum extent to be substantially flushing with an upper cover surface S1. When the trolley case is subjected to an external pressure, the first buffer surface 121 may buffer the pressure to prevent deformation of the trolley case.

[0020] Horizontal concave sections 140, which are parallel to each other, are also provided horizontally on the upper cover surface S1 to serve the effect of assisting baggage in the trolley case. The concave sections 140 have a smooth curvilinear cross section, the preferred number of the concave sections 140 of the present embodiment are set to be four and a vertical distance between an apex of curvature of each of the concave sections 140 and the surface of the trolley case is limited between 1 mm and 5 mm in order to ensure a certain degree of a support effect and an internal space.

[0021] In order to further increase the strength of the trolley case, it is also possible to further provide a reinforcing strip (not shown) having a hollow structure on the inside of the upper cover surface S1, illustrated structures of the hollow structure is shown in any one of Figs. 6 to 11 or various combinations, the reinforcing strip is configured for enhancing compression strength of the upper cover surface S1, and further protect the trolley case from external impact and deformation. Meanwhile, when objects in the trolley case experience external impact, the trolley case can bear and remove a certain external force through the reinforcing strips in the trolley case body, thereby increasing the case crash performance, so as to protect the trolley case body from damage by external forces. It will be appreciated that the inner side of the lower cover surface S2 may also be provided with a re-

inforcing strip (not shown) for enhancing the compressive strength of the lower cover surface S2.

[0022] As illustrated by Fig. 4, the lower cover 200 is similar to the upper cover 100, an inner side of the lower cover 200 is provided continuously or intermittently with the lower reinforcing strip 210 for preventing deformation of the lower cover 200, the lower reinforcing strip 210 is defined at an inner periphery of a side of the lower cover 200 adjacent to the upper cover 100, namely is defined on an inner sidewall of the second reinforcing surface 222 and is defined by extending toward in a direction toward the upper cover 100 from the lower cover 200. Preferably, the second angle is 90°, the second buffer surface 221 is parallel to a lower cover side surface 201. A maximum height of the second buffer surface 221 may be substantially equal to a height of the lower cover side surface 201, that is, the second buffer surface 221 may extend to a position in a maximum extent to be substantially flushing with a lower cover surface S2. When the trolley case is subjected to an external pressure, the second buffer surface 221 may buffer the pressure to prevent deformation of the trolley case. Horizontal concave sections 140, which are parallel to each other, are also provided horizontally on the lower cover surface S2, the horizontal concave sections are configured for a small increase in the inner space of the trolley case, and for forming gaps in the trolley case, then to a certain extent, play a role in preventing external force from damaging the objects inside the trolley case. In order to further increase the strength of the trolley case, it is also possible to further provide a reinforcing strip (not shown) inside the concave sections 140, the reinforcing strip is configured for enhancing compression strength of the lower cover surface S2, and further protect the trolley case from external impact and deformation. Meanwhile, when objects in the trolley case experience external impact, the trolley case can bear and remove a certain external force through the reinforcing strips in the trolley case body, thereby increasing the case crash performance, so as to protect the trolley case body from damage by external forces. It will be appreciated that the inner side of the lower cover surface S2 may also be provided with a reinforcing strip (not shown) for enhancing the compressive strength of the lower cover surface S2. In the present embodiment, the upper reinforcing strip 110, the lower reinforcing strip 210 and the reinforcing strip in the trolley case body are all made of plastic materials.

[0023] The lower cover 200 is further provided with a support block 250 for supporting on the ground when place the trolley case on the ground to load and unload luggage in the trolley case, preventing the lower cover 200 from deforming by gravity of the luggage when the luggage is overweight or during repeated normal use of the trolley box. Preferably, the support block 250 is provided in a middle portion of the lower cover 200, since under gravity of the trolley case, the lower cover surface S2 will have a slightly outwardly convex arc, so that the middle portion of the lower cover 200 is closest to the

ground, then it is possible for the support block 250 to be provided here so as to use the minimum amount of materials to avoid a phenomenon that the lower cover 200 is deformed by the luggage and the like.

[0024] Further, as shown in Fig. 5, the lower reinforcing strip 210 for preventing the deformation of the trolley case is continuously or intermittently fixed to the second reinforcing surface 222 close to an inner wall of the trolley case to enhance the strength of the second reinforcing surface 222. In the present embodiment, it is preferable that a width of the lower reinforcing strip 210 and a width of the second reinforcing surface 222 are the same, a height of the lower reinforcing strip 210 and a height of the second buffer surface 221 are equal. In order to reduce the production process of the trolley case, the lower reinforcing strip 210 and the second reinforcing surface 222 are integrally molded from the mold and are positioned on the inner wall of the second reinforcing surface 222 so as not to affect the appearance of the case cover; understandably, the width and fixing means of the lower reinforcing strip 210 are not limited thereto, and the lower reinforcing strip 210 may be fixed to the inner wall of the second reinforcing surface 222 in such a manner of adhesion, buckle connection, and so on. The lower reinforcing strip 210 surround the second reinforcing surface 222 at least one turn, i.e., the second reinforcing surface 222 comprises at least one lower reinforcing strip 210. Similarly, with respect to the upper cover 100, the lower reinforcing strip 110 for preventing the deformation of the trolley case is continuously or intermittently fixed to the first reinforcing surface 122 close to an inner wall of the trolley case to enhance the strength of the second reinforcing surface 222. In the present embodiment, it is preferable that a width of the upper reinforcing strip 110 and a width of the first reinforcing surface 122 are the same, a height of the upper reinforcing strip 110 and a height of the first buffer surface 121 are equal. In order to reduce the production process of the trolley case, the upper reinforcing strip 110 and the first reinforcing surface 122 are integrally molded from the mold and are positioned on the inner wall of the first reinforcing surface 122 so as not to affect the appearance of the case cover; understandably, the width and fixing means of the upper reinforcing strip 110 are not limited thereto, and the upper reinforcing strip 110 may be fixed to the inner wall of the first reinforcing surface 122 in such a manner of adhesion, buckle connection, and so on. The upper reinforcing strip 110 surrounds the first reinforcing surface 122 at least one turn, i.e., the first reinforcing surface 122 comprises at least one upper reinforcing strip 110.

[0025] As shown in Fig. 6, the lower reinforcing strip 210 comprises a second outer surface a2 and a second inner surface b2, a second gap c2 is defined between the second outer surface a2 and the second inner surface b2, and the second hollow structure is formed in the second gap c2. The second hollow structure is in a stepped shape (shown as Fig. 6), a honeycomb shape (shown as Fig. 7), a lattice shape, or a wavy shape (shown as Fig.

8). Similarly, the upper reinforcing strip 110 comprises a first outer surface a1 and a first inner surface b1, a first gap c1 is defined between the first outer surface a1 and the first inner surface b1, the first hollow structure is formed in the first gap c1, the first hollow structure is in a stepped shape (shown as Fig. 6), a honeycomb shape (shown as Fig. 7), a lattice shape, or a wavy shape (shown as Fig. 8). It is to be understood that the shape of the first hollow structure and the second hollow structure is not limited to the above-mentioned shape, and may be in the form of a plate, a swash plate, a strip (as shown in Fig. 9), an oblique bar (as shown in Fig. 10), a wavy shape (as shown in Fig. 11), other irregular shapes or a combination of the like, as long as it is able to effectively guide the external force dispersed in the hollow structure to increase the strength of the reinforcing strips and resistance to deformation. Certainly, the hollow structure of the present invention of the reinforcing strip can be set at different locations according to the trolley case load-bearing areas, different load-bearing areas can be set up with a different hollow structure to enhance the strength of the trolley case. In this embodiment, the hollow structure is provided mainly on side surfaces of the upper cover and the lower cover, the hollow structure can be provided on the entire side surfaces of the upper cover and the lower cover so that the area to be supported is larger when the upper cover and the lower cover are closed, then the trolley box can afford collision and squeezing when traveling or checked, the trolley can also be used as a seat for rest when the user is tired.

[0026] The stepped shape comprises a plurality of straight lines 301 and oblique lines 302, the straight lines 301 alternately comprise first straight line segments 301a and second straight line segments 301b, the first straight line segments 301a are straight line segments extending from the first outer surface a1 toward the first inner surface b1 or straight line segments extending the second outer surface a2 toward the second inner surface b2; the second straight line segments 301b are straight line segments extending from the first inner surface b1 toward the first outer surface a1 or straight line segments extending the second inner surface b2 toward the second outer surface a2, a ratio between a length of the straight line 301 and a width of the first reinforcing surface 120 is a first ratio; one oblique line 302 is connected between one end of one first straight line segment 301a and one end of one second straight line segment 301b, an angle between adjacent oblique lines is a fourth angle B, preferably, the first ratio is 1:8, and the fourth angle is in a range of 60° to 90°, so that the oblique lines 302 can remove the external force at the straight line segments 301 and enhance the strength of the trolley case. The above reinforcing strip structure not only supports case covers, prevents the case covers from being deformed, and is integrally molded with the upper cover 100 or the lower cover 200, then the production process is simple and cost effective.

[0027] As illustrated in Fig. 7, in the third embodiment

of the present invention, a ratio of the number of honeycomb cells of the honeycomb shape to a length of the first reinforcing surface 122 or the second reinforcing surface 222 is 1-1.5/cm. A larger number of cellular cells can cause a large dense of cells, then a structure of the one-piece molding mold requires a high precision, thereby increasing a cost of processing, a smaller number of the cells will result in less force bearing, then the reinforcement effect of the trolley case is not obvious.

[0028] As illustrated in Fig. 8, in the second embodiment of the present invention, the wavy shape comprises a plurality of triangles, preferably, a vertical line segment perpendicular to the first outer surface a1 or the second outer surface a2 is provided at vertexes of the triangles, due to the simultaneous presence of straight segments and oblique lines, external forces can be transmitted into the reinforcing strip, and the force is exerted by strength of the reinforcing strip. Preferably, the triangle is an isosceles triangle, angles of the vertexes of the isosceles triangle are in a range of 60° to 120°, a smaller angle leads to a larger dense of the triangles, then a structure of the one-piece molding mold requires a high precision, thereby increasing a cost of processing, a larger angle will result in less force transmitting caused by a smaller dense of the triangles, then the reinforcement effect of the trolley case is not obvious.

[0029] As shown in Fig. 9, in the hollow structure of straight strips of the present embodiment, each straight strip is perpendicular to the first outer surface a1 or the second outer surface a2, it is to be understood that the straight strips may also be parallel to the first outer surface a1 or the second outer surface a2, or may be formed in a grid shape by vertical strips parallel to the first outer surface a1 or the second outer surface a2, respectively.

[0030] As shown in Fig. 10, in the oblique striped hollow structure, angles of acute angles between the oblique strips and the first outer surface a1 or the second outer surface a2 range from 10° to 60°, so that the oblique strips are able to withstand and scatter force, and not be damaged by the external forces.

[0031] As shown in Fig. 11, in the waved hollow structure, straight line segments may be added at crests, as shown in Fig. 6, for enhancing the strength of the hollow structure.

[0032] As illustrated in Fig. 12, in the fourth embodiment of the present invention, differences from the first embodiment of the present invention are that in the present embodiment, a part of the second reinforcing surface 222 is recessed along the lower cover side surface 201 to form a second inner groove 202, namely, the second gap c2 is recessed along the lower cover side surface 201 to form a second inner groove 202, the lower reinforcing strip 210 is defined in the second inner groove 202, preferably, a height of the lower reinforcing strip 210 is equaled to a recessed height Hb of the second inner groove 202. The recessed height Hb of the second inner groove 202 is smaller than or equal to a height H2 of the second buffer surface 221, the second buffer surface 222

has a third angle C with respect to a horizontal direction X, a thickness D of the second buffer surface 221 is larger than a thickness d of the lower cover side surface 201. The second buffer surface 221 is firstly subjected to an external force when the trolley case suffers the external force, thus the thickness D of the second buffer surface 221 is larger than the thickness d of the lower cover side surface 201 to enhance the strength of the second buffer surface 221, so as to protect the lower cover side surface 201 from deformation or collapse, thereby protecting the luggage inside the trolley case. Similarly with the first embodiment of the present invention, a maximum height of the second buffer surface 221 may be substantially equal to a height of the lower cover side surface 201, that is, the second buffer surface 221 may extend to a position in a maximum extent to be substantially flushing with the lower cover surface S2 (referring to Fig. 4 and descriptions of Fig. 4). Thus, in the present embodiment, the second inner groove 202 can follow the second buffer surface 221 to extend to a position in a maximum extent to be substantially flushing with the lower cover surface S2, namely, the recessed height Hb of the second inner groove 202 is equaled to the height of the lower cover side surface 101 as well, so that the entire lower cover side surface 201 is reinforced.

[0033] In the present embodiment, the height H2 of the second buffer surface 221 is 24 mm, the thickness Hb of the second inner groove 202 is 7 mm, the thickness D of the second reinforcing surface 222 is 2.5 mm, and the thickness d of the lower cover side surface 201 is 1.3 mm, the third angle C is 3°. In practice, the second buffer surface 221 has a slight inclination downwardly directed to the lower reinforcing strip 210 through the third angle C, the external forces in different directions can be transmitted to the lower reinforcing strip 210 for unloading the external forces, thereby enhancing the strength of the lower cover 200. Meanwhile, the lower reinforcing strip 210 is circumscribed by the side walls of the lower cover 200, and the lower reinforcing strip 210 can be protected by the side walls of the lower cover 200 to further protect the lower cover 200 from collapsing or deforming under the external forces.

[0034] It is to be understood that the upper cover 100 may also be provided with the above-described structure. The other technical features of the present embodiment are the same as those of the foregoing embodiment, and will not be described again.

[0035] Generally, during the use of the trolley case, positions where the edge of the upper cover 100 is connected to the edge of the lower cover 200 are most likely to be deformed and are not easily restored, resulting in failure of the trolley case. The trolley case provided by the present invention is provided with reinforcing strips close to the edges of the upper cover 100 and the lower cover 200 to prevent the deformation, and the upper reinforcing strip 110 and the lower reinforcing strip 210 are formed by injection molding. The production process is relatively simple, the reinforcing strips do not affect the

overall appearance of the trolley case, and their materials are the same as that of the trolley case. Thus it is relatively light, compared to the steel ring and external support in the prior art, it does not increase the weight of the trolley case. It will be appreciated that the reinforcing strips may also be added to the upper cover 100 and the lower cover 200 of the trolley case to enhance the strength of the overall strength of the trolley case.

[0036] While the embodiments of the present application are described with reference to the accompanying drawings above, the present application is not limited to the above-mentioned specific implementations. In fact, the above-mentioned specific implementations are intended to be exemplary not to be limiting. In the inspiration of the present application, those ordinary skilled in the art can also make many modifications without breaking away from the subject of the present application and the protection scope of the claims. All these modifications belong to the protection of the present application.

List of reference signs

[0037]

100	upper cover
101	upper cover side surface
110	upper reinforcing strip
120	first buffer step
121	first buffer surface
122	first reinforcing surface
140	horizontal concave sections
200	lower cover
201	lower cover side surface
202	second inner groove
210	lower reinforcing strip
220	second buffer step
221	second buffer surface
222	second reinforcing surface
250	support block
301	straight lines
301a	first straight line segments
301b	second straight line segments
302	oblique lines
A	first angle
a1	first outer surface
a2	second outer surface
B	fourth angle
b1	first inner surface
b2	second inner surface
C	third angle
c1	first gap
c2	second gap
D	thickness of second buffer surface
d	thickness of lower cover side structure
H2	height
Hb	recessed height
S	support region
S1	upper cover surface

S2 lower cover surface
X horizontal direction

Claims

1. A trolley case comprises an upper cover (100) and a lower cover (200) which is openable and connectable to the upper cover (100), **characterized in that** an inner side of the upper cover (100) is provided continuously or intermittently with an upper reinforcing strip (110), an inner part of the upper reinforcing strip (110) is a first hollow structure, the upper reinforcing strip (110) is defined at an inner periphery of a side of the upper cover (100) adjacent to the lower cover (200); an inner side of the lower cover (200) is provided continuously or intermittently with a lower reinforcing strip (210), an inner part of the lower reinforcing strip (210) is a second hollow structure, the lower reinforcing strip (210) is defined at an inner periphery of a side of the lower cover (200) adjacent to the upper cover (100), the upper reinforcing strip (110) and the lower reinforcing strip (210) form a support region (S) for preventing deformation of the upper cover (100) and the lower cover (200) and co-supporting the trolley case when the upper cover (100) and the lower cover (200) are closed.
2. The trolley case according to claim 1, **characterized in that** the upper reinforcing strip (110) comprises a first outer surface (a1) and a first inner surface (b1), a first gap (c1) is defined between the first outer surface (a1) and the first inner surface (b1), the first hollow structure is formed in the first gap (c1), the lower reinforcing strip (210) comprises a second outer surface (a2) and a second inner surface (b2), a second gap (c2) is defined between the second outer surface (a2) and the second inner surface (b2), and the second hollow structure is formed in the second gap (c2).
3. The trolley case according to claim 2, **characterized in that** a cross section of the first hollow structure and the second hollow structure are in a honeycomb shape, a stepped shape, a lattice shape, or a wavy shape.
4. The trolley case according to claim 1, **characterized in that**
5. The upper cover (100) comprises an upper cover side surface (101) and an upper cover surface (S1), the lower cover (200) comprises a lower cover side surface (201) and a lower cover surface (S2), and the upper cover surface (S1) and the lower cover surface (S2) are both provided with a horizontal recess (140), and a support block (250) is further provided on the lower cover surface (S2).

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6. The trolley case according to claim 1, **characterized in that** an edge of the upper cover (100) adjacent to the lower cover (200) protrudes outwardly to form a first buffer step (120), the first buffer step (120) comprises a first buffer surface (121) and a first reinforcement surface (122), one end of the first buffer surface (121) is defined at the edge of the upper cover (100) close to the lower cover (200), the other end of the first buffer surface (121) extends in a direction opposite to the lower cover (200) and is connected to the first reinforcing surface (122), the first reinforcing surface (122) forms a first angle (A) with the first buffer surface (121), the upper reinforcing strip (110) is defined on the first reinforcing surface (122); an edge of the lower cover (200) adjacent to the upper cover (100) protrudes outwardly to form a second buffer step (220), the second buffer step (220) comprises a second buffer surface (221) and a second reinforcement surface (222), one end of the second buffer surface (221) is defined at the edge of the lower cover (200) close to the upper cover (100), the other end of the second buffer surface (221) extends in a direction opposite to the upper cover (100) and is connected to the second reinforcing surface (222), the second reinforcing surface (222) forms a second angle (B) with the second buffer surface (221), the lower reinforcing strip (210) is defined on the second reinforcing surface (222), when the upper cover (100) and the lower cover (200) are closed, the first buffer surface (121) is abutted against the second buffer surface (221) to form the support region (S), the first reinforcing surface (122) defines at least one upper reinforcing strip (110); the second reinforcing surface (222) defines at least one lower reinforcing strip (210), the upper reinforcing strip (110) and the lower reinforcing strip (210) are made of plastic materials.
7. The trolley case according to claim 1, **characterized in that** the upper reinforcing strip (110) is integrally molded with the upper cover (100), and the lower reinforcing strip (210) is integrally molded with the lower cover (200).
8. The trolley case according to claim 3, **characterized in that** the first hollow structure and the second hollow structure comprise a plurality of straight lines (301) and oblique lines (302), when the first hollow structure and the second hollow structure have a cross-sectional shape in a stepped shape, the straight lines (301) are composed of first straight line segments (301a) and second straight line segments (301b), the first straight line segments (301a) are straight line segments extending from the first outer surface (a1) toward the first inner surface (b1) or straight line segments extending from the second outer surface (a2) toward the second inner surface (b2); the second straight line segments (301b) are

straight line segments extending from the first inner surface (b1) toward the first outer surface (a1) or straight line segments extending from the second inner surface (b2) toward the second outer surface (a2), a ratio between a length of each of the straight line segments and a straight distance of the first outer surface (a1) to the first inner surface (b1) or the second outer surface (a2) to the second inner surface (b2) is 1: 8; one oblique line (302) is connected between one end of one first straight line segment (301a) and one end of one second straight line segment (301b), an angle between adjacent oblique lines is a fourth angle, wherein the fourth angle is in a range of 60 ° to 90 °.

9. The trolley case according to claims 3, **characterized in that** the first hollow structure and the second hollow structure comprise a plurality of triangles when a cross-sectional shapes of the first hollow structure and the second hollow structures are in the wavy shape, a vertical line segment perpendicular to the first outer surface (a1) or the second outer surface (a2) is provided at an vertex of one triangle, each of the triangles is an isosceles triangle, an angle of the vertex of the isosceles triangle is in a range of 60° to 120.

10. The trolley case according to claims 3, **characterized in that** when the first hollow structure and the second hollow structure have a cross-sectional shape in the honeycomb shape, a ratio of the number of honeycomb cells comprised in the first hollow structure or the second hollow structure to a length of the first reinforcing surface (122) or the second reinforcing surface (222) is 1-1.5/cm.

11. The trolley case according to claims 1, **characterized in that** the upper cover (100) comprises an upper cover side surface (101) and an upper cover surface (S1), the lower cover (200) comprises a lower cover side surface (201) and a lower cover surface (S2), an edge of the upper cover (100) adjacent to the lower cover (200) protrudes outwardly to form a first buffer step (120), the first buffer step (120) comprises a first buffer surface (121) and a first reinforcement surface (122), one end of the first buffer surface (121) is defined at the edge of the upper cover (100) close to the lower cover (200), the other end of the first buffer surface (121) extends in a direction opposite to the lower cover (200) and is connected to the first reinforcing surface (122), a part of the first reinforcing surface (122) is recessed along the upper cover side surface (101) to form a first inner groove, the upper reinforcing strip (110) is defined in the first inner groove; an edge of the lower cover (200) adjacent to the upper cover (100) protrudes outwardly to form a second buffer step (220), the second buffer step (220) comprises a second buffer surface (221)

and a second reinforcement surface (222), one end of the second buffer surface (221) is defined at the edge of the lower cover (200) close to the upper cover (100), the other end of the second buffer surface (221) extends in a direction opposite to the upper cover (100) and is connected to the second reinforcing surface (222), a part of the second reinforcing surface (222) is recessed along the lower cover side surface (201) to form a second inner groove (202), the lower reinforcing strip (210) is defined in the second inner groove (202).

12. A height of the first inner groove is smaller than or equal to a height of the first buffer surface (121), a thickness of the first buffer surface (121) is larger than a thickness of the upper cover side surface (101); a recessed height of the second inner groove (202) is smaller than or equal to a height (H2) of the second buffer surface (221), a thickness (D) of the second buffer surface (221) is larger than a thickness (d) of the lower cover side surface (201).

Amended claims in accordance with Rule 137(2) EPC.

1. A trolley case comprises an upper cover (100) and a lower cover (200) which is openable and connectable to the upper cover (100), an inner side of the upper cover (100) is provided continuously or intermittently with an upper reinforcing strip (110), an inner part of the upper reinforcing strip (110) is a first hollow structure, the upper reinforcing strip (110) is defined at an inner periphery of a side of the upper cover (100) adjacent to the lower cover (200); an inner side of the lower cover (200) is provided continuously or intermittently with a lower reinforcing strip (210), an inner part of the lower reinforcing strip (210) is a second hollow structure, the lower reinforcing strip (210) is defined at an inner periphery of a side of the lower cover (200) adjacent to the upper cover (100);

characterized in that the upper cover (100) comprises an upper cover side surface (101) and an upper cover surface (S1), the lower cover (200) comprises a lower cover side surface (201) and a lower cover surface (S2), an edge of the upper cover (100) adjacent to the lower cover (200) protrudes outwardly to form a first buffer step (120), the first buffer step (120) comprises a first buffer surface (121) and a first reinforcement surface (122), one end of the first buffer surface (121) is defined at the edge of the upper cover (100) close to the lower cover (200), the other end of the first buffer surface (121) extends in a direction opposite to the lower cover (200) and is connected to the first reinforcing surface (122), a part of the first reinforcing surface (122) is recessed along the upper cover side surface (101) to form a first

inner groove, the upper reinforcing strip (110) is defined in the first inner groove; an edge of the lower cover (200) adjacent to the upper cover (100) protrudes outwardly to form a second buffer step (220), the second buffer step (220) comprises a second buffer surface (221) and a second reinforcing surface (222), one end of the second buffer surface (221) is defined at the edge of the lower cover (200) close to the upper cover (100), the other end of the second buffer surface (221) extends in a direction opposite to the upper cover (100) and is connected to the second reinforcing surface (222), a part of the second reinforcing surface (222) is recessed along the lower cover side surface (201) to form a second inner groove (202), the lower reinforcing strip (210) is defined in the second inner groove (202); a height of the first inner groove is smaller than or equal to a height of the first buffer surface (121), a thickness of the first buffer surface (121) is larger than a thickness of the upper cover side surface (101); a recessed height of the second inner groove (202) is smaller than or equal to a height (H2) of the second buffer surface (221), a thickness (D) of the second buffer surface (221) is larger than a thickness (d) of the lower cover side surface (201); when the upper cover (100) and the lower cover (200) are closed, the first buffer surface (121) is abutted against the second buffer surface (221) to form the support region (S) for preventing deformation of the upper cover (100) and the lower cover (200) and co-supporting the trolley case.

2. The trolley case according to claim 1, **characterized in that** the upper reinforcing strip (110) comprises a first outer surface (a1) and a first inner surface (b1), a first gap (c1) is defined between the first outer surface (a1) and the first inner surface (b1), the first hollow structure is formed in the first gap (c1), the lower reinforcing strip (210) comprises a second outer surface (a2) and a second inner surface (b2), a second gap (c2) is defined between the second outer surface (a2) and the second inner surface (b2), and the second hollow structure is formed in the second gap (c2).
3. The trolley case according to claim 2, **characterized in that** a cross section of the first hollow structure and the second hollow structure are in a honeycomb shape, a stepped shape, a lattice shape, or a wavy shape.
4. The trolley case according to claim 1, **characterized in that** the upper cover surface (S1) and the lower cover surface (S2) are both provided with a horizontal recess (140), and a support block (250) is further provided on the lower cover surface (S2).
5. The trolley case according to claim 1, **characterized**

in that the first reinforcing surface (122) forms a first angle (A) with the first buffer surface (121); the second reinforcing surface (222) forms a second angle (B) with the second buffer surface (221), the first reinforcing surface (122) defines at least one upper reinforcing strip (110); the second reinforcing surface (222) defines at least one lower reinforcing strip (210), the upper reinforcing strip (110) and the lower reinforcing strip (210) are made of plastic materials.

6. The trolley case according to claim 1, **characterized in that** the upper reinforcing strip (110) is integrally molded with the upper cover (100), and the lower reinforcing strip (210) is integrally molded with the lower cover (200).
7. The trolley case according to claim 3, **characterized in that** the first hollow structure and the second hollow structure comprise a plurality of straight lines (301) and oblique lines (302), when the first hollow structure and the second hollow structure have a cross-sectional shape in a stepped shape, the straight lines (301) are composed of first straight line segments (301a) and second straight line segments (301b), the first straight line segments (301a) are straight line segments extending from the first outer surface (a1) toward the first inner surface (b1) or straight line segments extending from the second outer surface (a2) toward the second inner surface (b2); the second straight line segments (301b) are straight line segments extending from the first inner surface (b1) toward the first outer surface (a1) or straight line segments extending from the second inner surface (b2) toward the second outer surface (a2), a ratio between a length of each of the straight line segments and a straight distance of the first outer surface (a1) to the first inner surface (b1) or the second outer surface (a2) to the second inner surface (b2) is 1: 8; one oblique line (302) is connected between one end of one first straight line segment (301a) and one end of one second straight line segment (301b), an angle between adjacent oblique lines is a fourth angle, wherein the fourth angle is in a range of 60 ° to 90 °.
8. The trolley case according to claims 3, **characterized in that** the first hollow structure and the second hollow structure comprise a plurality of triangles when a cross-sectional shapes of the first hollow structure and the second hollow structures are in the wavy shape, a vertical line segment perpendicular to the first outer surface (a1) or the second outer surface (a2) is provided at a vertex of one triangle, each of the triangles is an isosceles triangle, an angle of the vertex of the isosceles triangle is in a range of 60 ° to 120 °.
9. The trolley case according to claims 3, **character-**

ized in that when the first hollow structure and the second hollow structure have a cross-sectional shape in the honeycomb shape, a ratio of the number of honeycomb cells comprised in the first hollow structure or the second hollow structure to a length of the first reinforcing surface (122) or the second reinforcing surface (222) is 1-1.5 /cm.

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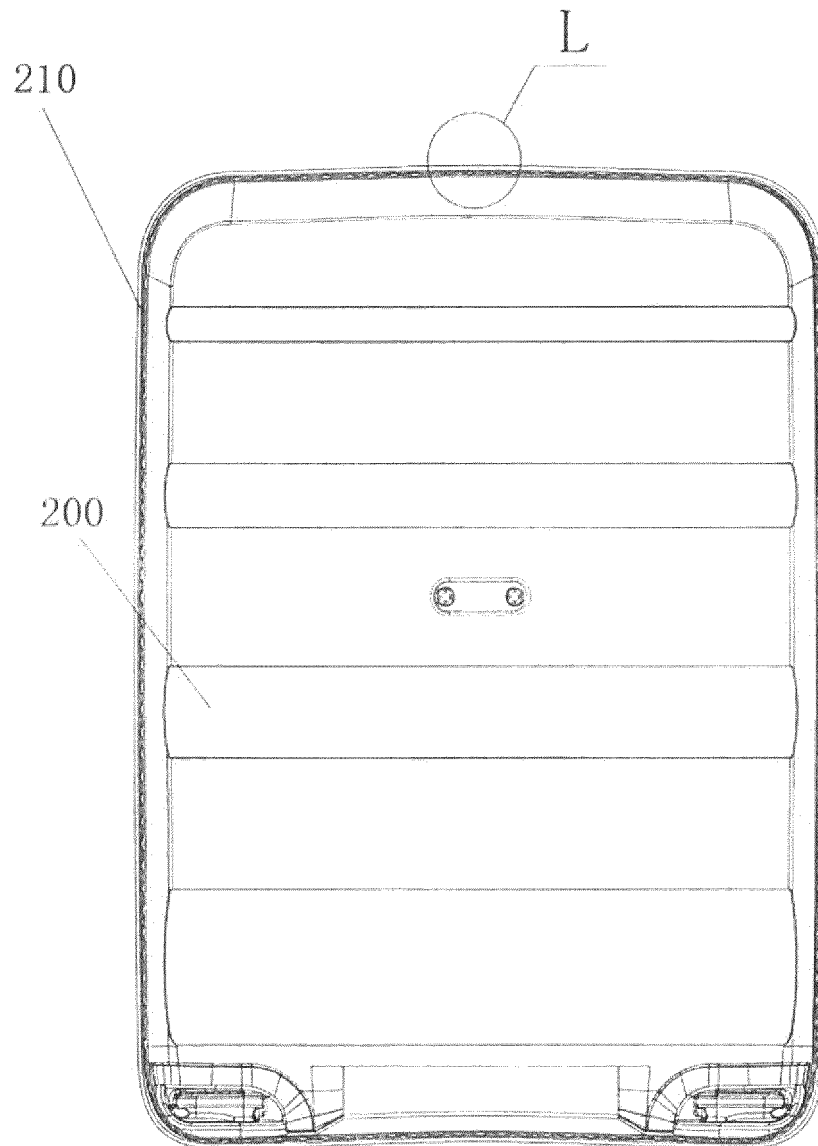


Fig. 1

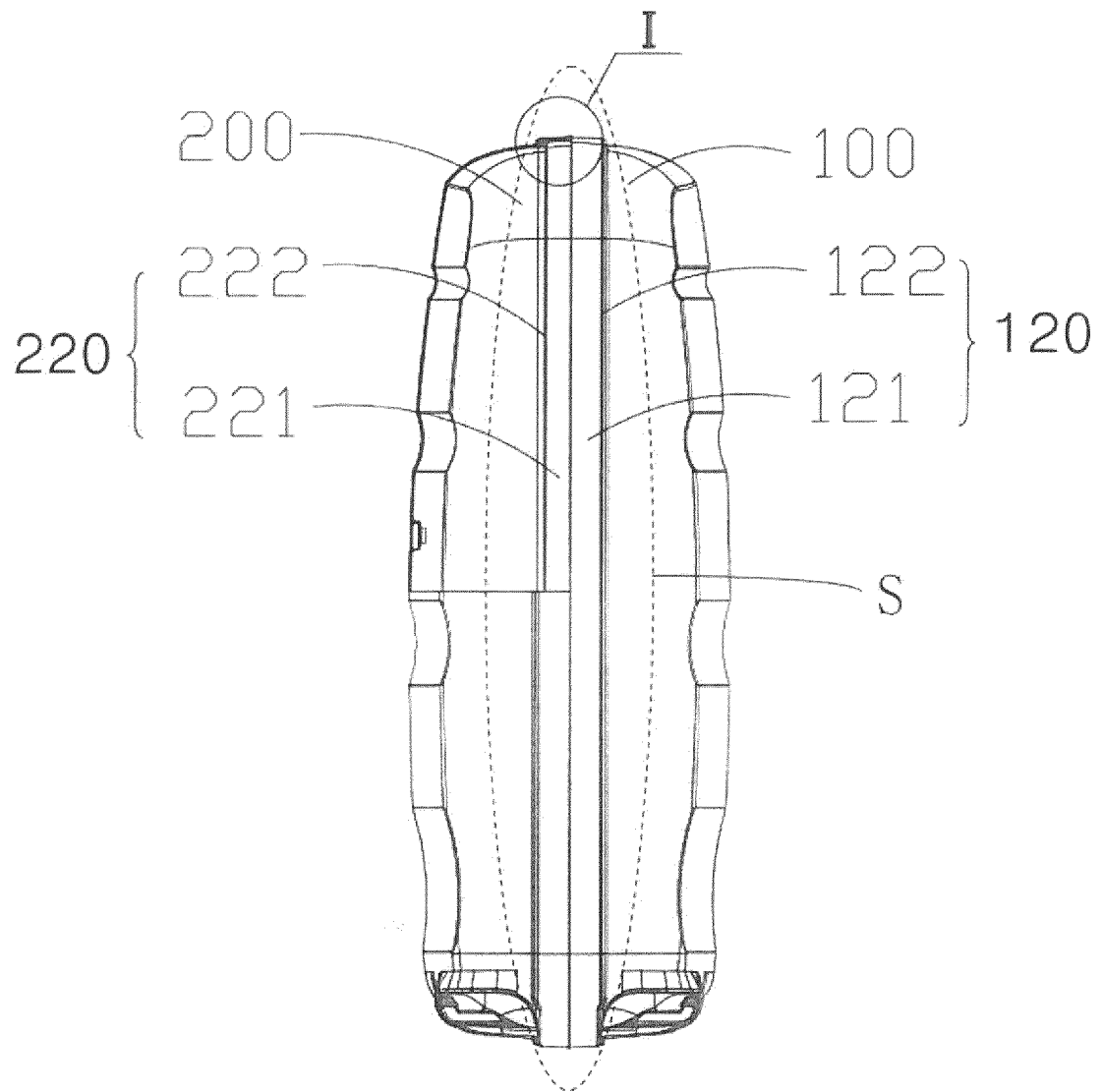


Fig. 2

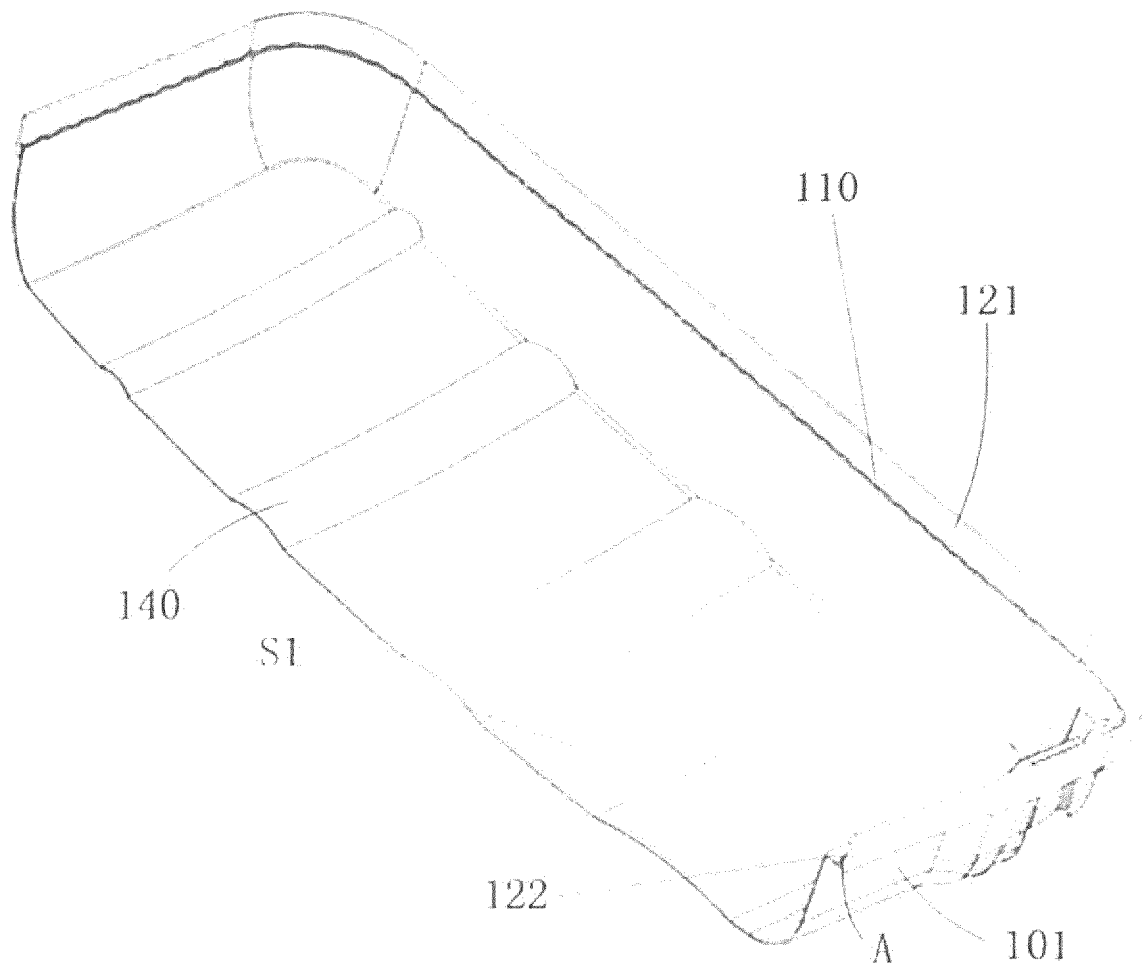


Fig. 3

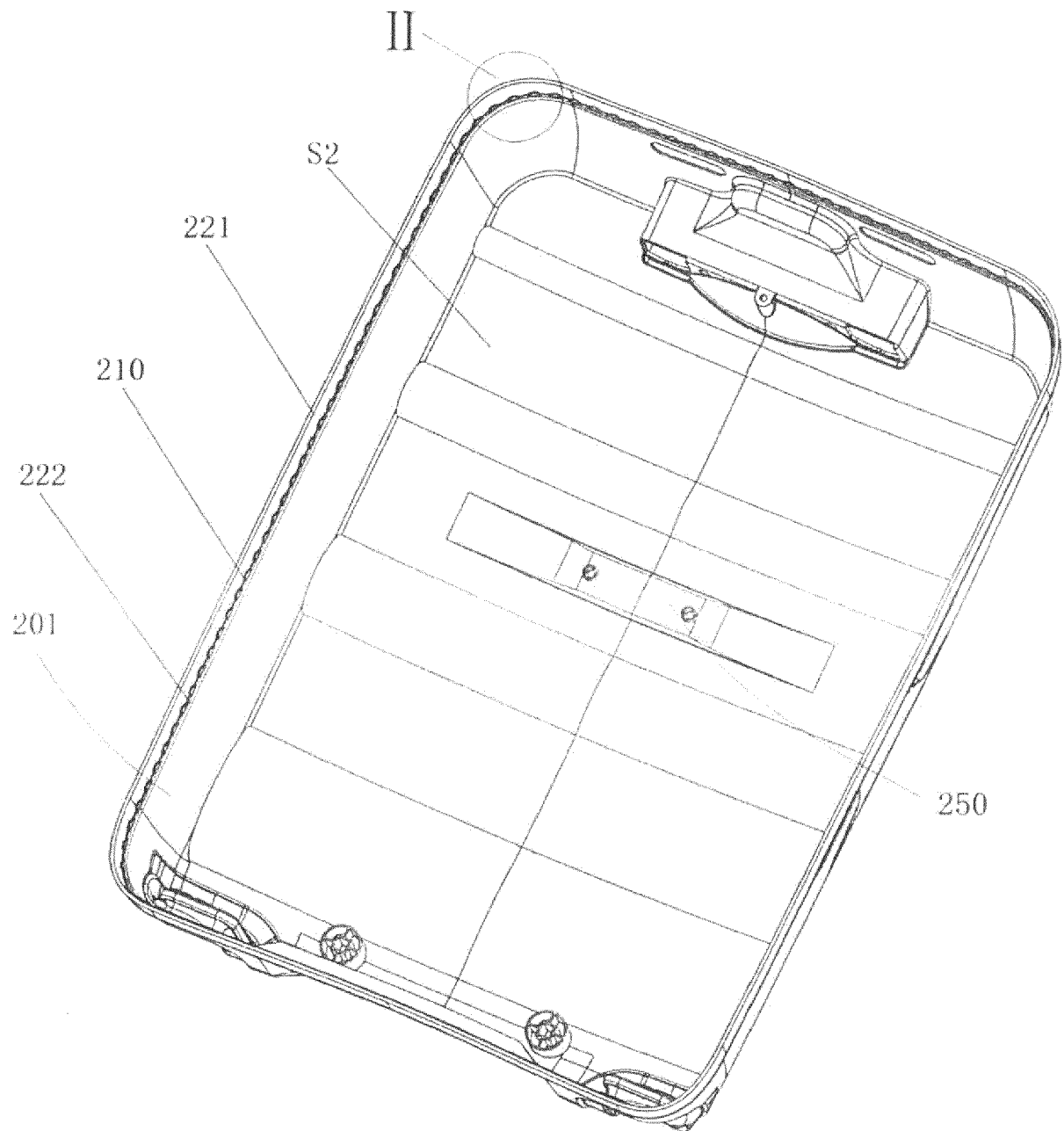


Fig. 4

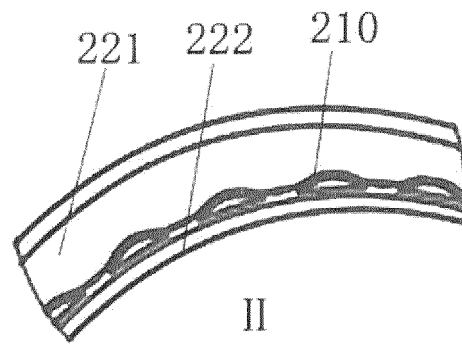


Fig. 5

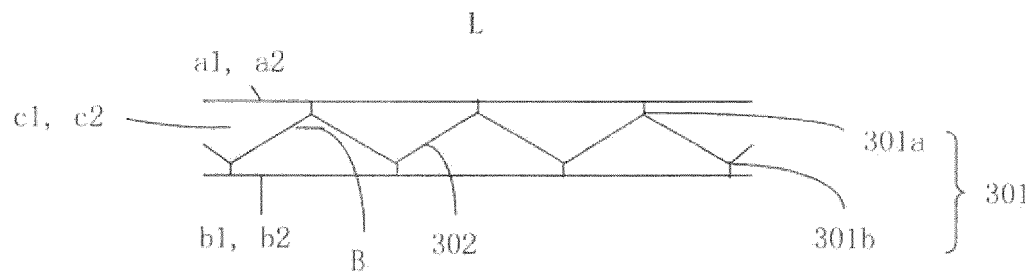


Fig. 6

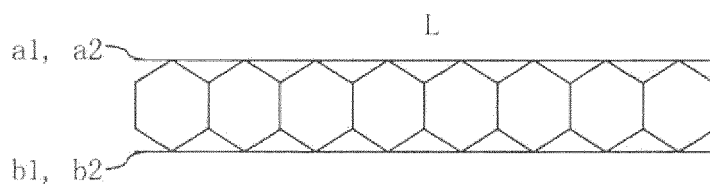


Fig. 7

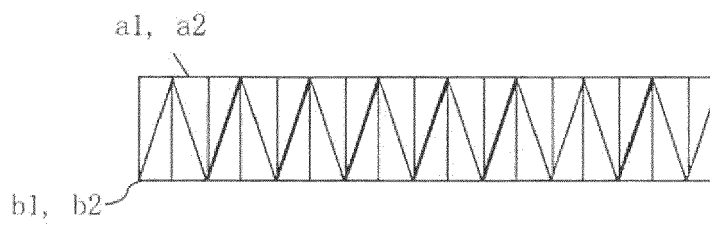


Fig. 8

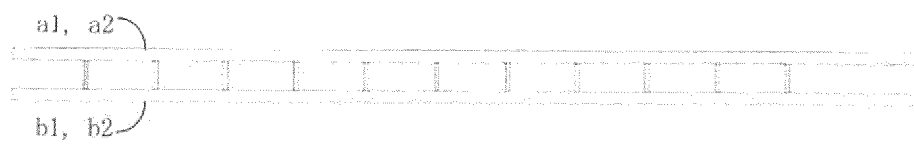


Fig. 9



Fig. 10

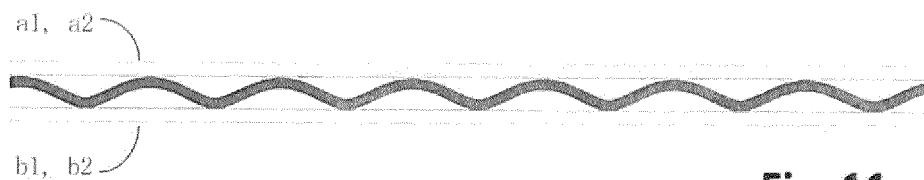


Fig. 11

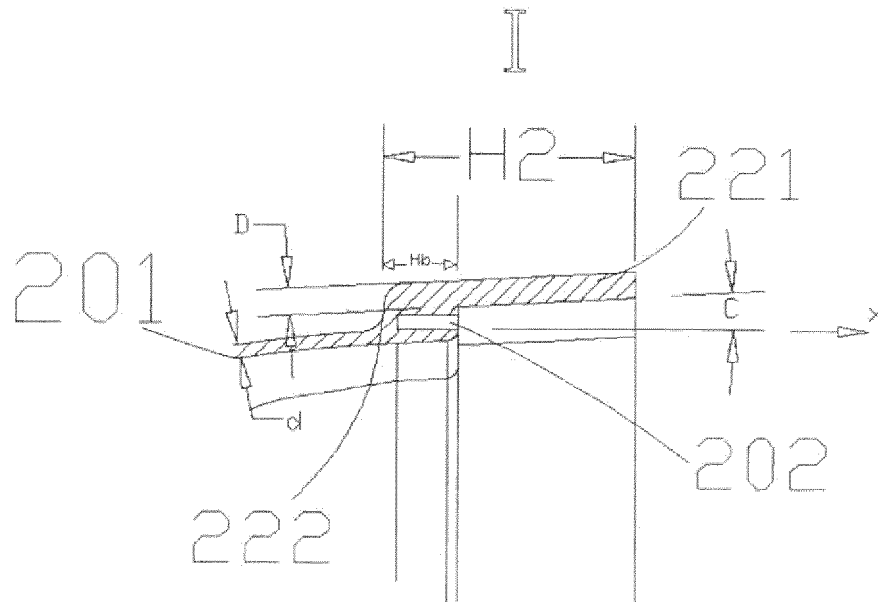


Fig. 12



EUROPEAN SEARCH REPORT

Application Number
EP 17 17 3299

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			A45C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		1 December 2017	Dinescu, Daniela
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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The members are as contained in the European Patent Office EDP file on
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01-12-2017

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		WO 2015070507 A1	21-05-2015
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US 2016166024 A1	16-06-2016	NONE	
DE 202012012047 U1	30-01-2013	NONE	

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