

**Research on the applicability improvement design of packing box with buffer  
protection function**

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*Abstract: as the name implies is used for packaging products packaging box, can be classified according to the materials such as paper box, tin box, wooden box, cloth box, leather box, acrylic box, corrugated boxes, PVC boxes, also can be classified according to the name of the product such as the moon cake box, tea box, Chinese wolfberry box, candy box, exquisite gift box, special local product box, wine box, chocolate box, food and drug health care products boxes, food boxes, tea boxes and pencil case; Packaging box to ensure the safety of the products in transport, improve the level of products; Has been widely used in electronics, food, beverage, alcohol, tea products, cigarettes, medicine, health care products, cosmetics, small household appliances, clothing, toys, sports products and other industries and product packaging supporting industries, is an indispensable industry.*

*Keywords: Packaging; Protection; Function; Improved design.*

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## **1. INTRODUCTION**

Involved in the field of packaging technology. Including box body, the box body surface has a buffer tank, the buffer groove clearance fit over the surface of the buffer plate, buffer plate surface runs slow punching, slow punch surface within a fixed connection has a short spring, buffer plate fixed connection limited block, another surface fixed connection box body surface has shock absorbing device, shock absorber set at the top of the chute, clearance fit over the surface of the thumb within the chute, the slider at the top of the fixed connection with the storage basket.

## **2. TECHNICAL ANALYSIS**

Through the buffer, short spring, limit boards, shock absorbing device, lifted the lid, compression springs, pressure plate, rubber layer of cotton, foam and rubber balloon, makes the items inside the box fixed tightly and avoid the trembled when items inside the box displacement occurs, items inside the box by a comprehensive range of buffer shock absorption effect, better protect the goods in the process of moving is not damaged.

A buffer to protect function of packaging, including the box body (1), whose character is described in the box body (1) the inner surface has a buffer tank (2), described the buffer tank (2) the sliding has to match the buffer tank (2) a buffer plate (3), described the buffer plate (3) a surface runs slow punching

(4), described in the slow punching (4) fixed on the inner surface connection has a short spring (5), described the buffer plate fixed connection co., LTD. (3) the surface a block (6);

The inner surface of the box body (1) is fixedly connected with a shock absorbing device (7), and the top of the shock absorbing device (7) is provided with a chute (8). The gap of the inner surface of the chute (8) is matched with a slider (9), and the top of the slider (9) is fixedly connected with a storage basket (10).

A surface of the box body (1) is hinged with a box cover (12) through a hinge (11);

The surface of the box cover (12) is fixedly connected with a pressing spring (13), one end of the pressing spring (13) is fixedly connected with a movable plate (14), one surface of the movable plate (14) is fixedly connected with a connecting block (15), and one surface of the connecting block (15) is fixedly connected with a pressing plate (16).

Damping device (7) including spring set (701), described in the spring set of inner surface fixed connection with damping spring (701) (702), described in the damping spring (702) (703), fixed at one end connected with shores (703) described shores from one end of the damping spring (702) through the spring set (701), described in columns (703) is located in the spring set (701) external damping plate is fixed at the end of the connection (704), described in the damping plate (704) surface with chute (8) fixed connection.

According to the packaging box with buffer protection function mentioned in claim 1, its feature is that the storage basket (10) has a limit slot (17) suitable for the limit block (6) on the surface, and the limit slot (17) fits with the gap of the limit block (6).

According to a packaging box with buffer protection function mentioned in claim 1, its feature is that the inner surface of the box body (1) is fixed connected with a rubber air bag (18), and the rubber air bag (18) is provided with an air valve (19).

According to a packaging box with buffer protection function mentioned in claim 1, its feature lies in that a push and pull frame (20) is arranged on the surface of the storage basket (10), and the push and pull frame (20) is a rectangular structure.

According to the packaging box with buffer protection function mentioned in claim 1, its characteristics lie in that the buffer slot (2) is a convex font structure and the limit slot (17) is a rectangular structure.

According to a packaging box with buffer protection function mentioned in claim 1, its feature is that the inner surface of the storage basket (10) is provided with a rubber layer (21), and the rubber layer (21) is fixed with foam cotton (22) on the surface.

According to claim 1 of the packing box of a buffer to protect function, its characteristics is described in the box body (1) set up over the surface of a buckle lock is (23), as described in the box body (1) through clasp lock body (23) with the lid (13) active connection, buckle lock is described for box (23) institutions or buckles institutions or lock mechanism or double spring lock mechanism.

### **3. TECHNICAL FIELD**

It belongs to the field of packing box technology, especially relates to a packing box with buffer protection function. Packaging items inside the box easy to shake, cause the damage of the goods, caused economic losses, in the packaging box items can only be fixed, single direction trembled when

the items easily without collision with box by fixed position, and items within the box placed with the lid has no fixed between the device and buffer device is very easy to damage.

#### **4. DESIGN CONTENT**

Aims to provide a buffer to protect function of packing box, through the buffer, limit boards, shock absorbing device, chute, compression spring, connecting piece, pressure plate, rubber layer and the bubble sliver, solves the existing internal box where things are not fixed, trembled, easy collision with the inner wall of the box down the bad goods.

To solve the above technical problems, the following technical solutions are adopted

As a buffer to protect function of packing box, including the box body, described in the box body surface has a buffer tank, described the buffer groove clearance fit over the surface of the buffer board, described a buffer plate surface runs slow punching, described in the inner surface fixed connection slow piercing has a short spring, described the buffer plate fixed connection co., LTD. A piece of another surface;

The inside surface of the box is fixedly connected with a shock absorbing device, and the top of the shock absorbing device is provided with a slide groove. The gap between the inside surface of the slide groove is matched with a slide block, and the top of the slide block is fixedly connected with a storage basket.

A surface of the box body is hinged with a box cover;

The surface of the box cover is fixedly connected with a pressing spring, and one end of the pressing spring is fixedly connected with a movable plate, and the movable plate is fixedly connected with a connecting block, and the pressing plate is fixedly connected with a surface.

Shock absorbing device including spring, described in the spring set of fixed connection with the inner surface damping spring, described the damping spring end fixed connection with sticks, as described in columns from one end of the damping spring throughout the spring set, as described in columns in the spring set of external damping plate is fixed at the end of the connection, described a chute and the surface damping plate fixed connection.

Further, a surface of the storage basket is provided with a limit slot suitable for the limit block, and the limit slot fits with the gap of the limit block.

Further, the inner surface of the box is fixedly connected with a rubber air bag, and an air valve is arranged on the rubber air bag.

Further, a push-pull frame is arranged on a surface of the storage basket, and the push-pull frame is a rectangular structure.

Further, the buffer slot is a convex font structure and the limit slot is a rectangular structure.

Further, the inner surface of the storage basket is provided with a rubber layer, and the rubber layer is fixedly connected with a foam cotton sliver.

Further, a latching mechanism is arranged on a surface of the box body, and the box body is connected with the box cover by a latching mechanism. The latching mechanism is a box latching mechanism or a latching mechanism or a double-spring latching mechanism.

#### **5. HAS THE FOLLOWING BENEFICIAL EFFECTS**

1) which has the function of buffering packaging, through the buffer, short spring, limit boards, shock absorbing device, lifted the lid, compression springs, pressure plate, rubber layer of cotton, foam and rubber balloon, makes the items inside the box fixed tightly and avoid the trembled when displacement items inside the box, and the items inside the box by a comprehensive range of buffer shock absorption effect, better protect the goods not damaged in the process of moving.

2) which has the function of buffering packaging, through the use of rubber airbag and valve, makes the items inside the box won't because the horse and causes items contact with packaging, damaged items, and can be through the control of the air inside rubber balloon filling the amount of control on the degree of fastening items, to avoid the damage to the goods during packaging fixed, through the valve rubber air inside the balloon, easy to pull out of the storage basket.

3) the packing box with buffer protection function is easier to take and put items through the functions of chute, slider, push and pull frame and locking mechanism, which is convenient for use.

4) of course, the implementation of any product does not necessarily need to achieve all the advantages mentioned above.

## 6. ATTACHED DRAWINGS

In order to more clearly shows that the implementation example of technical solution, below the appended drawings of use necessary to implement the case description is introduced simply, clearly, described below the appended drawings just yes, some cases, for the field common technical personnel, on the premise of not giving creative labor, can also according to the appended drawings for other appended drawings. See figure 1-9.

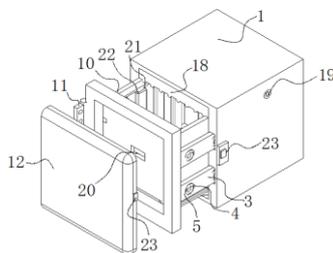


Figure 1 is the internal structure diagram of the packaging box with buffer protection function;

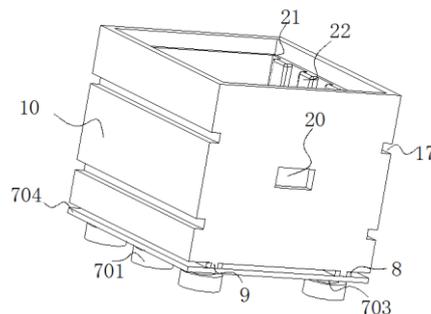


FIG. 2 is the structural diagram of the matching of the middle buffer device and the storage basket;

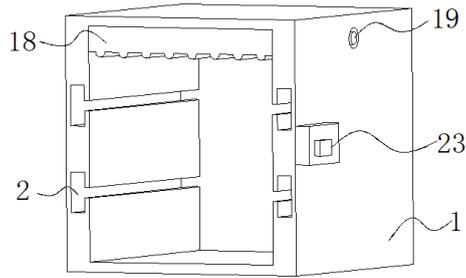


FIG. 3 is the structural diagram of box body and rubber air bag matching.

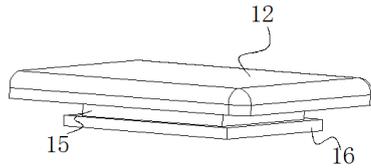


FIG. 4 is the structural diagram of the box cover.

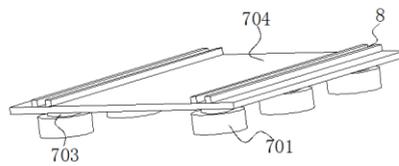


FIG. 5 is a schematic diagram of the buffer device.

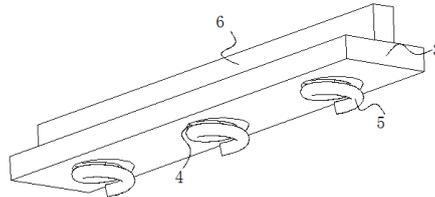


FIG. 6 is a schematic diagram of the matching of buffer plate, short spring and limit block.

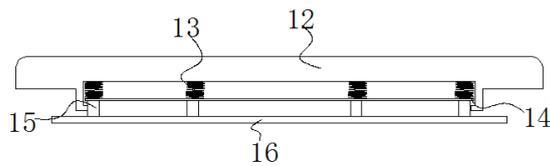


FIG. 7 shows the section of the box cover.

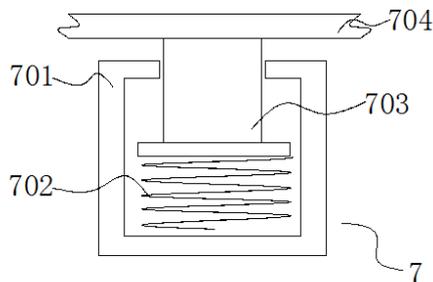


FIG. 8 is the section diagram of the buffer device;

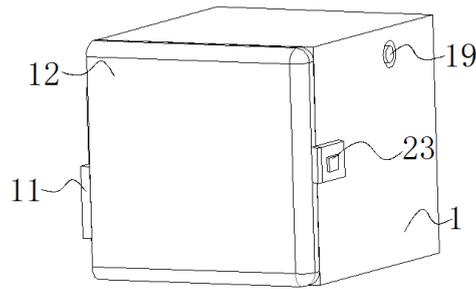


Figure 9 is the structural diagram of the packaging box with buffer protection function;

In the attached figure, the parts represented by each label are listed as follows

1 - the box body, 2 - buffer tank, 3 - buffer plate, 4 - slow punching, 5 - short spring, 6 - set blocks, 7 - shock absorbing device, the 701 - spring set, 702 - damping spring, 703 - sticks, 704 - damping plate, 8 - chute, 9 - the slider, 10 - storage baskets, 11 - hinge, 12 - lifted the lid, 13 - compression spring, 14 - activity board, 15 - connection piece, 16 - clamp, 17 - limit slot, 18 - rubber balloon, 19 - valve, 20 - push and pull, 21 - rubber layer, 22 - bubble sliver, 23 to buckle lock mechanism.

## 7. SPECIFIC IMPLEMENTATION METHODS

The technical scheme in the embodiments will be clearly and completely described in combination with the attached drawings in the embodiments below. Obviously, the embodiments described are only part of the embodiments, not all of them. Based on the embodiments in, all other embodiments obtained by ordinary technicians in the field without creative labor are within the scope of protection. In the description of the need to understand is that the term opening, up, down, thickness, top, in, length, inside and around indicates a location or position, only is to facilitate the description and simplified description, rather than instructions or suggest referring to components or elements must have a specific location, in a specific orientation structure and operation, therefore cannot be understood as to limit.

Please refer to the figure 1-9, as a buffer to protect function of packing box, including 1 box body, the box body inner surface has a buffer tank 2, buffer tank within 2 clearance fit over the surface of the buffer board 3, 3 a buffer plate surface runs slow punch 4, slow piercing inner surface fixed connection has a short spring 5, 4 buffer plate 3 another surface fixed connection limited block 6; The inner surface of box 1 is fixedly connected with a shock absorbing device 7, and the top of the shock absorbing device 7 is provided with a sliding groove 8. The gap of the inner surface of the sliding groove 8 is matched with a sliding block 9, and the top of the sliding block 9 is fixedly connected with a storage basket 10.

A surface of box body 1 is hinged with box cover 12 through hinge 11;

One surface of the box cover 12 is fixedly connected with a pressing spring 13, one end of the pressing spring 13 is fixedly connected with a movable plate 14, one surface of the movable plate 14 is fixedly connected with a connecting block 15, and one surface of the connecting block 15 is fixedly connected with a pressing plate 16;

Shock absorbing device 7 including the spring of 701, spring 701 inner surface fixed connection with damping spring 702, damping spring 702 one end fixed connection had 703 columns, columns, 703 from suspension spring 702 throughout the spring of 701, at the end of the support column 703

located at one end of the spring of 701 external fixed connection had 704 damping plate, vibration plate 704 a chute and the surface 8 fixed connection.

As shown in FIG. 2, on the surface of 10 of the storage basket, there is a limit slot 17 that matches the limit block 6, and the limit slot 17 fits the gap of the limit block 6.

As shown in FIG. 3, the inner surface of box 1 is fixedly connected with rubber air bag 18, and the air valve 19 is set on the rubber air bag 18.

As shown in FIG. 3, there is a push-pull frame 20 on the surface of the storage basket 10, and the push-pull frame 20 is a rectangular structure.

As shown in figure 2-3, buffer slot 2 is a convex shape structure, and limit slot 17 is a rectangular structure.

As shown in FIG. 2, rubber layer 21 is arranged on the inner surface of 10 storage baskets, and foam cotton sliver 22 is fixed on the surface of the rubber layer 21.

As shown in FIG. 9, a latch mechanism 23 is arranged on the surface of box body 1. Box body 1 is connected to the box cover 13 through the latch mechanism 23.

In the description of this specification, a description of the reference terms an embodiment, an example, a concrete example, etc., means at least one embodiment or example contained in combination with the specific features, structures, materials or features described by the embodiment or example. In this specification, a schematic representation of the above terms does not necessarily refer to the same embodiment or example. Furthermore, the specific features, structures, materials, or features described may be combined in an appropriate manner in any one or more embodiments or examples.

## **8. CONCLUSION**

Preferred embodiments are used only to assist in elaboration. Preferred embodiments do not describe in detail all the details nor do they limit the invention to the specific embodiments described. Obviously, according to the contents of this manual, a lot of modifications and changes can be made. These embodiments are selected and specifically described in order to better explain the principles and practical applications, so that the technical personnel in the technical field can well understand and use. Subject only to the claims and their full scope and equivalents.

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