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

(11) EP 3 245 893 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.11.2017 Bulletin 2017/47

(51) Int Cl.:
A45C 5/03 *(2006.01)* ***A45C 7/00*** *(2006.01)*

(21) Application number: **16179917.6**

(22) Date of filing: **18.07.2016**

(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:
MA MD

(30) Priority: **18.05.2016 TW 105207239**

(71) Applicant: **C & C Luggage Manufacturing Co., Ltd.**
Zhongshan Guangdong (CN)

(72) Inventor: **CHIANG, Hsi-Wu**
Zhongshan, Guangdong (CN)

(74) Representative: **Becker Kurig Straus**
Patentanwälte
Bavariastrasse 7
80336 München (DE)

(54) EXTENDABLE LUGGAGE

(57) An extendable luggage (1) includes a first shell (10), a second shell (20), an annular strap (30), at least one extendable device (40) and at least one guiding device (50). The annular strap (30) connects the first shell (10) with the second shell (20). The extendable device (40) has a movable base (42) disposed at the first shell (10), a fixed base (44) disposed at the second shell (20) and sleeved to the movable base (42), and a positioning mechanism (46) connected with the fixed base (44) and the movable base (42). When an operation end (460) of the positioning mechanism (46) exposed from the first shell (10) is actuated, the positioning mechanism (46) is in an unlocked state where the movable base (42) is moveable relative to the fixed base (44). When the operation end (460) is actuated, the positioning mechanism (46) is in an unlocked state where the movable base (42) is moveable relative to the fixed base (44). As a result, user can extend the luggage (1) uniformly according to demand to increase accommodating capacity thereof.

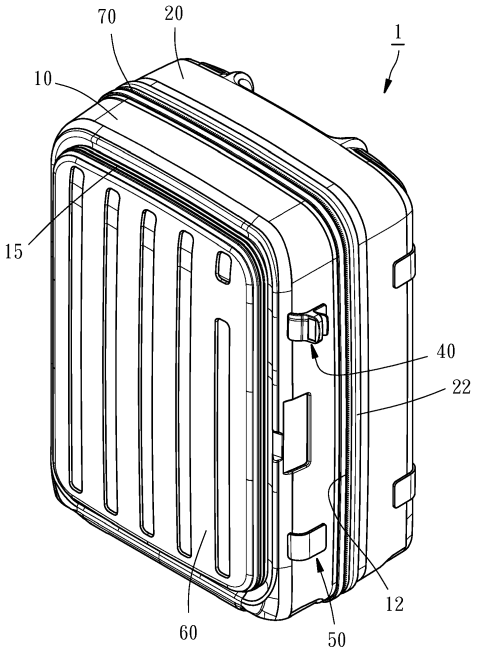

FIG. 1

EP 3 245 893 A1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to luggage and more particularly, to an extendable luggage.

2. Description of the Related Art

[0002] Current commercial luggage is mainly classified into two types, soft shell luggage and hard shell luggage, wherein a part of soft shell luggage has an extendable function which extends a certain accommodating capacity with an increment of goods inside the soft shell luggage as long as a specific device such as a zip fastener is unlocked, to solve a problem that the original capacity can't accommodate all goods. However, when positions where goods are placed are not averagely distributed inside the soft shell luggage, extensions of different parts of the luggage may be different, the luggage would be deformed, and it's easier to damage the goods inside the luggage because the shell body of the luggage may be pressed by external force during transportation of the luggage. When compared with the soft shell luggage, although goods inside a commercial hard shell luggage may has lower probability to be damaged, but the hard shell luggage does not have the extendable function, and thus an usage capacity of the hard shell luggage is still limited. Therefore, designing a luggage capable of extending the accommodating capacity uniformly and reducing the probability that goods get damaged becomes a goal which the related industry wants to achieve.

SUMMARY OF THE INVENTION

[0003] The present invention has been accomplished in view of the above-noted circumstances. It is an objective of the present invention to provide an extendable luggage can be extended uniformly according to demand of user so as to increase accommodating capacity thereof.

[0004] To attain the above objective, the present invention provides an extendable luggage including a first shell, a second shell, an annular strap, at least on extendable device and at least one guiding device. The first shell has a first opening edge and at least one through hole. The second shell has a second opening edge. Two sides of the annular strap are respectively connected with the first opening edge and the second opening edge so as to connect the first shell with the second shell. The extendable device has a movable base disposed at the first shell, a fixed base disposed at the second shell and inserted by the movable base, and a positioning mechanism connected with the fixed base and the movable base. The positioning mechanism has an operation end exposed from the first shell through the through hole. When the operation end is not actuated, the positioning mechanism is in a locked state where the movable base is not movable relative to the fixed base. When the operation end is actuated, the positioning mechanism is in an unlocked state where the movable base is moveable relative to the fixed base. The guiding device has a movable tube disposed at the first shell and a fixed tube disposed at the second shell and sleeved to the movable tube.

[0005] Accordingly, when user actuates the operation end, the luggage can be extended uniformly according to demand so as to extend accommodating capacity thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 is a perspective view of a luggage before extending according to a first preferred embodiment of the present invention.

FIG. 2 is an exploded perspective view of a part of the extendable luggage according to the first preferred embodiment of the present invention.

FIG. 3 is a perspective view of the luggage after extending according to the first preferred embodiment of the present invention.

FIG. 4 is a perspective view of an extendable device according to the first preferred embodiment of the present invention.

FIG. 5 is an exploded perspective view of the extendable device of the first preferred embodiment of the present invention.

FIG. 6 is a sectional view of FIG. 4 along a direction 6-6.

FIG. 7 is a perspective view of a guiding device of the first preferred embodiment of the present invention.

FIG. 8 is an exploded perspective view of the guiding device of the first preferred embodiment of the present invention.

FIG. 9 is a sectional view of FIG. 7 along a direction 9-9.

FIG. 10 is a perspective view of a pin member of the first preferred embodiment of the present invention.

FIGs. 11-15 illustrate the function of the extendable device according the first preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0007] Referring to FIGs. 1 to 3, an extendable luggage 1 according to a first preferred embodiment of the present invention includes a first shell 10, a second shell 20, an annular strap 30, two extendable devices 40, two guiding devices 50, a case cover 60 disposed at the first shell 10, and a zip fastener 70.

[0008] The first shell 10 has a first opening edge 12.

Diagonal positions of the first shell 10 have two through holes 14. The first shell 10 is connected with the case cover 60 by a zip fastener 15. When the zip fastener 15 is unfastened, the case cover 60 is swingable relative to the first shell 10, so as to open the luggage 1. In other embodiments, the connecting manner of the case cover 60 and the first shell 10 is not limited thereto, and the case cover 60 may be disposed on the second shell 20.

[0009] The second shell 20 has a second opening edge 22.

[0010] Two sides of the annular strap 30 are respectively connected with the first opening edge 12 and the second opening edge 22 so as to connect the first shell 10 with the second shell 20. The annular strap 30 is made by a flexible material such as fabric, rubber, etc.

[0011] In this embodiment, if observing from the view of FIG. 2, the two extendable devices 40 are respectively disposed at the left side and the right side of the luggage 1, the two guiding devices 50 are also respectively disposed at the left side and the right side of the luggage 1. The extendable device 40 on the left side is located below the guiding device 50, and the extendable device 40 on the right side is located above the guiding device 50. Referring to FIGs. 4 to 6, each of the extendable devices 40 has a movable base 42 disposed at the first shell 10, a fixed base 44 disposed at the second shell 20 and sleeved to the movable base 42, and a positioning mechanism 46 connected with the fixed base 44 and the movable base 42. Each of the positioning mechanisms 46 has an operation end 460 exposed from the first shell 10 through one of the two through holes 14. When the operation end 460 is not actuated, the positioning mechanism 46 is in a locked state where the movable base 42 is not movable relative to the fixed base 44. When the operation end 460 is actuated, the positioning mechanism 46 is in an unlocked state where the movable base 42 is moveable relative to the fixed base 44.

[0012] Referring to FIGs. 7 to 9, each of the guiding devices 50 has a movable tube 52 disposed at the first shell 10 and a fixed tube 54 disposed at the second shell 20 and sleeved to the movable tube 52.

[0013] There may be many embodiments of the extendable devices 40 and the guiding devices 50, the implementing manner of this embodiment would be described in the following.

[0014] The fixed base 44 of each of the extendable devices 40 has a tubular member 441 disposed at the second shell 20, three positioning holes 443 disposed at the wall of the tubular member 441, two fixing members 445 respectively disposed at two ends of the tubular member 441 and fixed at the inner surface of the second shell 20, and a first panel 447 disposed at the outer surface of the second shell 20. The first panel 447 is connected with one of the fixing members 445 located more far from the first shell 10. There is a predefined distance between the first panel 447 and the connected fixing member 445 for part shell body of the second shell 20 being sandwiched between the first panel 447 and the fixing member 445. The first panel 447 may be connected with the fixing member 445 by screwing, but not limited thereto. It should be noticed that, the fixed base 44 may be disposed at the second shell 20 by other manners, i.e. the fixing member 445 can be omitted, or the number of the fixing members 445 can be modified.

[0015] The movable base 42 of each of the extendable devices 40 has an insertion tube 421 accommodated in the tubular member 441, an outer base 423 disposed at an outer end 421a of the insertion tube 421, an inner base 425 disposed at an inner end 421b of the insertion tube 421, and a second panel 427 disposed at the outer surface of the first shell 10. The outer end 421a forms the end of the insertion tube 421 exposed from the tubular member 441, and the inner end 421b forms the end of the insertion tube 421 accommodated in the tubular member 441. The outer base 423 is disposed at the inner surface of the first shell 10 and connected with the second panel 427. There is a predefined distance between the second panel 427 and the outer base 423 for part shell body of the first shell 10 being sandwiched between the second panel 427 and the outer base 423. The second panel 427 may be connected with the outer base 423 by screwing, but not limited thereto. The inner base 425 has a first axial hole 425a communicated with the insertion tube 421 and a first radial hole 425b communicated with the first axial hole 425a and outside. The second panel 427 has a slot hole 427a through which the operation end 460 extends and a protruded fringe 427b located aside the slot hole 427a. The protruded fringe 427b is in proximity to the operation end 460 of the positioning mechanism 46 and can prevent the operation end 460 from being actuated by unexpected external force.

[0016] The positioning mechanism 46 of each of the extendable devices 40 has a pin member 461 movable into and out of the first radial hole 425b of the inner base 425, a first spring 463 accommodated in the inner base 425 and abutting against the pin member 461 and the inner wall of the inner base 425 respectively by two ends of the first spring 463, a connecting rod 464 accommodated in the insertion tube 421 and the first axial hole 425a of the inner base 425, and a toggle member 468 pivotally connected with the outer base 423 and penetrating though the through hole 14 of the first shell 10 and a slot hole 427a of the second panel 427. The top end of the pin member 461 inserts into one of the positioning holes 443 at the tubular member 441. The first spring 463 provides a prestressing force upwardly to the pin member 461, so that the pin member 461 can insert into one of the positioning holes 443 when the pin member 461 is not pushed by other external force. Referring to FIG. 10, the pin member 461 has a first guiding surface 462, more specifically, the pin member 461 has a hollow portion 461a, and the first guiding surface 462 is located at the inner wall of the hollow portion 461a. The connecting rod 464 has an inner end 465 and an outer end 466, and the inner end 465 has a second guiding surface 467 abutting against the first guiding surface 462. The toggle

member 468 has an extending porting 469 for pushing the outer end 466 of the connecting rod 464, and the toggle member 468 forms the operation end 460 of the positioning mechanism 46. It should be noticed that, the pin member 461 may not have the hollow portion 461a.

[0017] The tube wall of the fixed tube 54 of each of the guiding devices 50 has three positioning holes 541. Two ends of each of the fixed tubes 54 are disposed at the second shell 20 by two fixing members 543 fixed at the inner surface of the second shell 20, respectively. The fixed tube 54 may has a third panel 545 disposed at the outer surface of the second shell 20. The third panel 545 is connected with the fixing member 543 located more far from the first shell 10. There is a predefined distance between the third panel 545 and the connected fixing member 543 for part shell body of the second shell 20 being sandwiched between the third panel 545 and the fixing member 543. The third panel 545 may be connected with the fixing member 543 by screwing, but not limited thereto. It should be noticed that, the fixed tube 54 may be disposed at the second shell 20 by other manners, i.e. the two fixing members 443 can be omitted, or the number of the fixing members 443 can be modified. In other embodiments, the structure of the fixed tube 54 can be modified depending on demand.

[0018] The movable tube 52 of each of the guiding devices 50 has an inner end 52a located in the fixed tube 54, an outer end 52b disposed at the first shell 10 by a fixing member 526 fixed at the inner surface of the first shell 10, and a fourth panel 525 disposed at the outer surface of the first shell 10. The fourth panel 525 is connected with the fixing member 526. There is a predefined distance between the fourth panel 525 and the fixing member 526 for part shell body of the first shell 10 being sandwiched between the fourth panel 525 and the fixing member 526. The fourth panel 525 may be connected with the fixing member 526 by screwing, but not limited thereto. The tube wall of the movable tube 52 may has a side hole 521 located at the inner end 52a. The movable tube 52 may further has a positioning member 522 accommodated in the side hole 521 and a second spring 523 disposed in the movable tube 52. Two ends of the second spring 523 respectively push the positioning member 522 and the inner wall of the movable tube 52, so that the positioning member 522 can insert into one of the positioning holes 541 at the fixed tube 54 from the side hole 521. The shape of the positioning member 522 may be but not limited to a ball-shaped. More specifically, each of the movable tubes 52 may have a tube portion 527 and an end base 528 disposed at an inner end 527a of the tube portion 527. The end base 528 forms the inner end 52a of the movable tube 52. The end base 528 has a second axial hole 528a communicated with inside of the tube portion 527 and a second radial hole 528b communicated with the second axial hole 528 and outside. The second radial hole 528b forms the side hole 521 of the movable tube 52. In other embodiments, the structure of the movable tube 52 can be modified depending on demand.

[0019] The zip fastener 70 is located at the periphery of the annular strap 30, and two lateral sides of the zip fastener 70 are respectively connected with the first opening edge 12 and the second opening edge 22, so that the first shell 10 is connected with the second shell 20. In other embodiments, the connecting manner of the first shell 10 and the second shell 20 may be modified depending on situation, or the zip fastener 70 can be omitted.

[0020] From the view of FIG. 2, the first panel 447 of the extendable device 40 located at the left side of the luggage 1 has a protruded fringe 447b, and the third panel 545 and the fourth panel 525 of the guiding device 50 located at the left side of the luggage 1 have a protruded fringe 545b and a protruded fringe 525b, respectively. When the luggage 1 is placed on the floor by left side thereof, the protruded fringes 427b, 447b, 545b and 521b can be foot members of the luggage 1, so that the luggage 1 can be placed on the floor steadily. In this situation, the protruded fringe 447b on the first panel 447 of the extendable device 40 located at the right side of the luggage 1 can be omitted, the protruded fringes 545b and 521b on the third and fourth panel 545 and 521 on the guiding device 50 located at the right side of the luggage 1 can also be omitted.

[0021] Referring to FIGs. 11 to 15, the positioning mechanism 46 is in a locked state as shown in FIG. 11 (with referring FIG. 6), the annular strap 30 is in a folded state, and the zip fastener 70 is in a fastened state. The pin member 461 inserts into the positioning hole 443 of the tubular member 441 located most far from the first shell 10, and the second guiding surface 467 of the connecting rod 464 merely abuts against a part of the first guiding surface 462 of the pin member 461. Referring to FIGs. 12 and 13, when user wants to extend the accommodating capacity of the luggage 1, the zip fastener 70 should be unfastened first, then the toggle member 468 should be pulled leftwardly as shown in FIG. 12, so that the extending portion 469 of the toggle member 468 pushes the connecting rod 464. In the meantime, a part of the toggle member 468 abuts against the protruded fringe 427b of the second panel 427, so that the second guiding surface 467 of the connecting rod 464 abuts against the first guiding surface 462 of the pin member 461 and provides a force to the pin member 461 to push the first spring 463. Then, the pin member 461 can overcome the elastic force of the first spring 463 and exit from the original positioning hole 443, in the meantime the positioning mechanism 46 becomes in an unlocked state. Referring to FIGs. 14 and 15, then the user merely need to continue to pull the toggle member 468 leftwardly in the drawing, and the movable base 42 is movable relative to the fixed base 44. In the meantime, the positioning member 522 of the guiding device 50 can overcome the elastic force of the second spring 523 by the tube wall of the fixed tube 54 and exit from the original positioning hole 541, then the movable tube 52 of the guiding device

50 is movable relative to the fixed tube 54, and the displacement distance of the moveable tube 52 of the guiding device 50 would be completely equal to the displacement distance of the movable base 42 of the extendable device 40. When the pin member 461 moves inside the tubular member 441 of the fixed base 445 and moves to a position corresponding to the next (or the third) positioning hole 443, the user merely need to release the toggle member 468, so that the second guiding surface 467 of the connecting rod 467 would not provide a force to the first guiding surface 462 of the pin member 461, and the pin member 461 would insert into the corresponding positioning hole 443 by the elastic force of the first spring 463 and be positioned. In the meantime, the positioning member 522 of the guiding device 50 also inserts into the corresponding positioning hole 541 and is positioned, and the positioning mechanism 46 is in the locked state again, but the annular strap 30 is in an opened state, and the accommodating capacity of the luggage 1 is extended.

[0022] Because the two extendable devices 40 and the two guiding devices 50 are the same in extending direction and generally located at four corners of the luggage 1, if user actuates the toggle members 468 of the two extendable devices 40 at the same time, the first shell 10 can move toward a direction leaving from the second shell 20 uniformly and would not be skewed, so as to extend the accommodating capacity of the luggage 1 according to demand of user. On the other hand, if a hard shell made by plastic (i.e. not soft material such as fabric and etc.) is selected for the shell bodies of the first shell 10 and the second shell 20, the luggage 1 can further have a function that reduces probability of damaging goods inside the luggage 1.

[0023] In other possible embodiments, merely at least one of the extendable devices 40 and at least one of the guiding devices 40 would be needed; the disposing positions and the disposing manners of each of the extendable devices 40 and the guiding devices 50 can be modified; the numbers of those positioning holes 443 and 541 can be modified depending on demand; the disposing positions of the fixed base 44 and the movable base 42 of the extendable device 40 can be exchanged, which means the fixed base 44 can be disposed at the first shell 10, and the movable base 42 can be disposed at the second shell 20, similarly, the fixed tube 54 of the guiding device 50 can be disposed at the first shell 10, and the movable tube 52 of the guiding device 50 can be disposed at the second shell 20; the first, second, third, and forth panels 447, 427, 545 and 525 are used to make the luggage 1 be well looked, for example, covering screws, however, those panels can be omitted depending on situation in other embodiments.

[0024] The above description represents merely the preferred embodiment of the present invention, without any intention to limit the scope of the present invention. The simple variations and modifications not to be regarded as a departure from the spirit of the invention are intended to be included within the scope of the following claims.

Claims

1. An extendable luggage (1), **characterized in that** the extendable luggage (1) comprises:

   a first shell (10), having a first opening edge (12) and at least one through hole (14);
   a second shell (20), having a second opening edge (22);
   an annular strap (30), two sides of which are respectively connected with the first opening edge (12) and the second opening edge (22) so as to connect the first shell (10) with the second shell (20);
   at least one extendable device (40), having a movable base (42) disposed at the first shell (10), a fixed base (44) disposed at the second shell (20) and sleeved to the movable base (42), and a positioning mechanism (46) connected with the fixed base (44) and the movable base (42), the positioning mechanism (46) having an operation end (460) exposed from the first shell (10) through the through hole (14), wherein when the operation end (460) is not actuated, the positioning mechanism (46) is in a locked state where the movable base (42) is not movable relative to the fixed base (44), and when the operation end (460) is actuated, the positioning mechanism (46) is in an unlocked state where the movable base (42) is moveable relative to the fixed base (44); and
   at least one guiding device (50), having a movable tube (52) disposed at the first shell (10) and a fixed tube (54) disposed at the second shell (20) and sleeved to the movable tube (52).

2. The extendable luggage (1) as claimed in claim 1, **characterized in that** the fixed base (44) has a tubular member (441) disposed at the second shell (20) and a plurality of positioning holes (443) disposed at a wall of the tubular member (441);
   the movable base (42) has an insertion tube (421) accommodated in the tubular member (441), an outer base (423) disposed at an outer end of the insertion tube (421), and an inner base (425) disposed at an inner end (421a) of the insertion tube (421), the outer base (423) is disposed at the first shell (10), the inner base (425) has a first axial hole (425a) communicated with the insertion tube (421) and a first radial hole (425b) communicated with the first axial hole (425a) and outside;
   the positioning mechanism (46) has a pin member (461) movable into and out of the first radial hole (425b) of the inner base (425), a first spring (463)

accommodated in the inner base (425) and abutting against the pin member (461) and an inner wall of the inner base (425) respectively by two ends of the first spring (463), a connecting rod (464) accommodated in the insertion tube (421) and the first axial hole (425a) of the inner base (425), and a toggle member (468) pivotally connected with the outer base (423) and penetrating though the through hole (14) of the first shell (10);
wherein the pin member (461) inserts into one of the positioning holes (443) at the tubular member (441), the pin member (461) has a first guiding surface (462), the connecting rod (464) has an inner end (465) and an outer end (466), the inner end (465) of the connecting rod (464) has a second guiding surface (467) abutting against the first guiding surface (462), the toggle member (468) has an extending portion (469) for pushing the outer end (466) of the connecting rod (464), the toggle member (468) forms the operation end (460) of the positioning mechanism (46).

3. The extendable luggage (1) as claimed in claim 2, **characterized in that** the pin member (461) has a hollow portion (461a), and the first guiding surface (462) is located at an inner wall of the hollow portion (461a).

4. The extendable luggage (1) as claimed in claim 2, **characterized in that** the fixed base (44) has two fixing members (445) respectively disposed at two ends of the tubular member (441) and fixed at an inner surface of the second shell (20).

5. The extendable luggage (1) as claimed in claim 4, **characterized in that** the fixed base (44) further has a first panel (447) disposed at an outer surface of the second shell (20), and the first panel (447) is connected with one of the fixing members (445).

6. The extendable luggage (1) as claimed in claim 2, **characterized in that** the movable base (42) further has a second panel (427) disposed at an outer surface of the first shell (10), and the second panel (427) is connected with the outer base (423), the second panel (427) has a slot hole (427a) through which the toggle member (468) extends.

7. The extendable luggage (1) as claimed in claim 6, **characterized in that** the second panel (427) has a protruded fringe (427b) located aside the slot hole (427a).

8. The extendable luggage (1) as claimed in claim 1, **characterized in that** a tube wall of the fixed tube (54) has a plurality of positioning holes (541), a tube wall of the movable tube (52) has a side hole (521), the movable tube (52) further has a positioning member (522) accommodated in the side hole (521) and a second spring (523) disposed in the movable tube (52), an end of the second spring (523) pushes the positioning member (522), so that the positioning member (522) is movable into one of the positioning holes (541) of the fixed tube (54).

9. The extendable luggage (1) as claimed in claim 8, **characterized in that** the movable tube (52) has a tube portion (527) and an end base (528) disposed at an inner end (527a) of the tube portion (527), the end base (528) has a second axial hole (528a) communicated with an inside of the tube portion (527) and a second radial hole (528b) communicated with the second axial hole (528a) and outside, the second radial hole (528b) forms the side hole (521) of the movable tube (52).

10. The extendable luggage (1) as claimed in claim 1, **characterized in that** two ends of the fixed tube (54) are disposed at the second shell (20) by two fixing members (543), respectively.

11. The extendable luggage (1) as claimed in claim 1, **characterized in that** the movable tube (52) has an inner end (52a) located in the fixed tube (54) and an outer end (52b) disposed at the first shell (10) by a fixing member (526).

12. The extendable luggage (1) as claimed in claim 1, **characterized in that** the extendable luggage (1) further has a zip fastener (70) located at a periphery of the annular strap (30); wherein two lateral sides of the zip fastener (70) are respectively connected with the first opening edge (12) and the second opening edge (22), so that the first shell (10) is connected with the second shell (20).

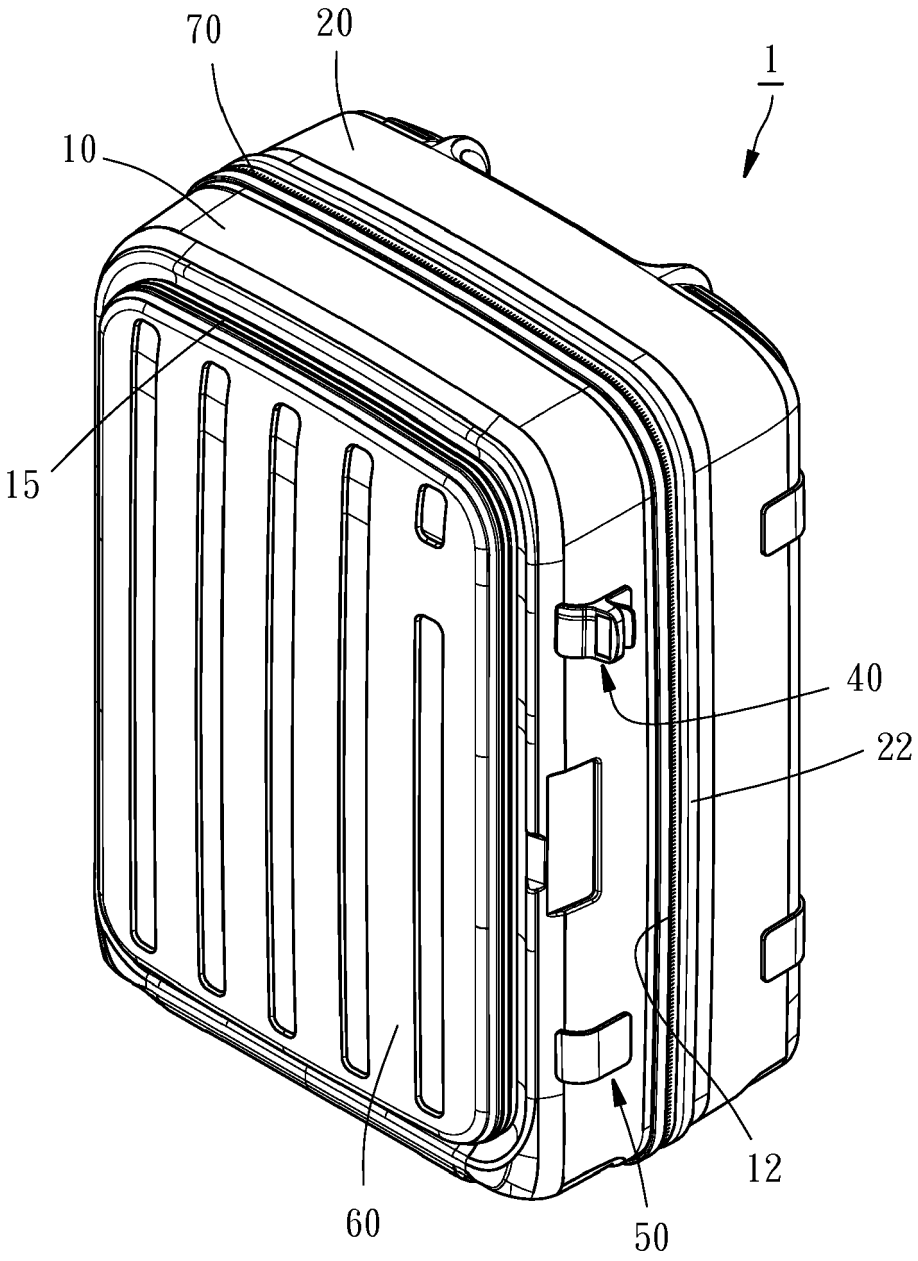

FIG. 1

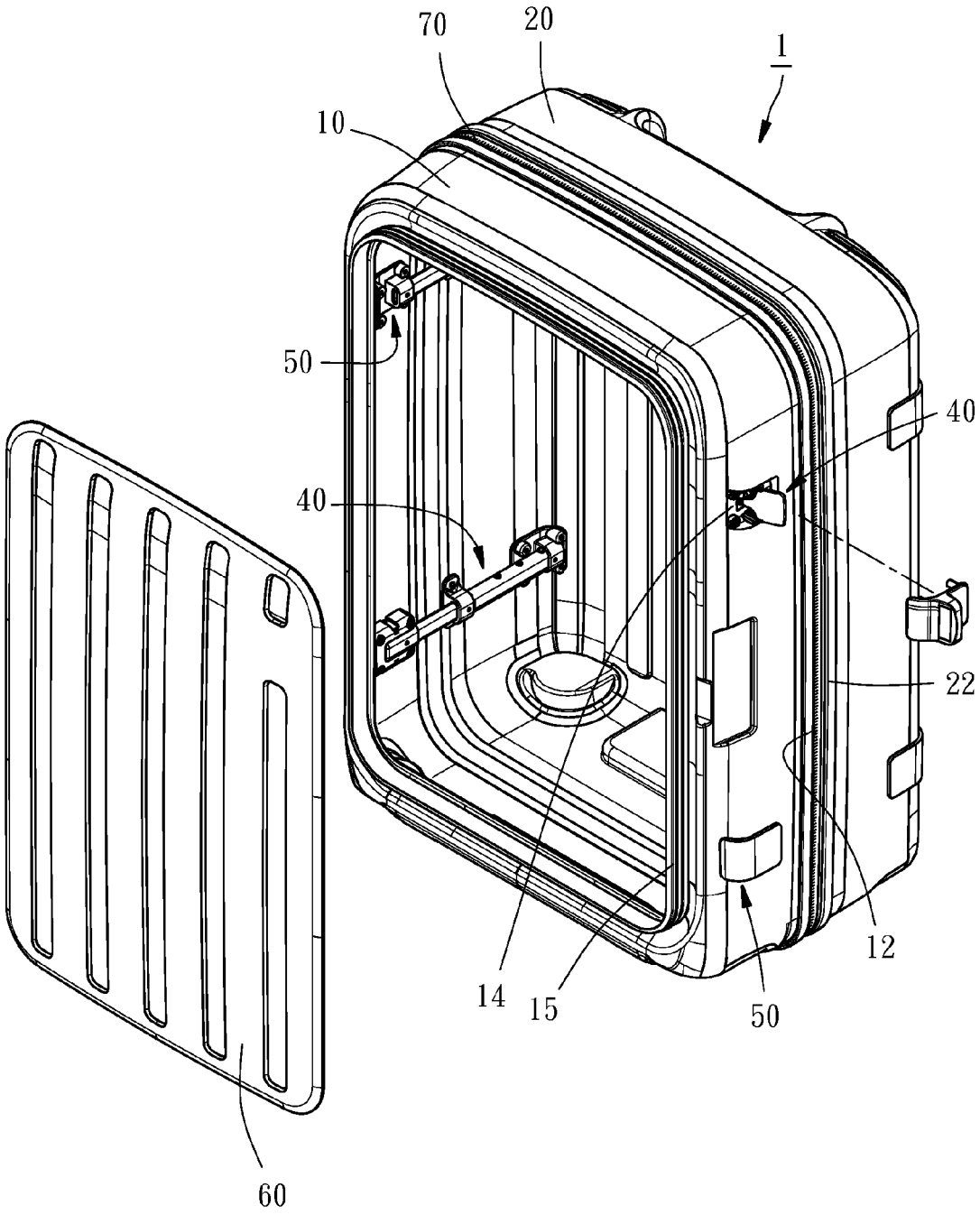

FIG. 2

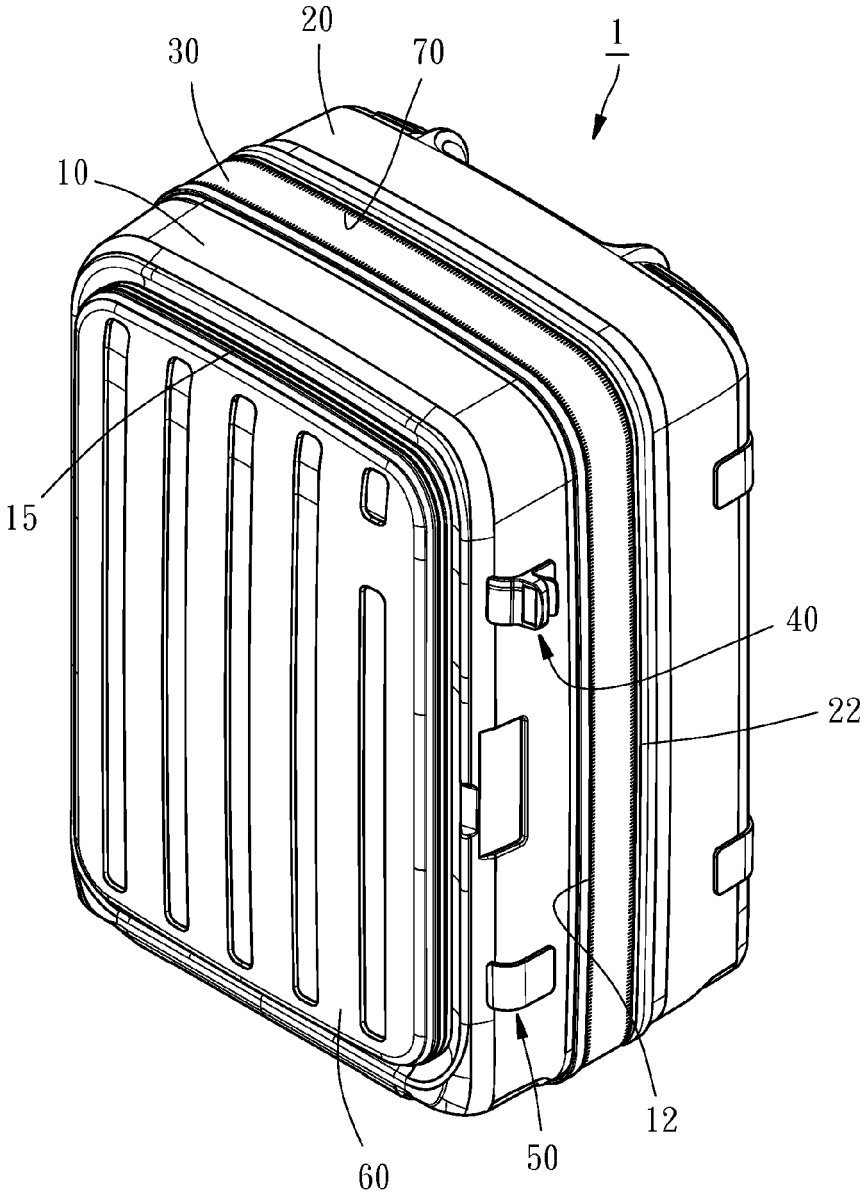

FIG. 3

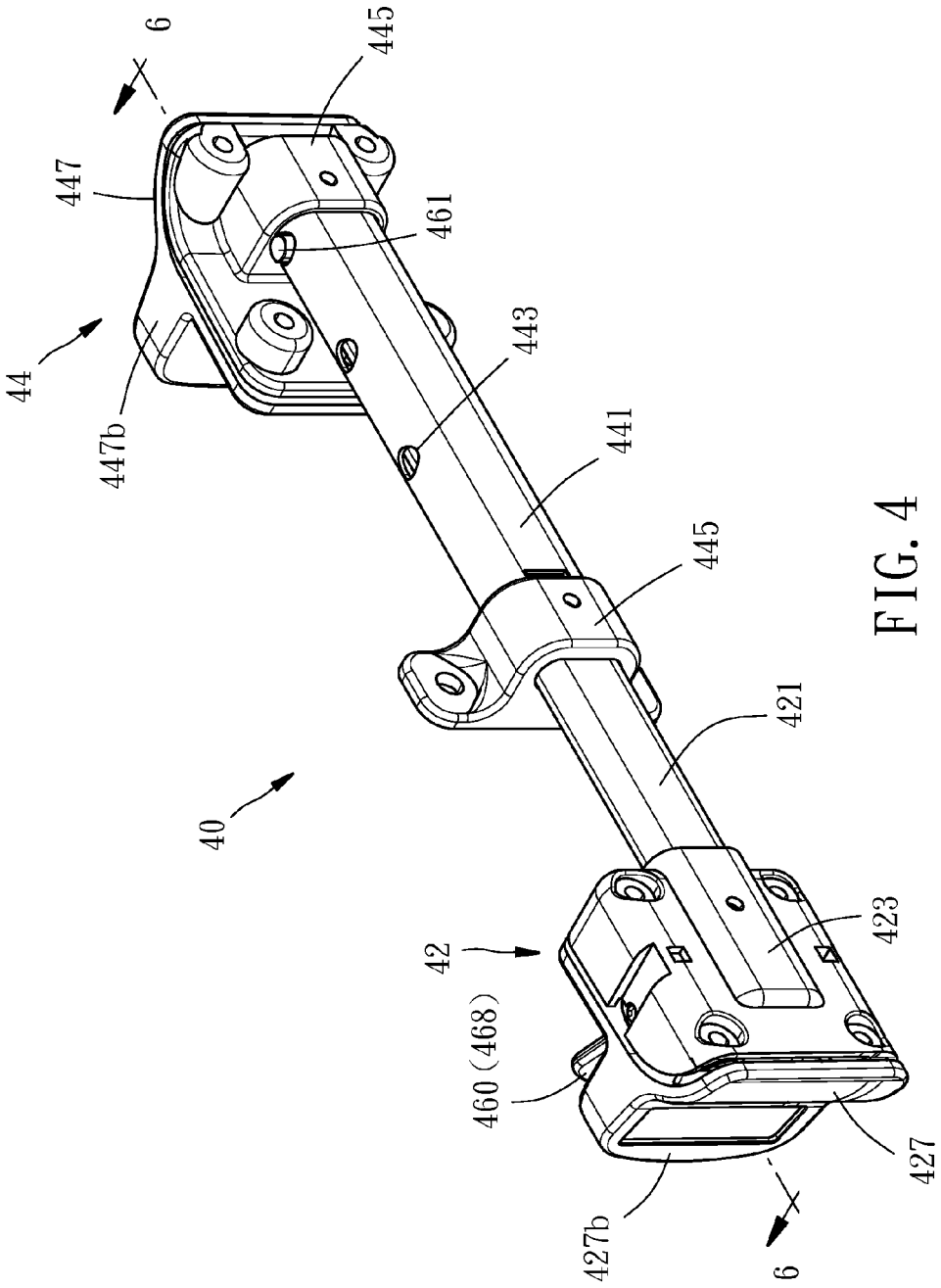

FIG. 4

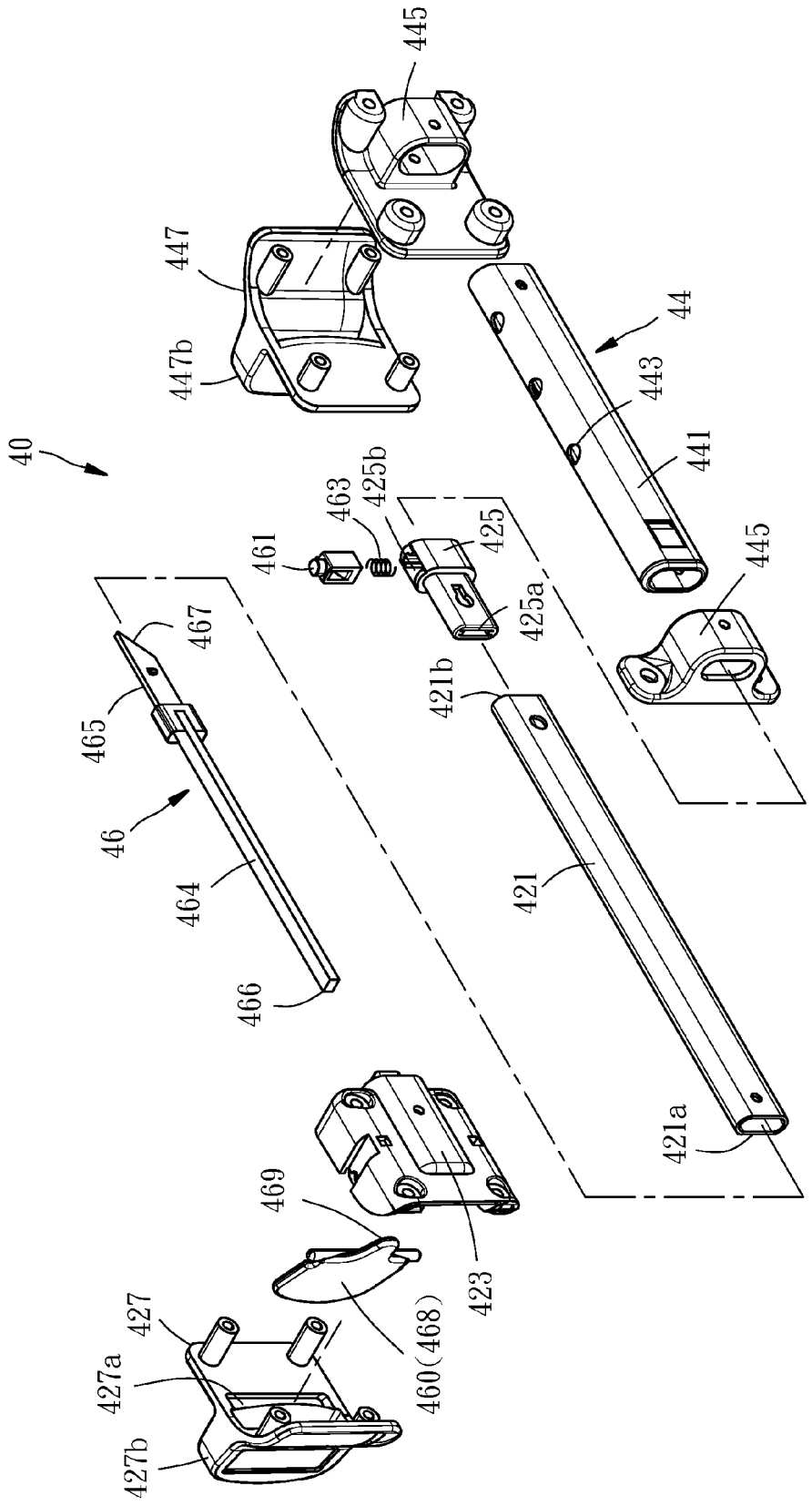
40
445
447
447b
44
443
441
445
463
425b
461
425
425a
421b
467
465
46
464
466
421
421a
469
423
460(468)
427
427a
427b

FIG. 5

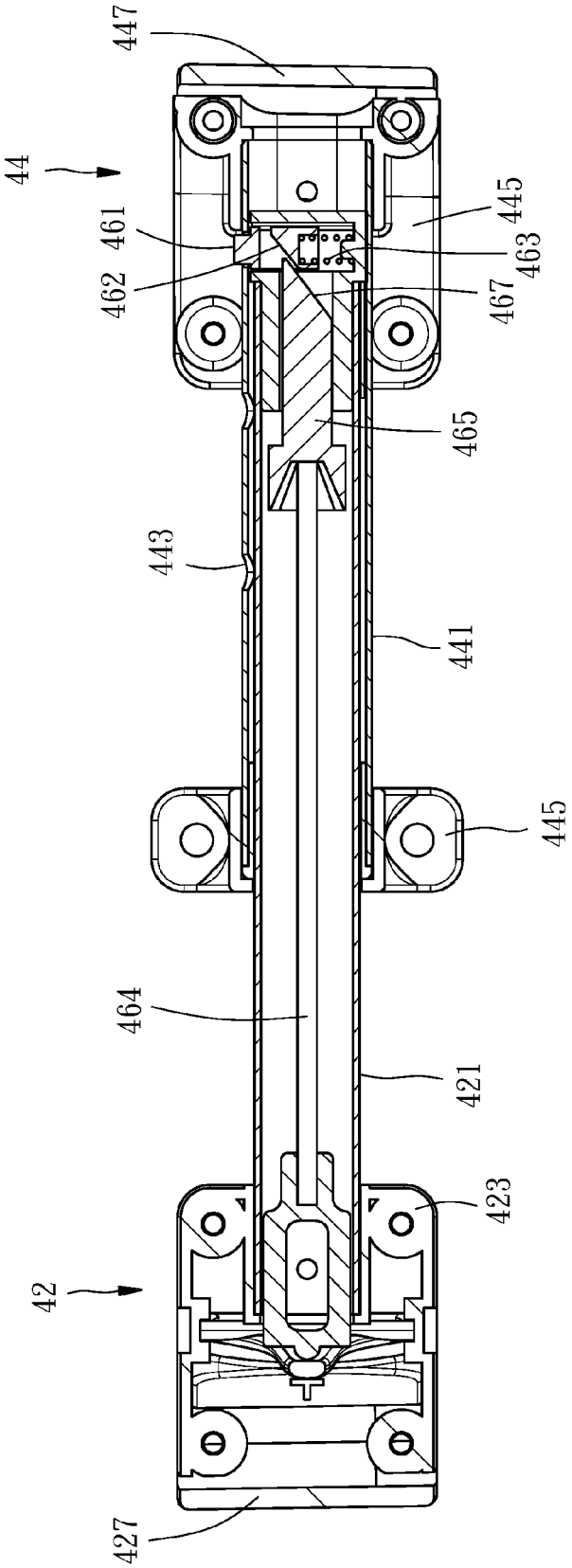

FIG. 6

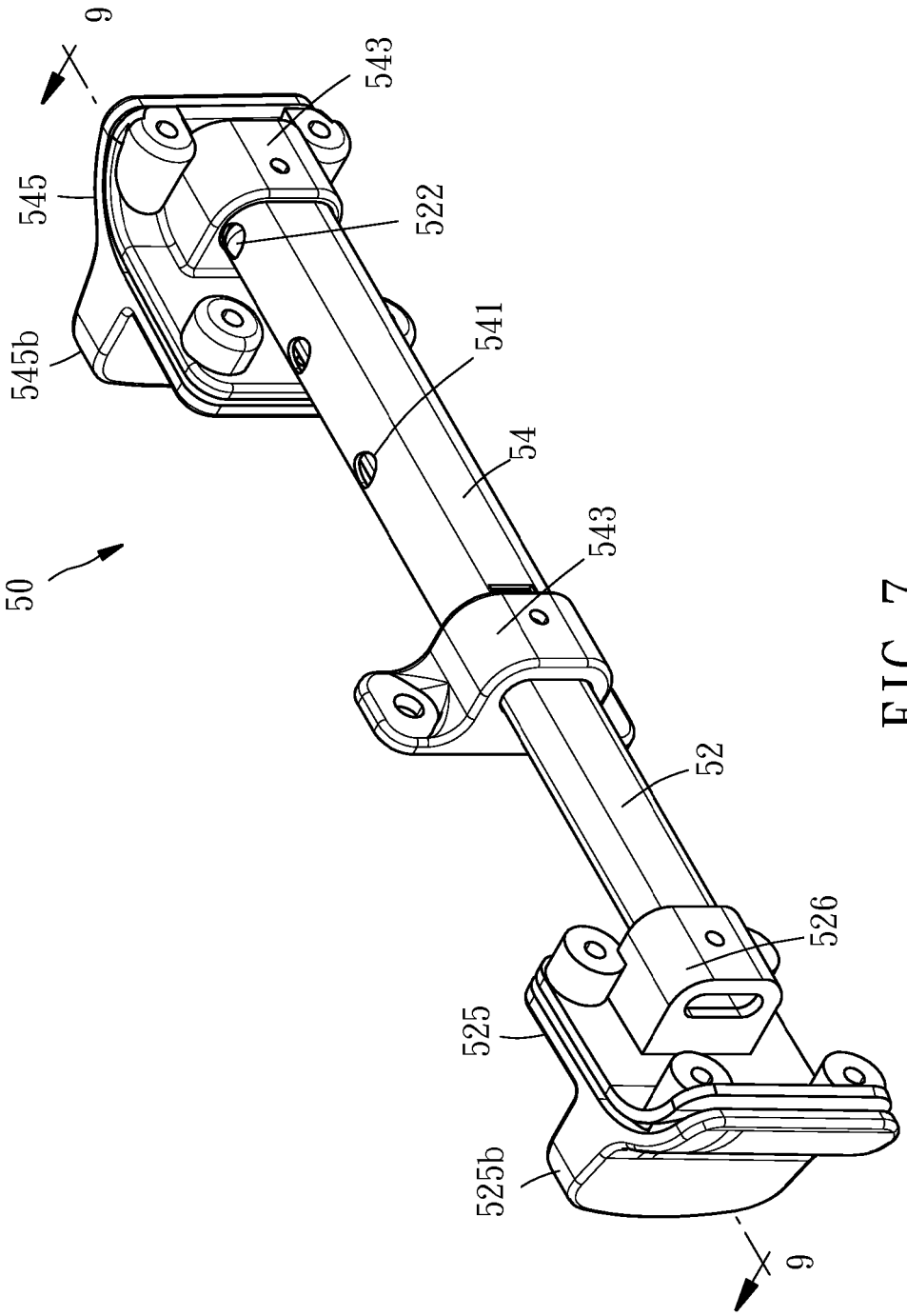

FIG. 7

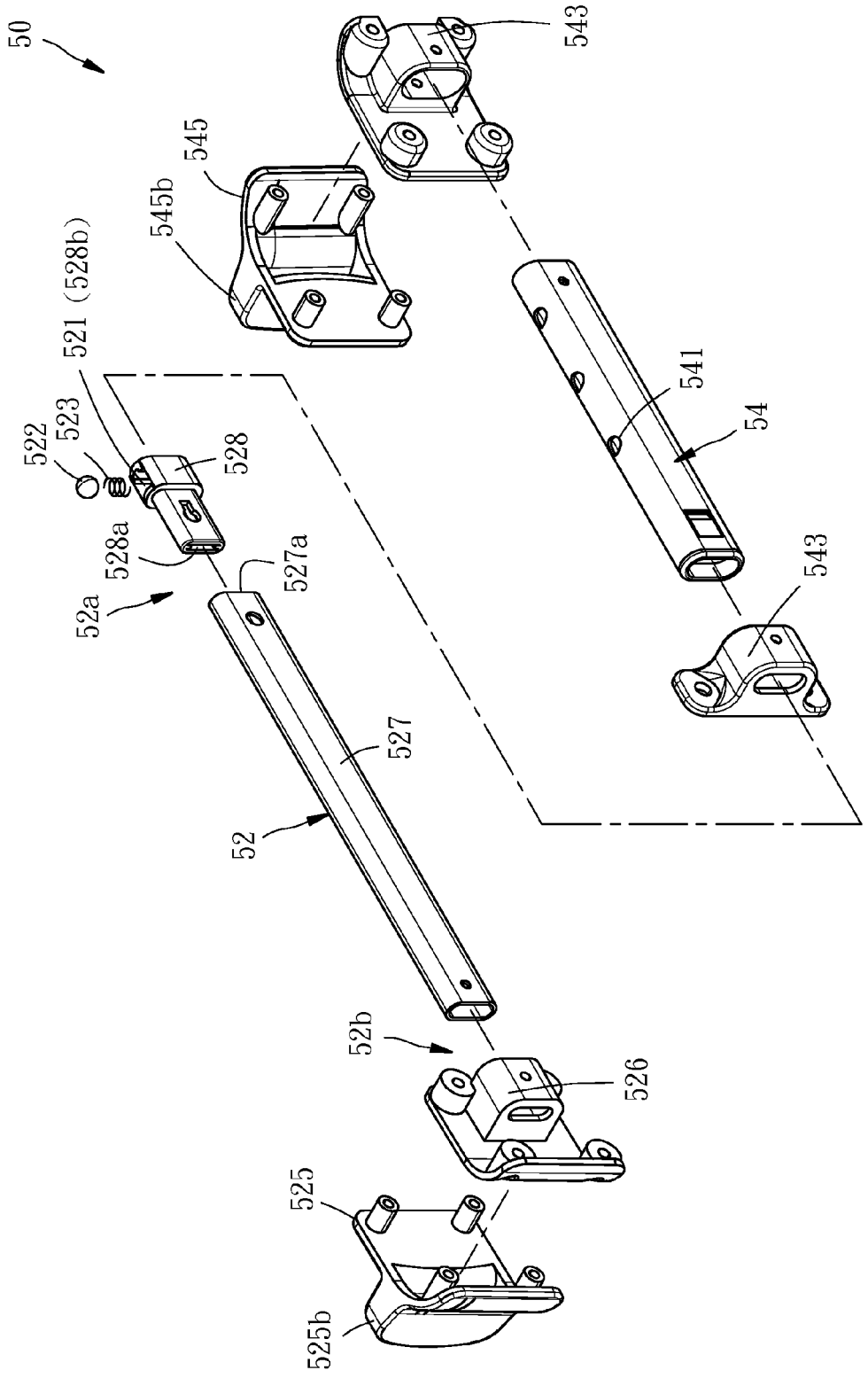
50
543
545
545b
521 (528b)
522
523
528
541
54
528a
527a
52a
543
527
52
52b
526
525
525b

FIG. 8

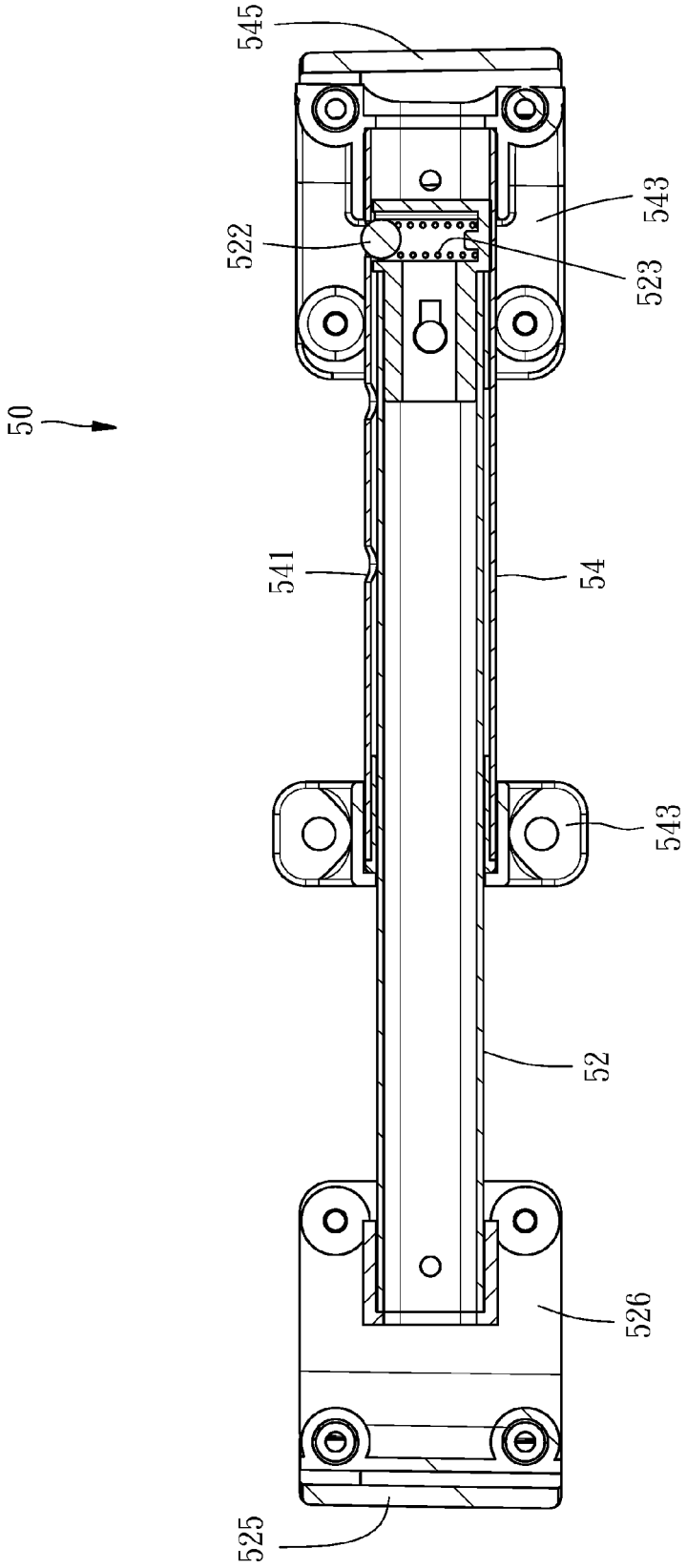

FIG. 9

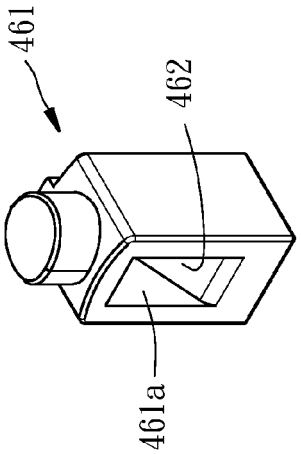
461
462
461a

FIG. 10

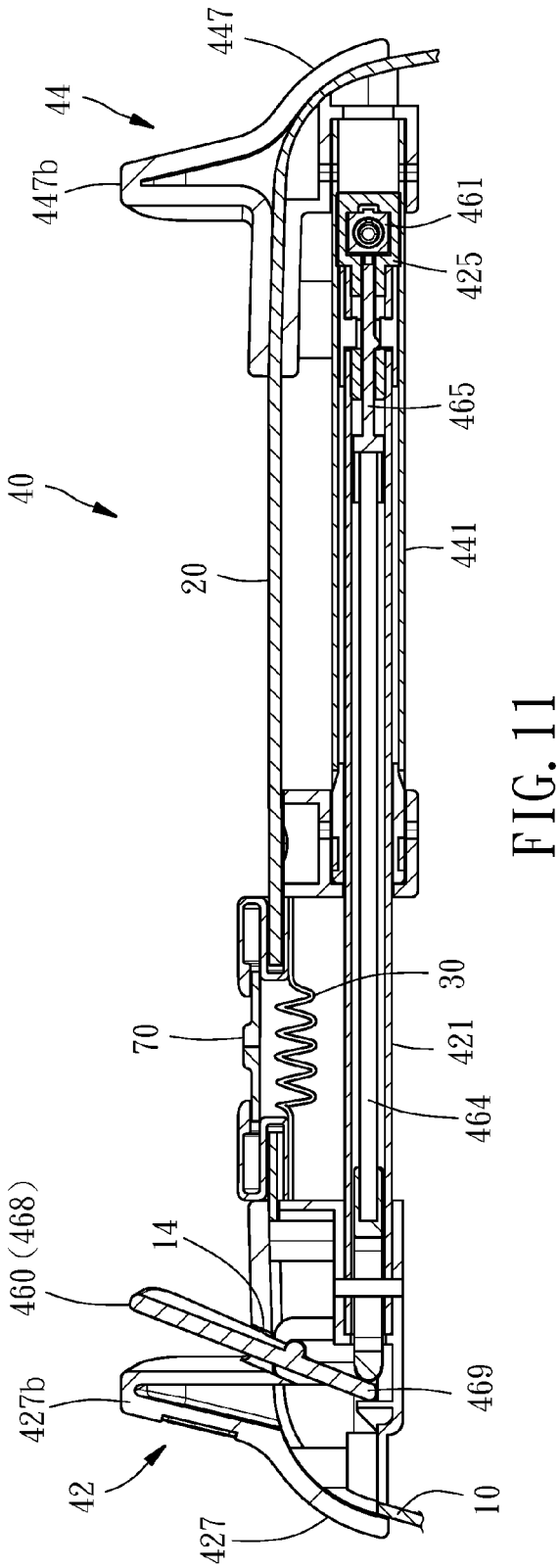
447
44
447b
461
425
465
40
441
20
30
70
421
464
460 (468)
14
427b
469
42
427
10

FIG. 11

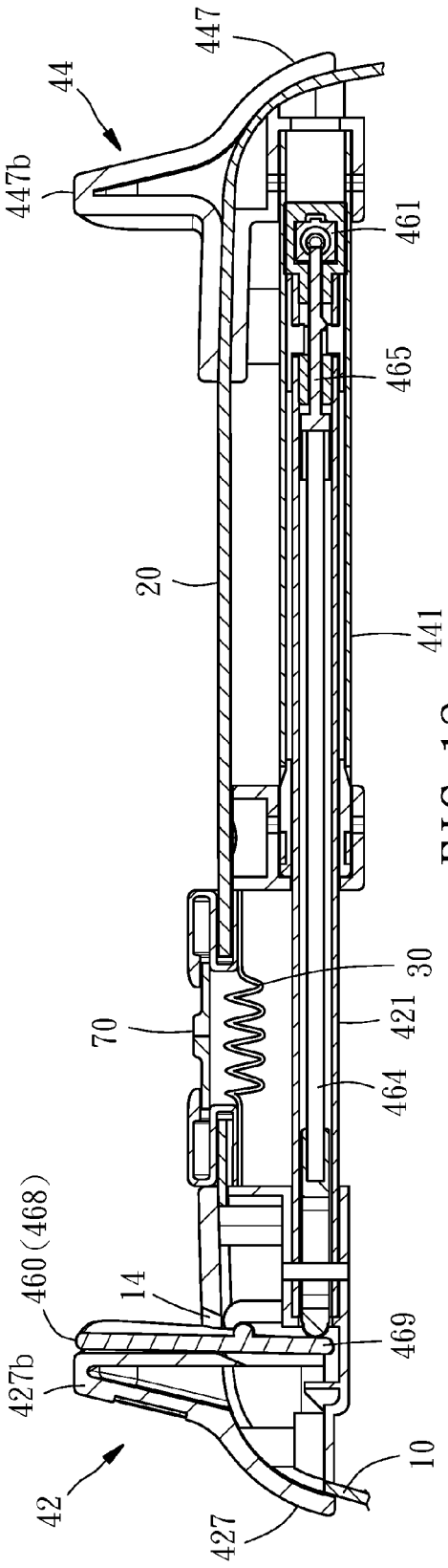
447
44
447b
461
465
20
441
30
70
421
464
460(468)
14
469
427b
42
10
427

FIG. 12

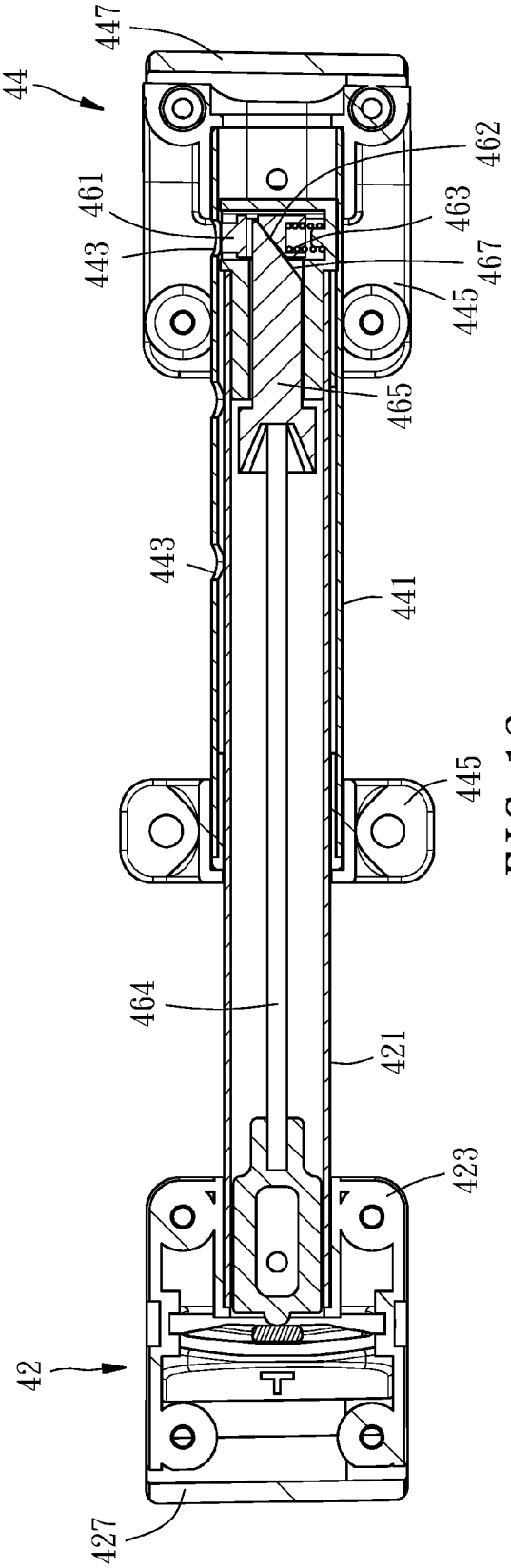
447
44
462
461
463
443
467
445
465
443
441
445
464
421
423
42
427

FIG. 13

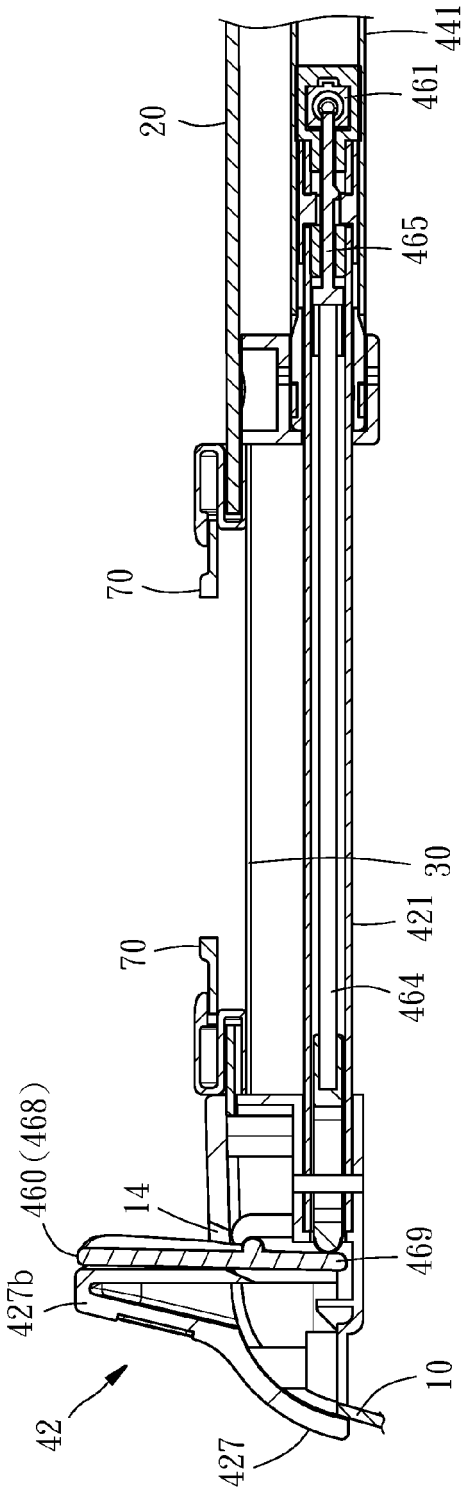
20
441
461
465
70
70
30
421
464
460(468)
14
469
427b
42
10
427

FIG. 14

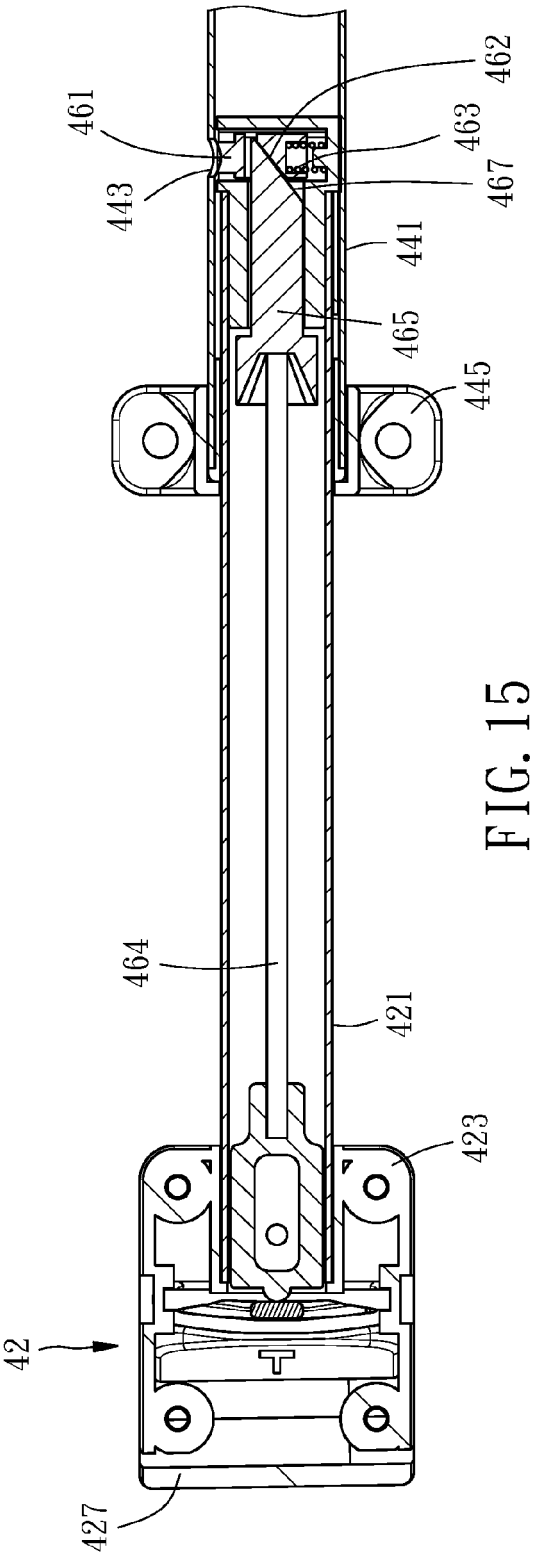
461
462
443
463
467
441
465
445
464
421
423
42
427

FIG. 15

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 17 9917

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2006/037823 A1 (PETERSON SHEP [US] ET AL) 23 February 2006 (2006-02-23) * the whole document *	1	INV. A45C5/03 A45C7/00
A	US 885 853 A (MABLE WILLIAM [US]) 28 April 1908 (1908-04-28) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A45C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 March 2017	Nicolás, Carlos

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 17 9917

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

24-03-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006037823 A1	23-02-2006	EP 1788903 A2	30-05-2007
		JP 4750794 B2	17-08-2011
		JP 2008510571 A	10-04-2008
		US 2006037823 A1	23-02-2006
		WO 2006023722 A2	02-03-2006
US 885853 A	28-04-1908	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82