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(54) TROLLEY TYPE CONTAINER, CONVERTIBLE INTO A SCOOTER

(57) A trolley (100) comprises a body (1) provided with a handle (2), connected to at least one extendable rod (3), and wheels (4a) adapted to facilitate the movement thereof without requiring a lifting, said at least one extendable rod (3) being slidably coupled to said body (1) for being extracted and inserted into the body (1). The trolley (100) comprises further wheels (4b) installed in a side (15) of the body (1) and said extendable rod (3), once extracted from the body (1), is configured to rotate with respect to said body (1) about an axis perpendicular to the direction of the rod (3), so that said handle (2) and a further side (19) of said body (1), which is opposite to said side (15), are a handlebar and a footboard of a vehicle (110) movable on said wheels (4a, 4b), respectively.

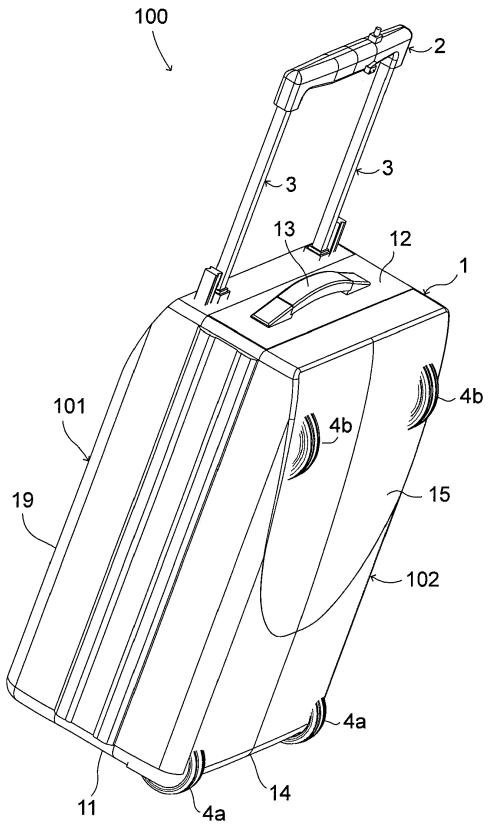

FIG.1

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Description

[0001] The present invention relates to a scooter-trolley.

[0002] It is often necessary to walk for variable distances with a piece of hand luggage, such as a cabin-size suitcase or a trolley. For example, transfers from one gate to another, from one part of a terminal to another, are frequent in airports because of departure gate changes. Considering that a trolley typically weighs approximately ten or so kilograms, the walk may sometimes become inconvenient.

[0003] Suitcases with integrated scooter are known to solve this problem. In particular, trolleys comprising a pair of wheels installed on a first side of the trolley body and an extendable handle on an opposite side of said first side are known. A footboard hinged to the first side and comprising a further wheel at the free end of the footboard itself is also present. Such a footboard is configured to be movable between a rest position, in which the footboard is arranged by the side of the trolley body, and an operating position, in which the footboard is opened so that the further wheel is in contact with the ground. In the operating position, the trolley may support a user over the footboard and work as a vehicle.

[0004] However, the capacity of the entire device is approximately one hundred kilograms, including the full suitcase, and thus the risk of failure of the footboard when it is in the operating position is thus not unlikely. In addition to being bulky because it protrudes, the footboard hinged to the trolley body is an element which is susceptible to breakage or wear. Furthermore, the user must make a given physical effort in all cases in order to move aboard the suitcase with scooter, requiring to push at least with a lower limb. Moreover, the configuration of the wheels does not allow to steer or perform curved trajectories aboard the aforesaid scooter.

[0005] Given the prior art, it is the object of the present invention to provide a scooter-trolley so as to overcome the aforesaid drawbacks.

[0006] In accordance with the present invention, said object is achieved by means of a trolley comprising a body provided with a handle, connected to at least one extendable rod, and wheels suitable to facilitate the movement thereof without requiring a lifting, said at least one extendable rod being slidably coupled to said body for being extracted and inserted inside the body, said trolley being characterized in that it comprises further wheels installed in a side of the body and in that said extendable rod, once extracted from the body, is configured to rotate with respect to said body about an axis perpendicular to the direction of the rod so that said handle and a further side of said body, which is opposite to said side, are a handlebar and a footboard of a vehicle movable on said wheels, respectively.

[0007] The features and advantages of the present invention will become apparent from the following detailed description of a practical embodiment thereof, shown by way of non-limitative example in the accompanying drawings, in which:

figure 1 shows a perspective view of a trolley according to the present invention;
figure 2 shows the trolley in figure 1 in a first operating position;
figure 3 shows the trolley in figure 1 in a second operating position;
figure 4 shows an inner part of the trolley according to the present invention;
figure 5 shows a detail of the inner part of the trolley in figure 4;
figure 6 shows a bottom view of the inner part of the trolley in figure 4;
figure 7 shows a first detail of the trolley in figure 1;
figure 8 shows the trolley in figure 1 switching from the second operating position to a third operating position;
figure 9 shows the trolley in figure 1 according to a configuration of use;
figure 10 shows the trolley in figure 1 according to a further configuration of use;
figure 11 shows a second detail of the trolley in figure 1;
figure 12 shows an electromechanical block chart of the trolley in figure 1.

[0008] Figure 1 shows a trolley 100 according to the present invention. Trolley 100 comprises a body 1, substantially shaped as a rectangular parallelepiped, said body 1 comprising a first half-shell 101 coupled to a second half-shell 102 by means of closing means (not shown in the figure), such as for example a zipper or specific hooks.

[0009] Body 1 may be made of polymeric material or of any material known and adapted for making suitcases. Said body 1 comprises a first side 11 with an edge 14 at which the wheels 4a, adapted to facilitate the movement of trolley 100 without being required to lift it, are installed. For example, said wheels 4a are a pair of wheels which are equally spaced apart along said edge 14. On the opposite side 12, there is a handle 2, connected to at least one extendable rod 3, adapted to transport trolley 100 by means of said wheels 4a, and a handle 13 adapted to lift it instead.

[0010] Further wheels 4b are installed in a third side 15 of the second half-shell 102 so that, when trolley 100 is resting on the ground with the third side 15 facing the surface of the ground, said wheels 4a and said further wheels 4b are equally in contact with the ground. For example, said further wheels 4b are a pair of wheels as well.

[0011] Said at least one extendable rod 3 comprises a plurality of telescopic elements 30 (Fig. 3) adapted to be slidingly inserted inside one another, a smaller section element 30a of which is connected to said handle 2 and a larger section element 30c of which is coupled to the

body 1 of trolley 100. In particular, the extendable rod 3 has a first closing position, in which rod 3 reaches a minimum extension and all telescopic elements 30 are inserted inside one another in body 1 (Fig. 2), and a second elongated position, in which rod 3 reaches a maximum extension, the telescopic elements are extracted from one another and are completely outside the body 1 (Fig. 3). Handle 2 advantageously comprises a release command adapted to enable the closing of rod 3 (not shown in the figures).

[0012] The coupling between the extendable rod 3 and body 1 may be achieved by means of a supporting frame 8 fixed to said body 1 (Fig. 4), said frame 8 comprising a least one guide 16 on which at least one sliding block 17 is slidingly coupled, the latter being connected to an end 31 of the greater section element 30c of rod 3. Guide 16 is provided with end stops adapted to prevent the sliding block 17 from exiting from the guide when the extendable rod 3 reaches the closing or elongated position. In use, when the extendable rod 3 is taken from the closing position to the elongated position, the sliding block 17 connected to the larger section element 30c slides from a first end 20 of guide 16 towards a second end 21 (near the second side 12) and at the same time the elements are extracted from one another, thus locking when rod 3 reaches the maximum elongation (Fig. 3).

[0013] Said at least one extendable rod 3 is also configured to rotate with respect to said body 1 about an axis perpendicular to the direction of rod 3 through a pin 18 which connects said larger section element 30c to said at least one sliding block 17 (Fig. 7). A third folded position is thus allowed, in which rod 3, starting from the second elongated position, is rotated by approximately 90 degrees with respect to the direction of block 16 (Fig. 8). After such a rotation, a specific pin (not shown in the figure) ensures the locking of the whole of telescopic elements 30 in said folded position. In use, when the extendable rod 3 is brought from the folded position to the closing position, rod 3 is rotated in the opposite direction until it reaches the elongation position again and is then closed inside body 1.

[0014] Preferably, there are two extendable rods 3 (Fig. 1-6) each comprising three square-sectioned, telescopic elements 30a, 30b and 30c. The coupling between extendable rods 3 and body 1 occurs by means of the frame 8 fixed to body 1 and comprises a pair of guides 16 on which the sliding blocks 17 slide being connected to the larger section element 30c of rods 3.

[0015] A fourth side 19 enclosed in the half-shell 101, and opposite to said third side 15, is configured so as to withstand the deformations generated by orthogonal forces while being made to offer a given grip.

[0016] The wheels 4a are free to rotate on axles coupled to frame 8 near said first side 11 of body 1, in which specific holes are obtained so that at least one portion of each of the wheels 4a is outside body 1 to come into contact with the ground.

[0017] The further wheels 4b are connected to frame 8 near the opposite side 12 by means of spindles 23 pivoted to said frame 8 by means of pins 24 and comprising shafts on which said wheels 4b are mounted (Fig. 5, 6); specific holes are obtained on the third side 15 so that at least one portion of each of the wheels 4b is outside body 1 to come into contact with the ground and can also rotate on said pins 24.

[0018] Said handle 2, connected to the extendable rods 3, and said fourth side 19 of the half-shell 101 of body 1 are configured to be a handlebar and a footboard of a vehicle 110 moving by means of said wheels 4a, 4b, respectively (Fig. 10).

[0019] Indeed, trolley 100 is such to be used in a first configuration (Fig. 9) as a normal suitcase with the wheels 4a adapted to facilitate the movement of trolley 100 without requiring to lift it, and in a second configuration as a vehicle 110 moving on wheels 4a and wheels 4b (Fig. 10). The switching from one configuration to the other is obtained by bringing the extendable rod 3 from the closing position to the folded position until the pin ensures the locking of the whole of telescopic elements 30, and by placing the trolley so as to rest on the ground on the third side 15 of the second half-shell 102, so that the wheels 4a and the further wheels 4b are equally in contact with the ground. At this point, the user can get onto the fourth side 19 holding onto said handle 2 which becomes the handlebar 20 of vehicle 110, the movement of which is described below.

[0020] Said spindles 23 allow the wheels 4b to steer because they can rotate about respective pins 24. Furthermore, the spindles 23 (Fig. 5, 6), and indirectly the wheels 4b, are coupled to one another by means of a steering rod 25, comprising connecting means 26 to said spindles 23 at its ends in order to allow a rotation of the spindles 23 about the respective pins 24 after a longitudinal translation of the steering rod 25. For example, the steering bar 25 may be connected to the spindles 23 by means of connecting means 26 known as "uniball".

[0021] The steering bar 25 is controlled and pivoted by a power steering 27 (Fig. 6) adapted to shift the bar 25 itself longitudinally and thus to steer the wheels 4b. The power steering 27 is controlled by the user by means of a steering 6 (Fig. 11) placed on handle 2 and connected to said power steering 27 (Fig. 12) by means of a first electronic control block 29. For example, steering 6 may be a rotary potentiometer adapted to convert the rotary movement given by the user into a curvature of the wheels 4b with a radius proportional to the given command.

[0022] A motor 5 (Fig. 12), coupled to at least one spindle 23 of one of the further wheels 4b, is adapted to move vehicle 110, by providing at least one wheel 4b with traction, and is controlled by means of an accelerator 33 housed, as the steering 6, on handle 2 (Fig. 11). The accelerator 33 is connected to motor 5 by means of a second electronic control block 34 (Fig. 12). For example, accelerator 33 may be implemented by means of a slider potentiometer adapted to convert a linear movement giv-

en by the user into a proportional traction generated on the at least one further wheel 4b. On the other hand, motor 5 may be, for example, a 24V motor (180W) powered by a battery 32 also adapted to power the electronic control blocks 29, 34, to which appropriate power electronic blocks 42, 44, which interface with the motor 5 and the power steering 27, are coupled.

[0023] A reverse control 35 (Fig. 12) is also provided in handle 2 adapted to change the rotation direction of the wheels 4b and therefore the advance direction of vehicle 110.

[0024] Alternatively, instead of a frame fixed to body 1, trolley 100 could comprise a self-bearing body which has at least one guide adapted to be coupled to the extendable rod 3 and a structure to allow the connection of the wheels 4a, 4b and the housing of the electronic and mechanical components as described above.

[0025] The described trolley 100 can be used by the user as a suitcase and, if needed, as a vehicle 110 to move conveniently and totally effortlessly. Furthermore, trolley 100 has the same loading capacity as a traditional trolley and is cabin-sized, thus can be inserted into the overhead compartment or under the seat of an aircraft.

Claims

1. Trolley (100) comprising a body (1) provided with a handle (2), connected to at least one extendable rod (3), and wheels (4a) suitable to facilitate the moving without being required a lifting, said at least an extendable rod (3) being slidably coupled with said body (1) for being extracted and inserted inside the body (1), said trolley (100) being **characterized in that** it comprises further wheels (4b) installed in a side (15) of the body (1) and **in that** said extendable rod (3), once extracted from the body (1), is configured to be able to rotate with respect to said body (1) around an axis perpendicular to the direction of the rod (3) so that said handle (2) and a further side (19) of said body (1), which is opposite to said side (15), are a handlebar and a footboard of a vehicle (110) movable on said wheels (4a, 4b), respectively.

2. Trolley (100) according to claim 1, **characterized in that** said body (1) comprises at least one guide (16) on which is slidingly coupled a sliding block (17) connected to said extendable rod (3) by means of at least a pin (18), said at least a pin (18) being suitable to make rotate said extendable rod (3) with respect to said body (1) once extracted from the body (1) so as to move in a position substantially perpendicular to said side (15) of the body (1).

3. Trolley (100) according to claim 1, **characterized in that** said further wheels (4b) are installed in the body (1) by means of spindles (23) pivoted to the body (1) through pins (24), said spindles (23) being mutually coupled by means of a steering rod (25) comprising at its ends connecting means (26) to said spindle (23) such as to allow, as a result of a longitudinal translation of the steering rod (25), a rotation of spindles (23) around the respective pins (4).

4. Trolley (100) according to claims 1, **characterized by** comprising a support frame (8) fixed to the body (1).

5. Trolley (100) according to claim 4, **characterized in that** said support frame (8) comprises said at least one guide (16) on which is coupled the sliding block (17) connected to said extendable rod (3) by means of the at least a pin (18), said at least a pin (18) being suitable to make rotate said extendable rod (3) with respect to said body (1) once extracted from the body (1).

6. Trolley (100) according to claims 3-4, **characterized in that** said further wheels (4b) are connected to the support frame (8) by means of said spindles (23) pivoted to the support frame (8) through the pins (24), said spindles (23) being coupled to each other by means of the steering rod (25), comprising at its ends the connecting means (26) to said spindle (23) such as to allow, as a result of a longitudinal translation of the steering rod (25), a rotation of the spindles (23) around the respective pins (24).

7. Trolley (100) according to claim 3, **characterized in that** said vehicle (110) comprises a power steering (27) suitable to transmit the motion to said steering rod (25) and, consequently, to make steer said additional steering wheels (4b), said power steering (27) being controlled by means of a steering (6) housed on said handle (2).

8. Trolley (100) according to claim 7, **characterized in that** said steering (6) is a rotary potentiometer suitable to convert the rotary motion given by the user in a curvature of the wheels (4b) of radius proportional to the command given.

9. Trolley (100) according to claim 1, **characterized in that** said vehicle (110) comprises a motor (5) suitable to provide traction to at least one of said further wheels (4b), said motor (5) being controlled by means of an accelerator (33) housed on said handle (2).

10. Trolley (100) according to claim 9, **characterized in that** said accelerator (33) is a slide potentiometer suitable to convert a linear movement given by the user in a proportional traction generated on the at least one of the additional wheels (4b).

11. Trolley (100) according to any one of the preceding

claims, **characterized in that** said handle (2) comprises a reverse command (35) suitable to change the direction of rotation of said further wheels (4b) and consequently the direction of advance of the vehicle (110).

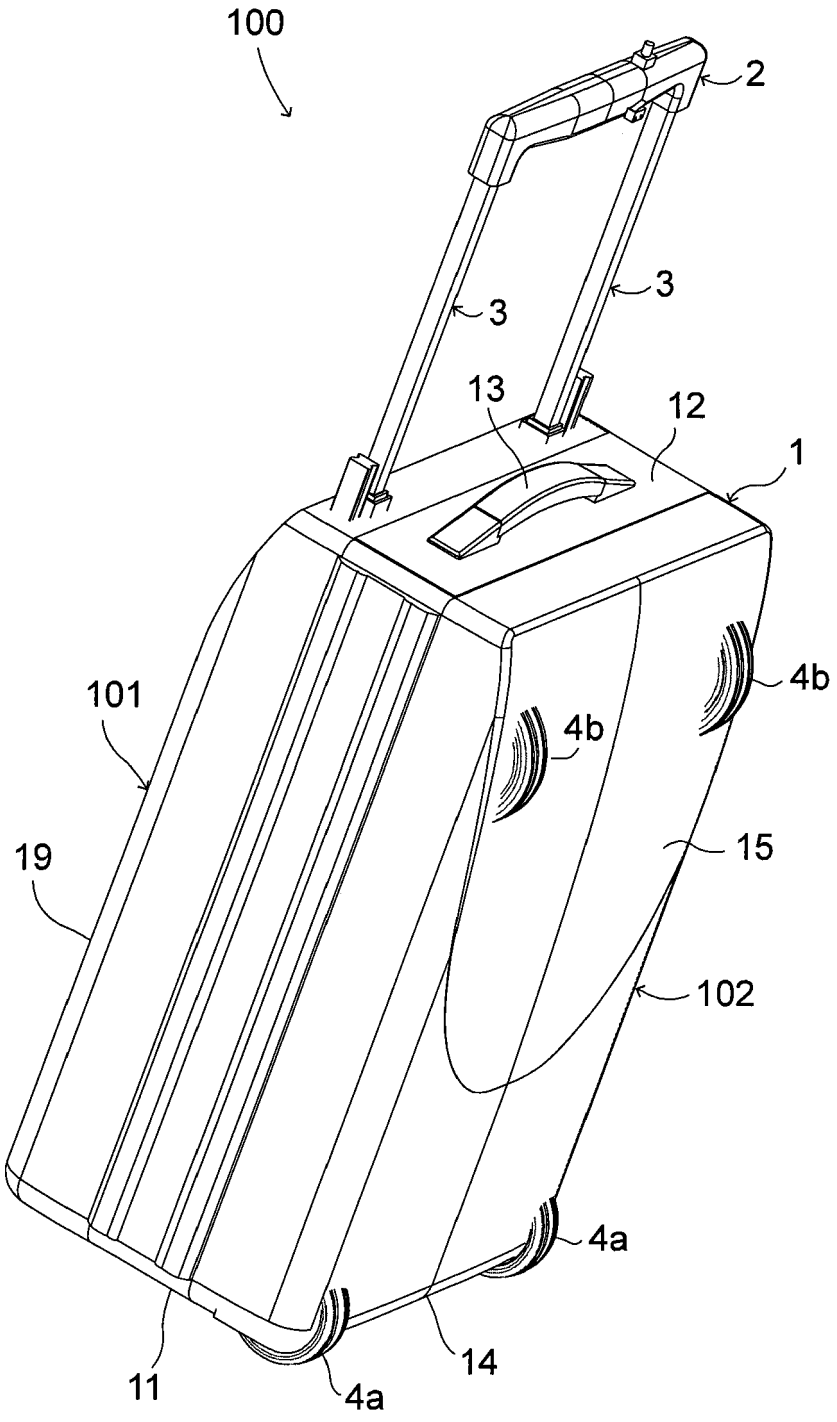

FIG.1

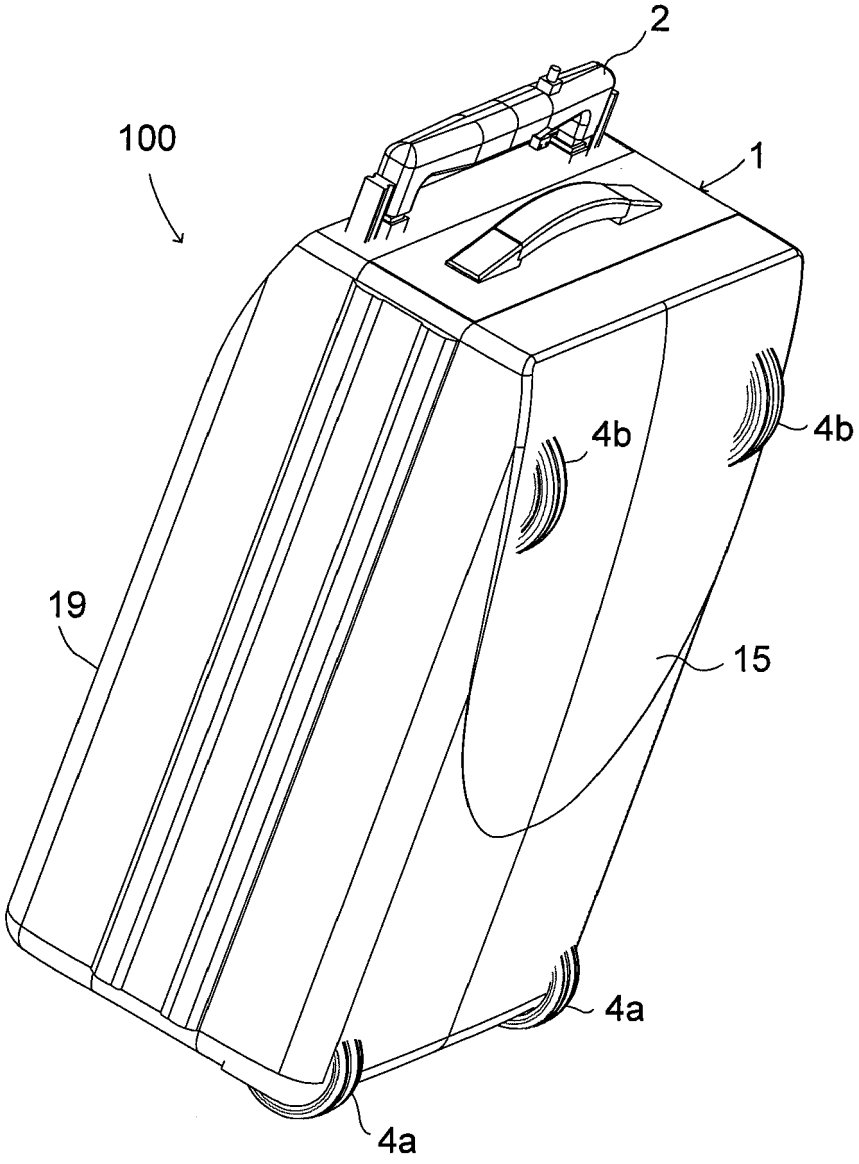

FIG.2

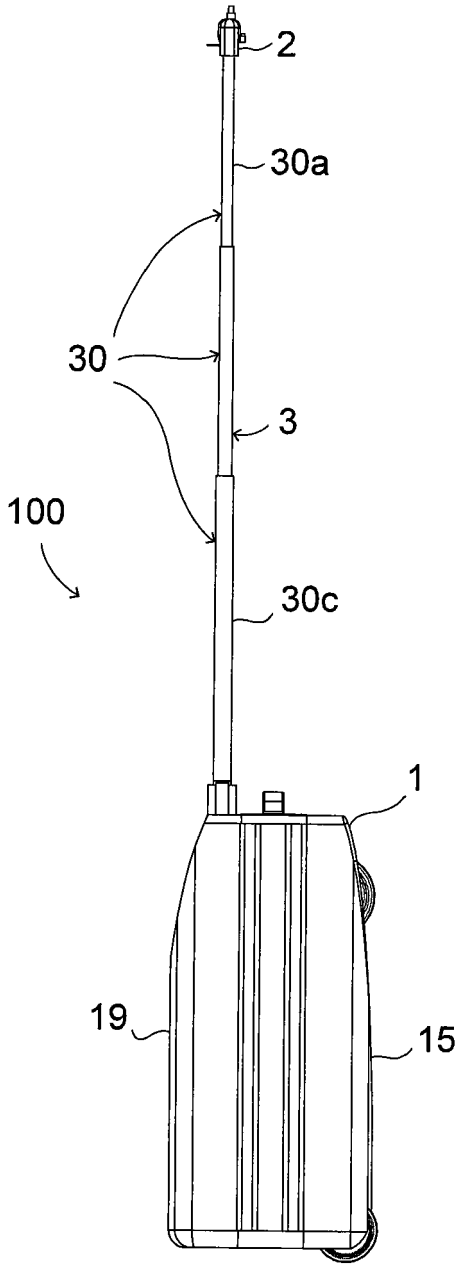

FIG.3

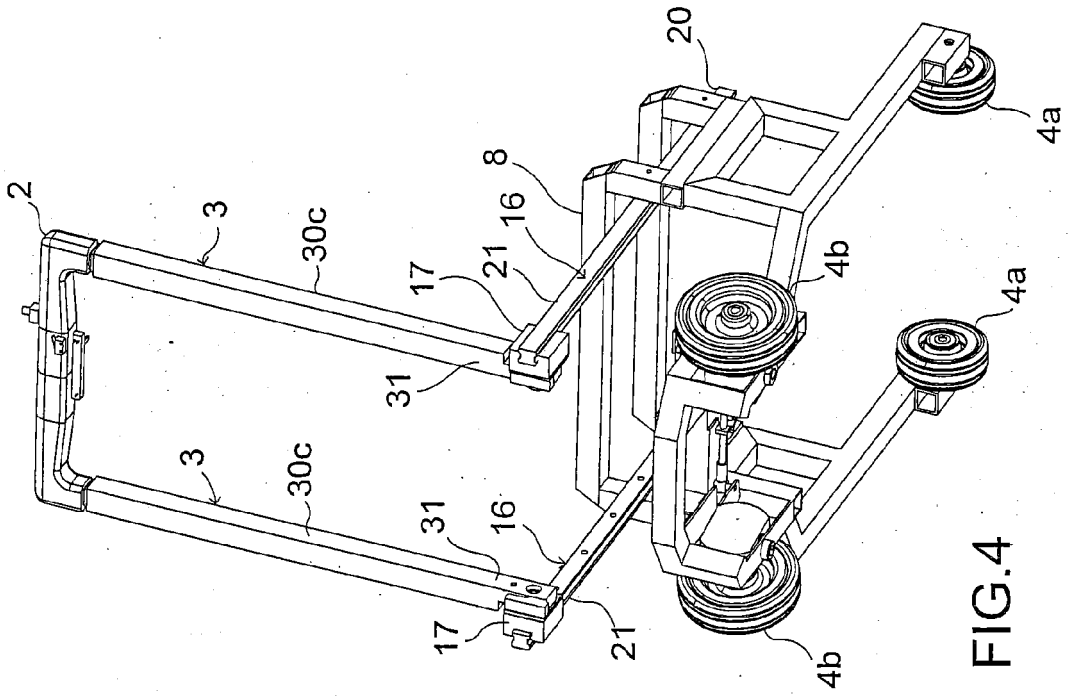
2
3
30c
17
21
16
8
20
4a
4b
31
3
30c
31
16
17
21
4b
4a

FIG.4

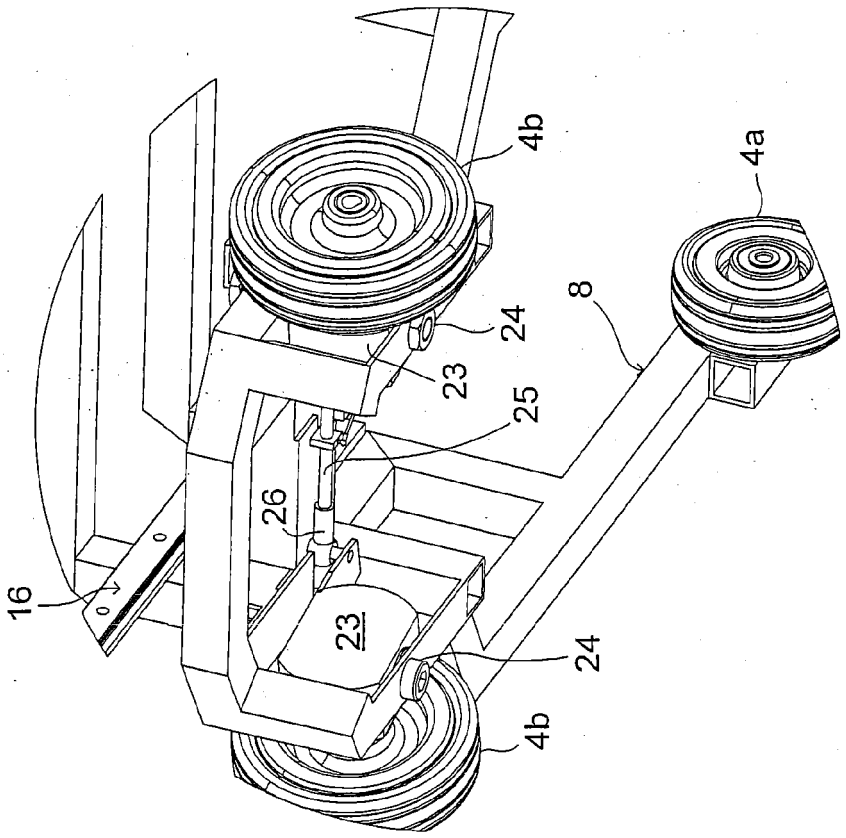
4b
4a
8
24
23
25
26
16
23
24
4b

FIG.5

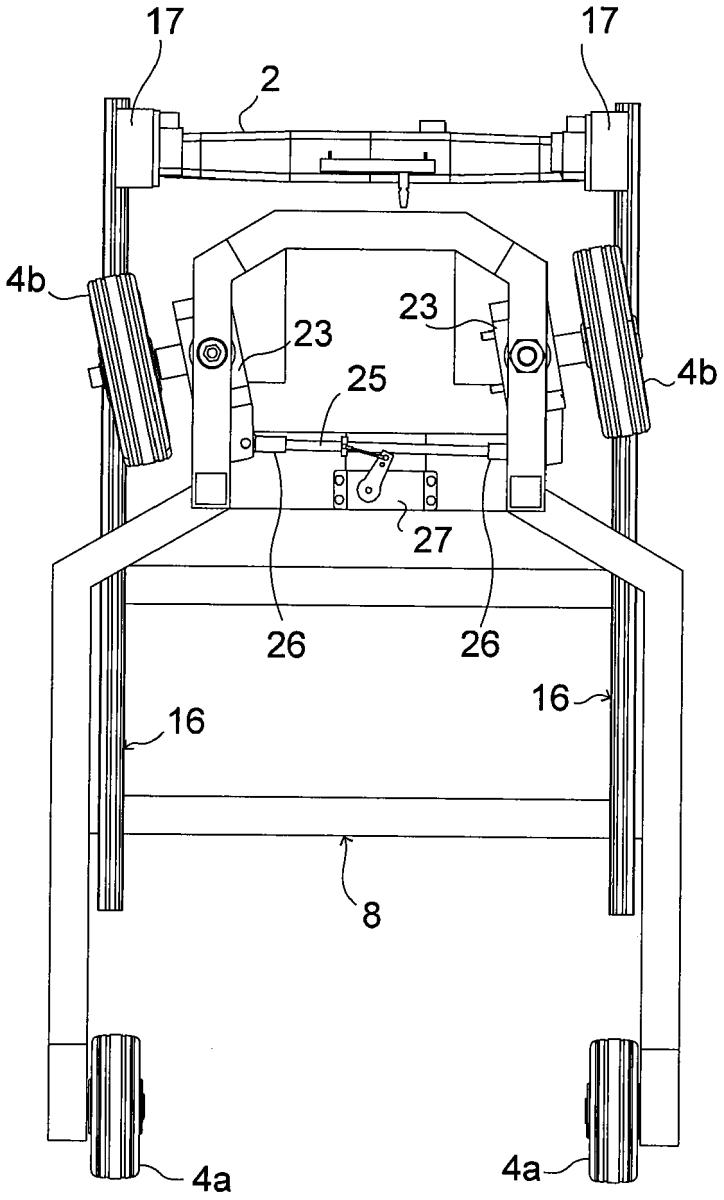

FIG.6

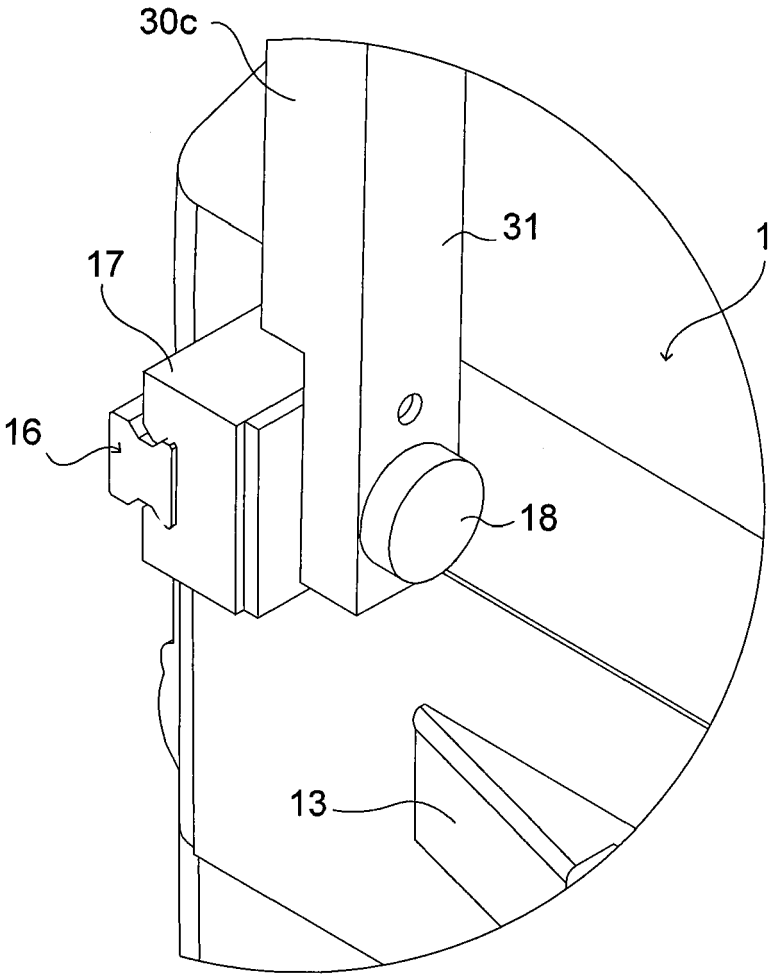

FIG.7

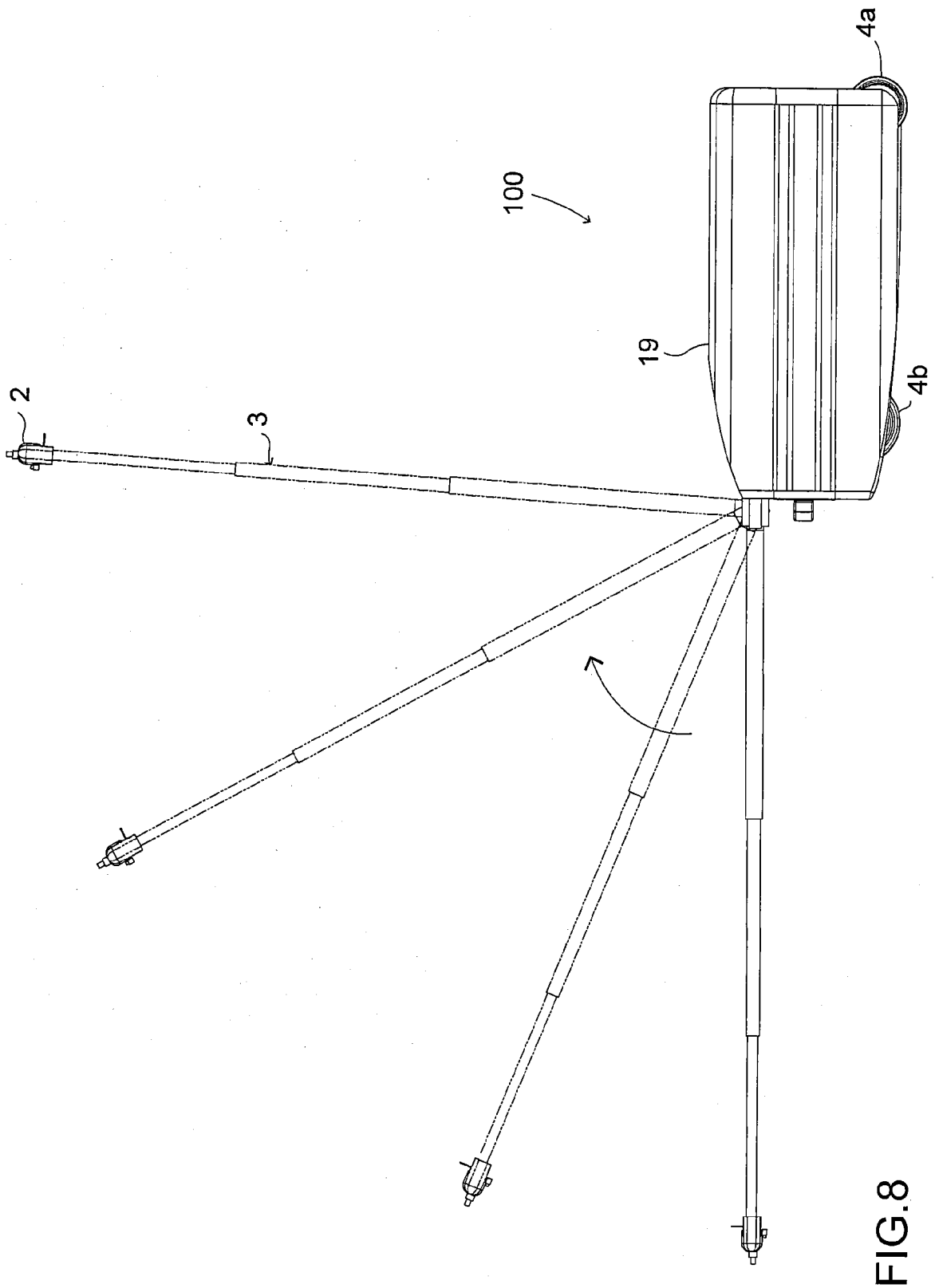

FIG.8

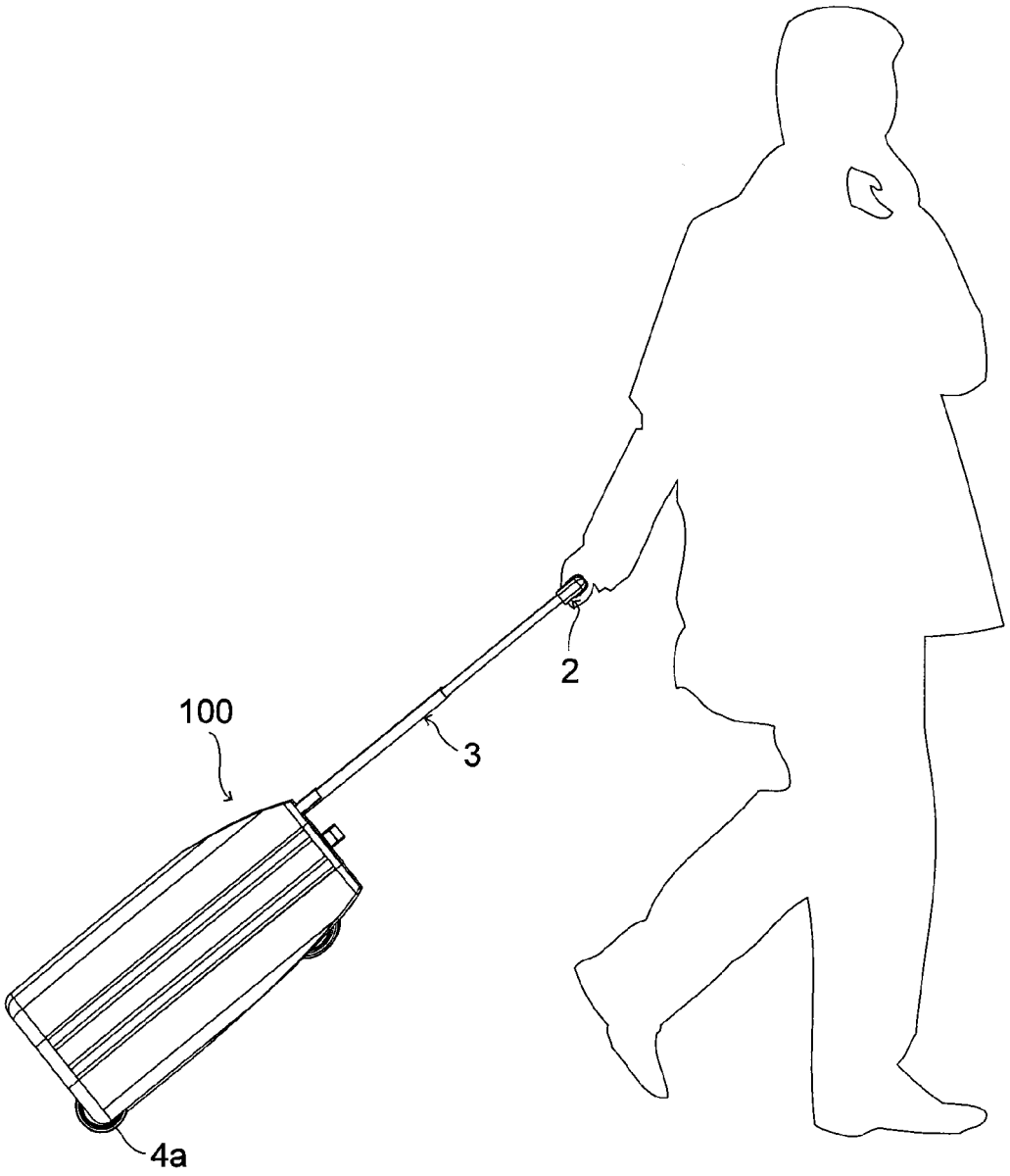

FIG.9

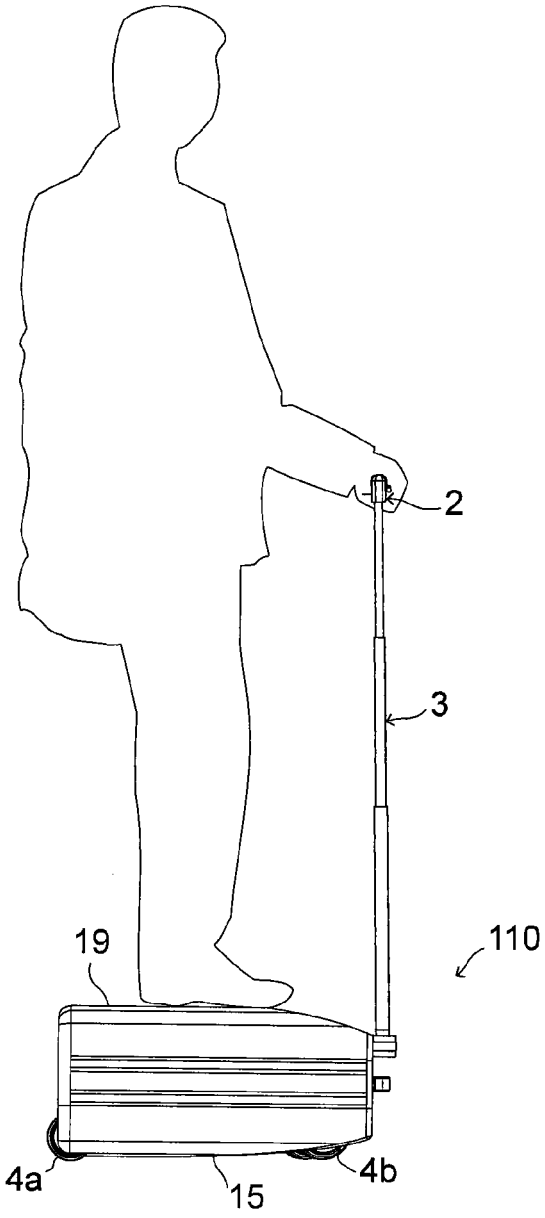

FIG.10

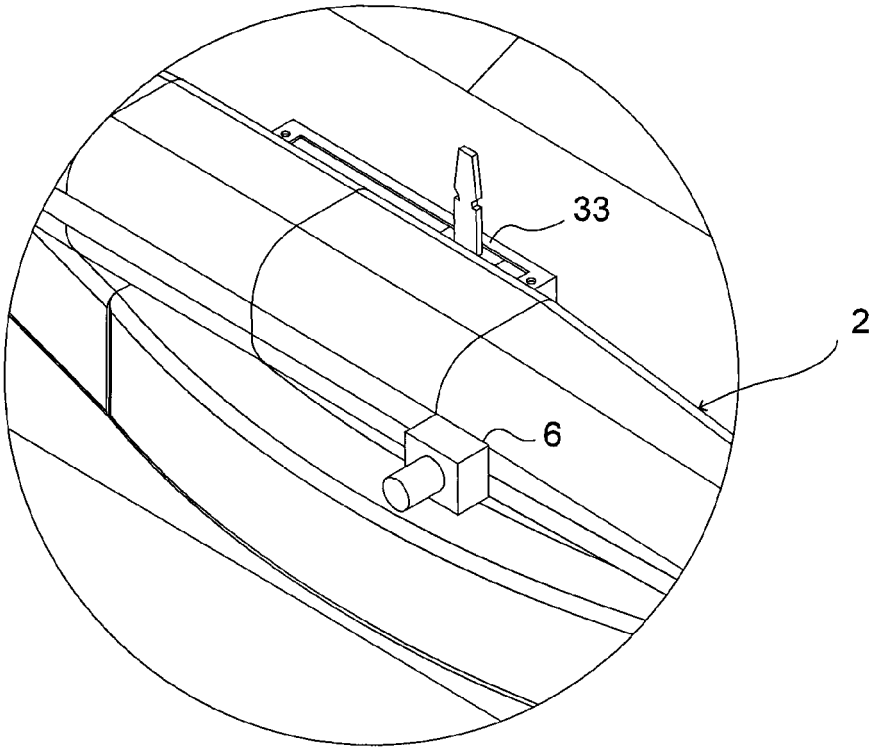

FIG.11

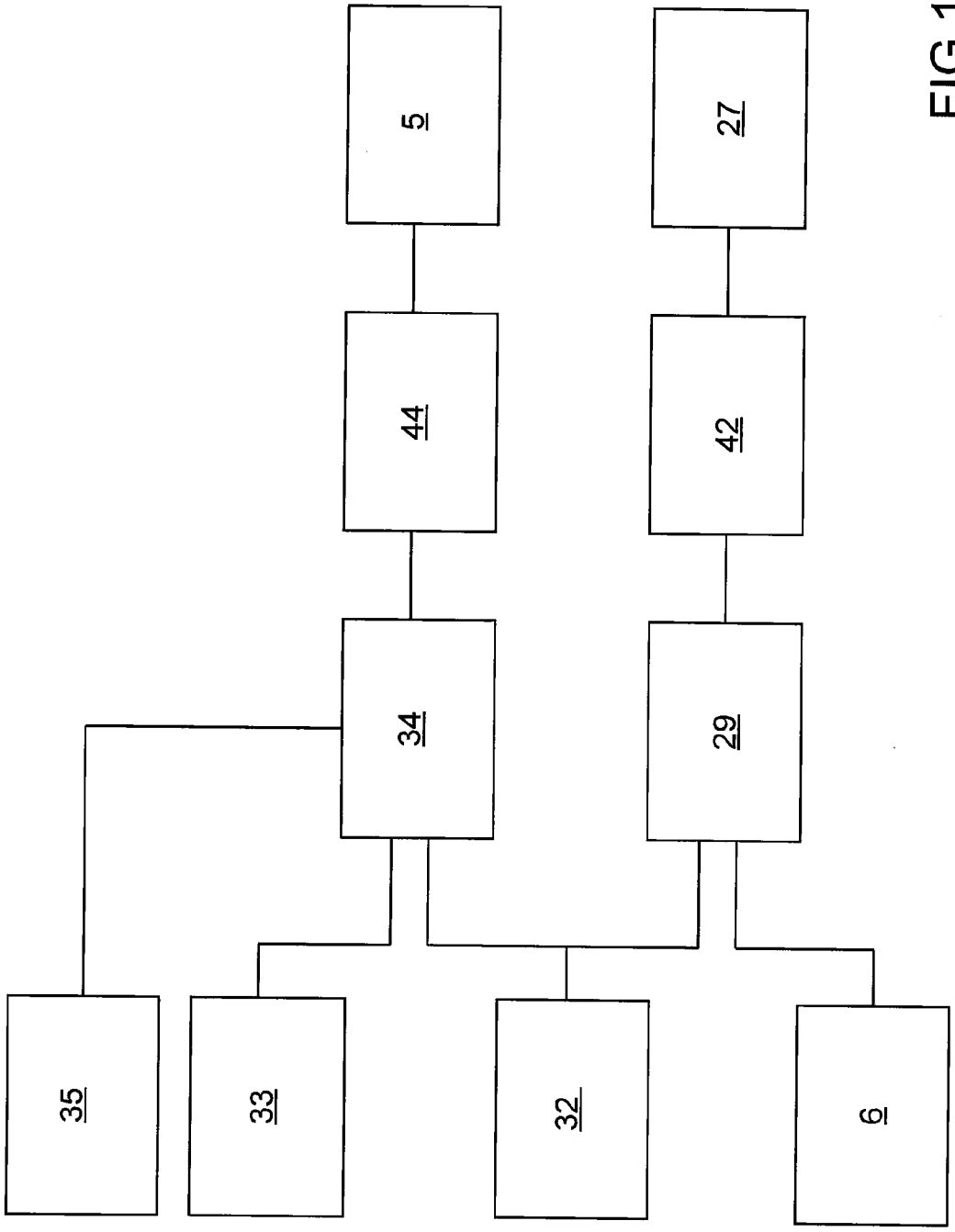

FIG.12

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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 2745

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 915 454 A1 (GAABAB JABER [FR]; COMSA MARIA [FR]; BANANA IMANE [FR]; BOUCHE NICOLAS) 31 October 2008 (2008-10-31) * abstract * -----	1	INV. A45C5/14 A45C13/26
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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	20 April 2015	Nicolás, Carlos

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