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(54) **CONNECTING SLEEVE FOR EXTENSION LADDER**

VERBINDUNGSMUFFE FÜR AUSZIEHLEITER

MANCHON DE RACCORDEMENT POUR ÉCHELLE EXTENSIBLE

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Description

Field of the Invention

[0001] The present invention relates to the field of an extending ladder, in particular to a connecting sleeve for an extending ladder.

Description of the Prior Art

[0002] Ladders are now widely used in the fields of construction, decoration, advertisement and family residence. In the present market, an extending ladder which can extend and shorten is comparatively popular. When the ladder is not in use, due to the fact that it can be shortened, it is easy for storage and transportation. For example, a Chinese patent CN2716479Y with the title of *An Extending Ladder* (patent number: ZL200420091638.2) discloses such an extending ladder which comprises: stiles and rungs, each stile is formed of telescopically collapsible columns which are disposed in a nested arrangement; the multiple rungs are fixed between two opposite stiles, each end of each rung is separately provided with an extensible pin which matches with a corresponding positioning socket formed on the column; the upper end of each column is arranged with a circular connecting sleeve which is connected with the rung. When using such an extending ladder, because there is no fixed space between the upper and lower rungs, and the hands of users generally just rest on a certain rung, at the time of folding the extending ladder, then, hidden danger in insecurity exists because the fingers of users placed on the lower rung will be pressed by the upper rung.

Summary of the Invention

[0003] The technical problem which the present invention seeks to solve is to provide, in response to the current state of the prior art, a connecting sleeve for an extending ladder, which provides a fixed space between the upper and lower rungs, thereby effectively preventing the fingers from being pressed by the rungs when folding the extending ladder. Additionally, the whole height of the extending ladder will not exceed the desired level when the product is packaged and transported, thereby being extremely fit for actual use.

[0004] The technical solution used in the present invention for solving the above technical problem is as follows: the connecting sleeve for an extending ladder comprises a connecting ring and a connecting block formed unitarily with each other and is characterized in that a seat and a rotating plate are mounted on the surface of the joint between the connecting ring and the connecting block; the seat is fixed relative to the connecting ring, a socket is provided in the center of the seat, and two shafts are formed at two sides of the socket, respectively extending

to the center;

the rotating plate is substantially in a T-shape, a vertical portion thereof being inserted into the socket of the seat while a transverse portion thereof is located on the seat, additionally, two shafts of the seat are inserted transversely into a through hole provided on the vertical portion;

furthermore, a torsion spring is mounted in the through hole of the vertical portion of the rotating plate and outside the shafts, a first end of the torsion spring is connected to the inner wall of the through hole of the rotating plate, and a second end of the torsion spring is connected to the seat, so as to allow the transverse portion of the rotating plate to rotate toward the connecting block round the shafts and always tend to stand up on the seat.

[0005] The connecting sleeve is connected with the corresponding stile by surrounding the column of the corresponding stile, while the connecting block is connected with the rung by inserting the end of the connecting block into the rung.

[0006] In order to further guarantee that the setting of the seat and the rotating plate effectively protect the hands of the users, the height of the rotating plate should be bigger than the thickness of the fingers.

[0007] In order to have a convenient assembly of parts, the seat can be composed of left and right sub-seats joined with each other, and the bottom of each sub-seat is inserted via a projecting column into the surface of the joint between the connecting ring and the connecting block.

[0008] As a further improvement, the transverse portion of the rotating plate may be trapeziform, so that the top thereof has a horizontal surface for convenient propping against the bottom of the upper rung. The thickness of the rotating plate is adapted to that of the seat, so that the rotating plate can form a whole with the seat when the rotating plate stands up, the surface can be tidy, and after the transverse portion of the rotating plate is folded down to be at the side of the seat, the surface of the rotating plate is substantially at the same level as the top surface of the seat.

[0009] In order to ensure the rotating plate protects the fingers when standing up, the whole height of the rotating plate is preferably bigger than or equal to 2cm.

[0010] Compared with prior art, the advantages of this invention are: with the seat, the rotating plate and the torsion spring therebetween, the transverse portion of the rotating plate is allowed to rotate round the shafts relative to the seat and the connecting sleeve itself, then, when the extending ladder is in normal use, as the rotating plate can always keep standing up relative to the seat, the rotating plate forms a fixed space between the upper and lower rungs. This space may accommodate the fingers, thereby effectively preventing the fingers on the lower rung from being pressed by the upper rung when the extending ladder is folded. Moreover, when the extending ladder is packaged and transported, the transverse portion of the rotating plate can be folded down to

be located at the side of the seat; accordingly, the distance between the upper and lower rungs is only the height of the seat, so the whole height thereof will not exceed the desired level when the product is packaged and transported, thereby being extremely fit for actual use.

Brief Description of the drawings

[0011]

FIG. 1 is a structural schematic diagram of an embodiment of the present invention;

FIG. 2 is a structural schematic diagram of an embodiment of the present invention when the rotating plate is rotated down;

FIG. 3 is a three-dimensional exploded view of an embodiment of the present invention.

Particular Embodiment

[0012] The present invention will be described in further detail below with reference to the embodiment in the accompanying drawings.

[0013] The extending ladder which includes the embodiment of the present invention, comprises two stiles disposed opposite each other and a plurality of rungs each fixed between the two stiles; each stile comprises two inner and outer telescopically collapsible columns which are disposed in a nested arrangement; each rung is fixed between two opposite columns in the same section, furthermore, two ends of each rung are fixed with corresponding columns of the stiles via the connecting sleeve of the embodiment of the present invention.

[0014] As shown in FIG 1 to FIG 3, the connecting sleeve for an extending ladder comprises a connecting ring 1 and a connecting block 2 formed unitarily with each other; a seat 3 and a rotating plate 4 are mounted on the surface of the joint between the connecting ring 1 and the connecting block 2.

[0015] The connecting sleeve 1 is fixed with the corresponding stile by surrounding the column of the corresponding stile, while the connecting block 2 is inserted into the end of the corresponding rung.

[0016] The seat 3 is composed of left and right sub-seats 3a joined with each other, each sub-seat 3a is fixed relative to the connecting ring 1 by inserting a projecting column 33 formed on the bottom of the sub-seat 3a at one side of the connecting ring 1. A socket 31 is provided in the center of the seat 3, and two shafts 32 are formed at two sides of the socket 31 respectively extending to the center of the seat 3.

[0017] The rotating plate 4 is substantially in a T-shape, the total height of which is 3cm; a vertical portion 41 thereof is inserted into the socket 31 of the seat 3 while the transverse portion 42 thereof is trapezoidal and located on the seat 3. The thickness of the rotating plate 4 is basically equal to that of the seat 3.

[0018] Two shafts 32 of the seat 3 are inserted transversely into a through hole 41a provided on the vertical portion 41, so as to allow the transverse portion 42 of the rotating plate 4 to rotate toward the connecting block 2 round the shafts 32, that is to be folded down relative to the connecting block 2.

[0019] Furthermore, a torsion spring 5 is mounted in the through hole 41a of the vertical portion 41 of the rotating plate 4, and outside the shafts 32, a first end of the torsion spring 5 is connected to the inner wall of the through hole 41a of the rotating plate 4, and a second end of the torsion spring 5 is connected to the seat 3, so as to allow the transverse portion 42 of the rotating plate 4 to rotate toward the connecting block 2 round the shafts 32 and always tend to stand up on the seat 3. In other words, under no external force, the transverse portion 42 of the rotating plate 4 will always face up. Therefore, during the practical application, the upper rung of the extending ladder is separated from the lower rung by the whole rotating plate 4 and the seat 3. Only when an external force is applied on the transverse portion 42 of the rotating plate 4 can it be folded down to the connecting block 2, so that the upper rung is separated from the lower rung by the seat 3 only.

Claims

1. A connecting sleeve for an extending ladder comprising a connecting ring (1) and a connecting block (2) formed unitarily with each other, **characterized in that** a seat (3) and a rotating plate (4) are mounted on the surface of the joint between the connecting ring (1) and the connecting block (2); the seat (3) is fixed relative to the connecting ring (1), a socket (31) is provided in the center of the seat (3), and two shafts (32) are formed at two sides of the socket (31) respectively extending to the center; the rotating plate (4) is substantially in a T-shape, a vertical portion (41) thereof being inserted downward into the socket (31) of the seat (3) while a transverse portion (42) thereof is located on the seat (3), additionally, two shafts (32) of the seat (3) are inserted transversely into a through hole (41 a) provided on the vertical portion (41); furthermore, a torsion spring (5) is mounted in the through hole (41a) of the vertical portion (41) of the rotating plate (4) and outside the shafts (32), a first end (51) of the torsion spring (5) is connected to the inner wall of the through hole (41a) of the rotating plate (4), and a second end (52) of the torsion spring (5) is connected to the seat (3), so as to allow the transverse portion (42) of the rotating plate (4) to rotate toward the connecting block (2) round the shafts and always tend to stand up on the seat (3).
2. The connecting sleeve for an extending ladder as claimed in claim 1, **characterized in that** the seat

(3) is composed of left and right sub-seats (3a) joined with each other, each sub-seat (3a) is inserted into the surface of the joint between the connecting ring (1) and the connecting block (2) via a projecting column (33) formed on the bottom of the sub-seat (3a).

3. The connecting sleeve for an extending ladder as claimed in claim 1 or claim 2, **characterized in that** the thickness of the rotating plate (4) is adapted to the thickness of the seat (3).
4. The connecting sleeve for an extending ladder as claimed in claim 1 or claim 2, **characterized in that** the whole height of the rotating plate (4) is bigger than or equal to 2cm.

wobei jeder Untersitz (3a) in die Oberfläche der Verbindungsstelle zwischen dem Verbindungsring (1) und dem Verbindungsblock (2) mittels einer auf der Unterseite des Untersitzes (3a) gebildeten vorstehenden Säule (33) eingesetzt ist.

3. Verbindungsmuffe für eine Ausziehleiter nach Anspruch 1 oder Anspruch 2, **dadurch gekennzeichnet, dass** die Dicke der drehbaren Platte (4) an die Dicke des Sitzes (3) angepasst ist.
4. Verbindungsmuffe für eine Ausziehleiter nach Anspruch 1 oder Anspruch 2, **dadurch gekennzeichnet, dass** die gesamte Höhe der drehbaren Platte (4) größer oder gleich 2 cm ist.

Patentansprüche

1. Verbindungsmuffe für eine Ausziehleiter, umfassend einen Verbindungsring (1) und einen Verbindungsblock (2), welche einheitlich miteinander ausgebildet sind, **dadurch gekennzeichnet, dass** ein Sitz (3) und eine drehbare Platte (4) auf der Oberfläche der Verbindungsstelle zwischen dem Verbindungsring (1) und dem Verbindungsblock (2) befestigt sind; wobei der Sitz (3) relativ zu dem Verbindungsring (1) fixiert ist, wobei eine Aufnahme (31) in der Mitte des Sitzes (3) vorgesehen ist, und wobei zwei Stiele (32) auf zwei Seiten der Aufnahme (31) ausgebildet sind, die sich jeweils zu der Mitte hin erstrecken; wobei die drehbare Platte (4) im Wesentlichen in einer T-Form vorliegt, wobei ein vertikaler Bereich (41) derselben nach unten in die Aufnahme (31) des Sitzes (3) eingesetzt ist, während ein transversaler Bereich (42) derselben auf dem Sitz (3) angeordnet ist, wobei zwei Stiele (32) des Sitzes (3) transversal in eine Durchgangsbohrung (41 a), welche in dem vertikalen Bereich (41) vorgesehen ist, eingesetzt sind; wobei weiterhin eine Torsionsfeder (5) in der Durchgangsbohrung (41 a) des vertikalen Bereichs (41) der drehbaren Platte (4) und außerhalb der Stiele (32) befestigt ist, wobei ein erstes Ende (51) der Torsionsfeder (5) mit der inneren Wand der Durchgangsbohrung (41a) der drehbaren Platte (4) verbunden ist, und wobei ein zweites Ende (52) der Torsionsfeder (5) mit dem Sitz (3) verbunden ist, sodass der transversale Bereich (42) der drehbaren Platte (4) hin zu dem Verbindungsblock (2) um die Stiele drehen kann und immer dazu tendiert, auf dem Sitz (3) aufrecht zu stehen.
2. Verbindungsmuffe für eine Ausziehleiter nach Anspruch 1, **dadurch gekennzeichnet, dass** der Sitz (3) aus linken und rechten Untersitzen (3a), welche miteinander verbunden sind, zusammengesetzt ist,

Revendications

1. Manchon de raccordement pour une échelle à coulisse comprenant une bague de raccordement (1) et un bloc de raccordement (2) formés en une seule pièce, **caractérisé en ce qu'un** siège (3) et une plaque tournante (4) sont montés sur la surface de la jonction entre la bague de raccordement (1) et le bloc de raccordement (2) ; le siège (3) est fixe par rapport à la bague de raccordement (1), une douille (31) est prévue au centre du siège (3), et deux arbres (32) sont formés au niveau des deux côtés de la douille (31) s'étendant respectivement vers le centre ; la plaque tournante (4) est sensiblement en forme de T, une partie verticale (41) de celle-ci étant insérée vers le bas dans la douille (31) du siège (3) tandis qu'une partie transversale (42) de celle-ci est située sur le siège (3), en outre, deux arbres (32) du siège (3) sont insérés de manière transversale dans un trou traversant (41 a) prévu sur la partie verticale (41) ; En plus, un ressort de torsion (5) est monté dans le trou traversant (41a) de la partie verticale (41) de la plaque tournante (4) et à l'extérieur des arbres (32), une première extrémité (51) du ressort de torsion (5) est raccordée à la paroi intérieure du trou traversant (41a) de la plaque tournante (4), et une deuxième extrémité (52) du ressort de torsion (5) est raccordée au siège (3), de manière à permettre à la partie transversale (42) de la plaque tournante (4) de tourner vers le bloc de raccordement (2) autour des arbres et d'avoir toujours tendance à se dresser sur le siège (3).
2. Manchon de raccordement pour une échelle à coulisse tel que revendiqué dans la revendication 1, **caractérisé en ce que** le siège (3) est composé de sous-sièges gauche et droit (3a) reliés l'un à l'autre, chaque sous-siège (3a) est inséré dans la surface de la jonction entre la bague de raccordement (1) et

le bloc de raccordement (2) par l'intermédiaire d'une colonne en saillie (33) formée sur le fond du sous-siège (3a).

3. Manchon de raccordement pour une échelle à coulisse tel que revendiqué dans la revendication 1 ou 2, **caractérisé en ce que** l'épaisseur de la plaque tournante (4) est adaptée à l'épaisseur du siège (3). 5
4. Manchon de raccordement pour une échelle à coulisse tel que revendiqué dans la revendication 1 ou 2, **caractérisé en ce que** toute la hauteur de la plaque tournante (4) est supérieure ou égale à 2 cm. 10

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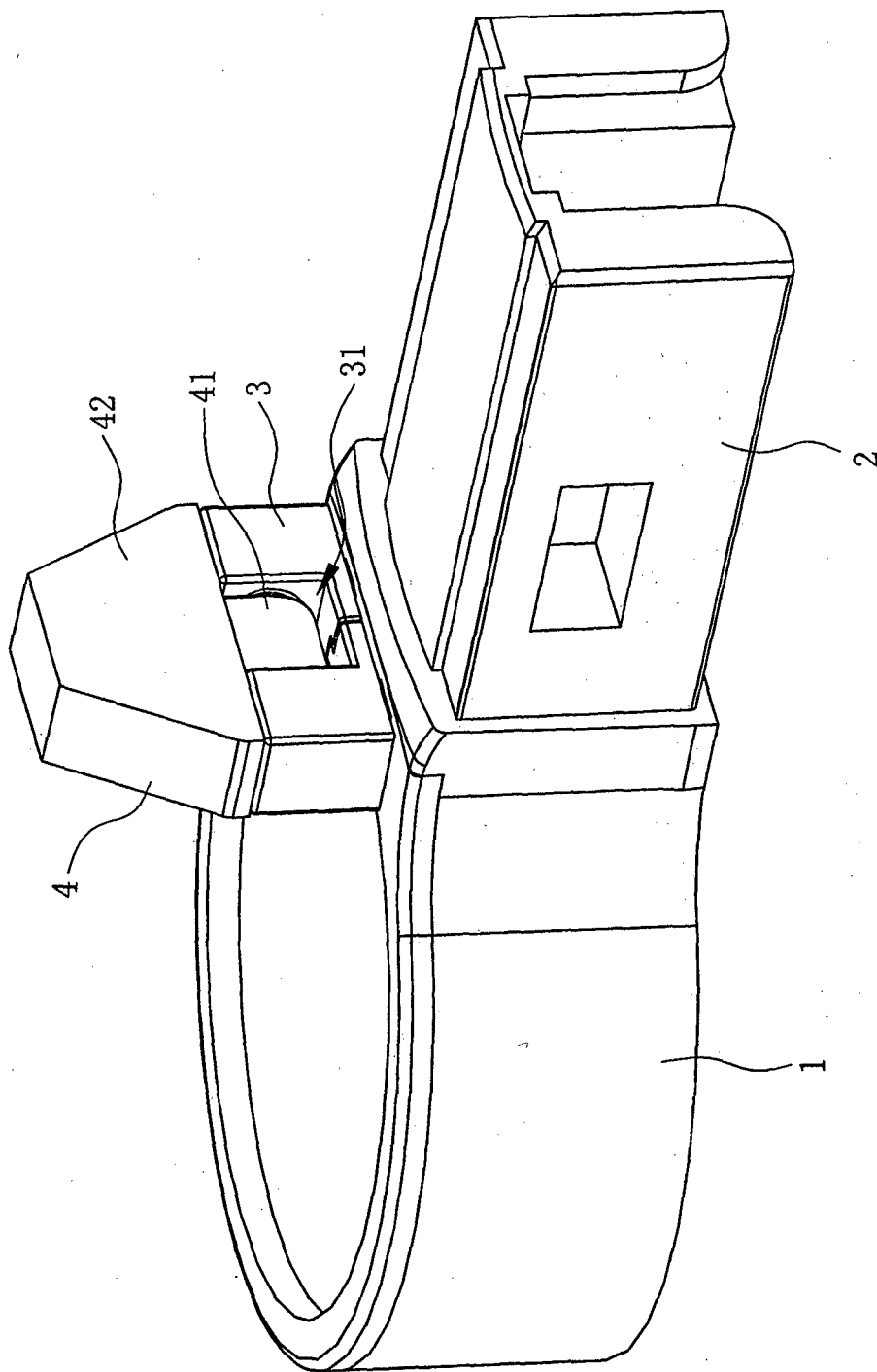


Fig. 1

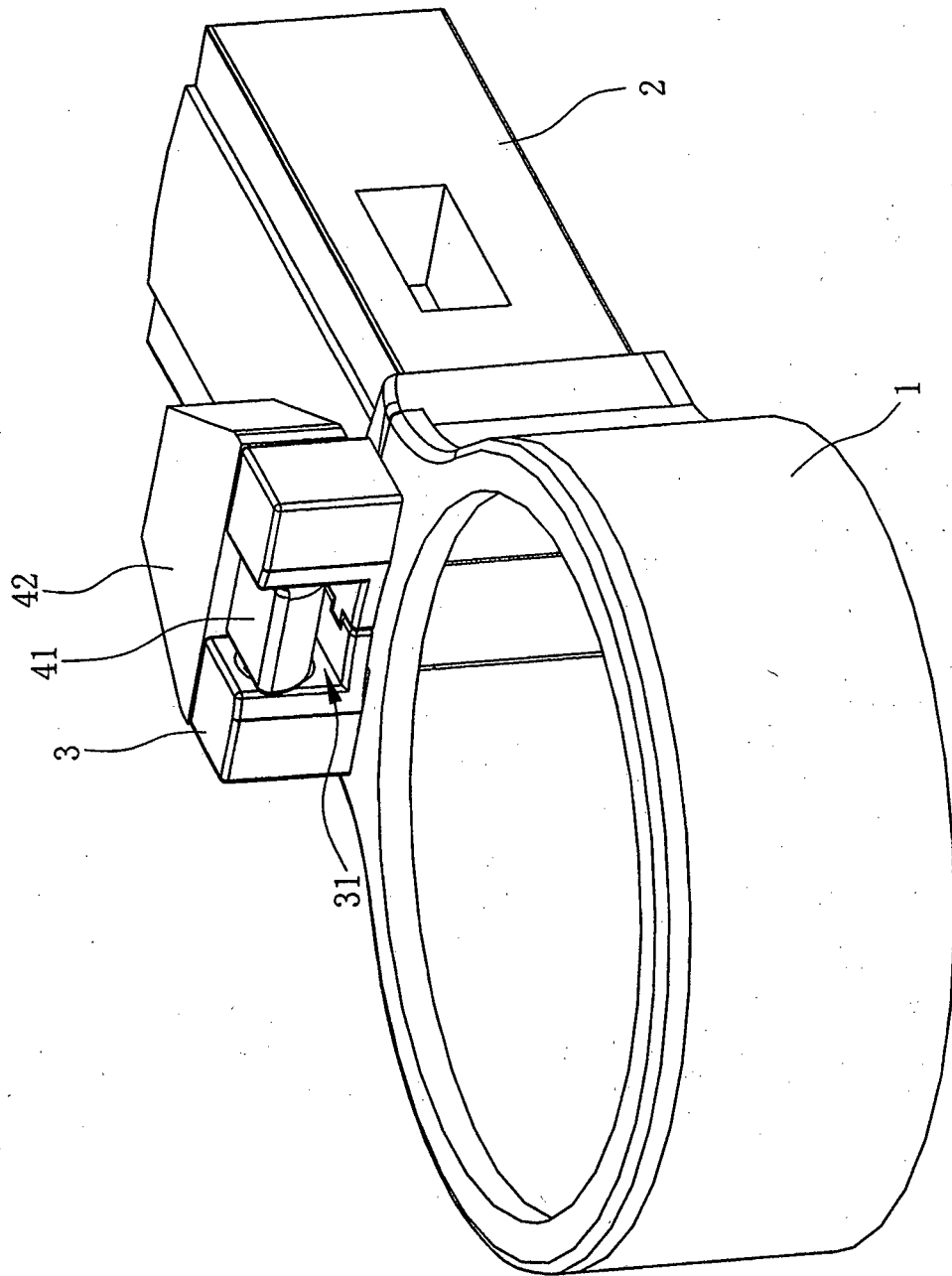


Fig. 2

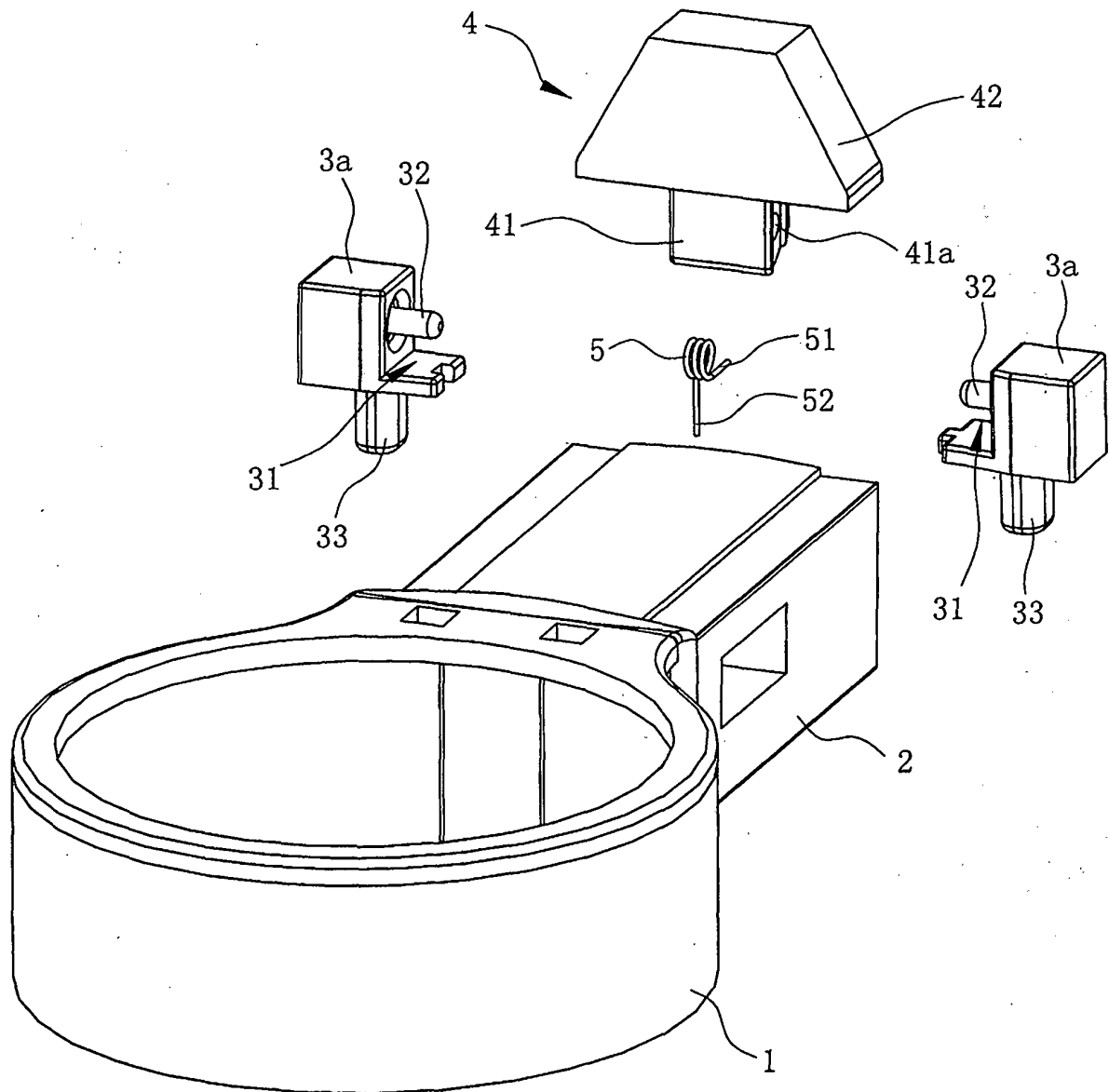


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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