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STACKED TOOLBOX SYSTEM

Abstract

A first locking mechanism disposed between two spaced apart second locking mechanisms for being set opposite to any one of said second locking mechanisms to form a first locking gap in a first direction between two spaced apart said second locking mechanisms being able to form a second locking gap in a first direction.

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Background/Summary

PRIORITY CLAIM [0001] This application claim priority to, the benefit of, and is a continuation application of Ser. No. 17/956,459, filed Sep. 29, 2022, which claims priority to and the benefit of Chinese Patent Application No. 202122677703.6 filed on Nov. 3, 2021; Chinese Patent Application No. 202210212862.5 filed on Mar. 4, 2022; Chinese Patent Application No. 202210212005.5 filed on Mar. 4, 2022; and Chinese Patent Application No. 202210588703.5 filed on May 27, 2022, the contents of all of which are hereby incorporated by reference herein.

TECHNICAL FIELD

[0002] This application relates to the field of article storage, and in particular to a main storage box, a secondary storage box, and a storage box set.

BACKGROUND INFORMATION

[0003] In order to facilitate the user in the case of carrying multiple storage boxes (such as toolboxes) to facilitate the overall movement and use, each storage box is usually stacked together, and each storage box is usually locked together by interlocking, so as to facilitate the user to move and use. A number of ways are known for interlocking storage boxes. Now on the market, there are roughly the following three forms of locking: the first way uses a single plastic latch that can be turned to clasp the lower bottom of the box protrusion to achieve the purpose of interlocking; the second way is the conventional use of the front of the two-segment latch moved to the side to lock between the upper and lower boxes; and the third way uses a combination of steel wire and plastic to lock boxes together at the side. However, the above locking methods can only be interlocked for the same length and width of the shape of the box, and cannot be interlocked for different length and width of the size of the shape of the box, with many professional users needing to carry more and more diverse types of tools, there is an urgent need for interlocking between different sizes of the box.

SUMMARY

[0004] Based on this, it is necessary to provide a main storage box that can be interlocked with other storage boxes of different sizes, a secondary storage box for interlocking with the main storage box, and a storage box set having storage boxes of different sizes and interlocked so that existing storage boxes of different sizes cannot be interlocked with each other.

[0005] According to an aspect of the present application, there is provided a main storage box comprising: a first box having a first end face; two spaced apart second locking mechanisms, provided symmetrically along the first direction on both edges of said first end face; and at least one first locking mechanism, said at least one first locking mechanism being provided on said first end face and disposed between two spaced apart said second locking mechanisms said at least one first locking mechanism is for being set opposite to any one of said second locking mechanisms to form a first locking gap in a first direction, between two spaced apart said second locking mechanisms being able to form a second locking gap in a first direction.

[0006] In one embodiment, each said first locking mechanism comprises a first snap hook, said first snap hook being movably mounted to said first box to enable one said first locking mechanism to form said first locking gap with one said second locking mechanism.

[0007] In one embodiment, said first end surface is provided with a first recess, one end of said first snap hook being movably mounted in said first recess to enable the other end of said first snap hook to protrude or be housed in said first recess. One said first locking mechanism is capable of

forming said first locking gap with one said second locking mechanism when the other end of said first snap hook protrudes from said first recess. In one embodiment, each said second locking mechanism comprises a second recess opened in said main storage box, a second connecting shaft fixed in said second recess and a second snap hook rotatably connected to said second connecting shaft, said second locking mechanism being lockable by flipping of said second snap hook.

[0008] In one of the embodiments, each said second locking mechanism comprises a second recess opened in the main storage box, a rail fixed to the bottom wall of said second recess, and a second snap hook capable of moving within said rail, said second locking mechanism being lockable by retraction of said second snap hook.

[0009] In one of the embodiments, said first box has a second end surface relative to said first end surface, said second end surface being provided with two second locking positions for cooperating with said second locking mechanism at the edges of said second end surface, the two said second locking positions being spaced along said first direction.

[0010] According to another aspect of the present application, there is provided a secondary storage box for cooperating with said main storage box, said secondary storage box comprising a second box, said second box having a third end face, at least one second locking mechanism provided on said third end face and a third locking mechanism provided opposite to said second locking mechanism, said second locking mechanism and said third locking mechanism forming a third locking gap between said second locking mechanism and said third locking mechanism.

[0011] In one embodiment, said secondary storage box further comprises a second locking mechanism, said fourth end face opposite said third end face, said fourth end face provided with a second locking bit opposite said second locking mechanism and a first locking bit opposite said third locking mechanism.

[0012] According to a further aspect of the present application, there is provided a storage box set, said storage box set comprising at least one said main storage box and at least one said secondary storage box; one said main storage box being capable of being stacked and locked with at least one said secondary storage box on top of each other.

[0013] When one said main storage box is stacked and locked in place with one said secondary storage box, said first locking mechanism of said main storage box snaps into said first locking position of said secondary storage box, and said second locking mechanism of said main storage box snaps into said second locking position of said secondary storage box so that said secondary storage box is confined in said first locking gap.

[0014] In one embodiment, said main storage box has a plurality of recessed portions opened on said first end, said main storage box has a plurality of tabs opened on said second end; said secondary storage box has a plurality of said recessed portions opened on said third end, said secondary storage box has a plurality of said tabs opened on said fourth end, each said tab being capable of being confined in one of said recessed portions to prevent stacking of one another said main storage box and said secondary storage box from moving relative to each other.

[0015] Said main storage box, sub-storage box and storage box set, by providing two spaced and symmetrically provided second locking mechanisms at the edge of one end face of the main storage box, and at least one first locking mechanism between the two second locking mechanisms, so that one first locking mechanism and one second locking mechanism can form a first locking gap, or so that two spaced and symmetrically provided second locking mechanisms can form A second locking gap, not only can the first locking mechanism and the second locking mechanism cooperate to make the secondary storage box confined in the first locking gap of the main storage box, so that the main storage box and the secondary storage box of different sizes can be interlocked when they are stacked together, but also can make use of the cooperation of multiple second locking mechanisms to make one main storage box confined in the second locking gap of another main storage box, so that the main storage box of the same size can be interlocked with the secondary storage box. This allows interlocking of main storage boxes of the same size when they are stacked

together. This greatly expands the convenience and versatility of the main storage box, secondary storage box and storage box group, greatly enhancing the user's experience.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other features and advantages of the present invention will be better understood by reading the following detailed description, taken together with the drawings wherein:

[0017] FIG. 1 is a three-dimensional schematic diagram of a storage box set of an embodiment provided by the invention.

[0018] FIG. 2 an exploded schematic diagram of the storage box set of an embodiment provided by the invention.

[0019] FIG. 3 a three-dimensional schematic diagram of an angle of the first storage box provided by the invention.

[0020] FIG. 4 a three-dimensional schematic diagram of another angle of the first storage box provided by the invention.

[0021] FIG. 5 a three-dimensional schematic diagram of an angle of the second storage box provided by the invention.

[0022] FIG. 6 a three-dimensional schematic diagram of another angle of the second storage box provided by the invention.

[0023] FIG. 7 a three-dimensional schematic diagram of another angle of the second storage box provided by the invention.

[0024] FIG. 8 a cross-sectional view along the second direction of the first storage box and the second storage box provided by the invention when stacked.

[0025] FIG. 9 a three-dimensional schematic diagram of the first locking mechanism provided by the invention.

[0026] FIG. 10 an exploded schematic diagram of the first locking mechanism provided by the invention.

[0027] FIG. 11 a three-dimensional schematic diagram of the second locking mechanism of the first embodiment provided by the invention.

[0028] FIG. 12 an exploded schematic diagram of the second locking mechanism of the first embodiment provided by the invention.

[0029] FIG. 13 a three-dimensional schematic diagram of the second locking mechanism of the second embodiment provided by the invention.

[0030] FIG. 14 is an exploded schematic diagram of the second locking mechanism of the second embodiment provided by the invention.

[0031] FIG. 15 is a cross-sectional view along the third direction when the first storage box and the second storage box are interlocked when the second locking mechanism is the first embodiment.

[0032] FIG. 16 shows a cross-sectional view along the third direction when the second locking mechanism is the first storage box and the second storage box interlocked for the second embodiment.

[0033] FIG. 17 is a schematic diagram of the three-dimensional structure of the storage boxes in a second embodiment of a second locking mechanism in the locked state.

[0034] FIG. 18 is a cross-sectional view of FIG. 17.

[0035] FIG. 19 is a three-dimensional view of the storage boxes of FIG. 17 in the unlocked state.

[0036] FIG. 20 is a three-dimensional view of the storage boxes of FIG. 17 separated from each other.

[0037] FIG. 21 is a three-dimensional view of the top storage box of FIG. 17 viewed from the bottom.

[0038] FIG. 22 is a three-dimensional view of the bottom storage box of FIG. 17 viewed from the top.

[0039] FIG. 23 shows the three-dimensional view of the bottom storage box of FIG. 17 viewed from the top with the locking mechanism in an exploded state.

[0040] FIG. 24 is a schematic diagram of a third embodiment of a locking mechanism for storage boxes.

[0041] FIG. 25 is a schematic diagram of the third embodiment of the locking mechanism for storage boxes in a partially exploded view.

[0042] FIG. 26 is a bottom perspective view of the storage box of FIG. 24.

[0043] FIG. 27 is a schematic diagram of the structure of a first connection.

[0044] FIG. 28 is a schematic diagram of the exploded structure of FIG. 27 after further decomposition.

[0045] FIG. 29 is a schematic diagram of the exploded structure of FIG. 27 after even further decomposition.

[0046] FIG. 30 is a schematic diagram of a three-dimensional structure of a storage box according to a fourth embodiment illustrating a linkage buckle for the second locking mechanism of the half-box of FIGS. 5-7.

[0047] FIG. 31 is a schematic diagram of the bottom, front side of the storage box of FIG. 30.

[0048] FIG. 32 is a schematic diagram of the bottom, back side of the storage box of FIG. 30.

[0049] FIG. 33 is a schematic diagram of the locking buckle.

[0050] FIG. 34 is a schematic diagram of the locking transmission mechanism.

[0051] FIG. 35 is a schematic diagram of stacked storage boxes with the locking buckle.

[0052] FIG. 36 is a rear-side view of the stacked storage boxes of FIG. 35.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0053] Referring to FIGS. 1-16, in order to make the above purpose, features and advantages of the invention more obvious and easy to understand, the following detailed description of the specific implementation of this invention is made in conjunction with the accompanying drawings. In the following description, many specific details are set forth to facilitate a full understanding of the invention. However, the invention can be implemented in many other ways than those described herein, and a person skilled in the art can make similar improvements without violating the connotation of the invention, so the invention is not limited by the specific embodiments disclosed below.

[0054] It should be noted that when an element is said to be “fixed” to another element, it may be directly on the other element or there may also be a centered element. When an element is considered to be “attached” to another element, it may be directly attached to the other element or there may be both centered elements.

[0055] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those of skill in the art belonging to the invention. The terms used herein in the specification of the invention are for the purpose of describing specific embodiments only and are not intended to limit the invention. The term “and/or” as used herein includes any and all combinations of one or more of the relevant listed items.

[0056] An embodiment of the invention provides a main storage box **100**, a secondary storage box **300** making up a storage box set **10**. The structure of the storage box set **10** and the main storage box **100** and the secondary storage box **300** in the storage box set **10** in this application is described below as an example of a tool box, which can include at least two main storage boxes **100** of the same size and dimension, or can include main storage boxes **100** and secondary storage boxes **300** of different sizes and dimensions. The storage box set **10** can include at least two main storage boxes **100** of the same size, but also can include different sizes of the main storage box **100** and secondary storage box **300**, each storage box stacked together, adjacent to the upper and lower two layers of the storage box can achieve interlock for the convenience of users to carry and use.

[0057] The present embodiment is used as an example only and does not limit the technical scope of the present application. It is understood that in other embodiments, the structure of the main storage box **100** and the secondary storage box **300** can also be used for other storage boxes other than toolboxes, and will not be limited here.

[0058] In one embodiment, the storage box set **10**, as shown in FIGS. **1** and **2**, includes three main storage boxes **100** and two secondary storage boxes **300** stacked and locked together, with the main storage boxes **100** and secondary storage boxes **300** having different dimensions. Two adjacent main storage boxes **100** are stacked and locked together in the third direction, two secondary storage boxes **300** are placed side by side in the first direction and locked above the two adjacent main storage boxes **100**, and another main storage box **100** is stacked and locked above the two secondary storage boxes **300** placed side by side in the first direction. The two adjacent main storage boxes **100** are aligned and stacked with each other, and the long side of each secondary storage box **300** is aligned with the short side of one main storage box **100**, so that the storage box set **10** provided by the invention can have storage boxes of different sizes aligned and stacked with each other and locked together. The arrangement of the storage boxes **100** and secondary storage boxes **300** can take any form with one or the other on top of the other.

[0059] In some embodiments, as shown in FIGS. **3** and **4**, the main storage box **100** has a rectangular cube structure and includes a first box body **110**. The first box body **110** of the main storage box **100** has a first end face **111** and a second end face **112** that are relatively parallel along the third direction. The first end **111** forms a part of the lid into the interior of the first box body **111**. A first locking mechanism **120** and a second locking mechanism **130** can be provided on the first end face **111**. Two first locking mechanisms **120** can be provided at the middle of the first end face **111**, and two second locking mechanisms **130** can be provided at the edges of the two short sides of the first end face **111**, each of which is symmetrical and spaced along the first direction with the central axis of the first box **110** as the axis of symmetry.

[0060] In this way, one first locking mechanism **120** and one second locking mechanism **130** spaced relatively therebetween can form a first locking gap in the first direction, and the first locking gap can be used to lock the secondary storage box **300**, and one second locking mechanism **130** can form a second locking gap with another second locking mechanism **130** in the first direction, and the second locking gap can be used to lock the main storage box **100**.

[0061] In some embodiments, two spaced-apart second locking bits **140** are provided correspondingly on two opposing short edge edges of the second end face **112** of the main storage box **100**, each second locking bit **140** being provided opposite a second locking mechanism **130** in a third direction. In a preferred embodiment, the second locking bits **140** are provided at the second end face **112** of the main storage box **100**. In a preferred embodiment, as shown in FIGS. **3** and **5**, the second locking bits **140** are mounts having a holding cavity with an opening at one end of the holding cavity away from the first box body **110**.

[0062] With the storage box set **10** placed in the orientation shown in FIG. **1**, the long side of the main storage box **100** is oriented in the same direction as the first direction and the short side of the main storage box **100** is oriented in the same direction as the second direction. The X direction in the figure is the first direction, the Y direction is the second direction, the Z direction is the third direction, and the first direction, the second direction and the third direction are perpendicular to each other.

[0063] When one main storage box **100** and another main storage box **100** are stacked on top of each other, the first end face **111** of the main storage box **100** located below fits into the second end face **112** of the main storage box **100** located above, and each second locking mechanism **130** snaps into a second locking bit **140**, so that one of the main storage boxes **100** is confined to the other main storage box **100** in the second locking position to achieve interlocking between the two main storage boxes **100**.

[0064] In some embodiments, the main storage box **100** is further provided with a plurality of tabs

at the second end face **112**, the tabs of the main storage box **100** including four first tabs **150** provided at the four corner positions of the second end face **112**, a plurality of depressions at the first end face **111** of the main storage box **100**, the depressions including a first depression **113** and a second depression **114**, the first depression **113** having four, set at the four top corners of the first end face **111** at positions corresponding to the four first tabs **150**. The two second depressions **114** are provided symmetrically along the short side of the second end face **112** in the middle of the second end face **112** near the long side. When the two main storage boxes **100** are stacked up and down in the third direction, each of the first tabs **150** is confined in one of the first depressions **113** to further limit the relative movement of the two adjacent main storage boxes **100** in the first direction or the second direction when stacked on top of each other.

[0065] In some embodiments, as shown in FIGS. 5, 6 and 7, the secondary storage box **300** includes a second box **310** having a third end face **311** and a fourth end face **312** relatively parallel to the third end face **311**, and the dimensions of the length and width of the secondary storage box **300** are smaller than those of the main storage box **100**. The second locking mechanism **320** and the third locking mechanism **330** are provided on the edge of one long side of the third end face **311**, and a third locking gap is formed between the second locking mechanism **320** and the third locking mechanism **330**, and the third locking gap can be used to lock the other secondary storage box **300**. A first locking bit **340** and a second locking bit **350** are provided on each of the two long edges of the fourth end face **312**, with one first locking bit **340** and one second locking bit **350** provided opposite each other. The first locking bit **340** may be locked with the third locking mechanism **330** to achieve stacking interlocking between the two secondary storage boxes **300**. The first locking bit **340** may also be locked with the first locking mechanism **120** of the main storage box **100** to achieve stacking interlocking between the secondary storage box **300** and the main storage box **100**. The second locking bit **350** may be locked with the second locking mechanism **320** of the secondary storage box **300**, thereby also enabling stacking interlocking between two secondary storage boxes **300**; the second locking bit **350** may also be locked with the second locking mechanism **130** of the main storage box **100**, thereby also enabling stacking interlocking between the secondary storage box **300** and the main storage box **100**. With the storage box set **10** placed in the orientation shown in FIG. 1, the long side of the secondary storage box **300** is oriented in the same direction as the second orientation.

[0066] In some embodiments, as shown in FIG. 6, FIG. 9 and FIG. 15, the first locking bit **340** of the secondary storage box **300** is opened at one long edge of the fourth end face **312** of the secondary storage box **300**, with the first locking bit **340** preferably being a rib position located at one long edge of the fourth end face **312** of the secondary storage box **300**. In a preferred embodiment, as shown in FIG. 5, the second locking bit **350** of the secondary storage box **300** is also a mount having a holding cavity with an opening at one end of the holding cavity away from the second box **310**.

[0067] When a secondary storage box **300** is stacked above a main storage box **100**, a first end face **111** of the main storage box **100** at the bottom fits over a fourth end face **312** of the secondary storage box **300** at the top, and a first locking mechanism **120** of the main storage box **100** snaps into a first locking bit **340** of the secondary storage box **300**, and a second locking mechanism **130** of the main storage box **100** snaps into a second locking bit **350** of a secondary storage box **300** so that a secondary storage box **300** is confined to a first locking bit **340** of the main storage box **100** to achieve interlocking between a main storage box **100** and a secondary storage box **300**.

[0068] When two secondary storage boxes **300** are stacked on top of one main storage box **100**, two first locking mechanisms **120** of the main storage box **100** snap into the respective first locking bits **340** of the two secondary storage boxes **300**, and two second locking mechanisms **130** of the main storage box **100** snap into the respective second locking bits **350** of the two secondary storage

boxes **300**, so that the two secondary storage boxes **300** are respectively confined in the two first locking gaps of one main storage box **100** to achieve interlocking of the two secondary storage boxes **300** located above and one main storage box **100** located below.

[0069] When one main storage box **100** is stacked above two secondary storage boxes **300**, the second end face **112** of the main storage box **100** located above fits into the third end face **311** of the secondary storage box **300** located below, and the respective second locking mechanism **320** of the two secondary storage boxes **300** can form a fourth locking gap along the first direction, and the second locking mechanism **320** of the two secondary storage boxes **300** snap into the two second locking bits **140** of the main storage box **100** above, respectively, so that one main storage box **100** located above the two secondary storage boxes **300** is confined in the fourth locking gap to achieve interlocking of one main storage box located above with the two secondary storage boxes **300** located below.

[0070] In some embodiments, as shown in FIGS. 7 and 8, the secondary storage box **300** is also provided with a plurality of tabs at the fourth end face **312**, and the tabs of the secondary storage box **300** include four third tabs **360** and two fourth tabs **370**, the four third tabs **360** being provided at the positions of the four corners of the fourth end face **312**, and the two fourth tabs **370** being provided symmetrically along the short side direction of the fourth end face **312** at the A plurality of depressions are provided in the third end face **311** of the sub-storage box **300**, and the depressions include a third depression **313**, and the third depression **313** has four, which are provided at the positions of the four corners of the third end face **311**, corresponding to the four third tabs **360**.

[0071] When a secondary storage box **300** is stacked on top of a main storage box **100**, the two third tabs **360** of the secondary storage box **300** are confined in the two first depressions **113** of the main storage box **100** to limit relative movement of the main storage box **100** and the secondary storage box **300** in the second direction or the third direction when stacked on top of each other. The two fourth tabs **370** of the secondary storage box **300** are confined in the two second depressions **114** of the main storage box **100**, wherein one side of each of the fourth tabs **370** fits against a side wall of one of the second depressions **114** to further limit relative movement of the main storage box **100** and the secondary storage box **300** in the third direction when stacked on top of each other.

[0072] When a main storage box **100** is stacked above two secondary storage boxes **300**, two of the four first tabs **150** of the main storage box **100** located above are limited to two third depressions **313** of one of the secondary storage boxes **300** located below, and the other two first tabs **150** are limited to two third depressions **313** of the other secondary storage box **300** located below to achieve the purpose of limiting the relative movement of the main storage box **100** and the secondary storage box **300** in the second or third direction when stacked with each other. The number and shape of the tabs and corresponding depressions of the main storage box **100** or the secondary storage box **300** are not limited, but can be round, square, polygonal, or elongated, as long as they can limit the relative displacement along the second direction and the third direction between the two stacked storage boxes.

[0073] It should be noted that the first locking mechanism **120** and the second locking mechanism **130** of the main storage box **100**, and the third locking mechanism **330** of the second locking mechanism **320** of the secondary storage box **300** can be unlimited in number, and some more numbers of the first locking mechanism **120** and the second locking mechanism **130** can be provided at the first end face **111** of the main storage box **100**, and thus more numbers of secondary storage boxes **300** can be realized and a main storage box **100** stacking and locking fit.

[0074] The stacking of the storage boxes is not limited to the stacking and locking of the secondary storage boxes **300** at the top of the main storage box **100**, but also to the stacking and locking of multiple secondary storage boxes **300** in the middle of the two main storage boxes **100**.

[0075] In some embodiments, shown in conjunction with FIGS. 2, 3, and 5, the first locking

mechanism **120** and the second locking mechanism **130** of the main storage box **100** are both retractable structures, and the first locking mechanism **120** of the main storage box **100** or the second locking mechanism **130** of the main storage box **100** are capable of moving relative to the first box body **110** to form a first locking gap on the first end face **111** of the first box body **110** in the first or a second locking gap in the first direction on the first end face **111** of the first box body **110** so that the secondary storage box **300** can be confined in the first locking gap of the main storage box **100** to achieve interlocking of the main storage box **100** and the secondary storage box **300**, or so that one main storage box **100** is confined in the second locking gap of the other main storage box **100**. The interlocking between the two main storage boxes **100** is achieved.

[0076] Specifically, in a preferred embodiment, as shown in FIGS. **9** and **10**, the first locking mechanism **120** includes a first connecting shaft **121** and a first snap hook **122** provided on the first box body **110**, and a first recess **115** is provided at the location where the first locking mechanism **120** is installed on the first end face **111** of the main storage box **100**. The first connection shaft **121** is preferably two, and one end of the two first connection shafts **121** is fixed to two opposite side walls of the first recess **115** in the second direction, and the two first connection shafts **121** are coaxially provided, and the end of the first snap hook **122** near the first recess **115** is provided with two mounting brackets for mounting the first connection shaft **121**. The first snap hook **122** is provided with two mounting holes **1221** near the first recess **115** for mounting the first connection shaft **121**, and each mounting hole **1221** is provided with one first connection shaft **121**, so that the first snap hook **122** can rotate around the central axis of the two first connection shafts **121** to realize the turning of the first locking mechanism **120**.

[0077] When the first locking mechanism **120** of the main storage box **100** snaps into the first locking bit **340** of the secondary storage box **300**, the first snap hook **122** rotates relative to the first connection shaft **121** so that the end of the first snap hook away from the first connection shaft **121** protrudes from the first recess **115**, while the bent portion of the first snap hook **122** hooks and holds against the outer wall of the ribbed position and cooperates with the second locking mechanism **130** to form the first locking gap thereby limiting the displacement of the main storage box **100** and the secondary storage box **300** in the first direction and the second direction. When it is not necessary to interlock the main storage box **100** and the secondary storage box **300**, the first snap hook **122** is rotated in the opposite direction with respect to the first connection shaft **121** so that the first snap hook **122** is completely accommodated in the first recess **115**, thereby keeping the first end face **111** of the main storage box **100** flat.

[0078] It is to be noted that the movable way of the first locking mechanism **120** relative to the second box **310** is not limited to a rotatable movable way, but may also be a retractable movable way. One end of the first snap hook **122** is movably mounted and housed in the first recess **115**, and when the locking between the storage boxes is required, the end of the first snap hook **122** mounted in the first recess **115** moves in the first direction toward the secondary storage box **300** so that the other end extends out of the first recess **115** and snaps into the first locking bit **340**, thereby forming a fit between the first snap hook **122** and the second locking mechanism **130** to form a first locking gap in the first direction on the first end face **111** of the main storage box **100**. When it is not necessary to interlock the main storage box **100** with the secondary storage box **300**, the first snap hook **122** is moved in the first direction toward the first box body **110** of the main storage box **100** so that the first snap hook **122** is fully accommodated in the first recess **115**.

[0079] As shown in FIG. **11**, FIG. **12** and FIG. **15**, the structure of the second locking mechanism **130** is described with the second locking mechanism **130** installed in the main storage box **100** as an example. A first embodiment of the second locking mechanism **130** is shown in the figure, and the second locking mechanism **130** includes a second attachment shaft **131** and a second snap hook **132**, and a second recess **116** is provided at the location where the second locking mechanism **130** is installed on the first end face **111** of the main storage box **100**, and the second recess **116** is provided at the edge of the first end face **111**, and the second recess **116** is open along the first

direction and the second The second recess **116** is opened at the edge of the first end face **111** and the second recess **116** is open at one end in the first and second directions. The two ends of the second attachment shaft **131** are fixed to two opposite side walls of the second recess **116** along the third direction perpendicular to each other, and the second snap hook **132** is provided on the second attachment shaft **131** so that the second snap hook **132** can rotate around the central axis of the second attachment shaft **131**.

[0080] As shown in conjunction with FIG. 1, FIG. 15 and FIG. 16, when the second locking mechanism **130** of the main storage box **100** snaps into the second locking bit **140** of the secondary storage box **300**, or when the second locking mechanism **130** of one main storage box **100** snaps into the second locking position **140** of the other main storage box **100**, the second snap hook **132** is rotated relative to the second attachment shaft **131** to be fully accommodated in the second recess **116** so that the second locking mechanism **130** can cooperate with the first locking mechanism **120** so as to form a first locking gap in the first direction on the first end face **111** of the main storage box **100**, or so that the two second locking mechanisms **130** of the main storage box **100** can cooperate so as to form a second locking gap in the first direction on the first end face **111** of the main storage box **100**, when the side of the first box body **110** remains flat while the bent portion of the second snap hook **132** hooks the bottom cavity wall of the holding cavity of the mount in the second locking bit **140** and holds against the side cavity wall of the holding cavity of the mount to limit the mutual displacement between the main storage box **100** and the secondary storage box **300** or between the two main storage boxes **100** in the second direction and the third direction.

[0081] When it is not necessary to interlock the main storage box **100** and the secondary storage box **300** or when it is not necessary to lock the two main storage boxes **100** to each other, the second snap hook **132** is rotated in the opposite direction relative to the second attachment shaft **131** so that the end of the second snap hook **132** away from the second attachment shaft **131** extends out of the second recess **116**.

[0082] As shown in FIG. 13, FIG. 14 and FIG. 16, again taking the second locking mechanism **130** installed in the main storage box **100** as an example, a second embodiment of the second locking mechanism **130** is shown, and unlike the first embodiment of the second locking mechanism **130**, the second locking mechanism **130** is movable in a retractable movable manner relative to the first box body **110**. Specifically, the second locking mechanism **130** includes two rails **133**, the rails **133** are fixed to the bottom wall of the second recess **116** in the second direction, and the bottom of the second snap hook **132** is provided with two travel slots (not shown) matching the rails **133**, each travel slot is set on one rail **133** to enable the second snap hook **132** to move in the second direction. When the second locking mechanism **130** of the main storage box **100** snaps into the second locking bit **140** of the secondary storage box **300**, or when the second locking mechanism **130** of one main storage box **100** locks the second locking bit **140** of the other main storage box **100**, the second snap hook **132** moves along the rail **133** to fully accommodate the second recess **116**, so that the first box body **110** of the main storage box **100** is sides of the first box body **110** of the main storage box **100** are kept flat while the bent portion of the second snap hook **132** is held against the side and bottom cavity walls of the holding cavity of the mount to limit mutual displacement between the main storage box **100** and the secondary storage box **300** or between the two main storage boxes **100** in the second and third directions. When it is not necessary to interlock the main storage box **100** and the secondary storage box **300** or when it is not necessary to lock the two main storage boxes **100** to each other, the second snap hook **132** is moved in the opposite direction along the rail **133** so that one end of the second snap hook **132** extends out of the second recess **116**.

[0083] The second locking mechanism **320** of the secondary storage box **300** is identical in structure to the second locking mechanism **130** of the main storage box **100**. In this embodiment, the second locking mechanism **320** of the secondary storage box **300** is structured in a retractable implementation, with locking achieved by retraction of the snap hooks. The structure of the third

locking mechanism **330** of the secondary storage box **300** is similar to the rotatable implementation of the second locking mechanism **320** in the main storage box **100**, which is also locked by means of a snap hook flip, and will not be repeated here.

[0084] The above storage box set **10**, by using the first locking mechanism **120**, the second locking mechanism **130**, the second locking bit **140**, the plurality of tabs and the plurality of corresponding depressions of the main storage box **100** and the second locking mechanism **320**, the third locking mechanism **330**, the first locking bit **340**, the second locking bit **350**, the plurality of tabs and the plurality of corresponding depressions of the secondary storage box **300** in conjunction, is able to simultaneously restrict the relative displacement between two stacked boxes in the first direction, the second direction and the third direction, so as to achieve the purpose of interlocking.

[0085] When the user needs to use a single storage box, the interlocked storage boxes in the storage box set **10** need to be unlocked. When unlocking two main boxes **100** of the same size, it is necessary to first unlock the second locking mechanism **130** of one main storage box **100**, pull out the second snap hook **132** relative to the first box body **110** of the main storage box **100** to protrude from the side of the first box body **110**, so that the second snap hook **132** is free from the second locking bit **140**, and then unlock the other second locking mechanism **130** so that the second snap hook **132** of the other second The second snap hook **132** of the other second locking mechanism **130** is released from its corresponding second locking bit **140**, thereby unlocking the two main storage boxes **100** of the same size. When unlocking two main storage boxes **100** and secondary storage boxes **300** of different sizes, taking the secondary storage boxes **300** stacked on top of the main storage boxes **100** as an example, the second locking mechanism **130** of one first storage box **100** is unlocked first, and then the first locking mechanism **120** is unlocked so that the first snap hook **122** of the first locking mechanism **120** is detached from the first locking bit **340** of the corresponding secondary storage box **300**, thus realizing the unlocking of two main storage boxes **100** of the same size. The first locking mechanism **120** is then unlocked so that the first snap hook **122** of the first locking mechanism **120** is disengaged from the first locking bit **340** of the corresponding secondary storage box **300**, thus realizing the unlocking of two different sizes of the main storage box **100** and the secondary storage box **300**. When unlocking two secondary storage boxes **300** of the same size, the second locking mechanism **320** of one secondary storage box **300** is first unlocked, so that the second locking mechanism **320** is released from its corresponding second locking bit **350**, and then the third locking mechanism **330** of one secondary storage box **300** is unlocked, so that the third locking mechanism **330** is released from its corresponding first locking bit **340**, thus realizing the unlocking of two secondary storage boxes **300** of the same size. The third locking mechanism **330** is released from its corresponding first locking bit **340**, so as to unlock two sub-storage boxes **300** of the same size.

Second Embodiment of Second Locking Mechanism

[0086] As shown in FIGS. **17-23**, different from the above embodiment **1**: the storage box **20a** in this embodiment (which can be the main storage box and the secondary storage box in the above embodiment **1**) also includes a stop part **3a**; the second locking mechanism **1a** and the second locking position **2a** can be automatically locked with each other, and the stop part **3** can make the second locking mechanism **1a** and the second locking position **2a** not automatically locked after unlocking, so that the second locking The second locking mechanism **1a** and the second locking position **2a** are kept in the unlocked state, so that the second locking mechanism **1a** and the second locking position **2a** can be unlocked and separated from each other, freeing the user's hands and facilitating the user's use.

[0087] Specifically, the second locking mechanism **1a** in this embodiment is provided on the lid (i.e., the first end **201a**) of the storage box **20a**, which includes a mounting part **11a**, a locking part **12a** movable relative to the mounting part **11a** and a first elastic member **13a** located between the mounting part **11a** and the locking part **12a**, and the locking part **12a** can be automatically kept in the locked state by the action of the first elastic member **13a**. In addition, in order to facilitate the

positioning of the second locking mechanism **1a** when interlocking with the second locking bit **2a**, a positioning slot **41a** may be provided in the box lid, and the positioning slot **41a** may accommodate exactly the bottom of the box (i.e., the second end face **202a**), and the second locking mechanism **1a** may be provided at the edge of the positioning slot **41a**. In other embodiments, the positioning slot **41a** can be positioned with the projections provided on the bottom of the box for the upper and lower storage boxes **20a** when stacked.

[0088] Further, as shown in FIG. 23, in this embodiment, the mounting portion **11a** is fixedly connected to the box lid. The mounting portion **11a** includes a mounting slot **111a** provided in the lid and a mounting body **112a** located in the mounting slot **111a**, which can be bolted in the mounting slot **111a**. In other embodiments, the mounting body **112a** may also be integrally formed with the mounting slot **111**, or may be fixedly connected by means such as snap-on.

[0089] Further, as shown in FIG. 23, in this embodiment, the locking portion **12a** may be housed within the mounting body **112a**, which may be movable relative to the mounting body **112a**. The locking portion **12a** is a sliding latch that moves horizontally relative to the mounting portion **11a**, thereby allowing the locking portion **12a** to move horizontally within the mounting slot **111a**. In other embodiments, the locking portion **12a** may also be a flip latch that flips to move relative to the mounting portion **11a**, or a rotary latch that rotates to move relative to the mounting portion **11a**. The locking portion **12a** includes a locking body **121a** that can be accommodated in the mounting body **112a** and a locking buckle **122a** located on the side of the locking body **121a** near the center of the storage box **20a**; when the locking buckle **122a** extends out of the mounting portion **11a** (i.e., the locking buckle **122a** extends into the positioning slot **41a**), the second locking mechanism **1a** and the second locking bit **2a** can be interlocked, and when the locking buckle **122a** does not extend out of the mounting portion **11a** (i.e., the locking buckle **122a** does not extend into the positioning slot **41a**), the second locking mechanism **1a** and the second locking position **2a** can be interlocked when the locking buckle **122a** does not extend out of the mounting portion **11a** (i.e., the locking buckle **122a** does not extend into the positioning slot **41a**). Also, to facilitate locking between the locking buckle **122a** and the second locking bit **2a**, the locking buckle **122a** is provided with a bevel **122aa**.

[0090] Further, as shown in FIG. 23, in this embodiment, the first elastic member **13a** is located between the locking body **121a** and the mounting body **112a**, so that the locking portion **12a** is automatically kept in the locked state by the action of the first elastic member **13a**. At the same time, in order to improve the reliability of the movement of the locking part **12a**, the first elastic member **13a** can be provided with two, respectively located at the two ends of the locking body **121a**. The first resilient member **13a** is a compression spring, which causes the locking part **12a** to move horizontally; in other embodiments, the first resilient member **13a** may also be a torsion spring, which causes the locking part **12a** to flip and move.

[0091] Further, as shown in FIG. 21, in this embodiment, the second locking position **2a** is provided at the bottom of the box of the storage box **20a**, which includes the mating part **21a** that can be interlocked with the locking part **12a** and the recessed part **22a** that can be interlocked with the stopping part **3**, and the locking part **12a** of one storage box **20a** can be automatically locked with the mating part **21a** of another storage box **20a** under the action of the first elastic member **13a**. The first elastic member **13a** is automatically locked. In addition, in order to facilitate the interlocking of the mating part **21a** and the locking buckle **122a**, a projection **42a** (here the projection **42a** is the bottom of the box) may be provided on the bottom of the box, and the projection **42a** may fit just inside the positioning slot **41a**. When the second locking mechanism **1a** is in a locked state with the second locking bit **2a**, the locking buckle **122a** interferes with the mating part **21a**; when the second locking mechanism **1a** is in a holding unlocked state with the second locking bit **2a**, the locking buckle **122a** does not interfere with the mating part **21a**, and the stopping part **3a** snaps with the recessed part **22a**. In other embodiments, when the second locking mechanism **1a** is in a holding unlocked state with the second locking position **2a**, the stop portion **3a** can be directly held with the mating portion **21a**. In addition, the mating part **21a** is a number of

slots **211a**, and the number of slots **211a** can be set corresponding to the number of locking buckles **122a**.

[0092] Further, as shown in FIG. **22** and FIG. **23**, in this embodiment, the stop portion **3a** is provided on the locking portion **12a**, which can move horizontally with the locking portion **12a**, and when the locking portion **12a** is in the unlocked state, the stop portion **3a** can snap with the second locking bit **2a** in the locking path of the locking portion **12a**, and the locking portion **12a** cannot be automatically locked, so that the second locking mechanism **1a** and the second locking bit **2a** are in the remain unlocked. The stopping portion **3a** includes a holding slot **31a** opened on the locking portion **12a**, a card block **32a** that can be accommodated in the slot **31a** and a second elastic member **33a** disposed between the holding slot **31a** and the card block **32a**, and the card block **32a** is retracted relative to the holding slot **31a** under the action of the second elastic member **33a**. Specifically, as shown in FIG. **19**, when the second locking mechanism **1a** and the second locking bit **2a** are in a holding unlocked state, the second elastic member **33a** extends and the card block **32a** extends into the holding slot **31a**; as shown in FIG. **17** and FIG. **18**, when the second locking mechanism **1a** and the second locking bit **2a** are in a locked state, the second elastic member **33a** compresses and the card block **32a** is squeezed and compressed by the second locking bit **2a** in the holding slot **31a**.

Third Embodiment

[0093] As shown in FIGS. **24-29**, different from the above embodiment 1: the storage box **20b** in this embodiment (which can be the main storage box and the secondary storage box in the above embodiment 1) also includes a stop portion **3b**; the second locking mechanism **1b** and the second locking bit **2b** can be automatically locked with each other, and the stop portion **3b** can make the second locking mechanism **1b** and the second locking bit **2b** unable to be automatically locked after unlocking, so that the second The second locking mechanism **1b** and the second locking position **2b** are kept in the unlocked state, so that the second locking mechanism **1b** and the second locking position **2b** can be unlocked and separated from each other, freeing the user's hands and facilitating the user's use.

[0094] Specifically, in this embodiment, the second locking mechanism **1b** is provided on the lid (i.e., the first end **201b**) of the storage box **20b**, which includes a mounting part **11b**, a locking part **12b** movable relative to the mounting part **11b** and a first elastic member **13b** located between the mounting part **11b** and the locking part **12b**, and the locking part **12b** can be automatically kept in the locked state under the action of the first elastic member **13b**. In addition, as shown in FIGS. **18** and **19**, to facilitate positioning of the second locking mechanism **1b** when interlocked with the second locking bit **2b**, a positioning slot **41b** may be provided in the lid, which may be positioned with the projection **42b** provided on the bottom of the box (i.e., the second end face **202b**) for positioning of the upper and lower storage boxes **20b** when stacked. In other embodiments, the positioning slot **41b** may precisely accommodate the bottom of the box, and the second locking mechanism **1b** may be provided at the edge of the positioning slot **41b**.

[0095] Further, as shown in FIG. **25**, in this embodiment, the mounting portion **11b** is fixedly connected to the box lid. The mounting section **11b** includes a mounting slot **111b** in the lid and a mounting body **112b** located in the mounting slot **111b**, which can be bolted in the mounting slot **111b**. In other embodiments, the mounting body **112b** may also be integrally formed with the mounting slot **111b**, or may be fixedly connected by means such as snap-on.

[0096] Further, as shown in FIGS. **27** to **29**, in this embodiment, the locking portion **12b** may be housed within the mounting body **112b**, which may be movable relative to the mounting body **112b**. The locking portion **12b** is a flip latch that flips and moves relative to the mounting portion **11b**, thereby allowing the locking portion **12b** to flip and move within the mounting slot **111b**. In other embodiments, the locking portion **12b** may also be a sliding latch that moves horizontally relative to the mounting portion **11b**, or a rotating latch that moves rotationally relative to the mounting portion **11b**. The locking part **12b** includes a locking body **121b** rotatable around a

rotating shaft (not marked) at one end and a locking clasp **122b** located at the other end of the locking body **121b** near the center of the storage box **20b**; when the locking clasp **122b** is extended into the second locking position **2b**, the second locking mechanism **1b** and the second locking position **2b** can be interlocked, and when the locking clasp **122b** is not extended into the second locking position **2b**, the second locking mechanism **1b** and the second locking position **2b** can be interlocked when the locking buckle **122b** is not extended into the second locking position **2b**. Also, to facilitate locking between the locking buckle **122b** and the second locking position **2b**, the locking buckle **122b** is provided with a bevel **122ab**.

[0097] Further, as shown in FIG. **28** and FIG. **29**, in this embodiment, the first resilient member **13b** is provided on the rotating shaft, and its two ends are respectively abutted to the locking body **121b** and the mounting body **112b**, so that the locking part **12b** is automatically kept in the locked state under the action of the first resilient member **13b**. Meanwhile, in order to improve the reliability of the movement of the locking part **12b**, the first elastic member **13b** can be provided at both ends of the rotating shaft. The first resilient member **13b** is a torsion spring, which causes the locking part **12b** to move over; in other embodiments, the first resilient member **13b** may also be a compression spring, which causes the locking part **12b** to move horizontally.

[0098] Further, as shown in FIGS. **24** to **26**, in this embodiment, the second locking bit **2b** is provided at the bottom of the box of the storage box **20b**, which includes a mating part **21b** that is interlockable with the locking part **12b**, and pressing down on the locking part **12b** of one module can make it automatically lock with the mating part **21b** of the other module under the action of the first elastic member **13b**. When the second locking mechanism **1b** and the second locking bit **2b** are in a locked state, the locking buckle **122b** interferes with the mating part **21b**; when the second locking mechanism **1b** and the second locking bit **2b** are in an unlocked state, the locking buckle **122b** does not interfere with the mating part **21b**. The mating part **21b** is a number of slots **211b**, and the number of slots **211b** may be set corresponding to the number of locking buckles **122b**.

[0099] Further, as shown in FIGS. **27** to **29**, in this embodiment, the stop portion **3b** includes a block **31b** and a protrusion **32b** that can be interlocked with the block **31b**, and when the block **31b** and the protrusion **32b** are interlocked, the locking portion **12b** cannot be automatically locked. Specifically, when the second locking mechanism **1b** and the second locking bit **2b** are in a holding unlocked state, the card block **31b** and the convex rib **32b** are stuck on the side of the convex rib **32b** away from the center of the storage box **20b**; when the second locking mechanism **1b** and the second locking bit **2b** are in a locked state, the card block **31b** is located on the other side of the convex rib **32b** near the center of the storage box.

[0100] Further, as shown in FIG. **28** and FIG. **29**, in this embodiment, the card **31b** is set on the locking part **12b** of the second locking mechanism **1b** and can move with the locking part **12b**, and the convex rib **32b** remains stationary compared with the card **31b**, and the locking part **12b** can drive the card **31b** over the convex rib **32b**. Specifically, the card **31b** is set at both ends of the locking part **12b**, and the card **31b** can be overturned to move between the two sides of the convex ribs **32b**, so as to realize the second locking mechanism **1b** and the second locking position **2b** to switch between the locked state, the unlocked state and the keep unlocked state.

[0101] Further, as shown in FIG. **29**, in this embodiment, the convex rib **32b** is also provided on the second locking mechanism **1b** and remains relatively stationary compared to the card **31b**, which includes a first holding slot **321b** opened on the convex rib body **325b**, a bump **322b** that can be accommodated in the first holding slot **321b** and a second resilient member located between the bump **322b** and the first holding slot **321b**, the bump **322b** being retractable relative to the first holding slot **321b** under the action of the second resilient member **323b**, so that after the card block **31b** crosses the bump **322b** the card block **31b** can again snap with the bump **322b** against each other, thereby keeping the second locking mechanism **1b** in an unlocked state with the second locking position **2b**. The protrusions **32b** may be retractable relative to the card block **31b**, for

example, the protrusions **32b** may be provided to be resilient to facilitate the card block **31b** to be held after crossing the protrusions **32b**. In other embodiments, the card block **31b** may also be resilient, and the card block **31b** may be provided with a resilient structure similar to the convex rib **32b** (i.e., the second resilient member **323b** is provided with the first holding slot **321b**); or both the card block **31b** and the convex rib **32b** may be resilient; the convex rib **322b** may be resilient without the second resilient member **323b**, and the convex rib **322b** may itself be a resilient material or be provided with a resilient structure. The cam **322b** may be a resilient material itself or may be provided as a suspended structure. In other embodiments, the locking part **12b** is a sliding latch, the block **31b** is set on the locking part **12b** of the second locking mechanism **1b** and can move with the locking part **12b**, and the protrusion **32b** is set on the second locking bit **2b** and remains stationary with respect to the block **31b**.

[0102] Further, as shown in FIG. 29, in this embodiment, the cam **32b** further includes a second holding slot **324b** opened on the second locking mechanism **1b**, a cam body **325b** that can be accommodated in the second holding slot **324b** and a third elastic member **326b** located between the cam body **325b** and the second holding slot **324b**, and the cam body **325b** can, under the action of the third elastic member **326b**. The third elastic member **326b** can be stretched relative to the second holding slot **324b** by the action of the third elastic member **326b**. When the third elastic member **326b** is extended, the projection **322b** is located above the card block **31b**, and the projection **322b** may not be held with the card block **31b**; when the third elastic member **326b** is compressed, the projection **322b** is located at the same level as the card block **31b** (or the projection **322b** is located on the flip movement trajectory of the card block **31b**), at which time the projection **322b** may be held with the card block **31b**, and the flip locking portion **12b** can make the card block **31b** stuck on the side of the convex rib **32b** away from the center of the storage box **20b** (i.e., remain in the unlocked state). Such a setting prevents misuse by the user while the two storage bins **20b** are not yet stacked, i.e., it does not have a hold unlock function while the two storage bins **20b** are not yet stacked. In other embodiments, the card block **31b** may also be resilient by setting the card block **31b** to a resilient structure similar to that of the convex ribbed body **325b** (i.e., by setting the third resilient member **326b** with the second holding slot **324b**).

Fourth Embodiment

[0103] As shown in FIGS. 30-36, different from the above embodiment 1: the second locking mechanism **1c** of the storage box **20c** (which can be the secondary storage box in the above embodiment 1) in this embodiment is set on the third end face **201c**, which includes the first locking buckle **11c** and the second locking buckle **12c** which is connected to the first locking buckle **11c** by transmission, and the second locking buckle **12c** can drive the first locking buckle **11c** to move, thus The second locking buckle **12c** can drive the first locking buckle **11c** to move, so that the second locking buckle **12c** and the first locking buckle **11c** are simultaneously locked and unlocked with the second locking position **2c**, thus enabling the interlocking function between two adjacent storage boxes **20c**, which is convenient and fast.

[0104] The first locking buckle **11c** has a first limiting member **111c** protruding in the direction away from the second locking buckle **12c**, and the first locking buckle **11c** is provided in correspondence with the first snap hook **21c** on the second locking position **2c** set on the fourth end face **202c**, and the first snap hook **21c** can form the first slot **211c**, so that the first limiting member **111c** can extend into the first slot **211c**. Specifically, when two storage bins **20c** are stacked and provided, the first limiting member **111c** of one of the storage bins **20c** is embedded in the first slot **211c** of the other storage bin **20c**, thereby limiting the vertical displacement between the two storage bins **20c**, thereby achieving interlocking between the two storage bins **20c**. In other embodiments, the locking of the first limiting member **111c** with the first slot **211c** may also limit both vertical and horizontal displacements between the two lockers **20c**. In this embodiment, the first slot **211c** is formed on the first snap hook **21c**, but the structure forming the first slot **211c** is not limited thereto. The first limiting member **111c** is provided with a first guiding ramp **112c** and

the first snap hook **21c** is provided with a second guiding ramp **212c**, thereby facilitating the first limiting member **111c** to slide into the first slot **211c**. In this embodiment, the number of first locking clasps **11c** corresponds to the number of second locking clasps **12c**; in other embodiments, multiple first locking clasps **11c** may also be provided.

[0105] The second locking buckle **12c** is a horizontal sliding buckle, and drive the first locking buckle **11c** for horizontal movement; specifically, a second locking buckle **12c** can drive at least one first locking buckle **11c** and the second locking bit **2c** lock and unlock each other, so as to easily and quickly achieve the interlocking function between the two storage boxes **20c**, convenient for stacking and rapid separation between multiple storage boxes **20c**. In this embodiment, the number of first locking buckle **11c** corresponds to the number of second locking buckle **12c**; in other embodiments, a second locking buckle **12c** can also be set to drive a plurality of first locking buckle **11c** to move at the same time; when a second locking buckle **12c** drives a plurality of first locking buckle **11c** to move, because a plurality of first locking buckle **11c** makes horizontal movement, therefore, a plurality of first locking buckle **11c** is not limited to be set at the edge position of the storage box **20c**, it can be set at the middle position of the storage box **20c**, so that the locking between the storage box **20c** is more solid and reliable. In other embodiments, the second locking buckle **12c** is a flip buckle and drives the first locking buckle **11c** for horizontal movement; or the first locking buckle **11c** is also a flip buckle, and the second locking buckle **12c** drives the first locking buckle **11** for flip movement.

[0106] The second locking buckle **12c** includes a drive part **121c**, a second limiting member **122c** connected to the drive part **121c** and a resilient member **123c**. The second locking buckle **12c** has a first position interlocked with the second locking position **2c** and a second position interlocked with the second locking position **2c**; when the second locking buckle **12c** is in the first position, the second locking buckle **12c** drives the first locking buckle **11c** to interlock with the second locking position **2c**. the second locking buckle **12c** drives the first locking buckle **11c** to interlock with the second locking position **2c** when the second locking buckle **12c** is in the second position and the second locking buckle **12c** drives the first locking buckle **11c** to interlock with the second locking position **2c** when the second locking buckle **12c** is in the second position.

[0107] The drive member **121c** is a rigid or soft material, which may be provided in an elongated structure and extend along the length of the bottom. In other embodiments, drive member **121c** may also be a rigid or soft, thickly shaped, curved structure. The drive member **121c** is disposed between the first locking clasp **11c** and the second locking clasp **12c** such that the second locking clasp **12c** can control the movement of the first locking clasp **11c** via the drive member **121c**.

Further, the transmission member **121c** is provided with a connecting part **121ac**, and the diameter of the connecting part **121ac** is larger than the diameter of the transmission member **121c**, so that one end of the resilient member **123c** is held against the connecting part **121ac**. In this embodiment, the number of transmission members **121c** is two and side by side, and the first locking buckle **11c** is fixed on the connecting part **121ac** of the two transmission members **121c**, so as to enhance the stability of the first locking buckle **11c** sliding. In other embodiments, multiple transmission members **121c** may be provided; the transmission structure **121c** may also be a gear transmission structure, a belt transmission structure, etc.

[0108] The second limiting member **122c** is a rod-like structure, which can be interlocked with the second locking position **2c**; specifically, the second limiting member **122c** is located at one end of the two transmission members **121c**, and the second limiting member **122c** is connected between the two transmission members **121c**, which is provided in correspondence with the second snap hook **22c** on the second locking position **2c**, and the second snap hook **22c** can form the second slot **221c**, so that the second limiting member **122c** can extend into the second slot **221c**. Specifically, when two storage bins **20c** are stacked, the second limiting member **122c** of one of the storage bins **20c** is embedded in the second slot **221c** of the other storage bin **20c**, thereby further limiting the vertical displacement between the two storage bins **20c**, and the two storage bins **20c** have two

fixing points between the front and rear, for better fixing effect. In other embodiments, the locking of the second limiting member **122c** with the second slot **221c** may also limit both vertical and horizontal displacement between the two storage bins **20c**. In this embodiment, the second slot **221c** is formed on the second snap hook **22c**, but the structure forming the second slot **221c** is not limited to this. The second snap hook **22c** is provided with a third guide ramp **222c**, thereby facilitating the second limiting member **122c** to slide into the second slot **221c**.

[0109] One end of the resilient member **123c** abuts against the second locking mechanism **1c** and the other end abuts against the storage box **20c**. In this embodiment, one end of the resilient member **123c** abuts against the attachment portion **121ac** on the drive member **121c** and the other end abuts against the storage box **20c**. In other embodiments, one end of the resilient member **123c** may also be abutted against the first locking clasp **11c**. Specifically, the resilient member **123c** can make the drive member **121c** of the second locking buckle **12c** automatically located in the first position to keep the first locking buckle **11c** automatically in the locked state, the drive member **121c** moved to the second position by external force, the drive member **121c** drive the first locking buckle **11c** into the unlocked state. The resilient member **123c**, such as a spring, the resilient member **123c** is set on the transmission member **121c** and one end is connected to the connection **121ac**, and the other end of the resilient member **123c** is connected to the storage box **20c**, and the second locking buckle **12c** is automatically fixed in the first position by the elastic force of the resilient member **123c**, so as to realize the automatic locking of the first locking buckle **11c** and the second locking buckle **12c**.

[0110] Further, the second locking buckle **12c** also includes a tie bar **214c** that can be connected to a plurality of transmission members **121c**, in this embodiment, the tie bar **214c** is provided at one end of the two transmission members **121c** away from the connecting part **121ac** and connected to the two transmission members **121c**. The lever **214c** is used to allow the user to pull the drive members **121c** to unlock the first locking buckle **11c**. In other embodiments, a plurality of pull rods **214c** may be provided.

[0111] Further, the second locking buckle **12c** also includes a connecting rod **215c** that can connect a plurality of rods **214c**. In this embodiment, the connecting rod **215c** is set between the rods **214c** of the two second locking buckles **12c** and can drive a plurality of rods **214c** to move; when the number of second locking buckles **12c** is two and set side by side, the two rods **214c** are connected to each other by the connecting rod **215c**. The storage box **20c** corresponding to the position of the connecting rod **215c** is provided with avoidance groove, pulling the connecting rod **215c** can move the transmission member **121c**, so that pulling the connecting rod **215c** can simultaneously control the movement of the two second locking buckle **12c**. In this embodiment, the locker **20c** is also provided with a handheld section **203c**. The handheld section **203c** is provided on the same side as the rod **215c** to facilitate the user to lift the locker **20c** while unlocking it. in other embodiments, the rod **215c** can also be used as the handheld section **203c** to simplify the design and achieve multiple uses of the rod **215c**.

[0112] The technical features of the above described embodiments can be combined in any number of ways. For the sake of brevity of description, not all possible combinations of the technical features of the above described embodiments are described, however, as long as the combinations of these technical features are not contradictory, they should be considered to be within the scope of the present specification.

[0113] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention, which is not to be limited except by the following claims.

Claims

1. A module connection structure comprising: a first connection part located on a first module, the first connection part comprising: a mounting part; a locking part movable relative to the mounting part; and a first elastic member positioned between the locking part and the mounting part, wherein the first elastic member retains the locking part in a resting position within the mounting part; a second connection part located on a second module, the second connection part comprising a mating part configured to receive the locking part; and a stop part comprising a block and a reciprocal protrusion, wherein the block is configured to abut the reciprocal protrusion; wherein when the block and the reciprocal protrusion are in abutment, the locking part is prevented from engaging with the mating part, such that the first connection part and the second connection part remain unlocked.
2. The module structure of claim 1, wherein the block of the stop part is provided on the locking part, such that the locking part and the block are movable with respect to the mounting part while the reciprocal protrusion remains in a fixed position.
3. The module connection structure of claim 2, wherein movement of the locking part is effective to cause the block to move relative to the reciprocal protrusion, wherein inward movement of the locking part is effective to cause the block to move relative to the reciprocal protrusion from a first position adjacent to an outside edge of the reciprocal protrusion to a second position adjacent to an inside edge of the reciprocal protrusion.
4. The module connection structure of claim 3, wherein when the first connection part and the second connection part are in an unlocked state, the block is in the first position, and wherein when the first connection part and the second connection part are in a locked state, the block is in the second position.
5. The module connection structure of claim 2, wherein the reciprocal protrusion is provided on the first connection part.
6. The module connection structure of claim 2, wherein the reciprocal protrusion is provided on the second connection part.
7. The module connection structure of claim 6, wherein the locking part defines a stop part receiving slot, wherein the stop part receiving slot is configured to receive the block herein when the first connection part and the second connection part transition from a locked state to an unlocked state.
8. The module connection structure of claim 7, wherein the stop part further comprises a stop part elastic member configured to enable translation of the block between an extended state and a retracted state, wherein in the retracted state the block is movable into the stop part receiving slot, and in the extended state the block is prevented from moving from the stop part receiving slot.
9. The module connection structure of claim 8, wherein when the block is in the extended state, the locking part and the mating part are interlockable.
10. The module connection structure of claim 1, wherein the locking part is a sliding latch configured to move horizontally relative to the mounting portion.
11. The module connection structure of claim 1, wherein the locking part is a flip latch or a rotary latch.
12. A modular storage system comprising two or more storage boxes comprising the module connection structure of claim 1, wherein each storage box of the two or more storage boxes comprises the first connection structure and the second connection structure, the first connection structure and the second connection structure being positioned on opposite ends of a side face of the storage box.
13. A storage box assembly comprising: a first storage box providing a first connection part, the first connection part comprising: a mounting part; a locking part movable relative to the mounting

part; and a first elastic member positioned between the locking part and the mounting part, wherein the first elastic member retains the locking part in a resting position within the mounting part; a second storage box comprising a second connection part, the second connection part comprising a mating part configured to receive the locking part; and a stop part comprising a block and a reciprocal protrusion, wherein the block is configured to abut the reciprocal protrusion; wherein, when the block and the reciprocal protrusion are in abutment, the locking part is prevented from being received within the mating part, such that the first connection part and the second connection part remain unlocked.

14. The storage box assembly of claim 13, wherein the block of the stop part is provided on the locking part, such that the locking part and the block are movable with respect to the mounting part while the reciprocal protrusion remains in a fixed position.

15. The storage box assembly of claim 14, wherein when the first connection part and the second connection part are in an unlocked state, the block is in the first position, and wherein when the first connection part and the second connection part are in a locked state, the block is in the second position.

16. The storage box assembly of claim 13, wherein the locking part defines a stop part receiving slot, wherein the stop part receiving slot is configured to receive the block therein when the first connection part and the second connection part transition from the locked state to the unlocked state.

17. The storage box assembly of claim 16, wherein the stop part further comprises a stop part elastic member configured to enable translation of the block between an extended state and a retracted state, wherein in the retracted state, the block is movable into the stop part receiving slot, and in the extended state, the block is prevented from moving from the stop part receiving slot.

18. The storage box assembly of claim 17, wherein when the block is in the extended state, the locking part and the mating part are interlockable.

19. The storage box assembly of claim 13, wherein the locking part is a sliding latch configured to move horizontally relative to the mounting portion.

20. The storage box assembly of claim 13, wherein the locking part is a flip latch or a rotary latch.
