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(54) PULL ROD BAG WITH STRETCHABLE WHEELS AND WHEEL STRETCHING OPERATION MECHANISM

(57) A pull rod bag with telescopic wheels (1) and a wheel telescoping operation mechanism, the wheel telescoping operation mechanism comprising: two pushing parts (9), the front end of each pushing part (9) can be connected with the rotating shaft (7) of a corresponding telescopic wheel (1); a transmission unit, comprising a transmission rod (8), two ends of the transmission rod (8) are connected with the rear end of a corresponding pushing part (9), respectively, such that the rotating shaft (7) of the corresponding telescopic wheel (1) can be driven to move back and forth in a mounting groove (45) when the transmission rod (8) moves up and down; and two locking parts (3), each locking part (3) can cooperate with a corresponding pushing part (9) so that the rotating shaft (7) of the telescopic wheel (1) connected with the corresponding pushing part (9) is locked in a folded state or an unfolded state. The pull rod bag with telescopic wheels (1) comprises a base (4) and two telescopic wheels (1) arranged on two sides of the base (4), respectively, as well as the above wheel telescoping operation mechanism arranged on the base (4). The pull rod bag with telescopic wheels (1) and the wheel telescoping operation mechanism are simple and reliable in structure and convenient to operate.

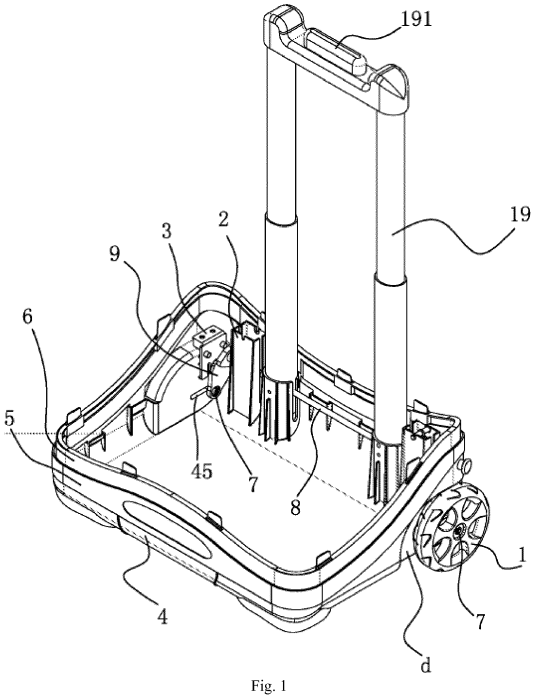

Fig. 1

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Description

Field of the Invention

[0001] The present invention relates to a bag and in particular to a pull rod bag with telescopic wheels.

Description of the Related Art

[0002] Existing pull rod bags with telescopic wheels, such as the bidirectional foldable multi-functional soft luggage with telescopic wheels disclosed by the Chinese Patent ZL200720032899.0, comprise a luggage frame and a soft shell luggage body, the luggage frame comprises left and right horizontal bent pipes and left and right vertical pipes symmetrically arranged on left and right wheel covers, the ends of the left and right vertical pipes are movably connected to the movable pull rod, and the ends of the left and right movable pull rods are movably connected with pull external sleeves and pull internal sleeves, respectively, and the pull external sleeves and pull internal sleeves are connected with the ends of the left and right horizontal bent pipes via socket joint, respectively; the left and right horizontal bent pipes are connected with each other via a directional hinge, and so are the left and right vertical pipes; a telescopic wheel controlled by a telescoping mechanism is arranged inside the wheel cover; the soft shell luggage body is fixed to the horizontal bent pipes and vertical pipes of the luggage frame through sewing. Wherein, the telescoping mechanism comprises a triangular movable wheel bracket and a movable support, one end of the triangular movable wheel bracket is connected to the wheel cover via the movable wheel bracket shaft that is fixed to the end of the wheel cover proximate to the horizontal bent pipes, another end is provided with a movable wheel bracket retainer, and the third end thereof is connected to the wheel via the wheel shaft; one end of the movable support is connected to the wheel cover via the movable support shaft that is fixed to the wheel cover proximate to the vertical pipes, the other end thereof is formed with a jack, and the jack is adapted to the movable wheel bracket retainer. When the telescopic wheels need to be unfolded, the left and right movable supports need to be pulled outwardly such that the wheels extend out, and then the movable wheel bracket retainer is inserted into the jack on the end of the movable supports such that the movable supports and the movable wheel bracket are fixed. With respect to this structure, the operation structure of telescopic wheels is complex and unreliable, and moreover, it is not easy to operate. Therefore, it is necessary to improve the existing pull rod bags with telescopic wheels.

Summary of the Invention

[0003] The technical problem that the present invention intends to solve is to overcome the drawbacks of prior art by providing a pull rod bag with telescopic wheels and a wheel telescoping operation mechanism that has a simple and reliable structure and is convenient to operate.

[0004] The technical solution according to the present invention in response to the above technical problem comprises: a wheel telescoping operation mechanism, comprising: two pushing parts, the front end of each pushing part can be connected with the rotating shaft of a corresponding telescopic wheel; a transmission unit, comprising a transmission rod, two ends of the transmission rod are connected with the rear end of a corresponding pushing part, respectively, such that the rotating shaft of the corresponding telescopic wheel can be driven to move back and forth in a mounting groove when the transmission rod moves up and down; and two locking parts, each locking part can cooperate with a corresponding pushing part so that the rotating shaft of the telescopic wheel connected with the corresponding pushing part is locked in a folded state or an unfolded state.

[0005] The mounting groove extends horizontally.

[0006] The front end of each pushing part is formed with a mounting hole, and the rotating shaft of the telescopic wheel rotatably runs through the mounting hole; the rear end of each pushing part is provided with a sleeve, and the end of the transmission rod is inserted in the sleeve.

[0007] Each pushing part is formed with a locking groove thereon, and the locking groove comprises a folding end and an unfolding end; each locking part is provided with a projection, and the projection can be correspondingly received into the locking groove to limit the movement of the pushing part.

[0008] The locking groove comprises a first segment and a second segment that are open to each other, one end of the first segment forms an obtuse angle with one end of the second segment, the other end of the first segment forms the folding end, and the other end of the second segment forms the unfolding end.

[0009] From inside to outside, the rotating shaft of the telescopic wheel first runs through the mounting groove and then runs through the central axle hole of the telescopic wheel, and the external end of the rotating shaft of the telescopic wheel extends out of the central axle hole and is fixed by means of a retainer ring.

[0010] The transmission unit further comprises two transmission rod mounting parts capable of being installed into two mounting columns, respectively, and the transmission rod horizontally runs through the two transmission rod mounting parts and is capable of moving up and down along the vertical grooves on said two mounting columns.

[0011] The transmission unit further comprises a set of push and pull rods, and the set of push and pull rods is provided with two pipe locks therein for engagement with the two transmission rod mounting parts, respectively.

[0012] The transmission unit further comprises two spring mounting parts and two springs, each spring

mounting part is disposed at the external side of the corresponding mounting column, the top end of each spring is connected to the top of a corresponding spring mounting part, and the bottom end thereof is connected to the transmission rod.

[0013] The technical solution according to the present invention in response to the above technical problem further comprises: a pull rod bag with telescopic wheels, comprising a base and two telescopic wheels arranged on two sides of the base, respectively, as well as the wheel telescoping operation mechanism arranged on the base.

[0014] Compared with prior art, the pull rod bag with telescopic wheels and the wheel telescoping operation mechanism according to the present invention forms a mounting groove extending back and forth on the base, runs the rotating shafts of the telescopic wheels through the mounting groove, and then provides the pushing parts, the transmission unit and the locking parts that cooperate mutually. As a result, it can control the folding and unfolding of the two telescopic wheels arranged on two sides of the base, respectively. It has a simple and reliable structure and is convenient to operate.

Brief Description of the Accompanying Drawings

[0015]

Fig. 1 is a three dimensional view of the wheel telescoping operation mechanism according to the present invention, wherein the telescopic wheels are in the unfolded state.

Fig. 2 is a three dimensional view of the wheel telescoping operation mechanism according to the present invention, wherein the telescopic wheels are in the folded state.

Fig. 3 is an exploded view of the wheel telescoping operation mechanism according to the present invention.

[0016] Wherein, the legends in the drawings are described as follows: 1 telescopic wheel, 2 spring mounting part, 3 locking part 34 projection, 4 base 45 mounting groove a folding end b unfolding end d wheel horizontal movement distance 46 mounting column 461 vertical groove, 5 central ring, 6 upper ring, 7 rotating shaft, 8 transmission rod, 9 pushing part 91 body 92 sleeve 93 mounting hole 94 locking groove, 10 spring pin, 11 spring, 12 wheel groove cover, 13 transmission rod mounting part, 14 wheel rubber cover, 15 screw, 16 screw, 17 retainer ring, 18 pipe lock, 19 push and pull rod 191 handle.

Detailed Description of the Preferred Embodiment

[0017] The present invention will be further described in detail below with reference to the accompanying drawings.

[0018] Referring to Fig. 1 to Fig. 3, an embodiment of the wheel telescoping operation mechanism according to the present invention substantially comprises: two pushing parts 9, the front end of each pushing part 9 is connected with the rotating shaft 7 of a corresponding telescopic wheel 1; a transmission unit, comprising a transmission rod 8, two ends of the transmission rod 8 are connected with the rear end of a corresponding pushing part 9, respectively, such that the rotating shaft 7 of the corresponding telescopic wheel 1 can be driven to move back and forth in a mounting groove 45 when the transmission rod 8 moves up and down, and the mounting groove 45 comprises a front end a and a rear end b; and two locking parts 3, each locking part 3 can cooperate with a corresponding pushing part 9 so that the rotating shaft 7 of the telescopic wheel 1 connected with the corresponding pushing part 9 is locked in a folded state or an unfolded state. Preferably, the mounting groove 45 extends horizontally such that the telescopic wheel 1 can horizontally move back and forth to be unfolded and folded.

[0019] The pushing part 9 comprises a body 91, a sleeve 92 arranged at the rear end of the body 91, a locking groove 94 formed on the body, and a mounting hole 93 formed at the front end of the body 91, wherein the rotating shaft 7 of the telescopic wheel 1 rotatably runs through the mounting hole 93, the end of the transmission rod 8 is inserted in the sleeve 92, the locking groove 94 is substantially in a herringbone shape, including a first segment and a second segment that are open to each other, the first end of the first segment forms an obtuse angle with the first end of the second segment, the second end of the first segment and the second end of the second segment form two locking points, respectively: the folding end and the unfolding end.

[0020] From inside to outside, the rotating shaft 7 first runs through the mounting groove 45 and then runs through the central axle hole of the telescopic wheel 1, the dimension of the internal end of the rotating shaft 7 is greater than the width of the mounting groove 45, and the external end of the rotating shaft 7 extends out of the central axle hole and is fixed by means of a retainer ring 17. Preferably, the retainer ring is E-shaped.

[0021] The locking part 3 is provided with a projection 34, and the projection 34 can be correspondingly received into the locking groove 94 of the pushing part 9 to limit the movement of the pushing part 9.

[0022] The transmission unit further comprises two transmission rod mounting parts 13, two spring mounting parts 2, two springs 11, two pipe locks 18 and a set of push and pull rods 19 that cooperate with the transmission rod 8. The two transmission rod mounting parts 13 can be installed into two mounting columns 46 on the base 4, respectively, and the transmission rod 8 horizontally runs through the two transmission rod mounting parts 13 and is capable of moving up and down along the vertical grooves 461 on said two mounting columns

46. The two pipe locks 18 are arranged inside the set of push and pull rods 19 for engagement with the two transmission rod mounting parts 13, respectively. The operation of the handle 191 on the push and pull rods 19 can control the pipe locks 18 to be in either the unfolded state or the folded state. Each spring mounting part 2 is disposed at the external side of the corresponding mounting column 46, the transmission rod 8 runs across the two spring mounting parts 2, the top end of each spring 11 is connected to the top of a corresponding spring mounting part 2, and the bottom end thereof is connected to the transmission rod 8. Preferably, a spring pin 10 may be installed on top of the spring mounting part 2, and the top end of the spring 11 is installed on the spring pin 10.

[0023] The pull rod bag with telescopic wheels according to the present invention comprises a base 4, two telescopic wheels 1, and the above wheel telescoping operation mechanism. The two telescopic wheels 1 may be arranged on two sides of the base 4, respectively, by means of the structural parts, such as the wheel groove cover 12, the wheel rubber cover 14 and screws 16. The two locking parts 3 may be arranged to the inner side of the base 4 by means of screws 15.

[0024] Due to water resistance and aesthetic considerations, it may further comprise a central ring 5 that is buckled to the base 4 and an upper ring 6 that is buckled to the central ring 5. The base 4, the central ring 5 and the upper ring 6 may all be made of a polymer material through injection molding. The bottom of the upper ring 6 can be firmly connected to the bottom of a textile (not shown) through sewing.

[0025] The working principle of the pull rod bag with telescopic wheels according to the present invention is substantially as follows: press down the handle 191 such that the pipe locks 18 are unlocked, the push and pull rods 19 will move upwardly as acted on by the springs 11, consequently the transmission rod 8 will drive the pushing parts 9 such that the rotating shaft 7 moves to the back, when the push and pull rods 19 rise to the high point, the locking parts 3 will lock the pushing parts 9, the telescopic wheels 1 move horizontally to the back by a preset distance of d relative to the folded state and are in the unfolded state, in which they can contact the ground and roll; on the other hand, press back the handle 191 such that the pipe locks 18 are locked, push the push and pull rods 19 downwardly, the transmission rod 8 will move downwardly and drive the pushing parts 9, such that the rotating shaft 7 moves to the front, when the push and pull rods 19 lower down to the low point, the locking parts 3 will also lock the pushing parts 9, the telescopic wheels 1 move horizontally to the front by a preset distance of d relative to the unfolded state and are in the folded state, in which the telescopic wheels 1 are retracted into the base 4.

[0026] Compared with the prior art, the pull rod bag with telescopic wheels and the wheel telescoping operation mechanism according to the present invention has the following advantages: it forms a mounting groove 45 extending back and forth on the base 4, runs the rotating shafts 7 of the telescopic wheels 1 through the mounting groove 45, and then provides the pushing parts 9, the locking parts 3, and the transmission unit composed of the transmission rod 8 and other parts that cooperate mutually. As a result, it can control the folding and unfolding of the two telescopic wheels 1 arranged on two sides of the base 4, respectively. It has a simple and reliable structure and is convenient to operate.

[0027] Preferred examples of the present invention are described above, which are not used to limit embodiments of the present invention. According to the main concept and spirit of the present invention, those skilled in the art can easily make corresponding variations or modifications. As a result, the scope of the present invention shall be subject to the appended claims.

Claims

1. A wheel telescoping operation mechanism, **characterized in that** it comprises: two pushing parts, the front end of each pushing part can be connected with the rotating shaft of a corresponding telescopic wheel; a transmission unit, comprising a transmission rod, two ends of the transmission rod are connected with the rear end of a corresponding pushing part, respectively, such that the rotating shaft of the corresponding telescopic wheel can be driven to move back and forth in a mounting groove as the transmission rod moves up and down; and two locking parts, each locking part can cooperate with a corresponding pushing part so that the rotating shaft of the telescopic wheel connected with the corresponding pushing part is locked in a folded state or an unfolded state.

2. The wheel telescoping operation mechanism as set forth in Claim 1, **characterized in that** the mounting groove extends horizontally.

3. The wheel telescoping operation mechanism as set forth in Claim 1, **characterized in that** the front end of each pushing part is formed with a mounting hole, and the rotating shaft of the telescopic wheel rotatably runs through the mounting hole; the rear end of each pushing part is provided with a sleeve, and the end of the transmission rod is inserted in the sleeve.

4. The wheel telescoping operation mechanism as set forth in Claim 1, **characterized in that** each pushing part is formed with a locking groove thereon, and the locking groove comprises a folding end and an unfolding end; each locking part is provided with a projection, and the projection can be correspondingly received into the locking groove to limit the movement of the pushing part.

5. The wheel telescoping operation mechanism as set forth in Claim 4, **characterized in that** the locking groove comprises a first segment and a second segment that are open to each other, one end of the first segment forms an obtuse angle with one end of the second segment, the other end of the first segment forms the folding end, and the other end of the second segment forms the unfolding end.

6. The wheel telescoping operation mechanism as set forth in Claim 1, **characterized in that** from inside to outside, the rotating shaft of the telescopic wheel first runs through the mounting groove and then runs through the central axle hole of the telescopic wheel, and the external end of the rotating shaft of the telescopic wheel extends out of the central axle hole and is fixed by means of a retainer ring.

7. The wheel telescoping operation mechanism as set forth in Claim 1, **characterized in that** the transmission unit further comprises two transmission rod mounting parts capable of being installed into two mounting columns, respectively, and the transmission rod horizontally runs through the two transmission rod mounting parts and is capable of moving up and down along the vertical grooves on said two mounting columns.

8. The wheel telescoping operation mechanism as set forth in Claim 7, **characterized in that** the transmission unit further comprises a set of push and pull rods, and the set of push and pull rods is provided with two pipe locks therein for engagement with the two transmission rod mounting parts, respectively.

9. The wheel telescoping operation mechanism as set forth in Claim 7, **characterized in that** the transmission unit further comprises two spring mounting parts and two springs, each spring mounting part is disposed at the external side of the corresponding mounting column, the top end of each spring is connected to the top of a corresponding spring mounting part, and the bottom end thereof is connected to the transmission rod.

10. A pull rod bag with telescopic wheels, **characterized in that** it comprises a base and two telescopic wheels arranged on two sides of the base, respectively, as well as the wheel telescoping operation mechanism arranged on the base as set forth in any one of Claims 1 to 9.

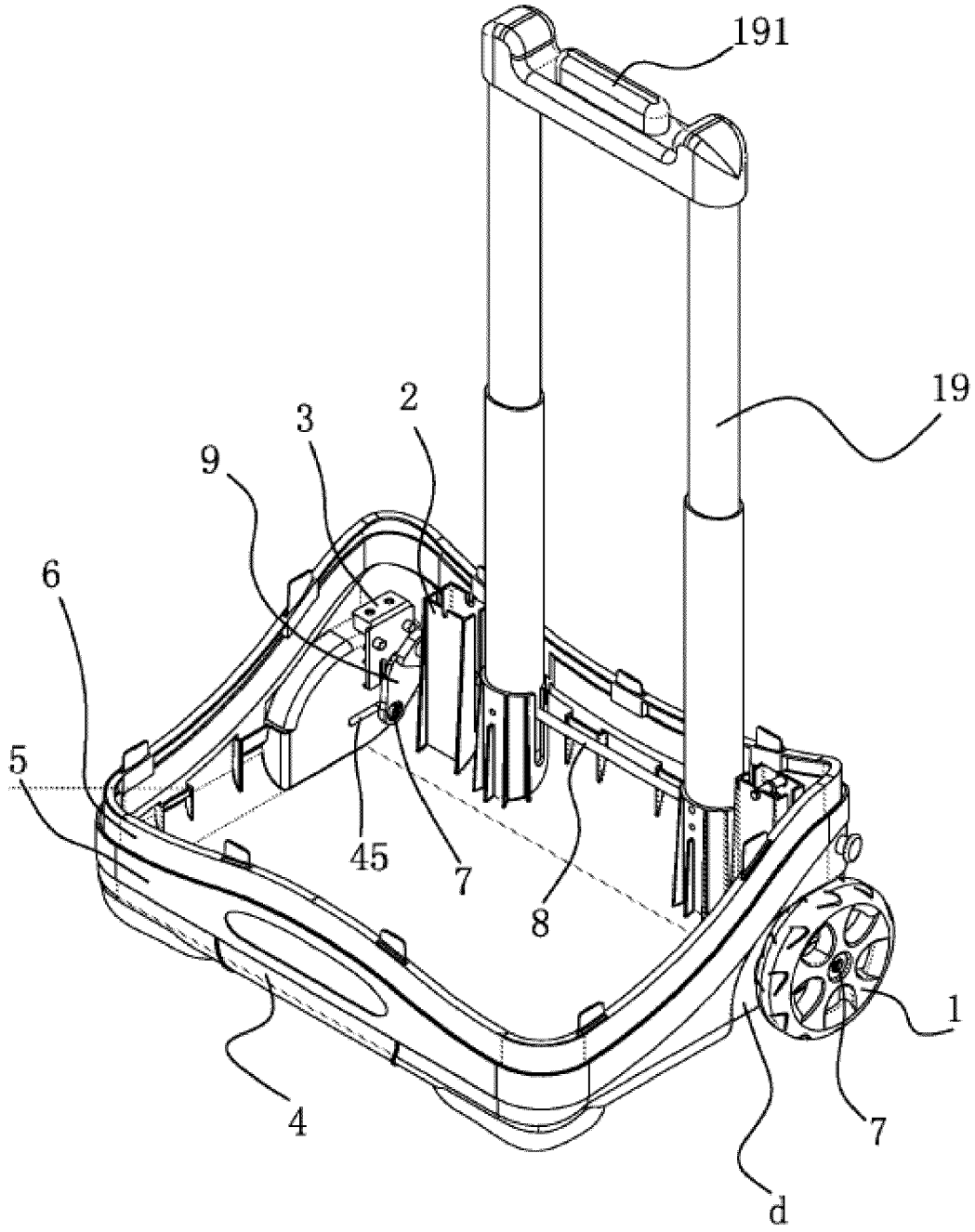

Fig. 1

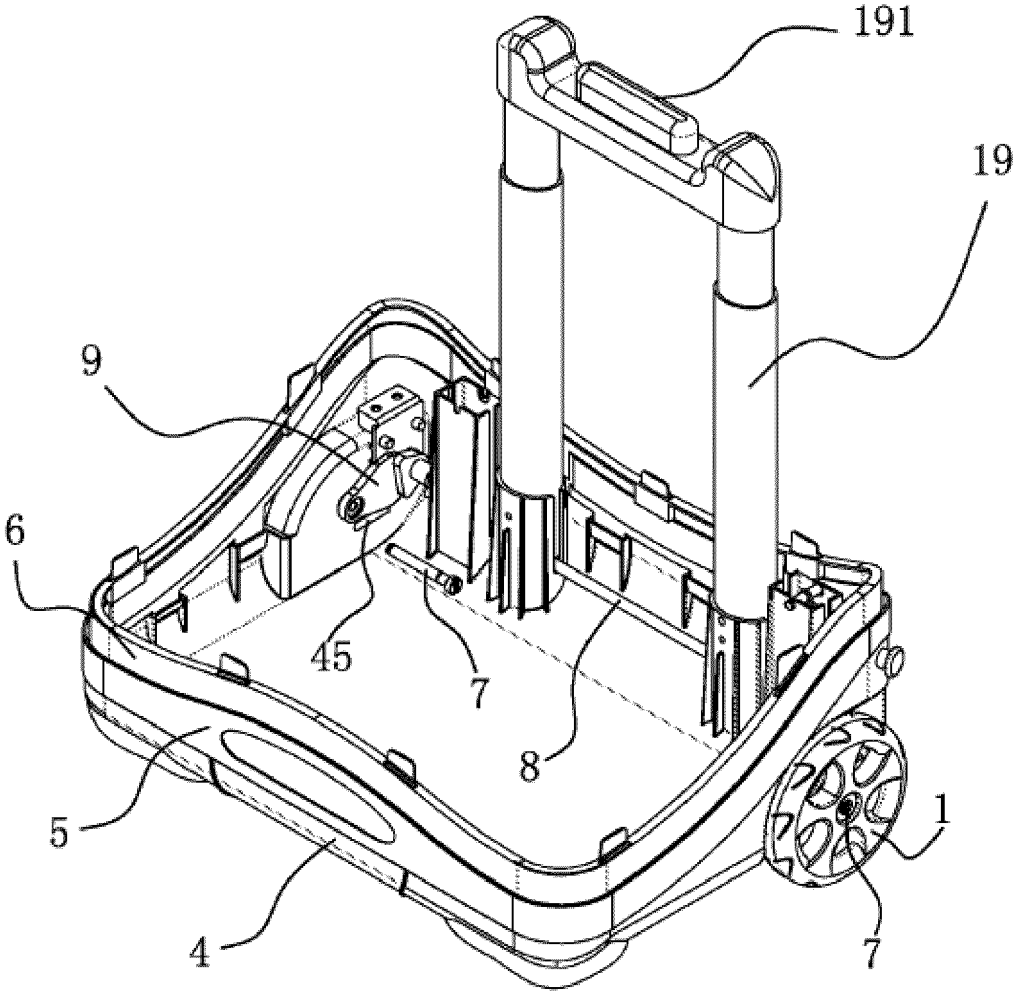

Fig. 2

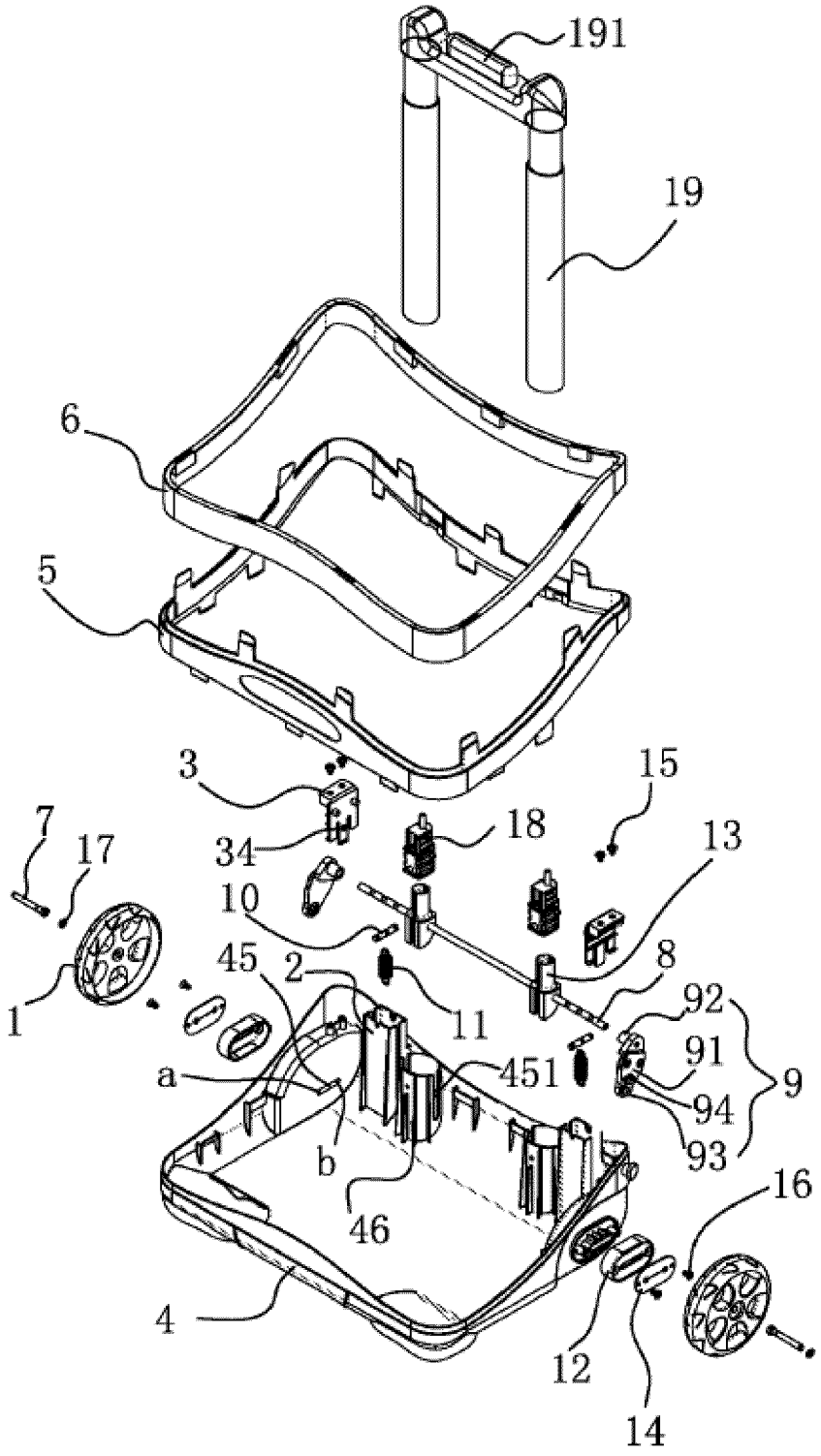
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Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2012/081557

A. CLASSIFICATION OF SUBJECT MATTER

A45C 5/14 (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)

IPC: A45C 5/+

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, VEN: retract+ enclose+ wheel+ cast+ roll+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	CN 2396682 Y (WANG, Donglong) 20 September 2000 (20.09.2000) the whole document	1-10
A	CN 2611195 Y (FENGHAN (XIAOMEN) PLASTIC PRODUCTS DEVELOPMENT CO LTD) 14 April 2004 (14.04.2004) the whole document	1-10
A	US 6360400 B1 (CHANG Fu-Jung) 26 March 2002 (26.03.2002) the whole document	1-10
A	US 2004004332 A1 (TSAI Bi-Hua) 08 January 2004 (08.01.2004) the whole document	1-10
A	US 2007007737 A1 (DAYTON Douglas C.) 11 January 2007 (11.01.2007) the whole document	1-10

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

* Special categories of cited documents:

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"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 December 2012 (21.12.2012)	**10 January 2013 (10.01.2013)**
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer ZHOU, Yu Telephone No. (86-10) **62085894**

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2012/081557

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 2009166140 A1 (GORGA Aaron et al.) 02 July 2009 (02.07.2009) the whole document	1-10
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A	WO 2005035400 A2 (O'SHEA Timothy J. C.) 21 April 2005 (21.04.2005) the whole document	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Patent documents cited in the description

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