(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 795 792 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
24.03.2021 Bulletin 2021/12

(21) Application number: **19794399.6**

(22) Date of filing: **29.08.2019**

(51) Int Cl.:
E05D 15/26 *(2006.01)* ***E06B 3/38*** *(2006.01)*

(86) International application number:
PCT/CN2019/103383

(87) International publication number:
WO 2021/022595 (11.02.2021 Gazette 2021/06)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **08.08.2019 CN 201921285844 U**

(71) Applicant: **Dongguan Coomo Household Products Manufacturing Co., Ltd.**
Dongguan City, Guangdong 523900 (CN)

(72) Inventor: **XU, Guofang**
Dongguan City
Guangdong 523073 (CN)

(74) Representative: **Locas, Davide et al**
Cantaluppi & Partners S.r.l.
Piazzetta Cappellato Pedrocchi, 18
35122 Padova (IT)

(54) **CONNECTION MECHANISM FOR UPTURNING AND FOLDING DOOR, AND FURNITURE HAVING SAME**

(57) The present disclosure provides a connecting mechanism for a tilt-up folding door and furniture with a connecting mechanism for a tilt-up folding door, and relates to the technical field of folding furniture, wherein the connecting mechanism for a tilt-up folding door comprises a tilt-up laborsaving component, a connecting component, and a clamping component; the connecting component is in connection with the clamping component; the tilt-up laborsaving component is provided with a clamping portion in cooperation with the clamping component; when the tilt-up laborsaving component is inserted into the connecting component, the clamping component is able to cooperate with the clamping portion by way of clamping, such that the tilt-up laborsaving component is connected to the connecting component. As a result of this, the technical problem existing in the prior art that the procedure of connecting a connecting component with a tilt-up laborsaving component is time and labor consuming is addressed, and the technical effects of convenient installation and both time and labor saving are achieved.

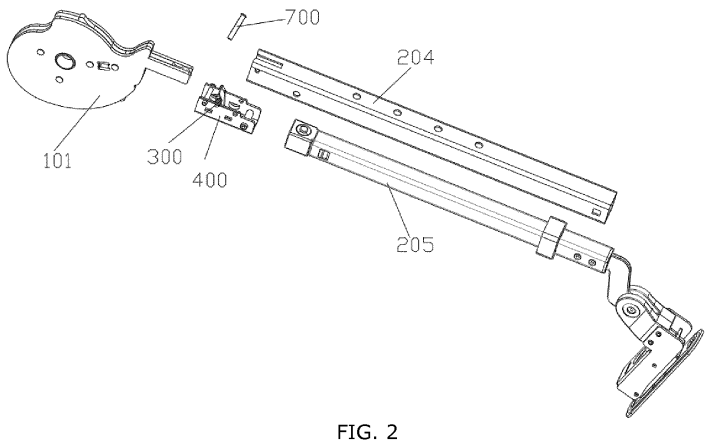

FIG. 2

EP 3 795 792 A1

Description

Cross-Reference to Related Applications

[0001] The present disclosure claims the priority of the Chinese Patent Application No. 201921285844.X, entitled "Connecting Mechanism for a Tilt-up Folding Door and Furniture with a Connecting Mechanism for a Tilt-up Folding Door", filed with the Chinese Patent Office on August 8, 2019, the entity of which is incorporated herein by reference.

Technical Field

[0002] The present disclosure relates to the technical field of folding furniture, and particularly relates to a connecting mechanism for a tilt-up folding door and furniture with a connecting mechanism for a tilt-up folding door.

Background Art

[0003] Furniture is an indispensable part of home life. With the increasing number of living items at home, furniture that can be used for storage is gradually favored by more and more people, and the usage experience of users may be directly influenced by the size of the storage capacity, and the convenience and the security in operations of the furniture with a storage function. Taking cabinets as an example, at present, cabinets are mainly divided into base cabinets and wall cabinets, wherein wall cabinets are usually mounted on the wall, and because the space on its both sides is generally small, even to save space, the cabinet doors of the wall cabinets generally have to be opened in an upturned manner, and thus, such wall cabinets are often referred to as cabinets with a tilt-up door.

[0004] Cabinets with an overhead door have advantages such as large storage capacity and space saving, and the application thereof in the design of wall cabinets is favored by more and more people. A cabinet with a tilt-up door comprises usually a cabinet body, a cabinet door, a connecting component connected on the cabinet door, and a tilt-up laborsaving component mounted in the cabinet body, wherein the connecting component and the tilt-up laborsaving component are clamped with each other, and the connection structure is simple and the installation is convenient.

[0005] Specifically, the tilt-up laborsaving component is provided with a first clamping groove and a second clamping groove, while the connecting component is provided with a first clamping portion and a second clamping portion, wherein the first clamping portion is in connection with the first clamping groove, and the second clamping portion is in connection with the second clamping groove. When in use, it is required to firstly clamp the first clamping portion of the connecting component with the first clamping groove of the tilt-up laborsaving component, and then rotate the connecting component in the first clamping groove, such that the second clamping portion of the connecting component can be clamped in the second clamping groove, hereby realizing the connection between the connecting component and the tilt-up laborsaving component. As for the above-mentioned clamping structure, although the connection between the connecting component and the tilt-up laborsaving component can be realized, during the installation, it is required to firstly manually align the first clamping portion of the connecting component with the first clamping groove of the tilt-up laborsaving component, and then rotate the connecting component, such that the second clamping portion of the connecting component can be clamped with the second clamping groove of the tilt-up laborsaving component, which aligning procedure is troublesome and both time and labor consuming.

Summary

[0006] An object of the present disclosure is to provide a connecting mechanism for a tilt-up folding door, so as to ease the technical problems existing in the prior art that the procedure of connecting a connecting component with a tilt-up laborsaving component is troublesome and is both time and labor consuming.

[0007] Another object of the present disclosure is to provide furniture with a connecting mechanism for a tilt-up folding door, so as to ease the technical problems existing in the prior art that the procedure of connecting a connecting component with a tilt-up laborsaving component is troublesome and is both time and labor consuming.

[0008] The present disclosure provides a connecting mechanism for a tilt-up folding door, comprising: a tilt-up laborsaving component, a connecting component, and a clamping component;

The connecting component is in connection with the clamping component; the tilt-up laborsaving component is provided with a clamping portion in cooperation with the clamping component; when the tilt-up laborsaving component is inserted in the connecting component, the clamping component is able to cooperate with the clamping portion by way of clamping, such that the tilt-up laborsaving component is connected to the connecting component.

[0009] Optionally, the clamping component includes a circular through hole provided on the upper end face of a projecting segment of the tilt-up laborsaving component and a spring pin shaft provided on the upper end face of the connecting component; when the projecting segment is inserted into a connecting groove of the connecting component, the spring pin shaft on the connecting component is able to cooperate with the circular through hole on the projecting segment to be clamped therein.

[0010] Optionally, the tilt-up laborsaving component includes a cam component and a projecting segment provided on the cam component, the connecting component is provided with a connecting groove, and the clamping

component is rotatably connected in the connecting groove;

The clamping component includes a double torsion spring and a latch fastener, wherein the double torsion spring includes a first spring portion, a second spring portion and a spring arm, with a first end of the first spring portion and a first end of the second spring portion being respectively in fixed connection with the connecting component, and a second end of the first spring portion and a second end of the second spring portion being in connection with each other via the spring arm, and the latch fastener being fixedly connected on the spring arm;

The projecting segment is provided with an abutting groove, wherein when the projecting segment is inserted into the connecting groove, the projecting segment is able to push the latch fastener and the double torsion spring to rotate, and the latch fastener is able to abut against and be fixed with the abutting groove under the effect of the torsional force of the double torsion spring.

[0011] Optionally, a communicating slot is provided on a side wall of the connecting groove;

The extension direction of the communicating slot is the same as the extension direction of the connecting groove; and the latch fastener passes through the communicating slot and the latch fastener is able to swing within the communicating slot.

[0012] Optionally, the communicating slot is provided on the side wall of the connecting groove of the connecting component and penetrates the same along a vertical direction.

[0013] Optionally, the latch fastener of the clamping component passes through the communicating slot and is in connection with the abutting groove on the tilt-up laborsaving component, and the latch fastener is able to swing within the communicating slot.

[0014] Optionally, the connecting mechanism for a tilt-up folding door further comprises a connecting bracket;

The connecting bracket is provided with a concave groove, the connecting bracket is connected in the connecting groove, and the first spring portion, the second spring portion and the latch fastener are all provided in the concave groove; and the first end of the first spring portion and the first end of the second spring portion are respectively in fixed connection with the inner walls on both sides of the concave groove of the connecting bracket.

[0015] Optionally, the projecting segment is able to be inserted into the concave groove, the first end of the first spring portion is in fixed connection with the inner wall on one side of the concave groove of the connecting bracket, while the first end of the second spring portion is in fixed connection with the inner wall on the other end of the concave groove of the connecting bracket, and the connecting bracket is configured to form a connection between the connecting component and the projecting segment of the tilt-up laborsaving component.

[0016] Optionally, the inner walls on both sides of the concave groove of the connecting bracket are both provided with arc-shaped protrusions, and the projecting segment of the tilt-up laborsaving component is able to be inserted between the two arc-shaped protrusions.

[0017] Optionally, the arc-shaped protrusions on both sides clamp the projecting segment of the tilt-up laborsaving component, and are configured to enable the horizontal center line of the projecting segment of the tilt-up laborsaving component to coincide with the horizontal center line of the connecting bracket.

[0018] Optionally, there are two arc-shaped protrusions on the inner wall on either side of the concave groove of the connecting bracket.

[0019] Optionally, the arc-shaped protrusion is in form of circular arc.

[0020] Optionally, the connecting mechanism for a tilt-up folding door further comprises a connecting pin and a locating pin;

One end of the connecting bracket is in connection with the connecting component via the connecting pin, while the other end of the connecting bracket is in connection with the connecting component via the locating pin.

[0021] Optionally, the connecting mechanism for a tilt-up folding door further comprises a pin shaft;

The pin shaft penetrates successively one side of the connecting bracket, the first spring portion, the latch fastener, the second spring portion, and the other side of the connecting bracket, such that the clamping component is in connection with the connecting bracket.

[0022] Optionally, the projecting segment is provided on one end of the cam component, and the end of the projecting segment departing from the cam component is provided with an inclined segment, which is arranged to incline along a direction of being close to the cam component.

[0023] Optionally, the side of the internal side wall of the abutting groove close to the tilt-up laborsaving component is arranged to incline towards the side of being close to the tilt-up laborsaving component.

[0024] Optionally, the connecting component is a telescopic pipe fitting.

[0025] Optionally, the connecting component includes a first square tube, a second square tube, and a spring pin;

The connecting groove is provided on the first square tube, the second square tube is slidably connected in the connecting groove, and the first square tube is provided with a plurality of through holes, which are successively arranged along the length direction of the first square tube; and the second square tube is provided with the spring pin, which penetrates one of the through holes, such that the first square tube is brought into connection with the second square tube.

[0026] Optionally, the connecting component is a parallelogrammic mechanism.

[0027] The present disclosure provides furniture with a connecting mechanism for a tilt-up folding door, comprising: a furniture body, a first folding door, a second folding door, and a connecting mechanism for a tilt-up

folding door as described above;
The first folding door is hinged to the furniture body, the second folding door is hinged to the first folding door, the tilt-up laborsaving component is in connection with the furniture body, and the end of the connecting component departing from the tilt-up laborsaving component is hinged to the second folding door.

[0028] As for the connecting mechanism for a tilt-up folding door provided in the present disclosure, the connecting component is in connection with the clamping component, the tilt-up laborsaving component is provided with a clamping portion in cooperation with the clamping component; when the tilt-up laborsaving component is inserted in the connecting component, the clamping component is able to cooperate with the clamping portion by way of clamping, such that the tilt-up laborsaving component is connected to the connecting component; by providing a clamping component and a clamping portion, it is only required to directly insert the tilt-up laborsaving component into the connecting component, and make the clamping component cooperate with the clamping portion by way of clamping, wherein only one clamping step is required, thus the mounting and aligning way is simple, which indicates both time and labor saving.

[0029] As for the furniture with a connecting mechanism for a tilt-up folding door provided in the present disclosure, the first folding door is hinged to the furniture body, the second folding door is hinged to the first folding door, the tilt-up laborsaving component is in connection with the furniture body, and the end of the connecting component departing from the tilt-up laborsaving component is hinged to the second folding door; when the tilt-up laborsaving component and the connecting component rotate relative to each other, the unfolding or folding between the first folding door and the second folding door is realized, hereby achieving the opening or closing of the folding door on the furniture body; and by providing a clamping component and a clamping portion, it is only required to directly insert the tilt-up laborsaving component into the connecting component, and make the clamping component cooperate with the clamping portion by way of clamping, wherein only one clamping step is required, thus the mounting and aligning way is simple, which indicates both time and labor saving.

Brief Description of Drawings

[0030] In order to more clearly describe the technical solutions of the specific embodiments of the present disclosure or in the prior art, the drawings required to be used in the description of the specific embodiments or the prior art will be simply presented below. Obviously, the drawings described below show certain embodiments of the present disclosure, and for a person ordinarily skilled in the art, other drawings could be obtained according to these drawings without inventive efforts.

FIG. 1 is a structural schematic diagram showing the connection between a cam component and a connecting component in a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure;

FIG. 2 is an explosive schematic diagram showing the connection between a cam component and a connecting component in a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure;

FIG. 3 is a structural schematic diagram showing a cam component in a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure;

FIG. 4 is a structural schematic diagram showing the connection of a connecting bracket, a clamping component, a connecting pin and a locating pin in a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure;

FIG. 5 is an explosive schematic diagram showing a connecting component in a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure; and

FIG. 6 is a structural schematic diagram showing furniture with a connecting mechanism for a tilt-up folding door according to an embodiment of the present disclosure.

[0031] Reference signs: 100-tilt-up laborsaving component; 200-connecting component; 300-clamping component; 400-connecting bracket; 500-connecting pin; 600-locating pin; 700-pin shaft; 800-furniture body; 900-first folding door; 1000-second folding door; 101-cam component; 102-projecting segment; 103-abutting groove; 104-inclined segment; 201-connecting groove; 203-communicating slot; 204-first square tube; 205-second square tube; 206-spring pin; 207-through hole; 301-double torsion spring; 302-latch fastener; 303-first spring portion; 304-second spring portion; 305-spring arm; 401-concave groove; and 402-arc-shaped protrusion.

Detailed Description of Embodiments

[0032] The technical solutions of the present disclosure will be clearly and comprehensively described below with reference to the embodiments. Obviously, the described embodiments are merely some of the embodiments of the present disclosure, but not all the embodiments. Any other embodiments, obtained by a person ordinarily skilled in the art without inventive efforts based on the embodiments in the present disclosure, shall fall within the scope of protection of the present disclosure.

[0033] In the description of the present disclosure, it shall be clarified that orientations or position relationships

indicated by terms such as "central", "upper", "lower", "left", "right", "vertical", "horizontal", "inner", and "outer", if used, are orientations or position relationships based on the drawings, merely for the purpose of facilitating the description of the present disclosure and for simplifying the description, rather than indicating or implying that a specified device or element must be in a specific orientation, or be constructed or operated in a certain orientation, and therefore cannot be construed as limiting the present disclosure. In addition, terms such as "first", "second", and "third", if used, are used merely for purpose of description, and cannot be construed as indicating or implying to have importance in relativity.

[0034] In the description of the present disclosure, it shall be clarified that, unless otherwise expressly specified and defined, terms such as "mount", "link", and "connect", if used, shall be construed in a broad sense. For example, it may be fixed connection, or detachable connection, or integrated connection; it may be mechanical connection, or electrical connection; or it may be direct linking, or indirect linking via an intermediate medium, or inner communication between two elements. For a person ordinarily skilled in the art, the specific meanings of the above-mentioned terms in the present disclosure could be construed in accordance with specific circumstances.

[0035] The present disclosure provides a connecting mechanism for a tilt-up folding door, with a connecting component 200 being in connection with a clamping component 300; a tilt-up laborsaving component 100 is provided with a clamping portion in cooperation with the clamping component 300; when the tilt-up laborsaving component 100 is inserted in the connecting component 200, the clamping component 300 can cooperate with the clamping portion by way of clamping, hereby realizing the connection between the tilt-up laborsaving component 100 and the connecting component 200; during the installation, for the clamped connection between the clamping component 300 and the clamping portion, the tilt-up laborsaving component 100 only needs to be directly inserted into the internal of the connecting component 200, wherein only one step is required to realize the connection between the connecting component 200 and the tilt-up laborsaving component 100, which indicates a simple mounting structure and saving of both time and labor.

[0036] Specifically, the tilt-up laborsaving component 100, the connecting component 200, and the clamping component 300 can be implemented in a preferred embodiment as follows: as shown in Figs. 1, 2, and 6, a cam component 101 is provided on the end of the tilt-up laborsaving component 100 departing from the cabinet body; the end of the cam component 101 departing from the tilt-up laborsaving component 100, viz. the right-hand end, is provided with a projecting segment 102; and the connecting component 200 is provided with a connecting groove 201, into which the projecting segment 102 can be inserted, and within which the clamping component 300 is in rotatable connection. Specifically, as shown in Figs. 2 and 4, the clamping component 300 includes a double torsion spring 301 and a latch fastener 302; the double torsion spring 301 includes a first spring portion 303, a second spring portion 304, and a spring arm 305; the right-hand end of the first spring portion 303 and the inner wall on the right side of the connecting component 200 are in fixed connection with each other, the left-hand end of the second spring portion 304 and the inner wall on the left side of the connecting component 200 are in fixed connection with each other, and the spring arm 305 is connected between the left-hand end of the first spring portion 303 and the right-hand end of the second spring portion 304, and the latch fastener 302 is fixedly connected on the spring arm 305; and the clamping portion is an abutting groove 103 provided on the projecting segment 102, wherein when the projecting segment 102 is inserted into the connecting groove 201, the projecting segment 102 can push the latch fastener 302 and the double torsion spring 301 to rotate, then the latch fastener 302 can abut against and be fixed with the abutting groove 103 under the effect of the torsional force of the double torsion spring 301, wherein a clamped fixation between the projecting segment 102 of the tilt-up laborsaving component 100 and the connecting component 200 is realized with the effect of the double torsion spring 301 and the latch fastener 302. It can be understood that as for the connecting mechanism for a tilt-up folding door provided in the present embodiment, the installation is more facilitated through the effect of the latch fastener 302 and the double torsion spring 301, and when in use, it is only required to align the portion of the projecting segment 102 of the tilt-up laborsaving component 100 provided with the abutting groove 103 with the latch fastener 302, wherein the aligning step is simple, and repeated manual alignments are unnecessary, which indicates saving of time and labor.

[0037] Specifically, if not being inserted into the connecting component 200, the double torsion spring 301 is in a normal state without a pressing force; when the connecting mechanism for a tilt-up folding door provided in the present embodiment is used, the projecting segment 102 of the cam component 101 extends into the connecting groove 201 of the connecting component 200, and with the continuous advancing of the projecting segment 102 of the cam component 101, the lower end of the latch fastener 302 is brought into contact with the right-hand end of the projecting segment 102, and the lower end of the latch fastener 302 is lifted, and at this time, the double torsion spring 301 is tightened up, and thus, the double torsion spring 301 exerts a counterforce on the latch fastener 302, such that the latch fastener 302 exercises a pressing force on the projecting segment 102, and when the projecting segment 102 moves to the abutting groove 103, the latch fastener 302 is locked in the abutting groove 103 under the effect of the double torsion spring 301, realizing a clamped connection between the tilt-up laborsaving component 100 and the connecting compo-

nent 200, wherein the clamping structure is convenient and is easy to mount.

[0038] Optionally, the tilt-up laborsaving component 100, the connecting component 200, and the clamping component 300 can be implemented in another embodiment as follows: the clamping component 300 includes a circular through hole provided on the upper end face of the projecting segment 102 of the tilt-up laborsaving component 100 and a spring pin shaft provided on the upper end face of the connecting component 200; when the projecting segment 102 is gradually inserted into the connecting groove 201 of the connecting component 200, the spring pin shaft on the connecting component 200 can cooperate with the circular through hole on the projecting segment 102 to be clamped therein, realizing the connection between the tilt-up laborsaving component 100 and the connecting component 200, wherein the installation is facilitated and is time- and labor-saving; and when the tilt-up laborsaving component 100 and the connecting component 200 need to be detached, it is only required to press the spring pin shaft on the connecting component 200, such that the spring pin shaft is separated from the circular through hole, wherein the detaching is facilitated.

[0039] Optionally, as shown in Figs. 2, 3, and 5, a communicating slot 203 is provided on a side wall of the connecting groove 201 of the connecting component 200 and penetrates the same along a vertical direction, with the extension direction of the communicating slot 203 being the same as the extension direction of the connecting groove 201; when the projecting segment 102 of the tilt-up laborsaving component 100 is inserted into the connecting component 200, the lower end of the latch fastener 302 of the clamping component 300 passes through the communicating slot 203 and is then brought into connection with the abutting groove 103 on the tilt-up laborsaving component 100, and the latch fastener 302 can swing in the communicating slot 203, which facilitates the movement of the latch fastener 302. If it is required to detach the tilt-up laborsaving component 100 from the connecting component 200, the upper end of the latch fastener 302 is to be pressed directly, such that the latch fastener 302 swings in the communicating slot 203, hereby enabling the lower end of the latch fastener 302 to be separated from the abutting groove 103, wherein the detaching is facilitated and a simple structure is realized by adopting the clamping component 300 and the communicating slot 203.

[0040] Optionally, as shown in Figs. 1, 2, and 4, the connecting mechanism for a tilt-up folding door further comprises a connecting bracket 400; the connecting bracket 400 is provided with a concave groove 401, the connecting bracket 400 is connected in the connecting groove 201 of the connecting component 200, the projecting segment 102 can be inserted into the concave groove 401, and the right-hand end of the first spring portion 303 is in fixed connection with the inner wall on the right side of the concave groove 401 of the connecting bracket 400, while the left-hand end of the second spring portion 304 is in fixed connection with the inner wall on the left side of the concave groove 401 of the connecting bracket 400; wherein by providing the connecting bracket 400, a connection is realized between the connecting component 200 and the projecting segment 102 of the tilt-up laborsaving component 100, avoiding the inconvenience in manufacture caused by direct and fixed connection of the first spring portion 303 and the second spring portion 304 on the connecting component 200.

[0041] As shown in Fig. 4, an arc-shaped protrusion 402 is respectively provided on inner walls on both sides of the concave groove 401 of the connecting bracket 400, the projecting segment 102 of the tilt-up laborsaving component 100 can be inserted between the two arc-shaped protrusions 402, and the arc-shaped protrusions 402 on both sides clamp the projecting segment 102 of the tilt-up laborsaving component 100, and can enable the horizontal center line of the projecting segment 102 of the tilt-up laborsaving component 100 to coincide with the horizontal center line of the connecting bracket 400; meanwhile, the latch fastener 302 is located between the first spring portion 303 and the second spring portion 304 that are arranged symmetrically, and the arrangement of the arc-shaped protrusions 402 can realize convenient matching of the latch fastener 302 with the projecting segment 102 of the tilt-up laborsaving component 100 as well as a facilitated installation.

[0042] It is to be clarified that there are two arc-shaped protrusions 402 on the inner wall on either side of the concave groove 401 of the connecting bracket 400; specifically, there are two arc-shaped protrusions 402 on the left side wall of the concave groove 401, and there are also two arc-shaped protrusions 402 on the right side wall of the concave groove 401, which facilitates the clamping of the projecting segment 102 of the tilt-up laborsaving component 100; meanwhile, the projecting segment 102 of the tilt-up laborsaving component 100 is guided to a certain degree, which avoids an offset of the center line of the projecting segment 102 of the tilt-up laborsaving component 100; furthermore, the arc-shaped protrusion 402 is provided as a form of circular arc, which can reduce the contact between the projecting segment 102 of the tilt-up laborsaving component 100 and the connecting bracket 400, decrease the friction force between the projecting segment 102 of the tilt-up laborsaving component 100 and the connecting bracket 400, and facilitate the pushing-in of the projecting segment 102 of the tilt-up laborsaving component 100.

[0043] As shown in Figs. 2 and 4, the end of the connecting bracket 400 close to the cam component 101 is brought into connection with the connecting component 200 via a connecting pin 500, while the end of the connecting bracket 400 departing from the cam component 101 is brought into connection with the connecting component 200 via a locating pin 600, hereby realizing a stable connection between the connecting bracket 400 and the connecting component 200.

[0044] As shown in Fig. 2, the pin shaft 700 penetrates successively the left-hand end of the connecting bracket 400, the first spring portion 303, the latch fastener 302, the second spring portion 304 and the right-hand end of the connecting bracket 400, hereby realizing a rotatable connection between the clamping component 300 and the connecting bracket 400.

[0045] Optionally, the end of the projecting segment 102 departing from the cam component 101 is provided with an inclined segment 104, which is arranged to incline towards the side close to the cam component 101; the lower end of the latch fastener 302 firstly contacts the lower portion on the side of the projecting segment 102 departing from the cam component 101, the lower end of the latch fastener 302 moves then along the inclined segment 104 of the projecting segment 102 successively, towards the side close to the cam component 101; the arrangement of the inclined segment 104 facilitates the contact of the end of the projecting segment 102 departing from the cam component 101 with the lower end of the latch fastener 302, wherein by providing the end of the projecting segment 102 departing from the cam component 101 as an inclined segment 104, the gradual movement of the latch fastener 302 from the lower end of the end face on the side of the projecting segment 102 departing from the cam component 101 to the upper end is facilitated, hereby avoiding the abrasion of the projecting segment 102.

[0046] Optionally, the side of the internal side wall of the abutting groove 103 close to the tilt-up laborsaving component 100 is arranged to incline towards the side of being close to the tilt-up laborsaving component 100, which facilitates the locking of the latch fastener 302 in the abutting groove 103 in an abutting manner.

[0047] Optionally, the connecting component 200 is a telescopic pipe fitting.

[0048] The arrangement as a telescopic pipe fitting facilitates the adjustment of the distance between the tilt-up laborsaving component 100 and the cabinet door connected with the connecting component 200, wherein the adjustment is simple and convenient.

[0049] Optionally, the connecting groove 201 is provided on a first square tube 204, a second square tube 205 is connected in the connecting groove 201, and a through hole 207 is provided on the upper end face of the first square tube 204, while a spring pin 206 is provided on the upper end face of the second square tube 205, wherein the spring pin 206 passes through the through hole 207, hereby realizing the connection between the first square tube 204 and the second square tube 205; and there is a plurality of through holes 207, which are successively arranged along the length direction of the first square tube 204, which facilitates the adjustment of the length of the connecting component 200.

[0050] Optionally, in another alternative of the connecting component 200, the connecting component 200 is a parallelogrammic mechanism.

[0051] The present disclosure further provides furniture with a connecting mechanism for a tilt-up folding door, as shown in Fig. 6, the furniture with a connecting mechanism for a tilt-up folding door comprises a furniture body 800, a first folding door 900, a second folding door 1000, and a connecting mechanism for a tilt-up folding door as described above; the side of the first folding door 900 close to the furniture body 800 is hinged to the furniture body 800, the side of the second folding door 1000 close to the furniture body 800 is hinged to the side of the first folding door 900 departing from the furniture body 800, the tilt-up laborsaving component 100 of the connecting mechanism for a tilt-up folding door is in connection with the furniture body 800, and the right-hand end of the connecting mechanism for a tilt-up folding door is hinged to the second folding door 1000, wherein through the adjustment of the connecting mechanism for a tilt-up folding door, the folding and the unfolding between the second folding door 1000 and the first folding door 900 is realized.

[0052] At last, it is to be clarified that the above respective embodiments are merely used to explain the technical solutions of the present disclosure, rather than limiting the same; although the present disclosure is explained in detail referring to the preceding respective embodiments, it should be understood for a person ordinarily skilled in the art that modifications could still be made to the technical solutions recorded in the preceding respective embodiments, or partial or all technical features therein could be substituted with equivalents; and these modifications or substitutions do not make the essence of the corresponding technical solutions depart from the scope of the technical solutions of the respective embodiments of the present disclosure.

Industrial Applicability

[0053] As for the connecting mechanism for a tilt-up folding door and the furniture with a connecting mechanism for a tilt-up folding door that are provided in the embodiments of the present disclosure, by providing a clamping component and a clamping portion, it is only required to directly insert the tilt-up laborsaving component into the connecting component, and make the clamping component cooperate with the clamping portion by way of clamping, wherein only one clamping step is required, thus the mounting and aligning way is simple, which indicates both time and labor saving.

Claims

1. A connecting mechanism for a tilt-up folding door, **characterized by** comprising: a tilt-up laborsaving component, a connecting component, and a clamping component,
   wherein the connecting component is in connection with the clamping component; the tilt-up laborsaving component is provided with a clamping portion in

cooperation with the clamping component, when the tilt-up laborsaving component is inserted into the connecting component, the clamping component is configured to match with the clamping portion by clamping, such that the tilt-up laborsaving component is connected to the connecting component.

2. The connecting mechanism for a tilt-up folding door according to claim 1, wherein the clamping component comprises a circular through hole provided on a upper end face of a projecting segment of the tilt-up laborsaving component and a spring pin shaft provided on a upper end face of the connecting component, when the projecting segment is inserted into a connecting groove of the connecting component, the spring pin shaft on the connecting component is configured to match with the circular through hole on the projecting segment to be clamped therein.

3. The connecting mechanism for a tilt-up folding door according to claim 1, wherein the tilt-up laborsaving component comprises a cam component and the projecting segment provided on the cam component, the connecting component is provided with the connecting groove, and the clamping component is rotatably connected in the connecting groove;

the clamping component comprises a double torsion spring and a latch fastener, wherein the double torsion spring comprises a first spring portion, a second spring portion and a spring arm, wherein a first end of the first spring portion and a first end of the second spring portion are respectively in fixed connection with the connecting component, a second end of the first spring portion and a second end of the second spring portion are in connection with each other via the spring arm, and the latch fastener is fixedly connected on the spring arm;
the clamping portion is an abutting groove provided on the projecting segment, wherein when the projecting segment is inserted into the connecting groove, the projecting segment is configured to push the latch fastener and the double torsion spring to rotate, and the latch fastener is configured to abut against and be fixed with the abutting groove under an effect of torsional force of the double torsion spring.

4. The connecting mechanism for a tilt-up folding door according to claim 3, wherein a communicating slot is provided on a side wall of the connecting groove, an extension direction of the communicating slot is identical with an extension direction of the connecting groove; and the latch fastener passes through the communicating slot and the latch fastener is configured to swing within the communicating slot.

5. The connecting mechanism for a tilt-up folding door according to claim 4, wherein the communicating slot is provided on the side wall of the connecting groove of the connecting component and penetrates the connecting groove along a vertical direction.

6. The connecting mechanism for a tilt-up folding door according to claim 4 or 5, wherein the latch fastener of the clamping component passes through the communicating slot and is in connection with the abutting groove on the tilt-up laborsaving component, and the latch fastener is configured to swing within the communicating slot.

7. The connecting mechanism for a tilt-up folding door according to any one of claims 4-6, wherein the connecting mechanism for a tilt-up folding door further comprises a connecting bracket,
the connecting bracket is provided with a concave groove, the connecting bracket is connected in the connecting groove, and the first spring portion, the second spring portion and the latch fastener are all provided in the concave groove; and the first end of the first spring portion and the first end of the second spring portion are respectively in fixed connection with inner walls on both sides of the concave groove of the connecting bracket.

8. The connecting mechanism for a tilt-up folding door according to claim 7, wherein the projecting segment is insertable into the concave groove, the first end of the first spring portion is in fixed connection with an inner wall on one side of the concave groove of the connecting bracket, and the first end of the second spring portion is in fixed connection with an inner wall on the other side of the concave groove of the connecting bracket, and the connecting bracket is configured to form a connection between the connecting component and the projecting segment of the tilt-up laborsaving component.

9. The connecting mechanism for a tilt-up folding door according to claim 7 or 8, wherein arc-shaped protrusions are provided on the inner walls on the both sides of the concave groove of the connecting bracket, and the projecting segment of the tilt-up laborsaving component is configured to be inserted between two arc-shaped protrusions.

10. The connecting mechanism for a tilt-up folding door according to claim 9, wherein the arc-shaped protrusions on the both sides clamp the projecting segment of the tilt-up laborsaving component, and are configured to enable a horizontal center line of the projecting segment of the tilt-up laborsaving component to coincide with a horizontal center line of the connecting bracket.

11. The connecting mechanism for a tilt-up folding door according to claim 9 or 10, wherein the arc-shaped protrusions on an inner wall on either side of the concave groove of the connecting bracket are provided in a number of two.

12. The connecting mechanism for a tilt-up folding door according to any one of claims 9-11, wherein each of the arc-shaped protrusions is in form of circular arc.

13. The connecting mechanism for a tilt-up folding door according to any one of claims 7-12, wherein the connecting mechanism for a tilt-up folding door further comprises a connecting pin and a locating pin, the connecting bracket has one end connected with the connecting component via the connecting pin, and the other end connected with the connecting component via the locating pin.

14. The connecting mechanism for a tilt-up folding door according to any one of claims 7-12, wherein the connecting mechanism for a tilt-up folding door further comprises a pin shaft,
the pin shaft penetrates successively one side of the connecting bracket, the first spring portion, the latch fastener, the second spring portion, and the other side of the connecting bracket, such that the clamping component is in connection with the connecting bracket.

15. The connecting mechanism for a tilt-up folding door according to any one of claims 2-14, wherein the projecting segment is provided on one end of the cam component, and an end of the projecting segment away from the cam component is provided with an inclined segment, wherein the inclined segment is arranged to incline along a direction of being close to the cam component.

16. The connecting mechanism for a tilt-up folding door according to claim 15, wherein a side, close to the tilt-up laborsaving component, of an internal side wall of the abutting groove is arranged to incline towards the side of being close to the tilt-up laborsaving component.

17. The connecting mechanism for a tilt-up folding door according to any one of claims 2-16, wherein the connecting component is a telescopic pipe fitting.

18. The connecting mechanism for a tilt-up folding door according to claim 17, wherein the connecting component comprises a first square tube, a second square tube, and a spring pin,
the connecting groove is provided on the first square tube, the second square tube is slidably connected in the connecting groove, and the first square tube is provided with a plurality of through holes, which are successively arranged along a length direction of the first square tube; and the second square tube is provided with the spring pin, which penetrates one of the through holes, such that the first square tube is in connection with the second square tube.

19. The connecting mechanism for a tilt-up folding door according to any one of claims 1-18, wherein the connecting component is a parallelogrammic mechanism.

20. Furniture with a connecting mechanism for a tilt-up folding door, **characterized by** comprising: a furniture body, a first folding door, a second folding door, and a connecting mechanism for a tilt-up folding door according to any one of claims 1-19,
wherein the first folding door is hinged to the furniture body, the second folding door is hinged to the first folding door, the tilt-up laborsaving component is in connection with the furniture body, and an end of the connecting component away from the tilt-up laborsaving component is hinged to the second folding door.

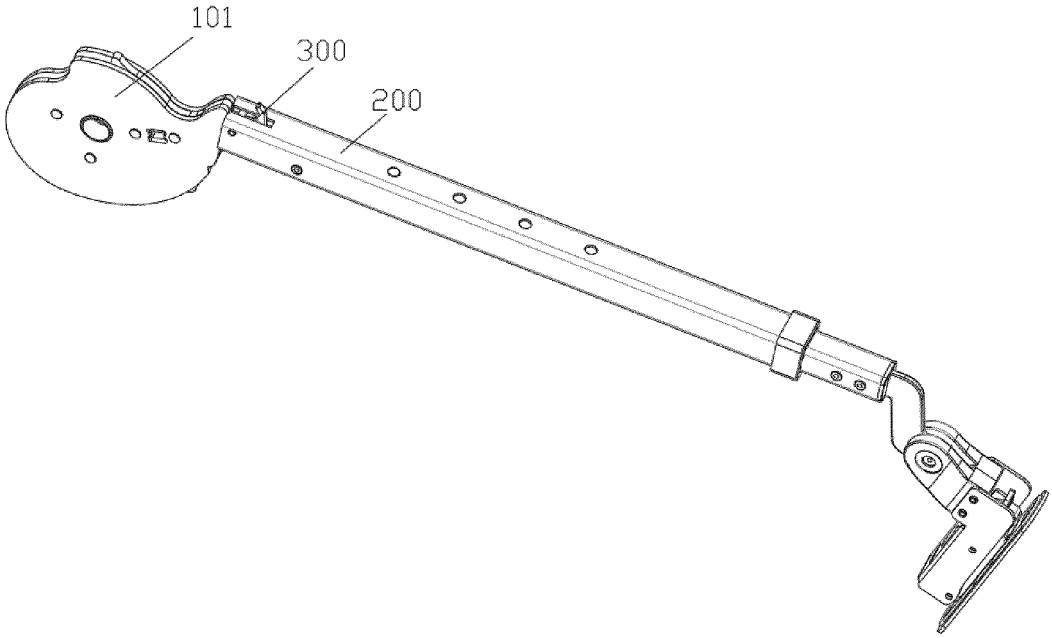

FIG. 1

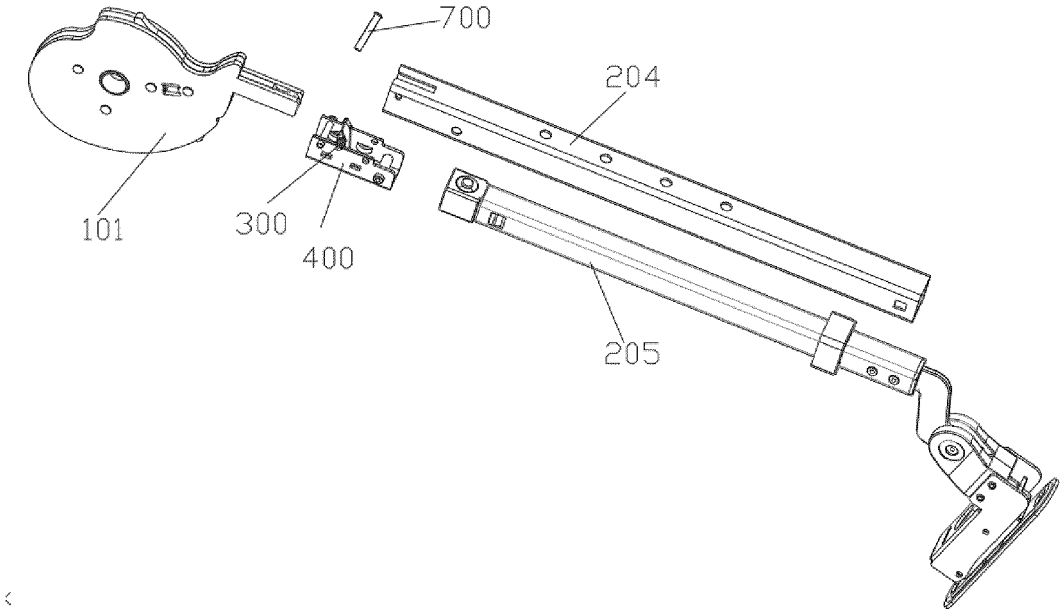

FIG. 2

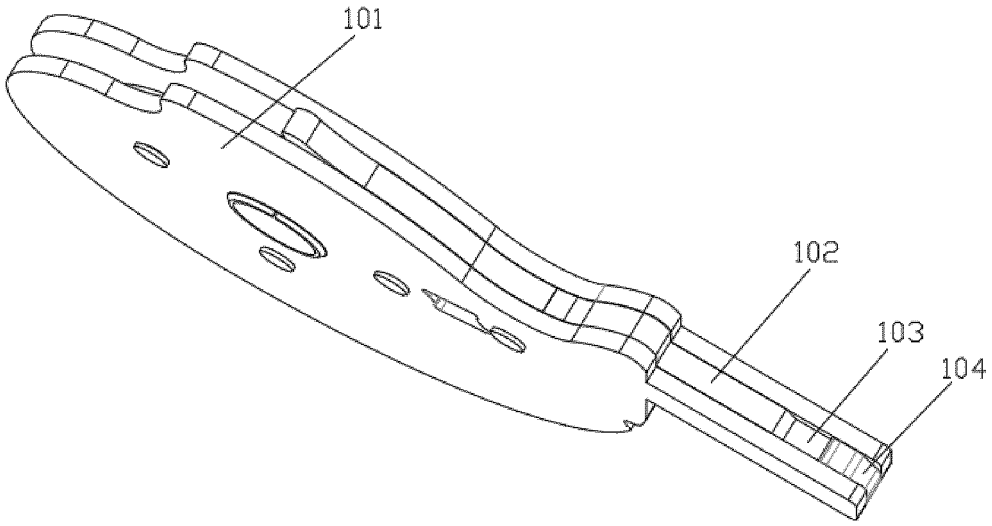

FIG. 3

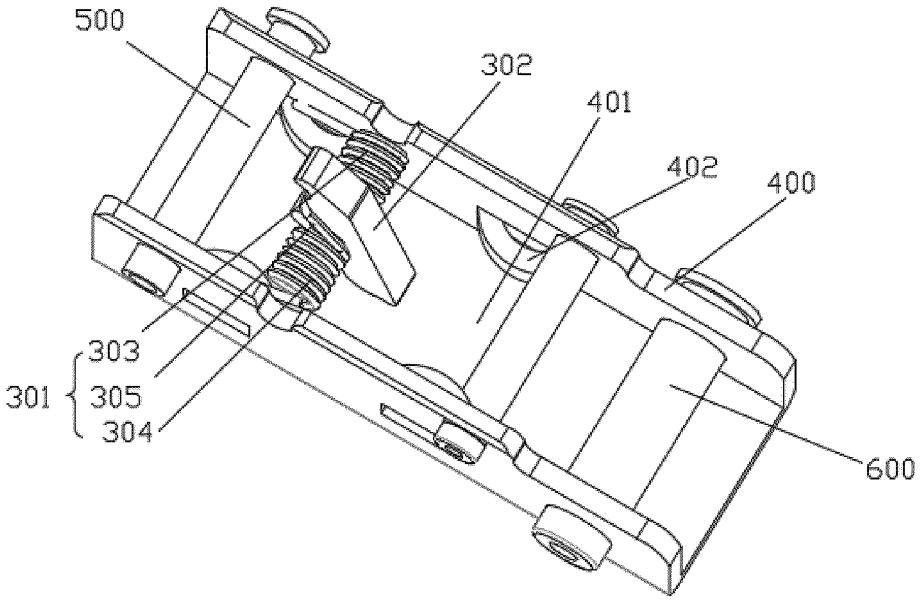

FIG. 4

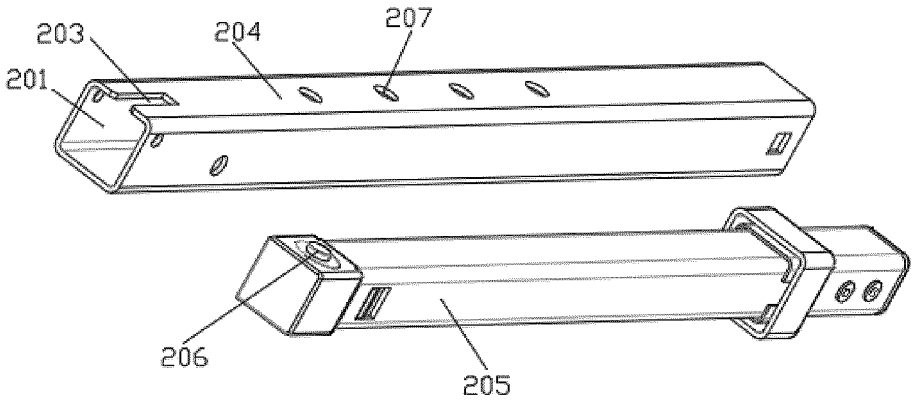

FIG. 5

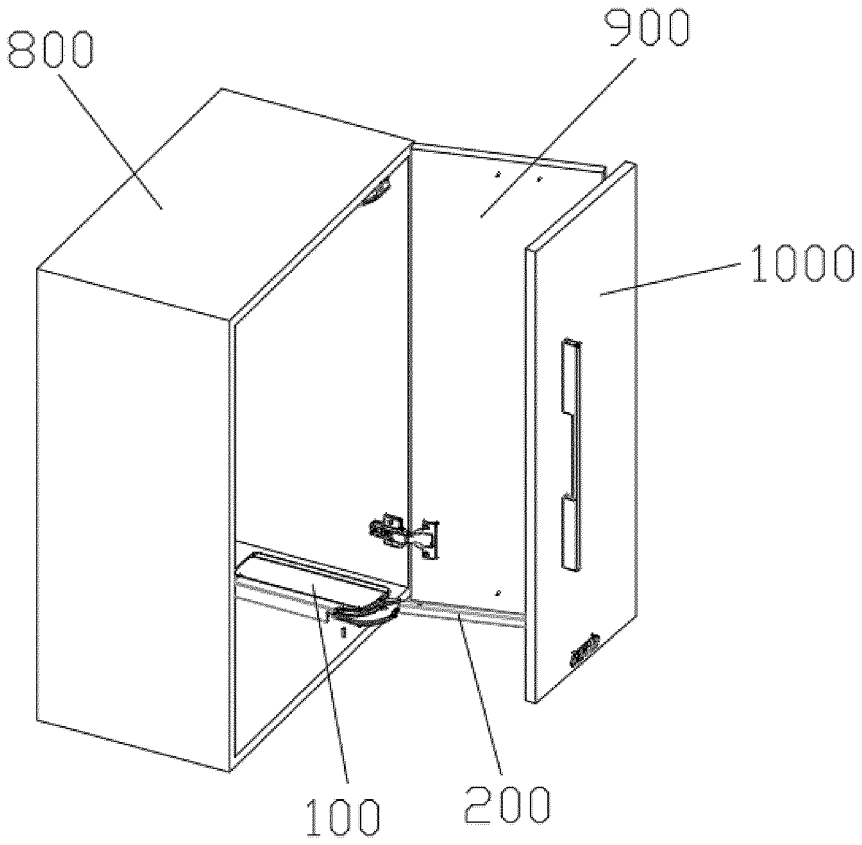

FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/103383

A. CLASSIFICATION OF SUBJECT MATTER

E05D 15/26(2006.01)i; E06B 3/38(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)

E06B, E05D

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: 楷模家居, 徐国芳, 折叠门, 上翻折叠门, 省力, 卡接, 卡扣, 卡紧, 锁扣, fold+, labor, labour, effort, time, sav+, low+, door

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 207813393 U (DONGGUAN COOMO HOUSEHOLD GOODS MANUFACTURING CO., LTD.) 04 September 2018 (2018-09-04) description, paragraphs 29-42, and figures 1-5	1, 2, 5-20
A	CN 208441673 U (DONGGUAN COOMO HOUSEHOLD GOODS MANUFACTURING CO., LTD.) 29 January 2019 (2019-01-29) entire document	1-20
A	CN 108505861 A (GUANGDONG DONGTAI HARDWARE PRECISION MANUFACTURING CO., LTD.) 07 September 2018 (2018-09-07) entire document	1-20
A	CN 207761487 U (DONGGUAN COOMO HOUSEHOLD GOODS MANUFACTURING CO., LTD.) 24 August 2018 (2018-08-24) entire document	1-20
A	CN 207999159 U (GUANGDONG DONGTAI HARDWARE PRECISION MANUFACTURING CO., LTD.) 23 October 2018 (2018-10-23) entire document	1-20

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 March 2020	**27 March 2020**
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**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/103383

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 207392961 U (DONGGUAN COOMO HOUSEHOLD GOODS MANUFACTURING CO., LTD.) 22 May 2018 (2018-05-22) entire document	1-20
A	CN 2644610 Y (NANHAI YONGSHENG FURNITURE FIT) 29 September 2004 (2004-09-29) entire document	1-20
A	JP 2005290735 A (ITOKI CORP.) 20 October 2005 (2005-10-20) entire document	1-20
A	KR 101936371 B1 (KOREA ARCH EXTERIOR CO., LTD. et al.) 08 January 2019 (2019-01-08) entire document	1-20
A	JP 2017089154 A (SUGIMOTO SOKEN K.K.) 25 May 2017 (2017-05-25) entire document	1-20
A	ES 2027163 A6 (CANTIN COULAUD SOC NOUV) 16 May 1992 (1992-05-16) entire document	1-20

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/103383

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 207813393 U	04 September 2018	WO 2019140970 A1	25 July 2019
CN 208441673 U	29 January 2019	WO 2020000537 A1	02 January 2020
CN 108505861 A	07 September 2018	None	
CN 207761487 U	24 August 2018	WO 2019140971 A1	25 July 2019
		EP 3533959 A1	04 September 2019
		EP 3533959 A4	04 September 2019
		KR 20190089157 A	30 July 2019
CN 207999159 U	23 October 2018	None	
CN 207392961 U	22 May 2018	None	
CN 2644610 Y	29 September 2004	None	
JP 2005290735 A	20 October 2005	None	
KR 101936371 B1	08 January 2019	None	
JP 2017089154 A	25 May 2017	JP 6341385 B2	13 June 2018
ES 2027163 A6	16 May 1992	FR 2665476 A1	07 February 1992
		FR 2665476 B1	13 July 1995

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201921285844X **[0001]**