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(72) Inventor; and

(71) Applicant: MANZONI, Giulio [IT/IT]; Via Vicinanza, 6,
23814 Cremenno (LC) (IT).

(74) Agent: RASTELLI, Franco; Dott. Franco Cicogna & C.
Srl, Via Visconti di Modrone, 14/A, 20122 Milano (IT).

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HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
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(54) Title: BED STRUCTURE WITH OPENABLE BED BASE

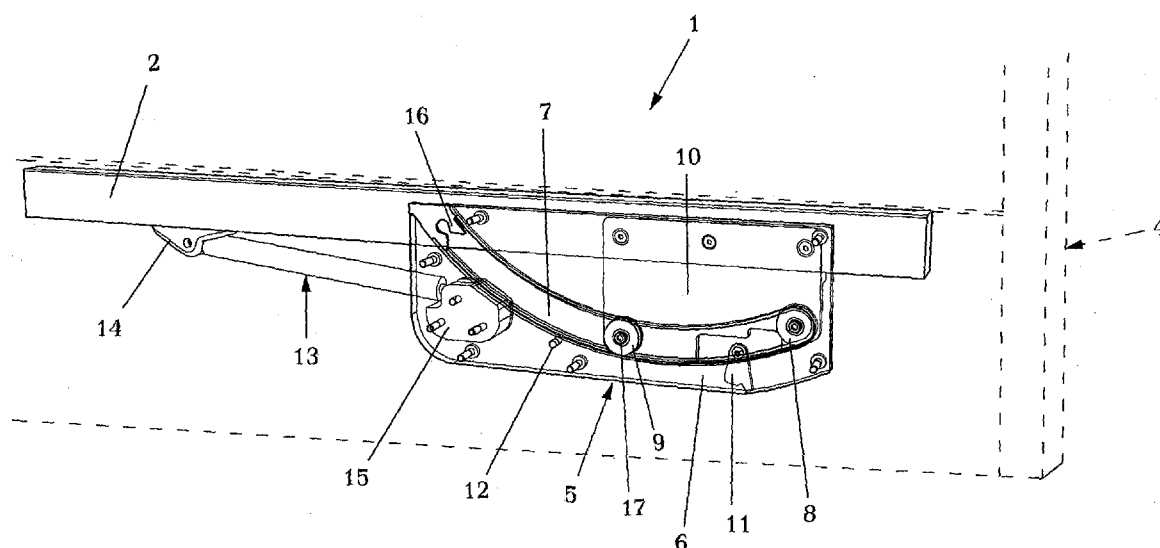


FIG. 2

(57) Abstract: A bed structure with openable bed base characterized in that it is automatically closable and comprises a bed base articulated to the sides of a bed via at least one articulation device; said articulation device comprising guide means of the lifting movement of the bed base, locking means of the bed base in an open position, and means of elastic support adapted to assist the lifting and lowering movement of the bed base.



BED STRUCTURE WITH OPENABLE BED BASE

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BACKGROUND OF INVENTION

The present invention relates to a bed structure with openable bed base.

More in particular, the bed structure of the present invention is of the type with bed base pivoted on one side and liftable to access a container
10 compartment arranged below said bed base.

There are known beds with a bed base that can be lifted to access a compartment under the same.

In turn, the bed base can also support one or more containers that in this way are made easily accessible.

15 Beds with liftable bed bases of a known type are generally produced by means of complicated lever mechanisms comprising springs that facilitate lifting of the bed base.

Bed base lifting systems of a known type generally have the drawback of being bulky and heavy, due to the fact that they are made of iron to withstand
20 the considerable forces required for their operation.

A further drawback of devices of a known type consists in the fact that with the existing kinematic mechanisms a considerable amount of starting energy is required for opening the bed and, during closing, a considerable amount of holding energy is required to avoid collapse, to the disadvantage of
25 safety.

A further drawback of known systems is that, once again due to the structure of the kinematic mechanism, gas springs with high forces must be used, subjecting the kinematic mechanism to considerable stress.

Another drawback of known devices is that the operations for assembling
30 and disassembling the kinematic mechanisms are laborious and slow.

A further drawback of known systems is that due to the functional limits of the kinematic mechanisms, the gas spring must be changed when the load

varies.

A further drawback of known systems is that, in the event of a sudden excessive load during closing, the bed base accelerates and collapses on the container of the bed, to the disadvantage of safety.

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SUMMARY OF INVENTION

The aim of the present invention is to provide a bed structure with openable bed base that overcomes the aforesaid drawbacks of the prior art.

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Within this aim, an object of the invention is to provide a bed structure with openable bed base provided with an articulation device that allows the bed base to be easily locked in an open position and in a completely safe manner.

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Another object of the invention is to provide a bed structure with openable bed base via an articulation device completely without levers and other complicated mechanisms, to the advantage of safety and reliability.

A further object of the invention is to provide a bed structure with openable bed base that can be made of light materials, even not metallic, such as wood for the bed base and plastic for the components of the articulation device.

20

Another object of the invention is to provide a bed structure with openable bed base provided with an articulation device of a limited size so as to be almost invisible and that can be arranged completely within the volume of the container of the bed.

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A further object of the invention is that to provide a bed structure with openable bed base that allows extremely easy and rapid assembly of the bed base with the bed without requiring tools, so as to allow a saving of time and therefore of costs, and easy and rapid assembly and disassembly, both for cleaning and for any movement required.

30

Another object of the invention is to provide a bed structure with openable bed base provided with an articulation device that, due to its characteristics, allows a considerable applicable load range, using the same gas springs.

The present structure, due to its peculiar construction characteristics, is

able to ensure the broadest possible guarantees of reliability and safety in use.

These and other objects, which will be more apparent below, are achieved by a bed structure with openable bed base characterized in that it comprises a bed base articulated to the sides of a bed via at least one articulation device; said articulation device comprising guide means of the lifting movement of the bed base, locking means of the bed base in an open position, and means of elastic support adapted to assist the lifting and lowering movement of the bed base.

BRIEF DESCRIPTION OF DRAWINGS

Further characteristics and advantages of the subject matter of the present invention will be more apparent by examining the description of a preferred, but not exclusive, embodiment of the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Fig. 1 is a perspective view illustrating the inner part of a side of a bed, in the articulation area of the openable bed base, with the bed base in closed position;

Fig. 2 is a perspective view illustrating the outer part of the side of the bed in the articulation area of the openable bed base, with the bed base in closed position;

Fig. 3 is a perspective view illustrating the inner part of a side of a bed, in the articulation area of the openable bed base, with the bed base in open position and with ratchet activated;

Fig. 4 is a perspective view illustrating the outer part of the side of the bed in the articulation area of the openable bed base, with the bed base in open position and with ratchet activated;

Fig. 5 is a perspective view illustrating the inner part of a side of a bed, in the articulation area of the openable bed base, with the bed base in open position and with ratchet deactivated;

Fig. 6 is a perspective view illustrating the outer part of the side of the bed in the articulation area of the openable bed base, with the bed base in open

position and with ratchet deactivated.

DESCRIPTION OF PREFERRED EMBODIMENTS

5 With particular reference to the numerical symbols of the aforesaid figures, the bed structure with openable bed base, according to the invention, generally indicated with the reference numeral 1, comprises a bed base 2 articulated to the sides 3 of a bed 4 via a pair of articulation devices 5.

10 In the figures, and in the following description, only one of the sides of the bed 4 and related articulation device 5 will be shown.

 According to the present invention, the articulation device 5 comprises guide means of the lifting movement of the bed base 2, locking means of the bed base 2 in an open position, and means of elastic support adapted to assist the lifting and lowering movement of the bed base 2.

15 The articulation device 5 comprises a small frame 6 fixed to the side 3 of the bed and provided with a curved guide 7 in which two wheels 8 and 9 slide, integral with a plate 10 fixed to the bed base 2.

 The curved guide 7 is configured so that the bed base 2 undergoes a swivelling opening movement, from a closed position, visible in Figs. 1 and 2, to
20 an open or raised position, visible in Figs. 3-6.

 The movement of the bed base 2 is lockable in an open position via a ratchet device consisting of a ratchet 11 hinged to the plate 10, which cooperates with a peg 12 fixed to the small frame 6.

25 The means of elastic support comprise a gas spring 13, which has a first end 14 hinged to the bed base 2 and a second end 15 hinged to the small frame 6 integral with the side 3 of the bed 4.

 Operation of the bed structure with openable bed base according to the present invention is as follows.

30 The bed base 2 can be taken by the user from the closed position, visible in Figs. 1 and 2, to an open position, visible in Figs. 3 and 4, simply by lifting the bed base without exerting any effort due to the positive action of the gas spring 13 that, in the closed position, is compressed and therefore loaded with energy.

During the rotation from the closed position to the open position, the ratchet 11, which is freely hinged in the plate 10, integral with the bed base, moves beyond the locking peg 12, fixed to the small frame 6, and the bed base 2 is activated.

5 At this point, the free end of the ratchet 11 engages the peg 12, preventing a further downward rotation of the bed base and locking the latter in the open position, as can be seen in Figs. 3 and 4.

According to the invention, at the end of the guide 7 that receives the bed base 2 in the open position there is provided an elastic clamp 16 ("ciapanas"),
10 designed for cooperating with the pin 17 of the wheel 9.

During opening of the bed, the bed base 2 is lifted upward in Fig. 4, until causing coupling of the ratchet 11 on the peg 12.

In this phase, the pin 17 of the screw 9 is not yet housed in the elastic clamp 16 (Fig. 4).

15 The deactivation operation is performed by further lifting of the bed base 2 from the position of Fig. 4, thereby causing elastic insertion of the pin 17 of the screw 9 in the clamp 16.

Simultaneously, the ratchet 11 is deactivated and, moreover, as there is no longer any action of the gas spring, which at this point has reached the end of
20 its travel, the bed base 2 is closed, as its own weight is sufficient to cause the pin 17 of the wheel 9 to exit from its seat in the elastic clamp 16.

Therefore, according to the present invention, in order to be activated the bed base does not require to be lowered, as it activates itself, opposing the screw of the pulley with the elastic clamp (the so-called "ciapanas") at the end of
25 travel.

To close the bed base, it is sufficient to lift the same bed base slightly, thereby causing it to rotate upward, to release the free end of the ratchet 11 which is positioned vertically, through gravity, as can be seen in Figs. 5 and 6.

From this vertical position, when the bed base is subsequently lowered,
30 the ratchet 11 slides on the peg 12, without engaging it, allowing the bed base to rotate until reaching the closed position.

It has in practice been seen that the invention achieves the intended aim

and objects.

In fact, a bed structure with openable bed base provided with an articulation device that facilitates the movement of the bed base, without any effort by the user, and allows reliable locking of the same bed base in any open
5 position has been achieved.

Moreover, from each open position the bed base is automatically closable.

The bed structure according to the present invention is characterized in that the bed base is articulated to the side of the bed via a pair of wheels sliding
10 in a curved guide, arranged under the plane of the mattress and positioned at a suitable distance from the head of the bed base, so as to allow an adequate angle of aperture, without the bed base interfering with the bottom of the bed.

The structure comprises a gas spring on each side of the bed acting between the bed base and the same side, positioned so as to express work that
15 in each point of the rotation balances the thrust given by the weight of the bed base and related mattress.

The articulation device of the present invention allows easy opening of the bed base even with container.

Of course the materials used and the dimensions can be any according to
20 needs.

CLAIMS

1. A bed structure with openable bed base **characterized in that** said bed base is automatically closable and includes a bed base (2) articulated to the sides (3) of a bed (4) via at least one articulation device (5); said articulation device (5) comprising guide means (7, 8, 9) of the lifting movement of the bed base (2), locking means (11, 12) of the bed base (2) in an open position, and means of elastic support (13) adapted to assist the lifting and lowering movement of the bed base (2).

2. A bed structure according to claim 1, **characterized in that** said articulation device (5) comprises a small frame (6) fixed to the side (3) of the bed (4) and provided with a curved guide (7) in which a wheel 8, and a wheel 9 provided with a pin (17), are sliding, said wheels (8,9) being integral with a plate (10), attached to the bed base (2); said curved guide (7) being configured so that the bed base (2) undergoes a swivelling opening movement, from a closed position to an open or raised position.

3. A bed structure according to claim 1, **characterized in that** said locking means comprise a ratchet device comprising a ratchet (11) hinged to said plate (10) and cooperating with a peg (12) fixed to said small frame (6).

4. A bed structure according to claim 1, **characterized in that** said means of elastic support comprise a gas spring (13) which has a first end (14) hinged to said bed base (2) and a second end (15) hinged to said small frame (6) fixed to the side (3) of the bed (4).

5. A bed structure according to one or more of the preceding claims, **characterized in that** it includes, at the end of the guide (7) which holds the bed base (2) in the open position, an elastic clamp (16) designed for cooperating with the pin (17) of the wheel (9).

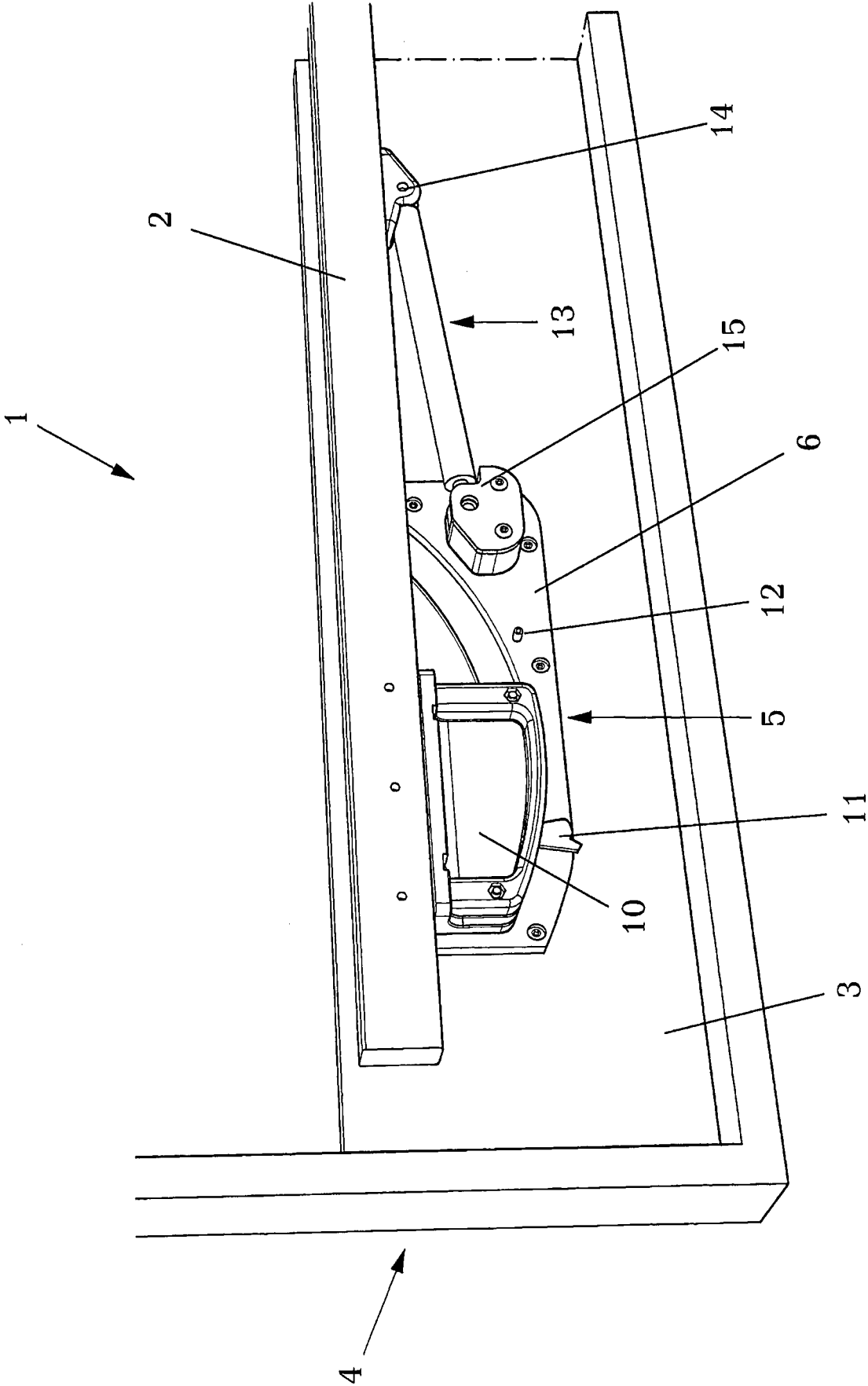


FIG. 1

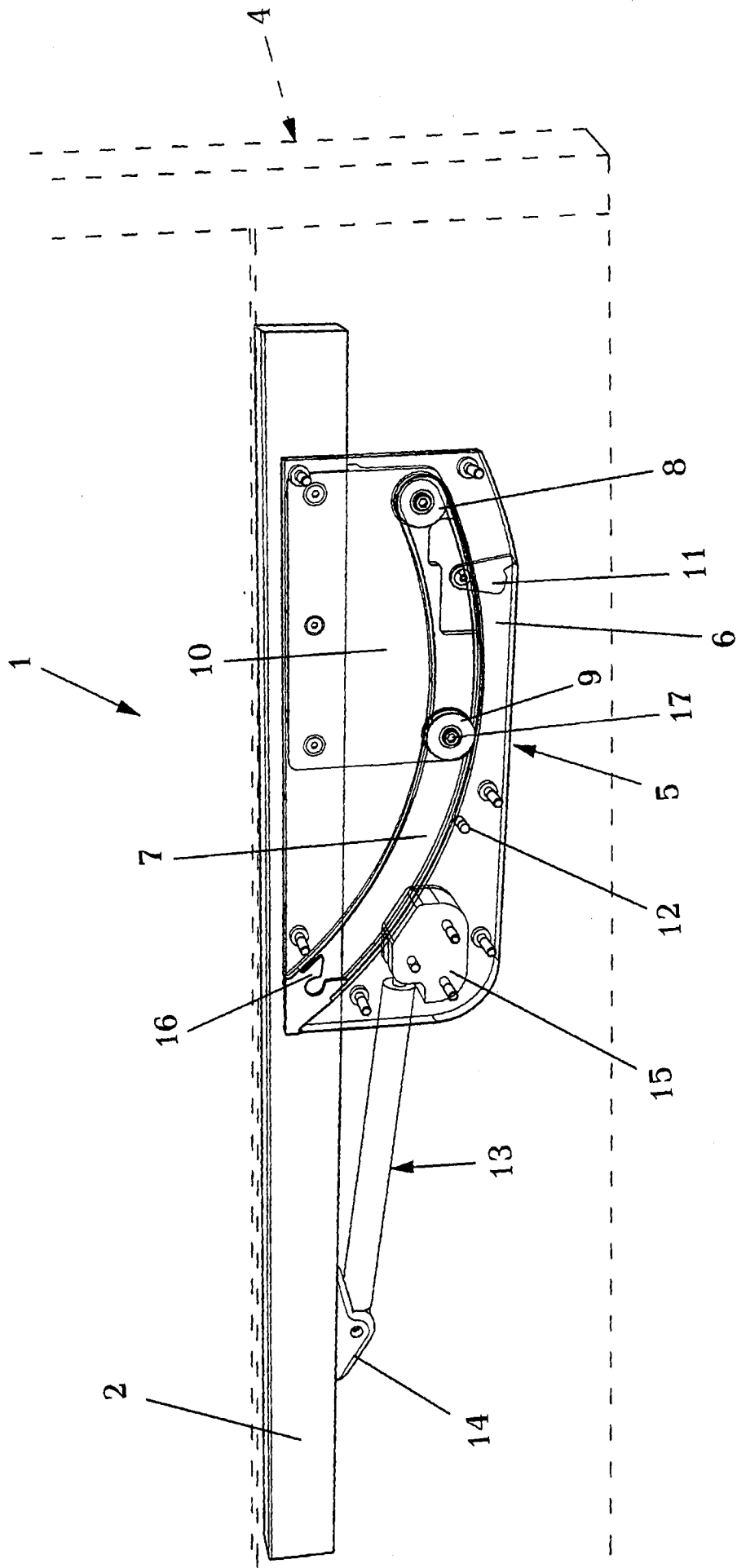
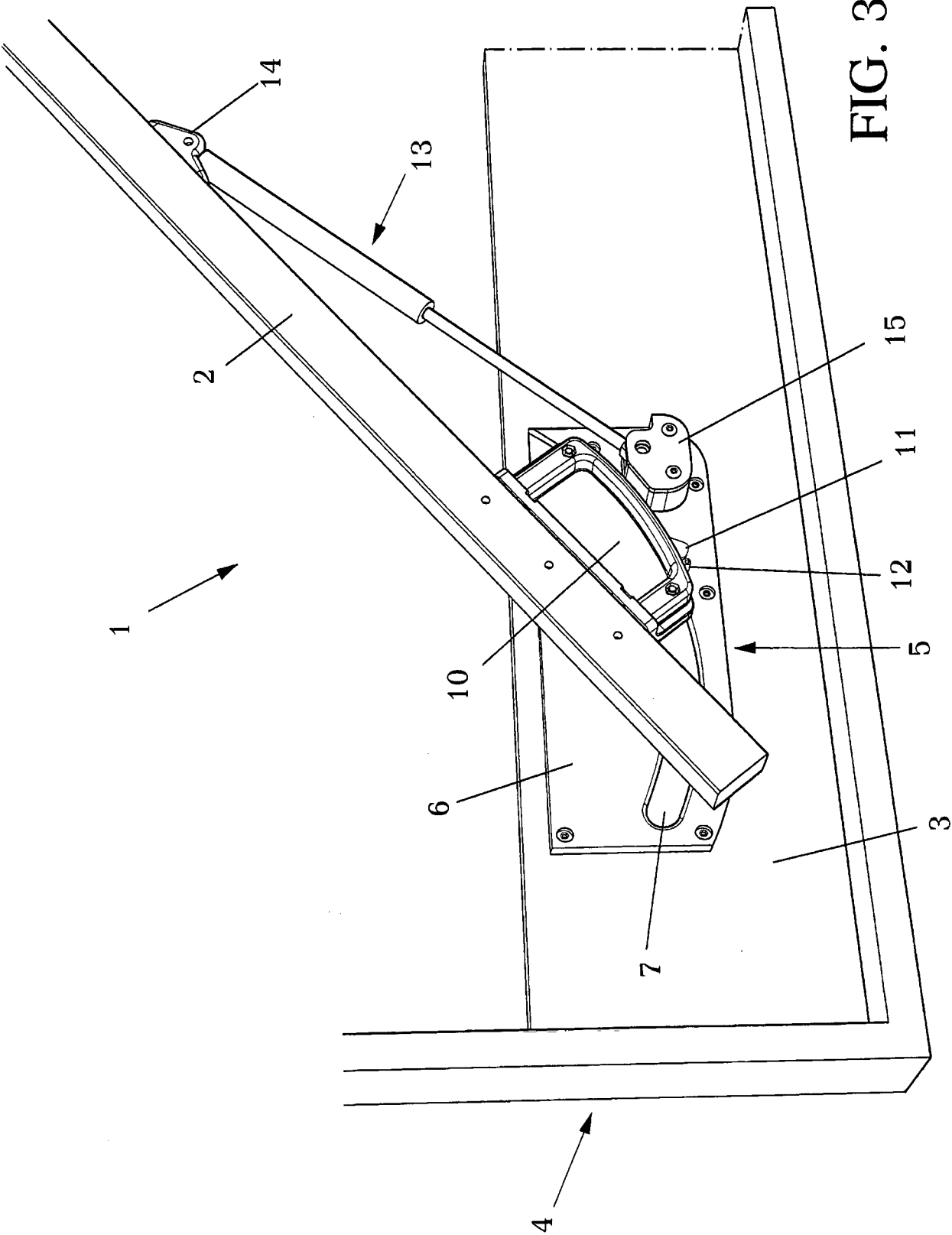
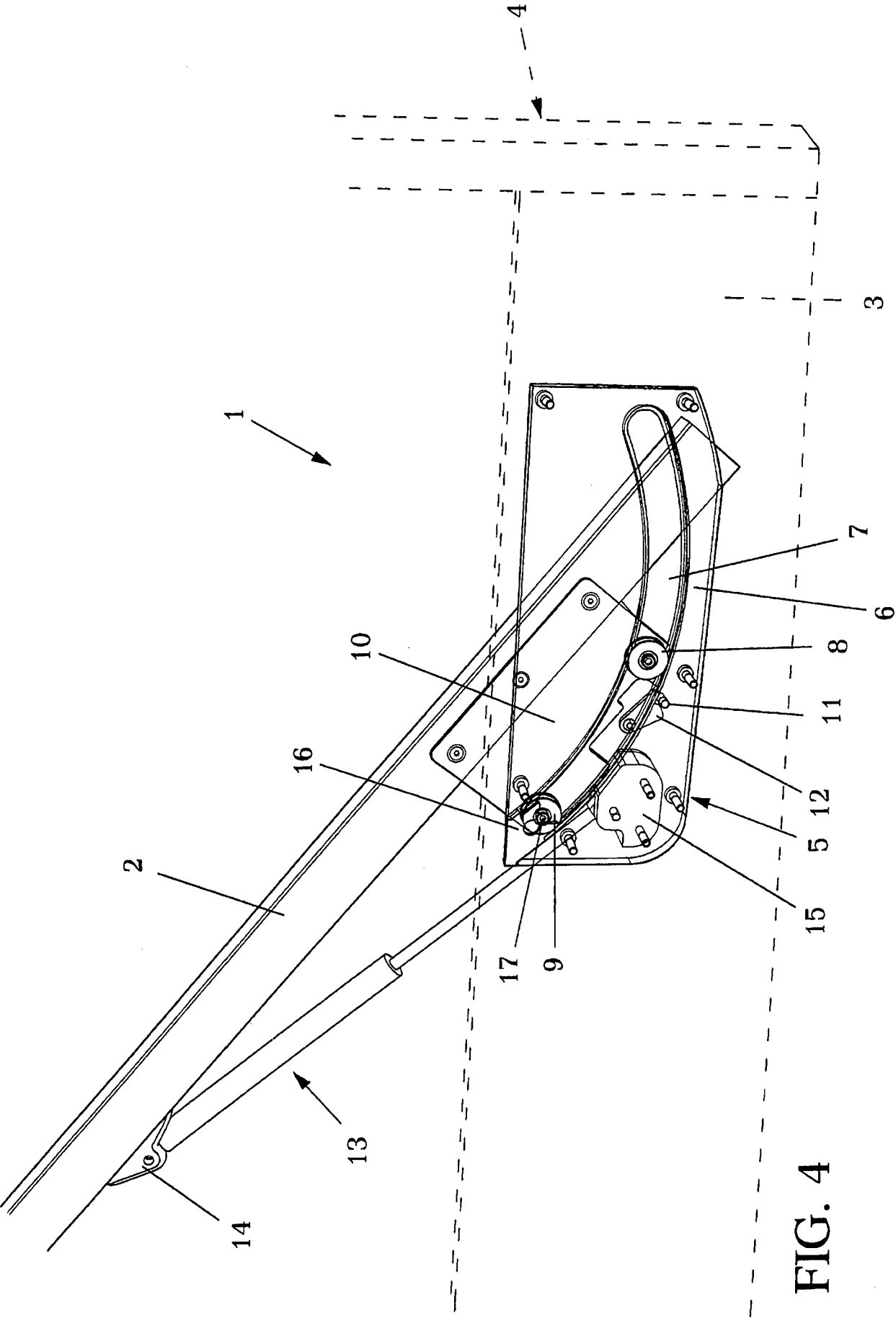
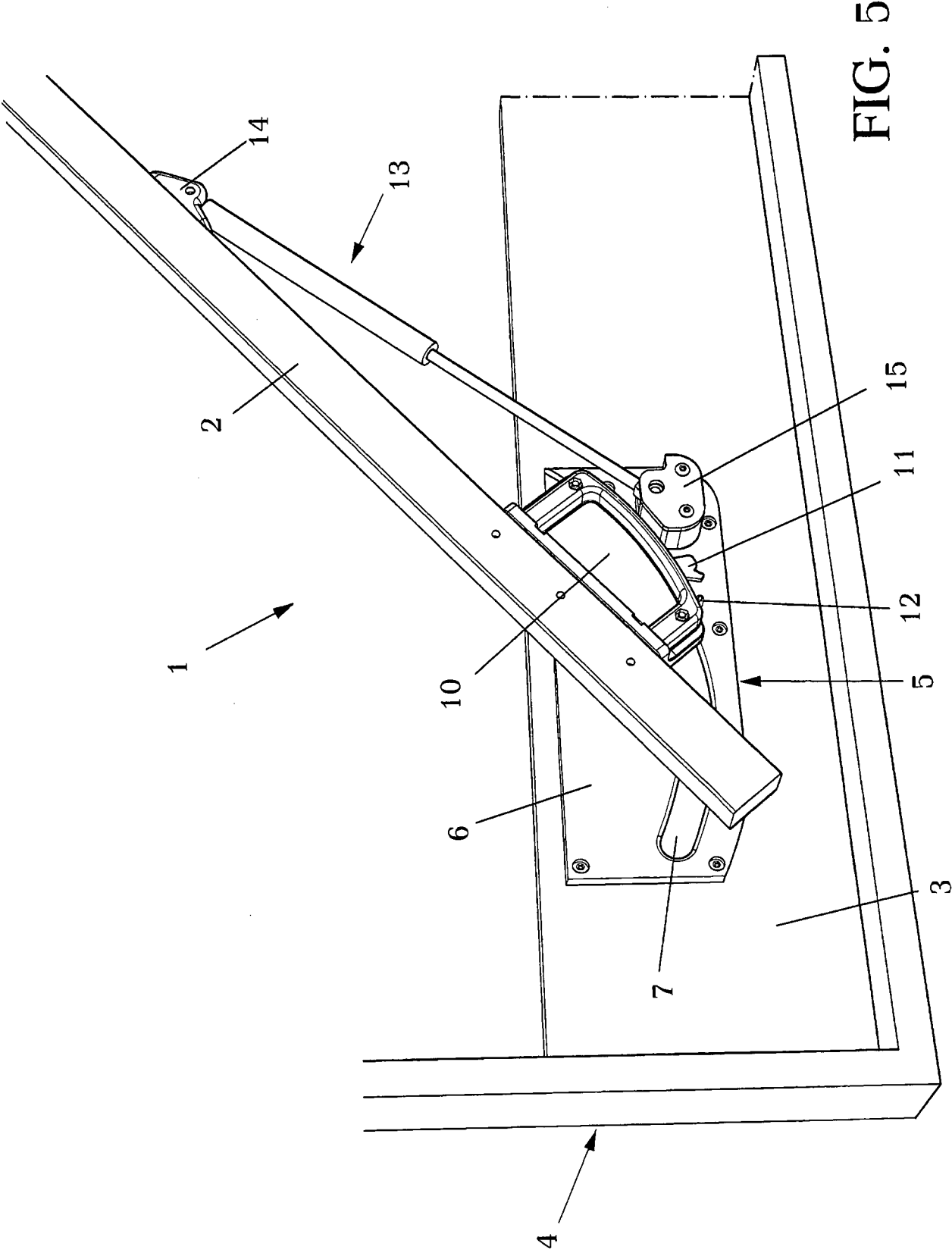


FIG. 2







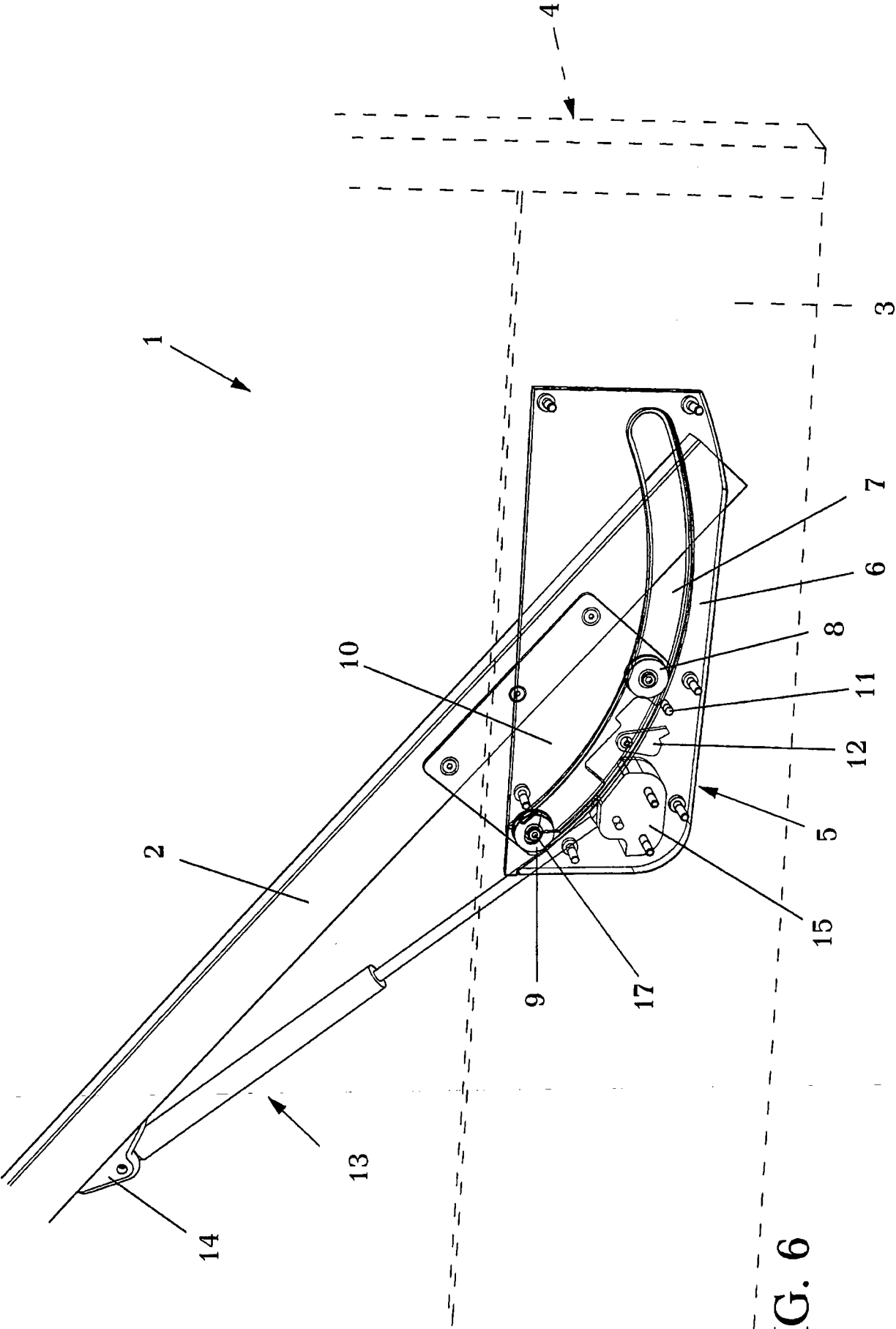


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/000874

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47C17/86
ADD.

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)
A47C

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)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2002 204734 A (FRANCE BED CO) 23 July 2002 (2002-07-23)	1,2,4
A	the whole document	3,5
A	----- WO 2016/038437 A1 (MANZONI GIULIO [IT]) 17 March 2016 (2016-03-17) page 4, line 23 - page 6, line 27; figures 1-4	1
A	----- JP 2002 209675 A (FRANCE BED CO) 30 July 2002 (2002-07-30) the whole document	1



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Lehe, Jörn

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2002204734 A	23-07-2002	NONE	

WO 2016038437 A1	17-03-2016	CN 106604663 A	26-04-2017
		EP 3190925 A1	19-07-2017
		TW 201609025 A	16-03-2016
		WO 2016038437 A1	17-03-2016

JP 2002209675 A	30-07-2002	NONE	
