

Design and Manufacture of a Reusable Biscuit Environmental Protection Packaging Box for Storing and Preserving Food

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Abstract

Biscuit is a common food in life. Because it is convenient to eat, it has become a standing food for snacks, afternoon tea and so on. Nowadays, the biscuit industry is developing continuously, and its market competitiveness is becoming stronger and stronger. There are a variety of biscuit packaging types in the market. The common types of biscuit packaging include plastic film sealed packaging, wax paper packaging, carton packaging and tin packaging, which have their own advantages. However, in the process of use, the disadvantages are also obvious. Although the iron box packaging can be reused, it is easy to deform and inconvenient to take biscuits. Plastic film sealed packaging, wax paper packaging and carton packaging are not only easy to deform and have a low reuse rate, which is not conducive to environmental protection. Therefore, in order to solve the above problems, a method with good sealing effect and convenient biscuits is proposed, Reusable biscuit environmental protection packaging box for storing and preserving food.

Keywords

Repetition; Structure; Packing Box; Design.

1. Introduction

The utility model relates to a biscuit environmental protection packaging box which can be reused to store and preserve food. The purpose is to provide a biscuit environmental protection packaging box which can be reused to store and preserve food, so as to solve the problems that the current biscuit packaging box proposed in the above background technology is easy to deform and inconvenient to take biscuits. In addition, the reuse rate of the biscuit dry packaging box is low, which is not conducive to environmental protection.

2. Technical Proposal

The utility model comprises a protective shell, the inner part of the protective shell is inlaid with edge plates, the four corners on the lower side of the protective shell are fixedly installed with cushion feet, the inner shell is fixedly installed at the left and right ends of the inner shell, the front and rear sides of the inner shell are vertically provided with first sliding grooves, the first sliding grooves are respectively embedded with connecting shafts, and the left and right ends of the inner shell are installed with biscuit boxes, The front and rear sides of the biscuit box are fixedly installed with a desiccant bin, the desiccant bin is connected with a box cover through a connecting rod, the front and rear ends of the lower side of the box cover are fixedly connected with an opening rod, and the lower ends of the two groups of opening rods are fixedly installed on the inner shell. The device is made of food grade plastic material as a whole and has high strength, which greatly improves the reuse rate of the device. In addition, the device has good sealing effect and convenient biscuit taking, which is conducive to production and promotion. The design effect is shown in Fig1.

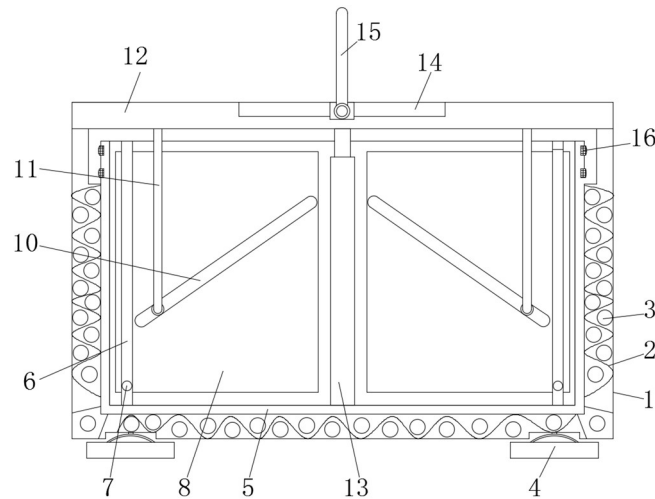


Fig. 1 design scheme

The decomposition legend of a biscuit environmental protection packaging box that can be reused to store and store food is shown in the figure, including a protective shell (1), which is characterized in that the interior of the protective shell (1) is inlaid with a prism plate (2), the four corners on the lower side of the protective shell (1) are fixedly installed with pads (4), and the left and right ends of the protective shell (1) are fixedly installed with inner shells (5), The front and rear sides of the inner shell (5) are vertically provided with a first chute (6), and the first chute (6) is respectively embedded with a connecting shaft (7). The left and right ends of the inner shell (5) are installed with a biscuit box (8), and the front and rear sides of the biscuit box (8) are fixedly installed with a desiccant bin (9), and the desiccant bin (9) is connected with a box cover (12) through a connecting rod (11), The front and rear ends of the lower side of the box cover (12) are fixedly connected with an opening rod (13), the lower ends of the two groups of opening rods (13) are fixedly installed on the inner shell (5), the middle part of the upper side of the box cover (12) is provided with a storage slot (14), and a handle (15) is installed in the storage slot (14).

The utility model relates to a biscuit environmental protection packaging box which can be reused to store and store food, which is characterized in that the edge plate (2) is arranged in a wave structure, the wave bends of the edge plate (2) are inserted with stiffeners (3), and both ends of the stiffeners (3) are fixedly connected to the protective shell (1).

The pad foot (4) comprises a rubber pad (41), a limit block (42), an arc spring (43) and a spring (44). The interior of the rubber pad (41) is inserted with an arc spring (43) through the limit block (42), and the arc spring (43) is connected with the inner wall of the lower end of the rubber pad (41) through the spring (44). The lower side of the rubber pad (41) is provided with a toothed structure.

A connecting shaft (7) is fixedly installed on the front and rear sides of the biscuit box (8), and the outer straight dimension of the connecting shaft (7) is less than the inner diameter of the first chute (6). The biscuit box (8) forms a sliding connection structure with the inner shell (5) through the connecting shaft (7).

The front and rear sides of the desiccant bin (9) are obliquely provided with a second chute (10), the connecting rod (11) is arranged in an L shape, and the outer dimension of the bottom end of the connecting rod (11) is smaller than the inner dimension of the second chute (10). The connecting rod (11) improves the desiccant bin (9), the second chute (10) and the biscuit box (8) to form a sliding structure.

3. Design Scheme

The utility model comprises a protective shell, the inner part of the protective shell is inlaid with edge plates, the four corners on the lower side of the protective shell are fixedly installed with cushion feet, the inner shell is fixedly installed at the left and right ends of the inner shell, the front and rear sides of the inner shell are vertically provided with first sliding grooves, the first sliding grooves are respectively embedded with connecting shafts, and the left and right ends of the inner shell are installed with biscuit boxes, The front and rear sides of the biscuit box are fixedly installed with a desiccant bin, the desiccant bin is connected with a box cover through a connecting rod, and the front and rear ends of the lower side of the box cover are fixedly connected with an opening rod, the lower ends of the two groups of opening rods are fixedly installed on the inner shell, the middle part of the upper side of the box cover is provided with a storage slot, and a handle is installed in the storage slot.

The edge plate is arranged in a wave structure, and the wave bends of the edge plate are inserted with stiffeners, and both ends of the stiffeners are fixedly connected to the protective shell.

The pad foot comprises a rubber pad, a limit block, an arc spring and a spring. The interior of the rubber pad is inserted with an arc spring through the limit block, and the arc spring is connected with the inner wall of the lower end of the rubber pad through the spring. The lower side of the rubber pad is provided with a toothed structure.

A connecting shaft is fixedly installed on the front and rear sides of the biscuit box, and the outer straight dimension of the connecting shaft is less than the inner diameter of the first chute. The biscuit box forms a sliding connection structure with the inner shell through the connecting shaft.

The front and rear sides of the desiccant bin are obliquely provided with a second chute, the connecting rod is arranged in an L-shape, and the outer dimension of the bottom end of the connecting rod is smaller than the inner dimension of the second chute. The connecting rod improves the desiccant bin and the second chute to form a sliding structure with the biscuit box. The inner dimension of the box cover is the same as the outer dimension of the inner shell, and the outer side of the upper end of the inner shell is fixedly installed with a rubber sealing strip. The inner side of the box cover is provided with a groove, and the inner dimension of the groove is the same as the thickness dimension of the rubber sealing strip. The box cover forms a snap connection structure with the inner shell through the rubber sealing strip.

The opening rod comprises a sleeve rod and a plug rod, the inner part of the sleeve rod and the outer part of the plug rod are provided with arc rubber bumps from top to bottom, the plug rod is inserted into the inner part of the sleeve rod, and the plug rod is arranged as a lifting structure through the sleeve rod.

The lower end of the handle is hinged on the inner wall of the storage groove, and the handle and the storage groove form a rotating embedded structure.

Compared with the prior art, the beneficial effects are: the reusable biscuit environmental protection packaging box for storing and storing food is provided with a protective shell, and the protective shell is provided with a wavy edge plate and matched with stiffeners, so that the device has high strength, so as to ensure that the device is not easy to deform whether in the process of stacking transportation or in the process of use;

By setting two groups of biscuit boxes, biscuits with no taste can be stored, and different causes channeling. By setting an opening rod, pull up the box cover through the handle, and the box cover drives the opening rod to rise. At this time, the inserting rod on the opening rod rises and falls along the. At the same time, the box cover drives the biscuit box to rise along the first chute through the connecting rod. When the box cover rises to a certain height, continue to lift the

box cover upward. At this time, The connecting rod on the box cover squeezes the second chute to force the biscuit box to rotate around the connecting shaft, so that the opening of the biscuit box faces outward, which greatly facilitates the taking of biscuits;

The whole device is made of food grade plastic material to ensure its safety. In addition, a box cover with rubber sealing strip is set to cooperate with the desiccant bin to ensure the tightness of the device, make the device have a better biscuit storage environment, and greatly improve the reuse rate of the device.

4. Specific Implementation Mode

The technical scheme in this design embodiment will be clearly and completely described below in combination with the attached drawings in this design embodiment. Obviously, the described embodiments are only part of the embodiments of this design, not all of them. Based on the embodiments in this design, all other embodiments obtained by ordinary technicians in the art without creative work belong to the scope of protection of this design.

Fig. 2 is a schematic diagram of the top section of the structure, which is an embodiment provided by this design.

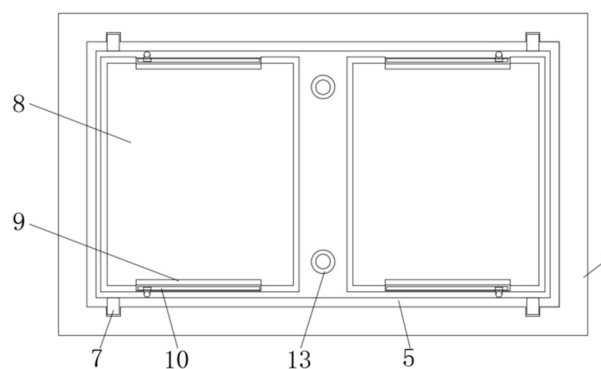


Fig. 2 Schematic diagram of top section of structure

The utility model relates to a biscuit environmental protection packaging box which can be reused to store and store food, which comprises a protective shell 1. The interior of the protective shell 1 is inlaid with an edge plate 2. The edge plate 2 is arranged in a wave structure, and the wave bends of the edge plate 2 are inserted with stiffeners 3. Both ends of the stiffeners 3 are fixedly connected to the protective shell 1. The wave shaped edge plate 2 can disperse the impact force on the device, and cooperate with the stiffeners 3, Make the protective shell 1 have high strength to ensure that the device is not easy to deform during stacking transportation or use;

The four corners on the lower side of the protective shell 1 are respectively fixedly installed with pad feet 4, which include rubber pad 41, limit block 42, arc-shaped spring 43 and spring 44. The interior of rubber pad 41 is inserted with arc-shaped spring 43 through limit block 42, and the arc-shaped spring 43 is connected with the inner wall of the lower end of rubber pad 41 through spring 44. The lower side of rubber pad 41 is provided with toothed structure, and the rubber pad 41 with toothed structure improves the friction between the device and the plane, So as to improve the placement stability of the device. In addition, when multiple groups of the device are stacked, the protective housing 1 is squeezed by gravity. At this time, the cushion foot 4 on the lower side of the protective housing 1, the internal arc spring 43 and spring 44 are deformed to reduce the gravity. At the same time, the reaction force of the arc spring 43 and spring 44 is used to reduce the gravity again, so as to avoid the device from being

stacked during transportation, Causing damage or deformation, so as to improve the safety of the device;

The middle part of the upper side of the box cover 12 is provided with a storage groove 14, and a handle 15 is installed in the storage groove 14. The inner dimension of the box cover 12 is the same as the outer dimension of the inner shell 5, and the outer side of the upper end of the inner shell 5 is fixedly installed with a rubber sealing strip 16. The inner side of the box cover 12 is provided with a groove, and the inner dimension of the groove is the same as the thickness dimension of the rubber sealing strip 16. The box cover 12 forms a snap connection structure with the inner shell 5 through the rubber sealing strip 16, The lower end of the handle 15 is hinged and installed on the inner wall of the storage slot 14. The handle 15 and the storage slot 14 form a rotating embedded structure. In addition, the rubber sealing strip 16 is matched with the box cover 12 to ensure the tightness of the device. The whole device is made of food grade plastic to ensure its safety and greatly improve the reuse rate of the device. The front section diagram of the opening rod structure is shown in Fig 3.

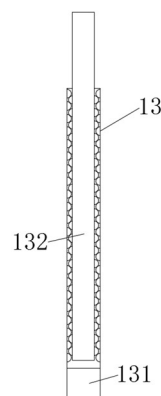


Fig. 3 Schematic diagram of front section of opening rod structure

Working principle: when in use, the box cover 12 is pulled upward by the handle 15 to separate the box cover 12 from the inner shell 5. During the rise of the box cover 12, the biscuit box 8 is driven up by the connecting rod 11. During the rise of the biscuit box 8, the plug rod 132 on the opening rod 13 moves along the sleeve rod 131. When the box cover 12 rises to a certain height, the connecting rod 11 moves in the second chute 10 and forces the biscuit box 8 to rotate around the connecting shaft 7, At this time, the opening of the biscuit box can be taken out, as shown in Fig4.

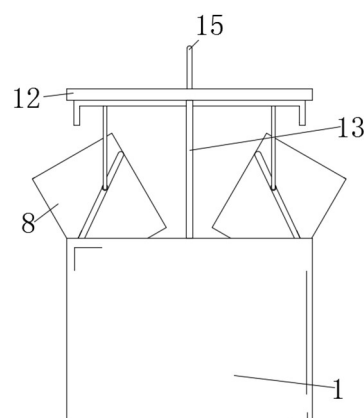


Fig. 4 front view of structure

During transportation, multiple groups of the device are stacked, and the protective shell 1 is squeezed by gravity. At this time, the cushion foot 4 on the lower side of the protective shell 1, the arc spring 43 and spring 44 inside the protective shell 1 are deformed to reduce the gravity. At the same time, the reaction force of the arc spring 43 and spring 44 is used to reduce the gravity again, so as to reduce the influence of gravity on the device, and cooperate with the edge plate 2 and stiffener 3 of the wave structure, The device has high hardness and avoids the damage or deformation of the device during cumulative transportation, so as to improve the safety of the device.

5. Conclusion

Obviously, the design is not limited to the details of the above exemplary embodiments, and the design can be realized in other specific forms without departing from the spirit or basic features of the design. Therefore, no matter from which point of view, the embodiment should be regarded as exemplary and non restrictive. The scope of the design is limited by the attached claims rather than the above description. Therefore, it is intended to include all changes within the meaning and scope of the equivalent elements of the claims in the design. Any reference numerals in the claims shall not be regarded as limiting the claims involved.

References

- [1] Pradeep N., Reddy K.S.. Design and investigation of solar cogeneration system with packed bed thermal energy storage for ceramic industry[J]. Renewable Energy,2022,192.
- [2] Li Qingyu,Li Qin,Wang Longchao,Wu Qiang,Qin Guofeng,Zhang Huabang,Wang Hongqiang. Improving the accuracy of insulation resistance measurements of a single arm unbalanced bridge using a parameter matching design and filtering algorithm for battery packs used in electric ships[J]. Measurement,2022,195.
- [3] Mooduto Krishnanda Raditya. Design of Strawberry Fruit Packaging for Agribusiness Small and Medium Enterprises in Cinumpang Village[J]. International Conference on Economics, Management and Accounting (ICEMAC 2021),2022,207.
- [4] Zhang Xiaoyi. The Application of Folding Structure in Paper Packaging Design[J]. 2021 Conference on Art and Design: Inheritance and Innovation (ADII 2021),2022,643.
- [5] Anggalih Nanda N.. Innovation Strategy of Cosmetic Packaging Design Made of Bamboo[J]. International Joint Conference on Arts and Humanities 2021 (IJCAH 2021),2022,618.
- [6] Peddada Satya R. T.,Zeidner Lawrence E.,James Kai A.,Allison James T.. An Introduction to 3D SPI2 (Spatial Packaging of Interconnected Systems With Physics Interactions) Design Problems: A Review of Related Work, Existing Gaps, Challenges, and Opportunities[J]. ASME 2021 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,2021.
- [7] Jiayi Hong , Ferran Argelaguet , Alain Trubuil , Tobias Isenberg. Design and Evaluation of Three Selection Techniques for Tightly Packed 3D Objects in Cell Lineage Specification in Botany[J]. GI 2021,2021.
- [8] Zhang Ziyang,Yang Zhe. Research on the Correlation Between Marketing and Product Packaging Design[J]. 6th International Conference on Financial Innovation and Economic Development (ICFIED 2021),2021,166.