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(54) FASTENING MECHANISM FOR PACKAGE DEVICE

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(57) ABSTRACT

A fastening mechanism for a package device is provided, which includes a plurality of first protrusions stagger-arranged in two rows at an edge of a lid of the package device, wherein a gap is formed between the two rows of the first protrusions; a second protrusion formed on an edge of a body of the package device and corresponding in position to the gap; at least a projection formed on the edge of the body and substantially opposed in position to the second protrusion; and at least a recess formed on the edge of the lid and corresponding in position to the projection of the body. By coupling the lid to the body, the second protrusion is engaged with the gap between the first protrusions, and the projection of the body is engaged with the recess of the lid, so as to provide strong fastening effect for the package device.

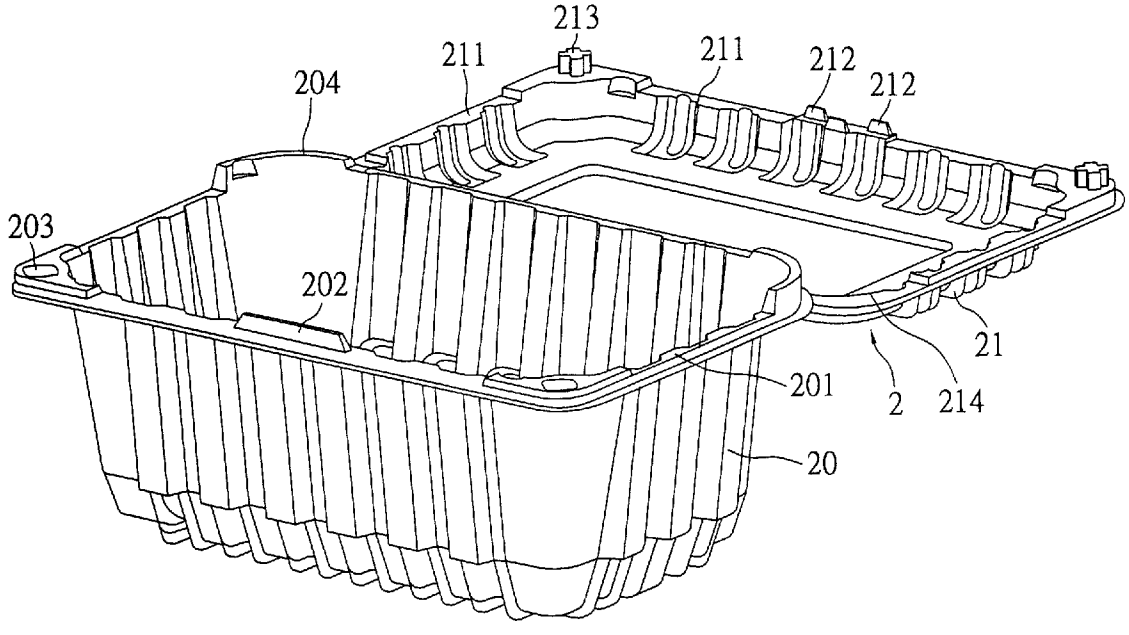


FIG. 1A (PRIOR ART)

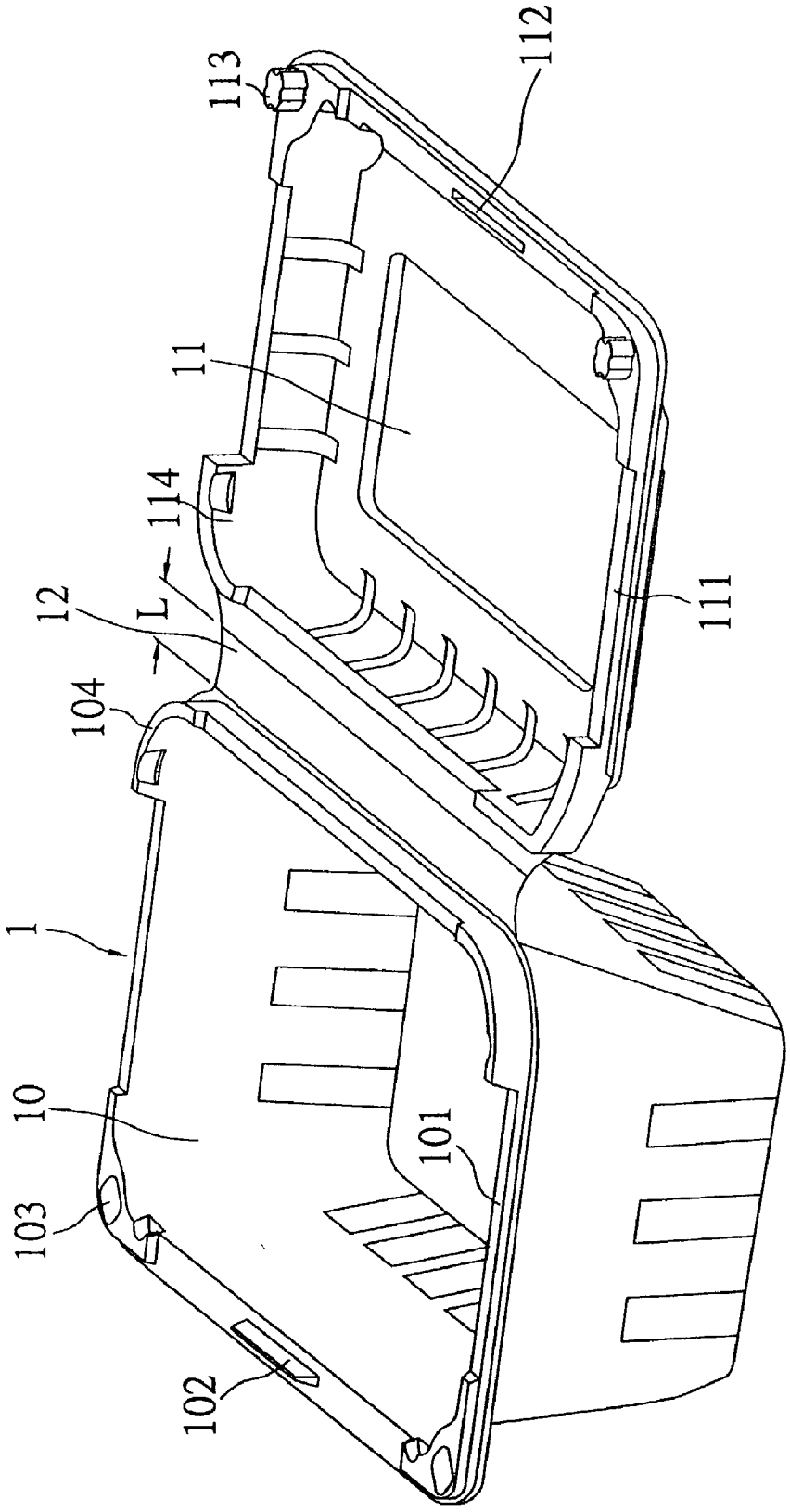


FIG. 1B (PRIOR ART)

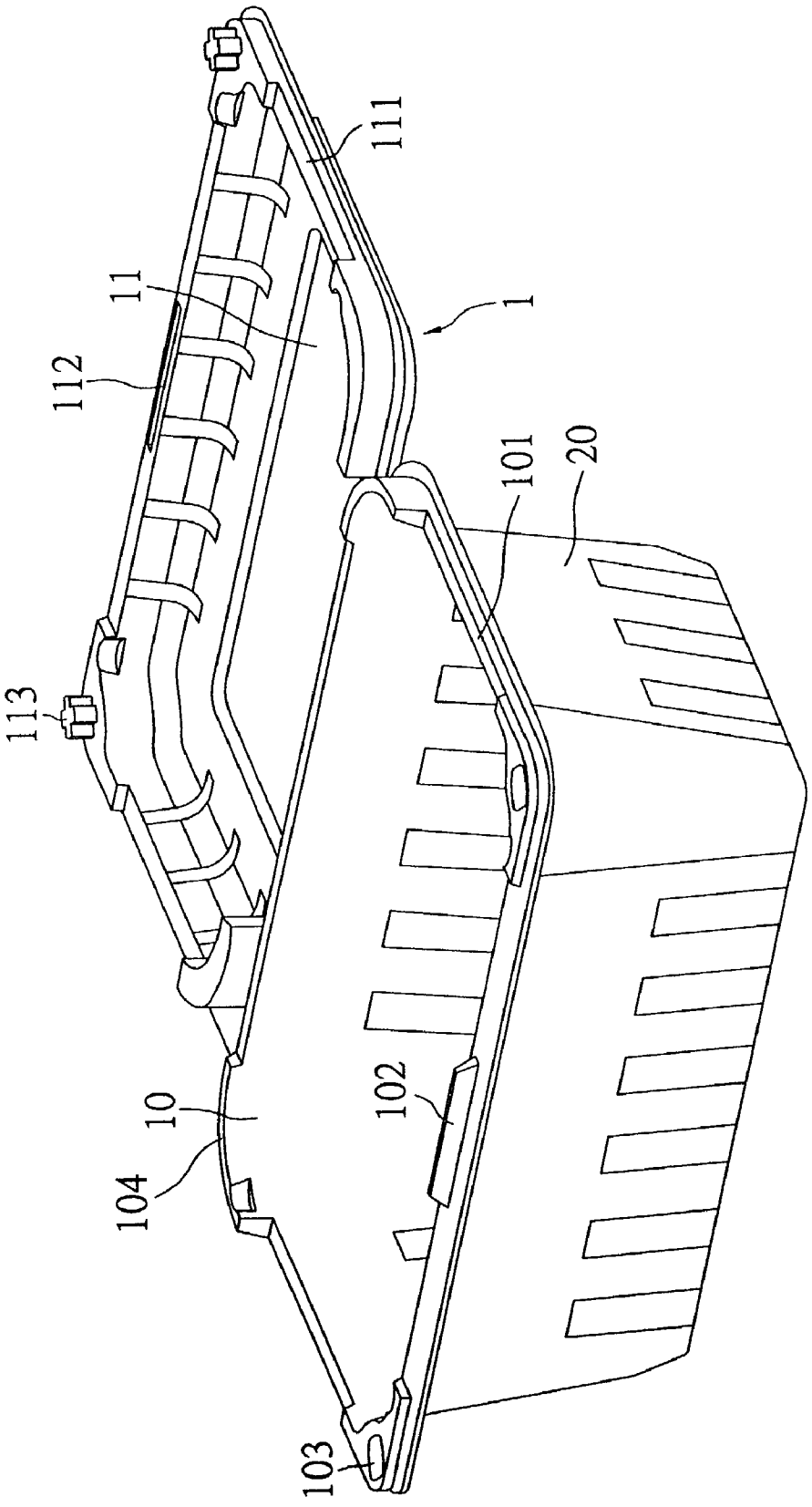


FIG. 2

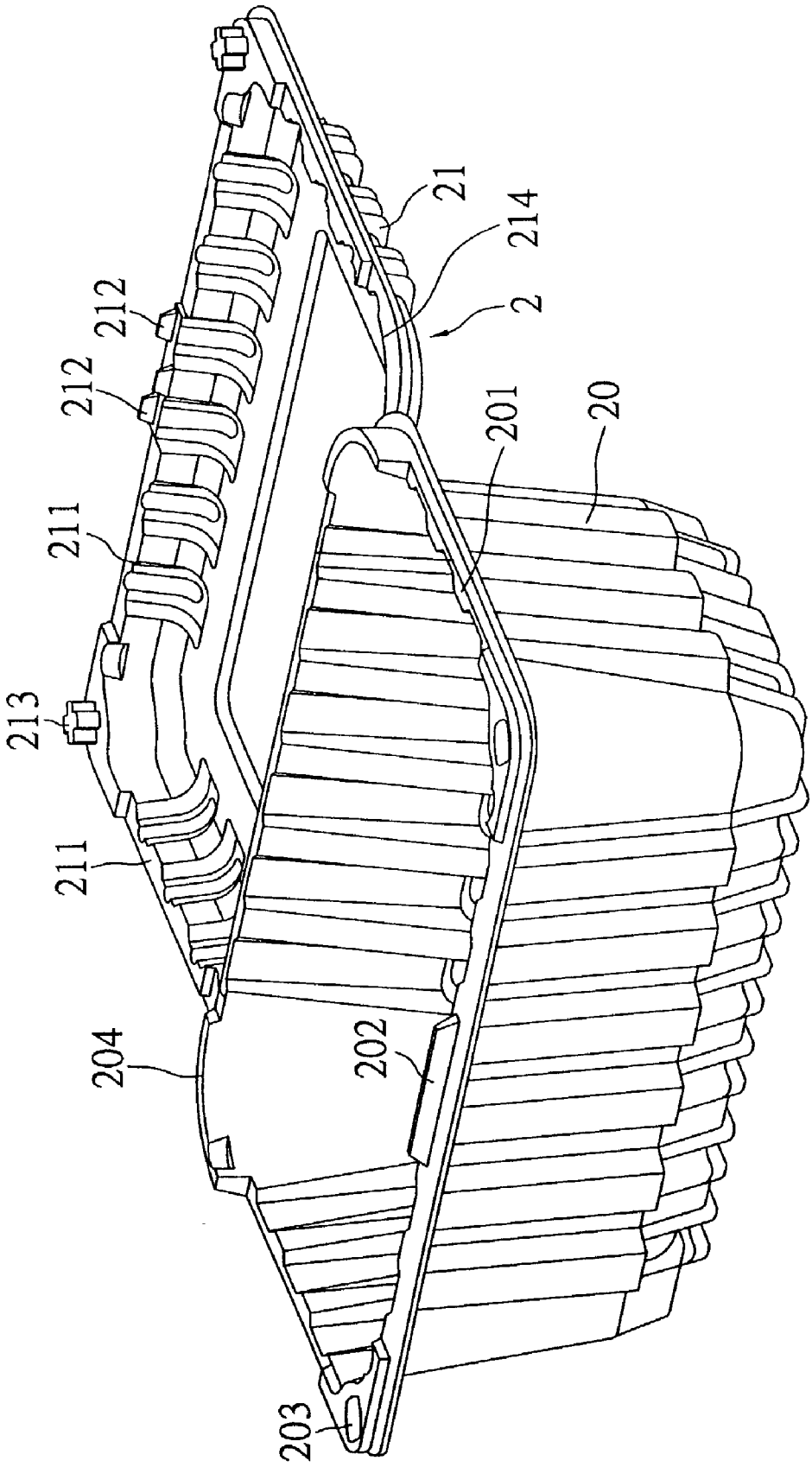
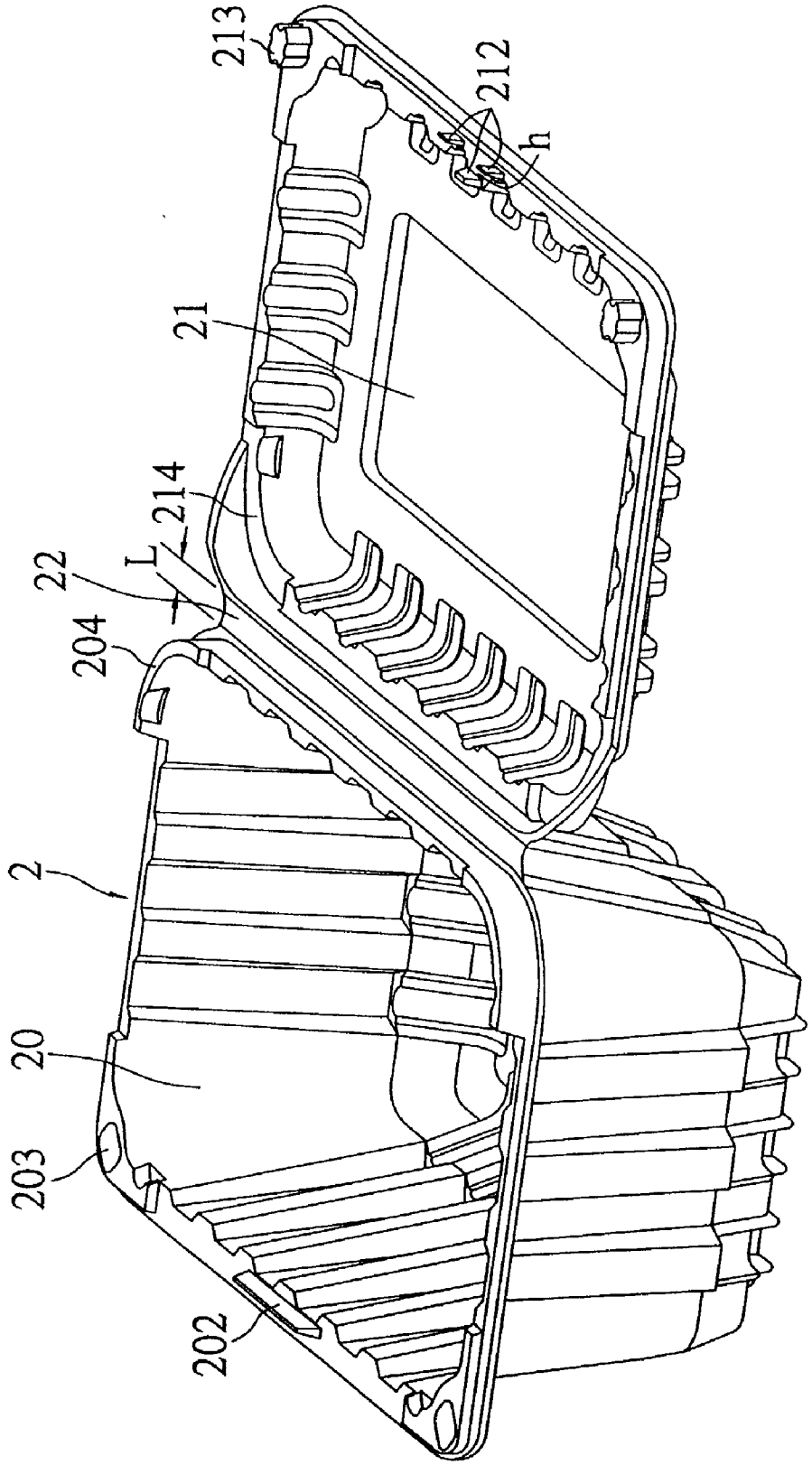


FIG. 3



FASTENING MECHANISM FOR PACKAGE DEVICE

FIELD OF THE INVENTION

[0001] The present invention relates to fastening mechanisms for package devices, and more particularly, to a fastening mechanism for a clam shell so as to provide strong coupling between a lid and a body of the clam shell.

BACKGROUND OF THE INVENTION

[0002] In the market, goods or products are normally enclosed in a variety of clam shells for selling and sealing purposes. For water-containing foods or fruits, it is unsuitable to use paper boxes that hermetically and completely receive the foods or fruits therein; instead, clam shells made of thermoplastic material are more commonly employed. Such a thermoplastic-made clam shell is formed with a plurality of holes on a body thereof, for allowing air to pass through the holes. When the clam shell having holes is packed with fruits and stored in a refrigerator, cold air can enter through the holes into the clam shell for chilling the fruits, and moisture generated from the fruits can be dissipated through the holes to outside of the clam shell, so as to prevent excess humidity in the clam shell and spoiling of the fruits.

[0003] **FIGS. 1A and 1B** illustrate a conventional clam shell made of thermoplastic material. As shown in **FIGS. 1A and 1B**, a fastening mechanism of this clam shell **1** comprises: a protrusion **102** formed on an edge of a body **10**; a plurality of grooves **103** respectively formed at front edge corners of the body **10**; a plurality of first flanges **104** respectively formed at back edge corners of the body **10**; a recess **112** provided on an edge of a lid **11** corresponding in position to the protrusion **102**; a plurality of corner-situated projections **113** provided on the lid **11** corresponding in position to the grooves **103**; a plurality of corner-situated second flanges **114** formed on the lid **11** corresponding in position to the first flanges **104**; and a connecting portion **12** for interconnecting the body **10** and the lid **11**.

[0004] When the clam shell **1** is closed by coupling the lid **11** to the body **10**, the recess **112** is engaged with the protrusion **102**, the projections **113** are engaged with the grooves **103**, and the second flanges **114** are stacked on the first flanges **104**. By stacking of the first and second flanges **104**, **114**, a gap or opening can be formed between corresponding edges **101**, **111** of the lid **11** and body **10**, for allowing air to pass through the gap or opening of the clam shell **1**. However, as the thermoplastic-made clam shell is fabricated to be pretty thin and relatively poor in mechanical strength, when these clam shells are stacked up with each other, weight of package contents would deform the clam shells and cause misalignment between the recess **112** of the lid **11** and the protrusion **102** of the body **10**, making the lid **11** not capable of being properly coupled to the body **10**. Besides, the recess **112** of the lid **11** is shaped to be of a concave slot corresponding in dimension to the ridge-like protrusion **102** the clam shell; such a shape is hard to be perfectly fabricated by plastic molding, thereby adversely affecting buckling or coupling between the body **10** and the lid **11** of the clam shell **1**.

[0005] Furthermore, the above conventional clam shell **1** is provided with the connecting portion **12** that interconnects the body **10** and the lid **11**. During coupling of the lid **11** to the body **10**, in order to stack the second flanges **114** on the first flanges **104**, the connecting portion **12** needs to be dimensioned with a width L' at least equivalent to combined height (i.e. the sum in height) of a pair of the first and second flanges **104**, **114**. Such a structure makes the clam shell **1**, in an open or closed condition with the lid **11** being uncoupled or coupled to the body **10**, occupy relatively more space by virtue of the connecting portion **12**; this would lead to difficulty in a packing process due to possible mismatch in dimension between the clam shell **1** and a packing machine.

[0006] Therefore, in response to the above drawbacks, the problem to be solved is to provide a fastening mechanism for a clam shell, so as to allow strong buckling between a lid and a body thereof, and to reduce overall structural profile of the clam shell in terms of forming a relatively smaller connecting portion that interconnects the lid and the body.

SUMMARY OF THE INVENTION

[0007] A primary objective of the present invention is to provide a fastening mechanism for a package device, so as to allow strong buckling between a lid and a body thereof, and to reduce overall structural profile of the package device in terms of forming a relatively smaller connecting portion that interconnects the lid and the body.

[0008] In accordance with the above and other objectives, the present invention proposes a fastening mechanism for a package device such as a claim shell. The fastening mechanism comprises: a plurality of first protrusions stagger-arranged in two rows at a coupling edge of a lid of the package device, wherein a gap is formed between the two rows of the first protrusions, and the coupling edge of the lid is to be coupled to a corresponding coupling edge of a body of the package device for fastening the package device; at least a second protrusion formed on the coupling edge of the body and corresponding in position to the gap between the first protrusions; at least a projection formed on the coupling edge of the body and substantially opposed in position to the second protrusion; at least a recess formed on the coupling edge of the lid and substantially opposed in position to the first protrusions, wherein the recess corresponds in position to the projection of the body; and a connecting portion for interconnecting the coupling edges of the body and the lid at positions substantially opposed to the first and second protrusions. By coupling the lid to the body, the second protrusion of the lid is engaged with the gap formed between the first protrusions of the body, and the projection of the body is engaged with the recess formed on the lid, so as to provide strong fastening effect for the package device.

[0009] Engagement of the first and second protrusions provides sufficient clamping force between the lid and the body, and prevents the package device from being opened up even if the body and the lid are deformed by weight of package contents in the package device when a plurality of package devices are stacked up. This thereby achieves desirable closed-packing effect through the use of the package device.

[0010] Moreover, the projection of the body engaged with the recess of the lid, has its to protruding height equal to recessed depth of the lid, such that the connecting portion only needs to be dimensioned in width at least equivalent to the protruding height of the projection, making overall

structural profile of the package device desirably reduced by virtue of reduced dimension of the connecting portion. Therefore, the package device would occupy relatively less space in an open or closed condition with the lid being uncoupled or coupled to the body, as compared to a conventional package device shown in **FIG. 1A**. This is favorable for making the package device suitably used in a standard automated packing machine equipped with guiding rails that are designed for accommodating particularly sized package devices.

BRIEF DESCRIPTION OF THE DRAWINGS

[**0011**] The present invention can be more fully understood by reading the following detailed description of the preferred embodiments, with reference made to the accompanying drawings, wherein:

[**0012**] **FIG. 1A** (PRIOR ART) is a perspective view of a conventional clam shell;

[**0013**] **FIG. 1B** (PRIOR ART) is another perspective view of the clam shell of **FIG. 1A**;

[**0014**] **FIG. 2** is a perspective view of a clam shell with a fastening mechanism according to an embodiment of the invention; and

[**0015**] **FIG. 3** is another perspective view of the clam shell of **FIG. 2**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[**0016**] **FIGS. 2 and 3** illustrate a clam shell with a fastening mechanism according to an embodiment of the present invention. As shown in **FIGS. 2 and 3**, the fastening mechanism of the clam shell **2** comprises: a plurality of first protrusions **212** arranged in a stagger two-row manner at a coupling edge **211** of a lid **21**, wherein a gap h is formed between two rows of the first protrusions **212**; a second protrusion **202** formed on a coupling edge **201** of a body **20** corresponding in position to the gap h between the first protrusions **212**; a plurality of projections **204** respectively formed at back edge corners of the body **20**; a plurality of corner-situated recesses **214** corresponding in position to the projections **204**; and a connecting portion **22** for interconnecting the body **20** and the lid **21**. By coupling the lid **21** to the body **21**, wherein the second protrusion **202** is engaged with the gap h between the first protrusions **212**, and the projections **204** are respectively engaged with to the recesses **214**, the clam shell **2** can form a closed space for receiving goods or products therein.

[**0017**] The coupling edges **201**, **211** of the body **20** and lid **21** refer to portions of the body **20** and lid **21** to be in contact with each other when the lid **21** is coupled to the body **20** for closing the clam shell **2**. The first protrusions **212** are illustrated in **FIGS. 2 and 3** with a number of three, and stagger-arranged in a manner that, one first protrusion **212** forms a front row relatively close to inside of the lid **21** and the other two first protrusions **212** form a back row relatively close to outside of the lid **21**, with a gap h being formed between the front and back rows. Alternatively, the three first protrusions **212** can be arranged with two of them being arrayed at the front row and the other one being positioned at the back row. And, it should be understood that, the number of the first protrusions **212** is not limited to three, other numbers of the first protrusions **212** that are stagger-arranged in two rows to form a gap h, are also suitably adopted herein. Optionally, the first protrusions **212** on the lid **21** and the second protrusion **202** on the body **20** can be switched in position with each other; that is, the plurality of first protrusions formed with a gap therebetween are to be formed on the body **20**, and the single second protrusion is to be formed on the lid **21**. Further, the gap h formed between the front and back rows of the first protrusions **212** on the lid **21** is dimensioned in conformity to the second protrusion **202** of the body **20**. And, the first and second protrusions **212**, **202** are each shaped as a pyramid for facilitating strong coupling between the first and second protrusions **212**, **202**. Such structural arrangement provides sufficient clamping force between the first and second protrusions **212**, **202**, and prevents the clam shell **2** from being opened up even if the body **20** and the lid **21** are deformed by weight of package contents in the clam shell **2** when a plurality of clam shells **2** are stacked up; this thereby achieves desirable closed-packing effect through the use of the clam shell **2**. And, when heavy weight acts on the lid **21** of the clam shell **2** to in turn deform the body **20**, strong coupling or clamping between the first and second protrusions **212**, **202** helps reduce extent of deformation of the body **20**, such that more clam shells **2** can be stacked up in favor of economical space usage.

[**0018**] Moreover, coupling between the body **20** and the lid **21** is further facilitated by provision of a plurality of buckling holes **203** and buckling pillars **213**, wherein the buckling holes **203** are formed at front edge corners of the body **20**, and the buckling pillars **213** formed on the lid **21** are corner-situated and corresponding in position to the buckling holes **203**, such that the buckling pillars **213** can be engaged with the buckling holes **203** as the lid **21** is coupled to the body **20**. Since this structural arrangement of the buckling pillars **213** and the buckling holes **203** are well known in the art, it is not to be further detailed herein.

[**0019**] The lid **21** and the body **20** of the clam shell **2** are interconnected by the connecting portion **22**, as shown in **FIG. 3**. When the lid **21** is coupled to the body **20**, the convex projections **204** of the body **20** are engaged in dimension with the concave recesses **214** of the lid **21**, and thus combined height of a pair of the engaged projection **204** and recess **214** is equal to height of the sole projection **204**. Therefore, the connecting portion **22** needs to be dimensioned with a width L at least equivalent to the combined height of the engaged projection **204** and recess **214** i.e. height of the projection **214**. Compared with the conventional clam shell **1** illustrated in **FIG. 1A**, the connecting portion **22** of the clam shell **2** is beneficial of having a width L smaller than a width L' of a connecting portion **12** of the conventional clam shell **1**, wherein the width L' is equal to the sum in height of a pair of stacked first and second flanges **104**, **114**. With reduced dimension of the connecting portion **22**, the clam shell **2** can be fabricated in relatively low structural profile, such that space occupied by the clam shell **2**, in an open or closed condition with the lid **21** being uncoupled or coupled to the body **20**, can be reduced. This is favorable for making the clam shell **2** suitably used in a standard automated packing machine equipped with guiding rails that are designed for accommodating particularly sized clam shells.

[0020] The invention has been described using exemplary preferred embodiments. However, it is to be understood that the scope of the invention is not limited to the disclosed embodiments. On the contrary, it is intended to cover various modifications and similar arrangements. The scope of the claims, therefore, should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

1. A fastening mechanism for a package device, the fastening mechanism, comprising:

a plurality of first protrusions stagger-arranged in two rows at a coupling edge of a lid of the package device, wherein a gap is formed between the two rows of the first protrusions, and the coupling edge of the lid is to be coupled to a corresponding coupling edge of a body of the package device for fastening the package device;

at least a second protrusion formed on the coupling edge of the body and corresponding in position to the gap between the first protrusions;

at least a projection formed on the coupling edge of the body and substantially opposed in position to the second protrusion; and

at least a recess formed on the coupling edge of the lid and substantially opposed in position to the first protrusions, wherein the recess corresponds in position to the projection of the body;

wherein by coupling the lid to the body, the second protrusion of the body is engaged with the gap formed between the first protrusions of the lid, and the projection of the body is engaged with the recess formed on the lid, so as to provide strong fastening effect for the package device.

2. A fastening mechanism for a package device, the fastening mechanism comprising:

a plurality of first protrusions stagger-arranged in two rows at a coupling edge of a body of the package device, wherein a gap is formed between the two rows of the first protrusions, and the coupling edge of the body is to be coupled to a corresponding coupling edge of a lid of the package device for fastening the package device;

at least a second protrusion formed on the coupling edge of the lid and corresponding in position to the gap between the first protrusions;

at least a projection formed on the coupling edge of the body and substantially opposed in position to the second protrusion; and

at least a recess formed on the coupling edge of the lid and substantially opposed in position to the first protrusions, wherein the recess corresponds in position to the projection of the body;

wherein by coupling the lid to the body, the second protrusion of the lid is engaged with the gap formed between the first protrusions of the body, and the projection of the body is engaged with the recess formed on the lid, so as to provide strong fastening effect for the package device.

3. The fastening mechanism of claim 1, further comprising:

a connecting portion for interconnecting the coupling edges of the body and the lid at positions substantially opposed to the first and second protrusions.

4. The fastening mechanism of claim 2, further comprising:

a connecting portion for interconnecting the coupling edges of the body and the lid at positions substantially opposed to the first and second protrusions.

5. The fastening mechanism of claim 3, wherein protruding height of the projection is equal to recessed depth of the recess, allowing the connecting portion to be dimensioned at least equally to the protruding height of the projection.

6. The fastening mechanism of claim 4, wherein protruding height of the projection is equal to recessed depth of the recess, allowing the connecting portion to be dimensioned at least equally to the protruding height of the projection.

7. The fastening mechanism of claim 1, wherein three first protrusions are formed on the lid in two rows, with two of the first protrusions being arrayed at one row, and the other one of the first protrusions being positioned at the other row.

8. The fastening mechanism of claim 2, wherein three first protrusions are formed on the body in two rows, with two of the first protrusions being arrayed at one row, and the other one of the first protrusions being positioned at the other row.

9. The fastening mechanism of claim 1, wherein the gap is dimensioned in correspondence with the second protrusion.

10. The fastening mechanism of claim 2, wherein the gap is dimensioned in correspondence with the second protrusion.

11. The fastening mechanism of claim 1, wherein the first and second protrusions are each shaped as a pyramid.

12. The fastening mechanism of claim 2, wherein the first and second protrusions are each shaped as a pyramid.

* * * * *