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(54) SAFETY BOX CAPABLE OF PREVENTING OPENING BY INFANT AND OPENING METHOD

(57) Disclosed is a safety box capable of preventing opening by an infant. The safety box comprises a paper pulp outer box (1) and a paper pulp inner box (2), the paper pulp outer box (1) is rectangular, an inner box inlet and outlet opening (10) is provided in one end of the paper pulp outer box (1), fastening holes (11) are provided in the two side edges of the paper pulp outer box (1) respectively, the paper pulp inner box (2) enters the paper pulp outer box (1) from the inner box inlet and outlet opening (10), outwardly protruding fasteners (20) fastened in the fastening holes (11) are arranged on the two side edges of the paper pulp outer box (1) respectively, the wall thickness of the outwardly protruding fasteners (20) is equal to that of the paper pulp inner box (2), and the two outwardly protruding fasteners (20) oppositely deform inwards under external force so as to force the outwardly protruding fasteners (20) to be separated from the fastening holes (11) and push out the paper pulp inner box (2). The safety box solves the problem that self-locking and self-locking cancellation are inconvenient, self-locking can be achieved, opening by an infant is prevented, and the structure is simple.

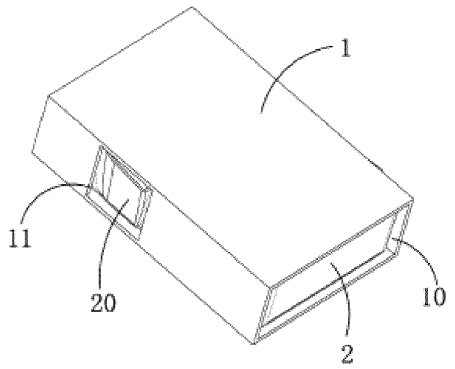

Fig. 1

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Description

Field of the invention

[0001] The present invention relates to the technical field of boxes, especially a safety box capable of preventing opening by an infant and an opening method.

Background of the invention

[0002] Boxes are used to store various kinds of objects in daily life, such as food, medicine and so on.

[0003] Infants tend to open boxes in their daily activities, so they may eat the food and/or medicines in the boxes by mistake, which leads to certain potential safety hazards.

[0004] The main reason for such hazards is that boxes usually do not have the function of self-locking.

[0005] For example, Chinese patent (Application No. 2018210920206) discloses a self-locking anti-shedding pull-out type gift packaging box, which includes an inner box and an outer box. Both side edges of the outer box are provided with transverse sliding grooves, the front end of the transverse sliding groove is provided with an anti-shedding stopper, the rear end of the transverse sliding groove is provided with a clamping hole, the rear part of the inner box is connected with a "U" shaped elastic sheet, the rear part of the inner box is provided with a longitudinal sliding groove, the U-shaped elastic sheet is provided with a sliding rod matched with the longitudinal sliding groove, the two ends of the "U" shaped elastic sheet are symmetrically provided with clamping balls matched with the transverse sliding grooves, and the clamping balls can be slidably clamped into the clamping holes. This packaging box has the advantage of preventing shedding. However, the structure of this packaging box is complex and inconvenient to open. At the same time, infants can still open it.

Summary of the invention

[0006] The purpose of the present invention is to provide a safety box capable of preventing opening by an infant and an opening method to solve the above-mentioned problems.

[0007] The technical solution adopted by the present invention to achieve the above purpose follows:

The safety box capable of preventing opening by an infant in the present invention includes:

a paper pulp outer box which is rectangular, an inner box inlet and outlet opening provided in one end of the paper pulp outer box, and buckle holes provided in the two side edges of the paper pulp outer box respectively;

a paper pulp inner box which enters the paper pulp outer box from the inner box inlet and outlet opening, so that the two side edges of the paper pulp outer box respectively have an outwardly protruding buckle of the inner pulp box buckled through the buckle hole, and the wall thickness of the outwardly protruding buckles is equal to that of the paper pulp inner box, and the two outwardly protruding buckles oppositely deform inwards under external force so as to force the outwardly protruding buckles to be separated from the buckle holes and to push out the paper pulp inner box.

[0008] In a preferred embodiment, the buckle hole provided on one side edge of the paper pulp outer box and the buckle hole provided on the other side edge of the paper pulp outer box are staggered in front and back;

[0009] The outwardly protruding buckle arranged on one side edge of the paper pulp outer box and the outwardly protruding buckle arranged on the other side edge of the paper pulp outer box are staggered in front and back. When the paper pulp inner box enters the paper pulp outer box, the outwardly protruding buckles are buckled in the buckle holes.

[0010] In a preferred embodiment, the outwardly protruding buckles are inwardly inclined from an upper opening of the paper pulp inner box to the bottom of the paper pulp inner box, and an inclined groove with an inclined direction consistent with that of the outwardly protruding buckle is formed on an inner side of the outwardly protruding buckle.

[0011] In a preferred embodiment, an upper end of the outwardly protruding buckle protrudes out of the outer opening of the buckle hole, and an upper end of the inclined groove communicates with the outside.

[0012] In a preferred embodiment, the outwardly protruding buckles include: an outwardly protruding side edge part I which is close to the end with the inner box inlet and outlet opening, with an angle I equal to 90° formed between an outer surface of the outwardly protruding side edge part I and the side edge of the paper pulp inner box; and an outwardly protruding side edge part II which is away from the outwardly protruding side edge part I, with an angle II greater than 90° formed between an outer surface of the outwardly protruding side edge part II and the side edge of the paper pulp inner box. The width of the outwardly protruding side edge part I gradually decreases from the upper opening to the bottom of the paper pulp inner box, and the width of the outwardly protruding side edge part II gradually decreases from the upper opening to the bottom of the paper pulp inner box. The outwardly protruding buckles further include an inclined part, with one side edge of the inclined part connected to one side edge of the outwardly protruding side edge part I which is away from the paper pulp inner box, and the other side edge of the inclined part connected to one side edge of the outwardly protruding side edge part II which is away from the paper pulp inner box. A bottom side of the inclined part is connected to a bottom side edge of the paper pulp inner box to form the above-mentioned inclined groove, and the

groove depth of the inclined groove gradually decreases from the side of the outwardly protruding side edge part I to the side of the outwardly protruding side edge part II. An angle III smaller than 90° is formed between an inner surface of the outwardly protruding side edge part I and an inner surface of the inclined part, and an angle IV greater than 90° is formed between an inner surface of the outwardly protruding side edge part II and the inner surface of the inclined part.

[0013] In a preferred embodiment, a closed portion is arranged at one end of the paper pulp outer box which is away from the inner box inlet and outlet opening, and an inner box ejection hole is arranged on the closed portion. The buckle holes are square holes, and the outer surface of the outwardly protruding side edge part I matches with the corresponding hole wall surface of the square holes. An angle II between 120° and 170° is formed between the outer surface of the outwardly protruding side edge part II and the side edge of the paper pulp inner box, and the outer surface of the outwardly protruding side edge part II is in line contact with the corresponding hole wall surface of the square holes.

[0014] In a preferred embodiment, the transverse cross-section of the outwardly protruding side edge part II is arc-shaped, the outer surface of the outwardly protruding side edge part II is an arc-shaped convex surface, the inner surface of the outwardly protruding side edge part II is an arc-shaped concave surface, and the arc-shaped concave surface and the arc-shaped convex surface match each other.

[0015] In a preferred embodiment, one side edge of the outwardly protruding side edge part II is connected to one side edge of the inclined part, and the other side edge of the outwardly protruding side edge part II is connected to the paper pulp inner box through an arc-shaped inner concave part.

[0016] In another embodiment, the outwardly protruding buckles include: an outwardly protruding side edge part I which is close to the end with the inner box inlet and outlet opening, with an angle I greater than 90° formed between an outer surface of the outwardly protruding side edge part I and the side edge of the paper pulp inner box; an outwardly protruding side edge part II which is away from the outwardly protruding side edge part I, with an angle II greater than 90° formed between an outer surface of the outwardly protruding side edge part II and the side edge of the paper pulp inner box. The width of the outwardly protruding side edge part I gradually decreases from the upper opening to the bottom of the paper pulp inner box, and the width of the outwardly protruding side edge part II gradually decreases from the upper opening to the bottom of the paper pulp inner box. The outwardly protruding buckles further include an inclined part, with one side edge of the inclined part connected to one side edge of the outwardly protruding side edge part I which is away from the paper pulp inner box, and the other side edge of the inclined part connected to one side edge of the outwardly protruding side edge part II which is away from the paper pulp inner box. A bottom side of the inclined part is connected to a bottom side edge of the paper pulp inner box to form the above-mentioned inclined groove, and the groove depth of the inclined groove gradually decreases from the side of the outwardly protruding side edge part I to the side of the outwardly protruding side edge part II. An angle III smaller than 90° is formed between an inner surface of the outwardly protruding side edge part I and an inner surface of the inclined part, and an angle IV greater than 90° is formed between an inner surface of the outwardly protruding side edge part II and the inner surface of the inclined part. The angle I is smaller than the angle II.

[0017] In a preferred embodiment, the paper pulp inner box and the outwardly protruding buckles are integrally formed by paper pulp pressing.

[0018] In a preferred embodiment, the inner part of the paper pulp inner box is provided with an inner arc chamfer, and the outer bottom of the paper pulp inner box is provided with an outer arc chamfer which is concentric with the inner arc chamfer.

[0019] A safety box capable of preventing opening by infant includes:

a paper pulp outer box which is rectangular, an inner box inlet and outlet opening provided in one end of the paper pulp outer box, and buckle holes provided in the two side edges of the paper pulp outer box respectively;

a paper pulp inner box which enters the paper pulp outer box from the inner box inlet and outlet opening, so that the two side edges of the paper pulp outer box respectively have an outwardly protruding buckle of the inner pulp box buckled through the buckle hole, where the wall thickness of the outwardly protruding buckles is equal to that of the paper pulp inner box, and the two outwardly protruding buckles oppositely deform inwards under external force so as to force the outwardly protruding buckles to be separated from the buckle holes and to push out the paper pulp inner box;

the buckle hole provided on one side edge of the paper pulp outer box and the buckle hole provided on the other side edge of the paper pulp outer box are staggered in front and back;

the outwardly protruding buckle provided on one side edge of the paper pulp outer box and the outwardly protruding buckle provided on the other side edge of the paper pulp outer box are staggered in front and back, and when the paper pulp inner box enters the paper pulp outer box, the outwardly protruding buckles are fastened in the buckle holes.

[0020] A method for manually opening a safety box capable of preventing opening by infant, which includes the following steps:

S1. Preparing. When the paper pulp inner box is lo-

cated in the paper pulp outer box and in a locked state, one hand presses the paper pulp outer box downward from above the paper pulp outer box, and the fingers contact with the outer surfaces of the outwardly protruding buckles on the two sides of the paper pulp inner box, and the fingers of the other hand extend into the inner box ejection hole and contact with the outer surface of the end of the paper pulp inner box which is close to the inner box ejection hole;

S2. Pressing inward towards each other. The fingers which contact with the outer surface of the outwardly protruding buckles in step S1 press inwardly, then, the two staggered outwardly protruding buckles oppositely deform inwards under the action of the inward forces, and the outwardly protruding buckles are separated from the buckle holes;

S3. Pushing out. When the outwardly protruding buckles are separated from the buckle holes in step S2, the fingers which contact with the outer surface of the end of the paper pulp inner box that is close to the inner box ejection hole in step S1 apply pressure toward the inner box inlet and outlet opening side of the paper pulp outer box, so that the paper pulp inner box can be pushed to the outside of the inlet and outlet opening or the paper pulp inner box can be completely removed from the paper pulp outer box.

[0021] Compared with the prior art, the present invention has the advantages as follows:

Distributed dislocations may form multiple opening-blocking effects, including the outwardly protruding buckles having asymmetrically positioned left and right sides, and the outwardly protruding buckles having edges that make the outwardly protruding buckles easily pushed in and prevented from being pulled out. Once the paper pulp inner box is pushed to the closed end, the outwardly protruding buckles on the left and right sides are automatically buckled to the paper pulp outer box, and the paper pulp inner box will be completely contained in the paper pulp outer box, which prevents children from digging out with their fingers or biting out with their teeth, and the design is more reasonable.

[0022] The structure is simple and convenient for processing and manufacturing.

Brief description of the drawings

[0023]

Fig. 1 is the perspective schematic diagram of a fitted-together paper pulp inner box and paper pulp outer box provided in the present invention.

Fig. 2 is the perspective schematic diagram of a separated paper pulp inner box and paper pulp outer box provided in the present invention.

Fig. 3 is the schematic diagram of the state of the fitted-together paper pulp inner box and paper pulp outer box provided in the present invention.

Fig. 4 is the schematic diagram of the paper pulp inner box provided in the present invention.

Fig. 5 is the schematic diagram of the matching structure of the paper pulp outer box provided in the present invention.

[0024] In these figures, paper pulp outer box 1, inner box inlet and outlet opening 10, buckle hole 11, closing portion 12, inner box ejection hole 13, paper pulp inner box 2, outwardly protruding buckles 20, outwardly protruding side edge part I 201, outwardly protruding side edge part II 202, inclined part 203, inclined groove 21, arc-shaped inner concave part 22, inner arc chamfer 23, and outer arc chamfer 24 have been shown.

Detailed description of preferred embodiments

[0025] The following are specific embodiments of the present invention and further describe the technical scheme of the present invention with reference to the drawings, but the present invention is not limited to these embodiments.

Embodiment 1

[0026] As shown in Fig. 1 and Fig. 2,

The safety box capable of preventing opening by an infant in the present invention includes:

A paper pulp outer box 1 which is rectangular, and an inner box inlet and outlet opening 10 provided in one end of the paper pulp outer box 1. The paper pulp outer box 1 is made of paper plant fiber material. The paper pulp outer box is environmentally friendly and degradable.

[0027] Two buckle holes are arranged on the two sides of the paper pulp outer box 1 respectively; and the buckle holes (11) are square holes.

[0028] A paper pulp inner box 2 which is made of paper plant fiber material. The paper pulp inner box is environmentally friendly and degradable.

[0029] The paper pulp inner box 2 enters the paper pulp outer box 1 through the inner box inlet and outlet opening 10, so that outwardly protruding buckles 20 one by one become buckled through the buckle holes 11 on the two side edges of the paper pulp outer box 1 respectively, and the wall thickness of the outwardly protruding buckles 20 is equal to that of the paper pulp inner box 2.

[0030] Equal wall thickness can facilitate processing and manufacturing, while it can also make a more beautiful inner box.

[0031] As shown in Fig. 3,

The two outwardly protruding buckles 20 oppositely deform inwards under external force so as to force the outwardly protruding buckles 20 to be separated from the buckle holes 11 and to push out the paper pulp inner box 2. The outwardly protruding buckles 20 are buckled in the buckle holes 11 so as to achieve the mutual locking

of the paper pulp outer box and the paper pulp inner box, which prevents infants from opening the paper pulp inner box by mistake and eating the food or medicine in the paper pulp inner box.

[0032] Optimally, the buckle hole 11 provided on one side edge of the paper pulp outer box 1 and the buckle hole 11 provided on the other side edge of the paper pulp outer box 1 are staggered in front and back;

[0033] The outwardly protruding buckle 20 provided on one side edge of the paper pulp outer box 1 and the outwardly protruding buckle 20 provided on the other side edge of the paper pulp outer box 1 are staggered in front and back. When the paper pulp inner box 2 enters the paper pulp outer box 1, the outwardly protruding buckles 20 become buckled in the buckle holes 11.

[0034] Distributed dislocations may form multiple opening-blocking effects, including the outwardly protruding buckles having asymmetrically positioned left and right sides, and the outwardly protruding buckles 20 having edges that make the outwardly protruding buckles 20 easily pushed in and prevented from being pulled out. Once the paper pulp inner box is pushed to the closed end, the outwardly protruding buckles on the left and right sides are automatically buckled to the paper pulp outer box, and the paper pulp inner box will be completely contained in paper pulp outer box, which prevents children from digging out with their fingers or biting out with their teeth.

[0035] Furthermore, the outwardly protruding buckles on the left and right sides are not arranged along a straight line and are specially arranged with a relatively long distance. An infant's hands are small, which makes it difficult for them to press the outwardly protruding buckles as the same time, thus preventing it from being pulled out by infant.

[0036] As shown in Fig. 1, Fig. 2 and Fig. 4,
The outwardly protruding buckles 20 are inwardly inclined from the upper opening to the bottom of the paper pulp inner box 2, and an inclined groove 21 with an inclined direction consistent with that of the outwardly protruding buckle 20 is formed on the inner side of the outwardly protruding buckle 20.

[0037] The design of the inclined groove can achieve the release of deformation pressure and freely rebound after release, while the inclined outwardly protruding buckles 20 facilitate pressing inward to quickly extract the paper pulp inner box.

[0038] The upper end of the outwardly protruding buckles 20 protrudes out of the outer opening of the buckle hole 11, and the upper end of the inclined groove 21 communicates with the outside. Such structure may achieve locking and avoid free shedding. Secondly, the communication with the outside can achieve air communication between the inside and the outside, which may prevent the formation of a seal that makes it difficult to withdraw the paper pulp inner box.

[0039] Furthermore, there is a gap between the inner top of the paper pulp outer box 1 and the upper opening end face of the paper pulp inner box 2. Similarly, the gap can also prevent the formation of a seal that makes it difficult to pull out the paper pulp inner box.

[0040] Specifically, the outwardly protruding buckle 20 includes an outer convex side edge part I 201 close to one end of the inner box inlet and outlet opening 10. An angle I equal to 90° is formed between an outer surface of the outwardly protruding side edge part I (201) and the side edge of the paper pulp inner box (2). The angle I facilitates the locking of the outwardly protruding side edge part I 201 on the hole wall of the buckle hole, because the outer surface of the outwardly protruding side edge part I 201 matches with the hole wall surface of the buckle hole, that is, achieves locking.

[0041] An outwardly protruding side edge part II 202 is away from the outwardly protruding side edge part I 201. An angle II greater than 90° is formed between an outer surface of the outwardly protruding side edge part II 202 and the side edge of the paper pulp inner box 2. Preferably, the angle II is greater than 90° and smaller than 180°.

[0042] The outwardly protruding side edge part II 202 is at such an angle that facilitates the insertion of the paper pulp inner box into the paper pulp outer box, that is, the outwardly protruding side edge part II 202 serves as a guide during insertion.

[0043] The width of the outwardly protruding side edge part I 201 gradually decreases from the upper opening to the bottom of the paper pulp inner box 2, and the width of the outwardly protruding side edge part II 202 gradually decreases from the upper opening to the bottom of the paper pulp inner box 2. This width structure of the design improves the structural strength of the outwardly protruding buckles without compromising the deformability of the outwardly protruding buckles. In addition, the above-mentioned structure not only realizes the function of self-locking, but also reduces the contact area between the outwardly protruding side edge part I 201 and the corresponding hole wall of the buckle hole. The main effect of reducing the contact area is to facilitate pull out of the paper pulp inner box later.

[0044] The width of the outwardly protruding side edge part II 202 gradually decreases from the upper opening to the bottom of the paper pulp inner box 2, and a line of contact is formed between corresponding hole wall of the buckle hole and the outwardly protruding side edge part II 202, which facilitates pulling out the paper pulp inner box from the paper pulp outer box.

[0045] The outwardly protruding buckles further include inclined parts 203, with one side edge of the inclined part 203 connected to one side edge of the outwardly protruding side edge part I 201 which is away from the paper pulp inner box 2, and the other side edge of the inclined part 203 connected to one side edge of the outwardly protruding side edge part II 202 which is away from the paper pulp inner box 2. The bottom side of the inclined part 203 is connected to the bottom side edge of the paper pulp inner box 2 to form the above-mentioned

inclined groove 21, and the groove depth of the inclined groove 21 gradually decreases from the side of the outwardly protruding side edge part I 201 to the side of the outwardly protruding side edge part II 202. The unequal depth design of the groove depth facilitates the release deformation and supports structural strength during the deformation process, that is, the deformation of the outwardly protruding side edge part I 201 is the largest, and the deformation of the outwardly protruding side edge part II 202 is less than that of the outwardly protruding side edge part 1201.

[0046] Furthermore, the depth of the inclined groove 21 is designed to facilitate the insertion of the paper pulp inner box into the paper pulp outer box to achieve quick assembly.

[0047] The outer surface of the inclined part 203 is an arc-shaped concave surface, and the inner surface of the inclined part 203 is an arc-shaped convex surface. This design facilitates the pressing of the outwardly protruding buckle 20, that is, prevents an inaccurate pressing position caused by the absence of pressing points and the failure to pull out the paper pulp inner box smoothly.

[0048] An angle III smaller than 90° is formed between an inner surface of the outwardly protruding side edge part I 201 and an inner surface of the inclined part 203, and an angle IV greater than 90° is formed between an inner surface of the outwardly protruding side edge part II 202 and the inner surface of the inclined part 203.

[0049] As shown in Fig. 5,
The design of the angles facilitates deformation and also facilitates restoration after deformation.

[0050] A closed portion 12 is arranged at one end of the paper pulp outer box 1 which is away from the inner box inlet and outlet opening 10, and an inner box ejection hole 13 is arranged on the closed portion 12 which facilitates push out of the paper pulp inner box. The closed portion 12 may limit the position of the paper pulp inner box after insertion.

[0051] As shown in Fig. 1 to Fig. 5,
Secondly, the buckle holes 11 are square holes, and outer surface of the outwardly protruding side edge part I 201 matches with the corresponding hole wall surface of the square hole. An angle II between 120° and 170° is formed between the outer surface of the outwardly protruding side edge part II 202 and the side edge of the paper pulp inner box 2, and outer surface of the outwardly protruding side edge part II 202 is in line contact with the corresponding hole wall surface of the square hole.

[0052] The paper pulp inner box and the paper pulp outer box are set in a tightly fitted state. The outwardly protruding buckles on the paper pulp inner box protrude outward, which will naturally form a tight and difficult to move state with the paper pulp outer box. Even if the outwardly protruding buckles on the left and right sides are pressed in at the same time, the paper pulp inner box can be pushed out only with the help of fingers that push out the paper pulp inner box through the ejection hole at the rear end.

[0053] Furthermore, the transverse section of the outwardly protruding side edge part II 202 is arc-shaped, an outer surface of the outwardly protruding side edge part II 202 is an arc-shaped convex surface, and the inner surface of the outwardly protruding side edge part II 202 is an arc-shaped concave surface, and the arc-shaped concave surface and the arc-shaped convex surface match each other.

[0054] One side edge of the outwardly protruding side edge part II 202 is connected to one side edge of the inclined part, and the other side edge of the outwardly protruding side edge part II 202 is connected to the paper pulp inner box 2 through an arc-shaped inner concave part 22. The design of the arc-shaped inner concave part 22 facilitates the insertion of the paper pulp inner box into the paper pulp outer box and extraction of the paper pulp inner box. At the same time, the directions of the outwardly protruding side edge part II 202 and the arc-shaped inner concave part 22 are different, and they are connected with each other, which can realize deformation and elastic deformation restoration during the pressing process.

[0055] In a preferred embodiment, the paper pulp inner box 2 and the outwardly protruding buckles 20 are integrally formed by paper pulp pressing. The paper pulp inner box 2 is manufactured by a paper pulp inner box mold. Of course, the paper pulp outer box 1 is manufactured by a paper pulp outer box mold.

[0056] The inner part of the paper pulp inner box 2 is provided with an inner arc chamfer 23, and the outer bottom of the paper pulp inner box 2 is provided with an outer arc chamfer 24 which is concentric with the inner arc chamfer 23. The outer arc chamfer 24 facilitates the insertion of the paper pulp inner box into the paper pulp outer box, while the design of the inner arc chamfer 23 facilitates the processing and manufacture of the paper pulp inner box 2.

[0057] A method for manually opening a safety box capable of preventing opening by an infant includes the following steps:

S1. Preparation. When the paper pulp inner box 2 is located in the paper pulp outer box 1 and in a locked state, one hand presses the paper pulp outer box 1 downward from above the paper pulp outer box 1, and the fingers contact with the outer surfaces of the outwardly protruding buckles 20 on the two sides of the paper pulp inner box 2, and the fingers of the other hand extend into the inner box ejection hole and contact with the outer surface of the end of the paper pulp inner box which is close to the inner box ejection hole;

S2. Pressing inward towards each other. The fingers which contact with the outer surface of the outwardly protruding buckles in step S1 press inwardly, then, the two staggered outwardly protruding buckles oppositely deform inwards under the action of the in-

ward forces, and the outwardly protruding buckles are separated from the buckle holes;

S3. Pushing out. When the outwardly protruding buckles are separated from the buckle holes in step S2, the fingers which contact with the outer surface of the end of the paper pulp inner box that is close to the inner box ejection hole in step S1 apply pressure toward the inner box inlet and outlet opening side of the paper pump outer box, so that the paper pulp inner box can be pushed to the outside of the inlet and outlet opening or the paper pulp inner box can be completely removed from the paper pulp outer box.

Embodiment 2

[0058] The outwardly protruding buckles 20 include: an outwardly protruding side edge part I 201 which is close to the end with the inner box inlet and outlet opening 10, with an angle I greater than 90° formed between outer surface of the outwardly protruding side edge part I 201 and the side edge of the paper pulp inner box 2; an outwardly protruding side edge part II 202 which is away from the outwardly protruding side edge part I 201, with an angle II greater than 90° formed between the outer surface of the outwardly protruding side edge part II 202 and the side edge of the paper pulp inner box 2. The width of the outwardly protruding side edge part I 201 gradually decreases from the upper opening to the bottom of the paper pulp inner box 2, and the width of the outwardly protruding side edge part II 202 gradually decreases from the upper opening to the bottom of the paper pulp inner box 2. The outwardly protruding buckles further include inclined parts 203, with one side edge of the inclined part 203 connected to one side edge of the outwardly protruding side edge part I 201 which is away from the paper pulp inner box 2, and the other side edge of the inclined part 203 connected to one side edge of the outwardly protruding side edge part II 202 which is away from the paper pulp inner box 2. The bottom side of the inclined part 203 is connected to the bottom side edge of the paper pulp inner box 2 to form the above-mentioned inclined groove 21, and the groove depth of the inclined groove 21 gradually decreases from the side of the outwardly protruding side edge part I 201 to the side of the outwardly protruding side edge part II 202. An angle III smaller than 90° is formed between the inner surface of the outwardly protruding side edge part I 201 and the inner surface of the inclined part 203, and an angle IV greater than 90° is formed between the inner surface of the outwardly protruding side edge part II 202 and the inner surface of the inclined part 203. The angle I is smaller than the angle II.

[0059] The specific embodiments described herein are only examples of the spirit of the present invention. Those skilled in the technical field of the present invention can make various modifications or supplements to the described specific embodiments or adopt similar methods to replace them, without deviating from the spirit of the present invention or beyond the scope defined in the claims.

Claims

1. A safety box capable of preventing opening by an infant, **characterized in that** the safety box comprises:

   a paper pulp outer box (1) which is rectangular, an inner box inlet and outlet opening (10) provided in one end of the paper pulp outer box (1), and buckle holes (11) provided in the two side edges of the paper pulp outer box (1) respectively;

   a paper pulp inner box (2) which enters the paper pulp outer box (1) from the inner box inlet and outlet opening (10), and outwardly protruding buckles (20) to be buckled in the buckle holes (11) arranged on the two side edges of the paper pulp outer box (1) respectively, where the wall thickness of the outwardly protruding buckles (20) is equal to that of the paper pulp inner box (2), and the two outwardly protruding buckles (20) oppositely deform inwards under external force so as to force the outwardly protruding buckles (20) to be separated from the buckle holes (11) and to push out the paper pulp inner box (2).

2. The safety box capable of preventing opening by an infant according to claim 1, **characterized in that** the buckle hole (11) provided on one side edge of the paper pulp outer box (1) and the buckle hole (11) provided on the other side edge of the paper pulp outer box (11) are staggered in front and back;
   the outwardly protruding buckle (20) provided on one side edge of the paper pulp outer box (1) and the outwardly protruding buckle (20) provided on the other side edge of the paper pulp outer box (1) are staggered in front and back, and when the paper pulp inner box (2) enters the paper pulp outer box (1), the outwardly protruding buckles (20) become fastened in the buckle holes (11).

3. The safety box capable of preventing opening by an infant according to claim 1 or 2, **characterized in that** the outwardly protruding buckles (20) are inwardly inclined from an upper opening to a bottom of the paper pulp inner box (2), and an inclined groove (21) with an inclined direction consistent with that of the outwardly protruding buckle (20) is formed on an inner side of the outwardly protruding buckles (20).

4. The safety box capable of preventing opening by an

infant according to claim 3, **characterized in that** an upper end of the outwardly protruding fasteners (20) protrudes out of the outer opening of the buckle holes (11), and the upper end of the inclined groove (21) communicates with the outside.

5. The safety box capable of preventing opening by an infant according to claim 4, **characterized in that** the outwardly protruding buckles (20) include: an outwardly protruding side edge part I (201) which is close to the end with the inner box inlet and outlet opening (10), with an angle I equal to 90° formed between an outer surface of the outwardly protruding side edge part I (201) and the side edge of the paper pulp inner box (2); an outwardly protruding side edge part II (202) which is away from the outwardly protruding side edge part I (201), with an angle II greater than 90° formed between an outer surface of the outwardly protruding side edge part II (202) and the side edge of the paper pulp inner box (2); and the width of the outwardly protruding side edge part I (201) gradually decreases from the upper opening to the bottom of the paper pulp inner box (2), and the width of the outwardly protruding side edge part II (202) gradually decreases from the upper opening to the bottom of the paper pulp inner box (2); and the outwardly protruding buckles further include inclined parts (203), with one side edge of the inclined part (203) connected to one side edge of the outwardly protruding side edge part I (201) which is away from the paper pulp inner box (2), and the other side edge of the inclined part (203) connected to one side edge of the outwardly protruding side edge part II (202) which is away from the paper pulp inner box (2); and a bottom side of the inclined part (203) is connected to the bottom side edge of the paper pulp inner box (2) to form the inclined groove (21), and a groove depth of the inclined groove (21) gradually decreases from the side of the outwardly protruding side edge part I (201) to the side of the outwardly protruding side edge part II (202); and an angle III smaller than 90° is formed between an inner surface of the outwardly protruding side edge part I (201) and an inner surface of the inclined part (203), and an angle IV greater than 90° is formed between an inner surface of the outwardly protruding side edge part II (202) and the inner surface of the inclined part (203).

6. The safety box capable of preventing opening by an infant according to claim 5, **characterized in that** a closed portion (12) is arranged at one end of the paper pulp outer box (1) which is away from the inner box inlet and outlet opening (10), and an inner box ejection hole (13) is arranged on the closed portion (12); the buckle holes (11) are square holes, and the outer surface of the outwardly protruding side edge part I (201) matches with a corresponding hole wall surface of the square holes; an angle II between 120° and 170° is formed between the outer surface of the outwardly protruding side edge part II (202) and the side edge of the paper pulp inner box (2), and the outer surface of the outwardly protruding side edge part II (202) contacts with a corresponding hole wall surface line of the square holes.

7. The safety box capable of preventing opening by an infant according to claim 6, **characterized in that** a transverse section of the outwardly protruding side edge part II (202) is arc-shaped, the outer surface of the outwardly protruding side edge part II (202) is an arc-shaped convex surface, the inner surface of the outwardly protruding side edge part II (202) is an arc-shaped concave surface, and the arc-shaped concave surface and the arc-shaped convex surface match each other.

8. The safety box capable of preventing opening by an infant according to claim 7, **characterized in that** one side edge of the outwardly protruding side edge part II (202) is connected to one side edge of the inclined part, and the other side edge of the outwardly protruding side edge part II (202) is connected to the paper pulp inner box (2) through an arc-shaped inner concave part (22).

9. The safety box capable of preventing opening by an infant according to claim 4, **characterized in that** the outwardly protruding buckles (20) include: an outwardly protruding side edge part I (201) which is close to the end with the inner box inlet and outlet opening (10), with an angle I greater than 90° formed between an outer surface of the outwardly protruding side edge part I (201) and the side edge of the paper pulp inner box (2); an outwardly protruding side edge part II (202) which is away from the outwardly protruding side edge part I (201), with an angle II greater than 90° formed between an outer surface of the outwardly protruding side edge part II (202) and the side edge of the paper pulp inner box (2); the width of the outwardly protruding side edge part I (201) gradually decreases from the upper opening to the bottom of the paper pulp inner box (2), and the width of the outwardly protruding side edge part II (202) gradually decreases from the upper opening to the bottom of the paper pulp inner box (2); the outwardly protruding buckles (20) further include inclined parts (203), with one side edge of the inclined part (203) connected to one side edge of the outwardly protruding side edge part I (201) which is away from the paper pulp inner box (2), and the other side edge of the inclined part (203) connected to one side edge of the outwardly protruding side edge part II (202) which is away from the paper pulp inner box (2); a bottom side of the inclined part (203) is connected to the bottom side edge of the paper pulp inner box

(2) to form the inclined groove (21), and groove depth of the inclined groove (21) gradually decreases from the side of the outwardly protruding side edge part I (201) to the side of the outwardly protruding side edge part II (202); an angle III smaller than 90° is formed between an inner surface of the outwardly protruding side edge part I (201) and an inner surface of the inclined part (203), and an angle IV greater than 90° is formed between an inner surface of the outwardly protruding side edge part II (202) and the inner surface of the inclined part (203); the angle I is smaller than the angle II.

10. The safety box capable of preventing opening by an infant according to claim 1 or 2, **characterized in that** the paper pulp inner box (2) and the outwardly protruding buckles (20) are integrally formed by paper pulp pressing.

11. The safety box capable of preventing opening by an infant according to claim 10, **characterized in that** an inner part of the paper pulp inner box (2) is provided with an inner arc chamfer (23), and an outer bottom of the paper pulp inner box (2) is provided with an outer arc chamfer (24) which is concentric with the inner arc chamfer (23).

12. A safety box capable of preventing opening by an infant, **characterized in that** the safety box comprises:

a paper pulp outer box (1) which is rectangular, an inner box inlet and outlet opening (10) provided in one end of the paper pulp outer box (1), and buckle holes (11) provided in the two side edges of the paper pulp outer box (1) respectively;

a paper pulp inner box (2) which enters the paper pulp outer box (1) from the inner box inlet and outlet opening (10), and outwardly protruding buckles (20) to be buckled in the buckle holes (11) arranged on the two side edges of the paper pulp outer box (1) respectively, the wall thickness of the outwardly protruding buckles (20) is equal to that of the paper pulp inner box (2), and the two outwardly protruding buckles (20) oppositely deform inwards under external force so as to force the outwardly protruding buckles (20) to be separated from the buckle holes (11) and to push out the paper pulp inner box (2);

the buckle hole (11) provided on one side edge of the paper pulp outer box (1) and the buckle hole (11) provided on the other side edge of the paper pulp outer box (1) are staggered in front and back;

the outwardly protruding buckle (20) provided on one side edge of the paper pulp outer box (1) and the outwardly protruding buckle (20) provided on the other side edge of the paper pulp outer box (1) are staggered in front and back, when the paper pulp inner box (2) enters the paper pulp outer box (1), the outwardly protruding fasteners (20) become fastened in the fastening holes (11).

13. A method for manually opening the safety box capable of preventing opening by an infant according to claims 1-12, **characterized in that** the method includes the following steps:

S1. Preparing, when the paper pulp inner box is located in the paper pulp outer box and under a locked state, one hand presses the paper pulp outer box downward from the top of the paper pulp outer box, and the fingers contact with the outer surfaces of the outwardly protruding buckles on the two sides of the paper pulp inner box, and the fingers of the other hand extend into the inner box ejection hole and contact with the outer surface of the end of the paper pulp inner box which is close to the inner box push out hole;

S2. Pressing inward oppositely, the fingers which contact with the outer surface of the outwardly protruding fasteners in step S1 press inward oppositely, then, the two staggered outwardly protruding buckles oppositely deform inwards under the action of the oppositely inward forces, and the outwardly protruding buckles are separated from the buckle holes;

S3. Pushing out, when the outwardly protruding buckles are separated from the buckle holes in step S2, the fingers which contact with the outer surface of the end of the paper pulp inner box that is close to the inner box ejection hole in step S1 apply pressure toward the inner box inlet and outlet opening side of the paper pulp outer box, so that the paper pulp inner box can be pushed out of the outer side of the inlet and outlet opening or the paper pulp inner box is completely removed from the paper pulp outer box.

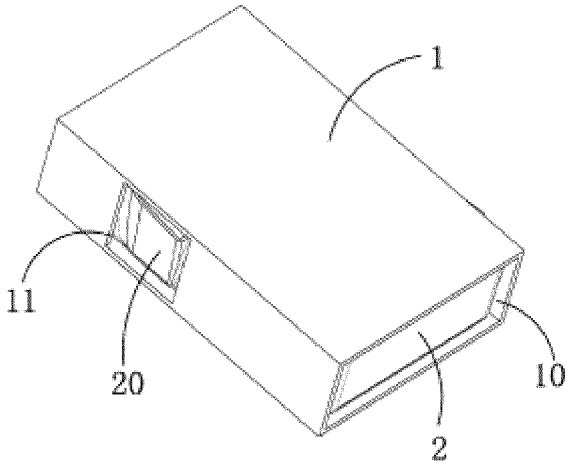

Fig. 1

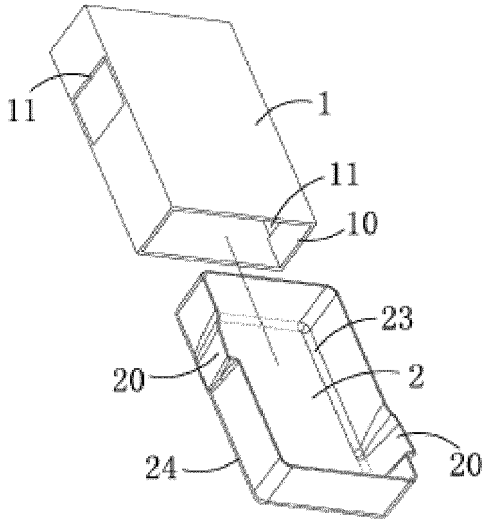

Fig. 2

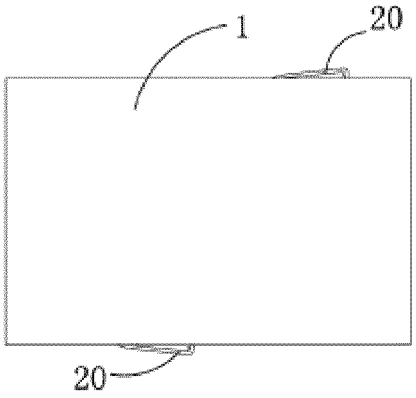

Fig. 3

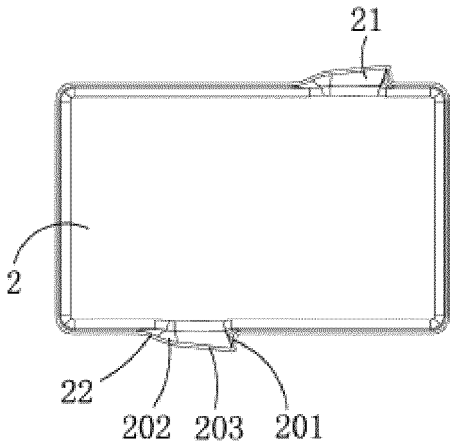

Fig. 4

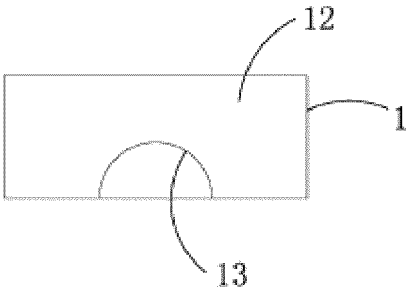

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/125179

A. CLASSIFICATION OF SUBJECT MATTER

B65D 6/06(2006.01)i; B65D 50/06(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; CNKI; VEN; SIPOABS: 盒, 箱, 纸, 外, 内, 防幼儿, 防儿童, 卡扣, 孔, 槽, 凸, box+, case, paper, child+, block, hole, slot, groove

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 209582362 U (NINGBO YINZHOU ZHUORONG INTERNATIONAL TRADE CO., LTD.) 05 November 2019 (2019-11-05) description, paragraphs 0028-0036, and figures 1-5	1-4, 10-13
X	CN 208360870 U (ZHEJIANG HUANGYAN DEWEI PLASTIC PRODUCT FACTORY) 11 January 2019 (2019-01-11) description, paragraph 0010 and figures 1-3	1-4, 10-13
X	CN 209337266 U (SHENZHEN JIANG TECHNOLOGY CO., LTD.) 03 September 2019 (2019-09-03) description, paragraphs 0026-0041, and figures 1-8	1-4, 10-13
PX	CN 111003315 A (JIANGSU LVSEN PACKAGE CO., LTD.) 14 April 2020 (2020-04-14) claims 1-13, description, entire document and figures 1-5	1-13
A	CN 1968856 A (KATSIS NICK) 23 May 2007 (2007-05-23) entire document	1-13
A	US 2014/0251842 A1 (R.J. REYNOLDS TOBACCO COMPANY) 11 September 2014 (2014-09-11) entire document	1-13

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 December 2020	**04 January 2021**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/125179

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2018/0257827 A1 (JOHNSBYRNE COMPANY) 13 September 2018 (2018-09-13) entire document	1-13

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/125179

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 209582362 U	05 November 2019	None	
CN 208360870 U	11 January 2019	None	
CN 209337266 U	03 September 2019	None	
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		AU 2005234809 A1	03 November 2005
US 2014/0251842 A1	11 September 2014	US 9346594 B2	24 May 2016
US 2018/0257827 A1	13 September 2018	US 10730671 B2	04 August 2020

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 2018210920206 **[0005]**