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(72) Inventors:
• **LOSCHI, Stefano**
41012 CARPI (IT)
• **GAMBAIANI, Lorenzo**
41012 CARPI (IT)

(74) Representative: **Paparo, Aldo**
Bugnion S.p.A.
Via Vellani Marchi, 20
41124 Modena (IT)

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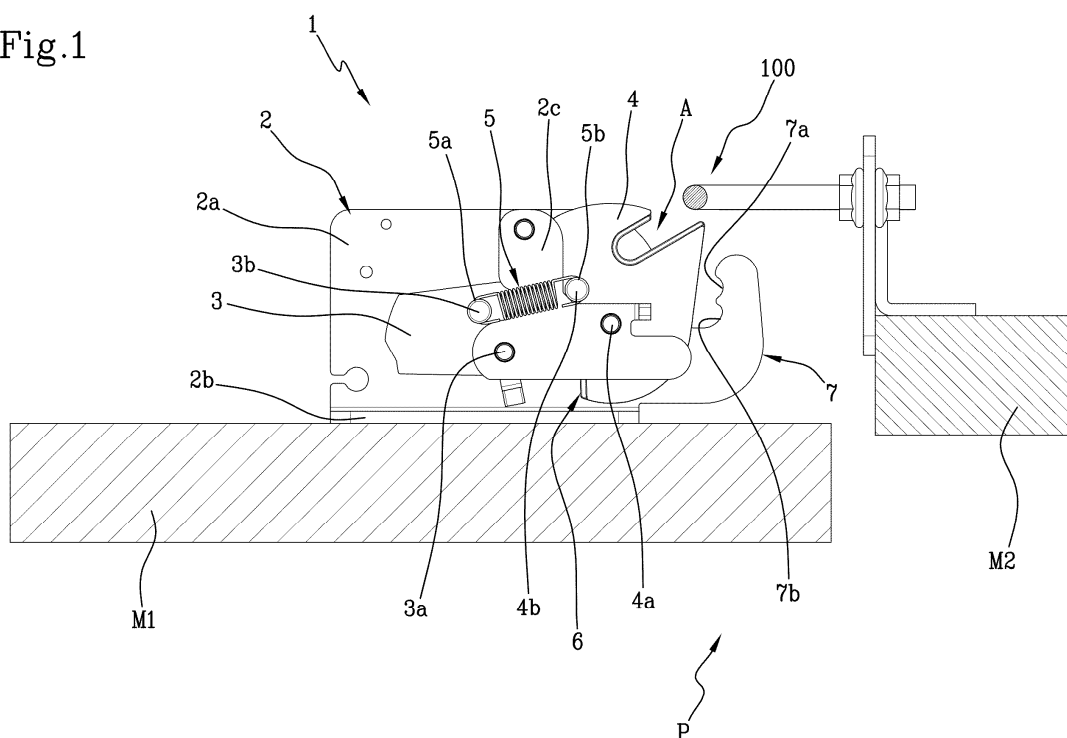
(71) Applicant: **CEV LAB S.r.l.**
20045 Lainate (MI) (IT)

(54) A LOCKING DEVICE FOR DOORS AND HATCHES

(57) A locking device (1) for doors (P) or hatches, comprising a support member (2), a hooking lever (3) and a closing lever (4). Elastic means (5) operatively connected to the hooking lever (3) and to the closing lever (4). The closing lever (4) has a housing (A), adapted to engage with a pin (100) solidly constrained with a frame

of the door (P) or hatch, and a shaped profile (6) adapted to engage with the hooking lever (3) at least when the levers (3, 4) are in the second position and third position. The support member (2) further has a locking profile (7) arranged to close a free end of the housing (A) when the levers (3, 4) are in the second position and third position.

Fig.1

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Description

[0001] The present invention relates to a snap-locking device for doors and hatches.

[0002] The present device therefore applies to the field of locks and safety locks for doors or hatches, such as, for example, the doors or hatches of motor vehicles such as vans, camper vans, caravans, motor caravans, motor homes and similar.

[0003] Generally, the locks are provided with elements that allow the hooking thereof to a pin that is projecting and fixed to a frame of the door.

[0004] In order to overcome critical issues due to the resistance loads that the regulations associate with locks and due to any problems caused, for example, by the possible breakage of return elements such as springs or problems caused by the protrusion of certain elements of the lock or pin, it is known in the prior art to manufacture locks provided with various components having a high mechanical complexity and also a high manufacturing cost.

[0005] Therefore, to date, the known locks have high manufacturing costs and therefore high maintenance or replacement costs, as well as being complex to manufacture.

[0006] The technical task of the present invention is thus to provide a locking device that is capable of overcoming the drawbacks that have emerged from the prior art.

[0007] An object of the present invention is therefore to provide a locking device that is lightweight and easy to manufacture.

[0008] A further object of the present invention is thus to provide a locking device that is not particularly complex from a structural viewpoint.

[0009] A further object of the present invention is thus to provide a locking device that is economical from a manufacturing or maintenance viewpoint.

[0010] Yet another object of the present invention is to provide a locking device that responds to high resistance loads, guaranteeing high operating standards.

[0011] The stated technical task and specified objects are substantially achieved by a locking device comprising the technical features disclosed in one or more of the appended claims. The dependent claims correspond to possible embodiments of the invention.

[0012] In particular, the stated technical task and specified objects are substantially achieved by a locking device for doors or hatches comprising a support member, a hooking lever, a closing lever and elastic means. According to an aspect of the present invention, the hooking lever and the closing lever are operatively connected to the support member.

[0013] The hooking lever and the closing lever are free to rotate with respect to each other between at least three positions, a first opening position, a second intermediate (or semi-closed) position and a third closing position. According to an aspect of the invention, the elastic means

(or elastic return means) are operatively connected to the hooking lever and to the closing lever and configured to exert a resisting moment on the rotation of said levers.

[0014] According to an aspect of the invention, the closing lever has a housing, adapted to engage with a pin solidly constrained with a frame of the door or hatch, and a shaped profile adapted to engage with the hooking lever at least when the levers are in the second position and third position. Preferably, the housing has a rectilinear shape, i.e. without bends or intermediate housings along the extension thereof.

[0015] According to an aspect of the invention, the support member also has a locking profile arranged to close a free end of the housing when the levers are in the second position and third position.

[0016] Advantageously, the presence of the locking profile allows the obtaining of a lightweight and economical locking device that does not require complex and costly components to overcome the known problems of the prior art.

[0017] Additional features and advantages of the present invention will emerge more clearly from the indicative and thus non-limiting description of an embodiment of a locking device.

[0018] Such description will be set forth herein below with reference to the accompanying drawings, provided for merely indicative and therefore non-limiting purposes, wherein:

- Figure 1 is a schematic representation of the locking device in a first operating configuration;
- Figure 2 is a schematic representation of the locking device in a second operating configuration;
- Figure 3 is a schematic representation of the locking device in a third operating configuration.

[0019] With reference to the appended figures, the number 1 indicates, in its entirety, a locking device for doors or hatches which, for simplicity of description, will be referred to below as the device 1.

[0020] In particular, the door "P" or hatch has a movable upright "M1" and a fixed upright "M2". Preferably, as shown in the appended figures, the device 1 is fixed to the movable upright "M1" and is configured to interact with a pin 100 fixed to the fixed upright "M2".

[0021] The pin 100 can have a U shape or a C shape. In other words, the pin has at least two rods perpendicular to a third rod, so as to define a portion configured to interact directly with the device 1.

[0022] The device 1 comprises a support member 2. The support member 2 can have a slab shape and is provided with a main portion 2a. The slab-shaped support member 2 is fixed or fixable to the movable upright "M1". The term slab-shaped means a three-dimensional body on which one of the three dimensions is negligible.

[0023] The support member 2 can also have an L shape and can therefore be provided with a hooking plate 2b, extending perpendicular to the main portion 2a, fixed

or fixable to the movable upright "M1".

[0024] The device 1 comprises a hooking lever 3 and a closing lever 4 (hereinafter also indicated as levers 3 and 4). The levers 3 and 4 are operatively connected to the support member 2. As shown in the appended figures, the levers 3 and 4 are operatively connected to the main portion 2a.

[0025] The levers 3 and 4 can be made in the form of slab-shaped elements. The hooking lever 3 and the closing lever 4 are free to rotate with respect to each other.

[0026] The support member 2 can comprise a hooking element 2c defining a first rotation pin 4a for the locking lever 4 and a second rotation pin 3a for the locking lever 3. In other words, the levers 3 and 4 are free to rotate with respect to each other, rotating around the rotation pins 3a and 4a.

[0027] As shown in the appended figures, the hooking lever 3 and the locking lever 4 are interposed between the main portion 2a of the support member 2 and the hooking element 2c. In other words, between the main portion 2a and the hooking element 2c, an interspace is defined in which the levers 3 and 4 are positioned and free to rotate.

[0028] The hooking element 2c can have a slab shape and therefore be advantageously lightweight and easily associable with the main portion 2a of the support member 2.

[0029] The levers 3 and 4 are free to move between at least three positions (also known as limit positions). The three positions are known as first opening position (Figure 1), second intermediate or semi-closed position (Figure 2) and third closing position (Figure 3). In other words, the three positions coincide with three operating configurations of the device 1. In use, a rotation of the closing lever 4 causes a rotation of the hooking lever 3 which allows the closing lever 4 to be maintained in one of the positions described above.

[0030] The device 1 further comprises elastic means 5 (or return means or elastic return means) operatively connected to the hooking lever 3 and to the closing lever 4. The elastic means 5 are configured to exert a resisting moment on the rotation of the levers 3 and 4.

[0031] The elastic means 5 can comprise a spring extending between a first end 5a, connected to the hooking lever 3, and a second end 5b, connected to the locking lever 4. In an embodiment such as the one shown in the appended figures, the first end 5a is hinged to the hooking lever 3 and the second end 5b is hinged to the locking lever 4. In other words, the hooking lever 3 can comprise a pin 3b in which the first end 5a is free to rotate and the locking lever 4 can comprise a pin 4b in which the second end 5b of the spring is free to rotate.

[0032] As shown in the appended figures, the closing lever 4 has a housing "A" adapted to engage with the pin 100 solidly constrained to the frame (i.e. to the fixed upright "M2") of the door "P" or hatch.

[0033] The housing "A" extends from a first free end to a second closed end defined in an inner portion of the

closing lever 4. The closed end has a counter-shaped shape with respect to a shape of the pin 100, so as to facilitate a housing thereof during closing of the door "P" or hatch (i.e. a passage from Figure 1 to Figure 2 or 3).

[0034] The closing lever 4 also has a shaped profile 6 adapted to engage with the hooking lever 3 at least when the levers 3 and 4 are in the second position (Figure 2) and third position (Figure 3).

[0035] According to an embodiment of the present invention, the shaped profile 6 defines a first step, adapted to accommodate the hooking lever 3 when the levers 3 and 4 are in the second intermediate position, and a second step adapted to accommodate the hooking lever 4 when the levers 3 and 4 are in the third closing position. When the door "P" is ajar and the housing "A" accommodates the pin 100, taking the device 1 from the first position to the second position, there is a first snap due to engagement between the hooking lever 3 and the first step of the shaped profile 6. When the door "P" is closed and the locking lever 4 continues to move, taking the device 1 from the second position to the third position, there is a second snap due to engagement between the hooking lever 3 and the second step of the shaped profile 6.

[0036] As shown in the appended figures, the support member 2 also has a locking profile 7 arranged to close a free end of the housing "A" when the levers 3 and 4 are in the second position and third position. In other words, during a rotation of the hooking lever 4 due to interaction with the pin 100, the free end of the housing "A" is turned towards the locking profile 7, preventing undesired exits of the pin 100.

[0037] Advantageously, the presence of the locking profile 7 makes it possible not to have to use further complex and costly components. Advantageously, since the locking profile 7 is an extension of the main portion 2a of the support member 2, it is easy to manufacture and obtainable with economical manufacturing processes.

[0038] Furthermore, the locking profile 7, since it allows additional components not to be used, allows a lightweight and easy to maintain device 1 to be obtained.

[0039] In one embodiment, the locking profile 7 has at least a first containment seat 7a adapted to accommodate the pin 100 when the levers 3 and 4 are in the second intermediate position (Figure 2) and a second containment seat 7b adapted to accommodate the pin when the levers 3 and 4 are in the third closing position (Figure 3).

[0040] The two seats 7a and 7b allow the pin 100 to be accommodated against the locking profile 7 if the locking device were to receive a load along a longitudinal direction, i.e. perpendicular to the plane subtended by the main portion 2a of the support member 2.

[0041] The locking profile 7 can define at least one seat (7a and/or 7b) shaped like a "U" or "C" or "V" and configured to accommodate the pin 100. In other words, the seats (7a and/or 7b) can be at least partly counter-shaped with respect to the pin 100.

[0042] The locking profile 7 can define, with a main

portion 2a of the support member 2, a sliding opening for the pin 100. Such sliding opening is transverse to the housing "A" in each position of the levers 3 and 4. In other words, during closing of the door "P", the pin 100 is accommodated both within the housing "A" and along the sliding opening. The pin is thus advantageously confined on a well-defined path that allows a closing of the door "P" capable of resisting applied loads, meaning pushes along a longitudinal direction, i.e. perpendicular to the plane subtended by the main portion 2a of the support member 2.

[0043] Advantageously, the present invention is capable of overcoming the drawbacks that have emerged from the prior art.

[0044] Advantageously, the device 1 is easy to manufacture and lightweight. Furthermore, the device 1 is inexpensive in terms of both manufacturing and maintenance.

[0045] Advantageously, the device 1 also allows the door "P" to be opened even in the case of breakage of several components.

[0046] Advantageously, the device resists high resistance loads, imposed by regulations, without the door "P" opening.

Claims

1. A locking device (1) for doors (P) or hatches, comprising:

- a support member (2);
- a hooking lever (3) and a closing lever (4) operatively connected to said support member (2), said hooking lever (3) and said closing lever (4) being free to rotate with respect to each other between at least three positions, a first opening position, a second intermediate position and a third closing position;
- elastic means (5) operatively connected to said hooking lever (3) and to said closing lever (4) and configured to exert a resisting moment on the rotation of said levers (3, 4);
- said closing lever (4) having a housing (A), adapted to engage with a pin (100) solidly constrained with a frame of said door (P) or hatch, and a shaped profile (6) adapted to engage with said hooking lever (3) at least when said levers (3, 4) are in said second position and third position;
- said support member (2) further having a locking profile (7) arranged to close a free end of said housing (A) when said levers (3, 4) are in said second position and third position.

2. The locking device (1) according to claim 1, wherein said locking profile (7) has at least a first containment seat (7a) adapted to accommodate said pin (100)

when said levers (3, 4) are in the second intermediate position and a second containment seat (7b) adapted to accommodate said pin (100) when said levers (3, 4) are in the third closing position.

3. The locking device (1) according to claim 1 or 2, wherein said locking profile (7) defines at least one seat (7a, 7b) shaped like a "U" or "C" or "V" and configured to accommodate said pin (100).
4. The locking device (1) according to one or more of the preceding claims, wherein said locking profile (7) defines, with a main portion (2a) of the support member (2), a sliding opening for said pin (100), said sliding opening being transverse to said housing (A) in each position of said levers (3, 4).
5. The locking device (1) according to one or more of the preceding claims, wherein said shaped profile (6) defines a first step, adapted to accommodate said hooking lever (3) when said levers (3, 4) are in said second intermediate position, and a second step adapted to accommodate said hooking lever (3) when said levers (3, 4) are in said third closing position.
6. The locking device (1) according to one or more of the preceding claims, wherein said elastic means (5) comprise a spring extending between a first end (5a), connected to said hooking lever (3), and a second end (5b), connected to said locking lever (4).
7. The locking device (1) according to claim 6, wherein said first end (5a) is hinged to said hooking lever (3) and wherein said second end (5b) is hinged to said locking lever (4).
8. The locking device (1) according to one or more of the preceding claims, wherein said support member (2) comprises a hooking element (2c) defining a first rotation pin (3a) for said hooking lever (3) and a second rotation pin (4a) for said locking lever (4).
9. The locking device (1) according to claim 8, wherein said hooking lever (3) and said locking lever (4) are interposed between a main portion (2a) of said support member (2) and the hooking element (2c).

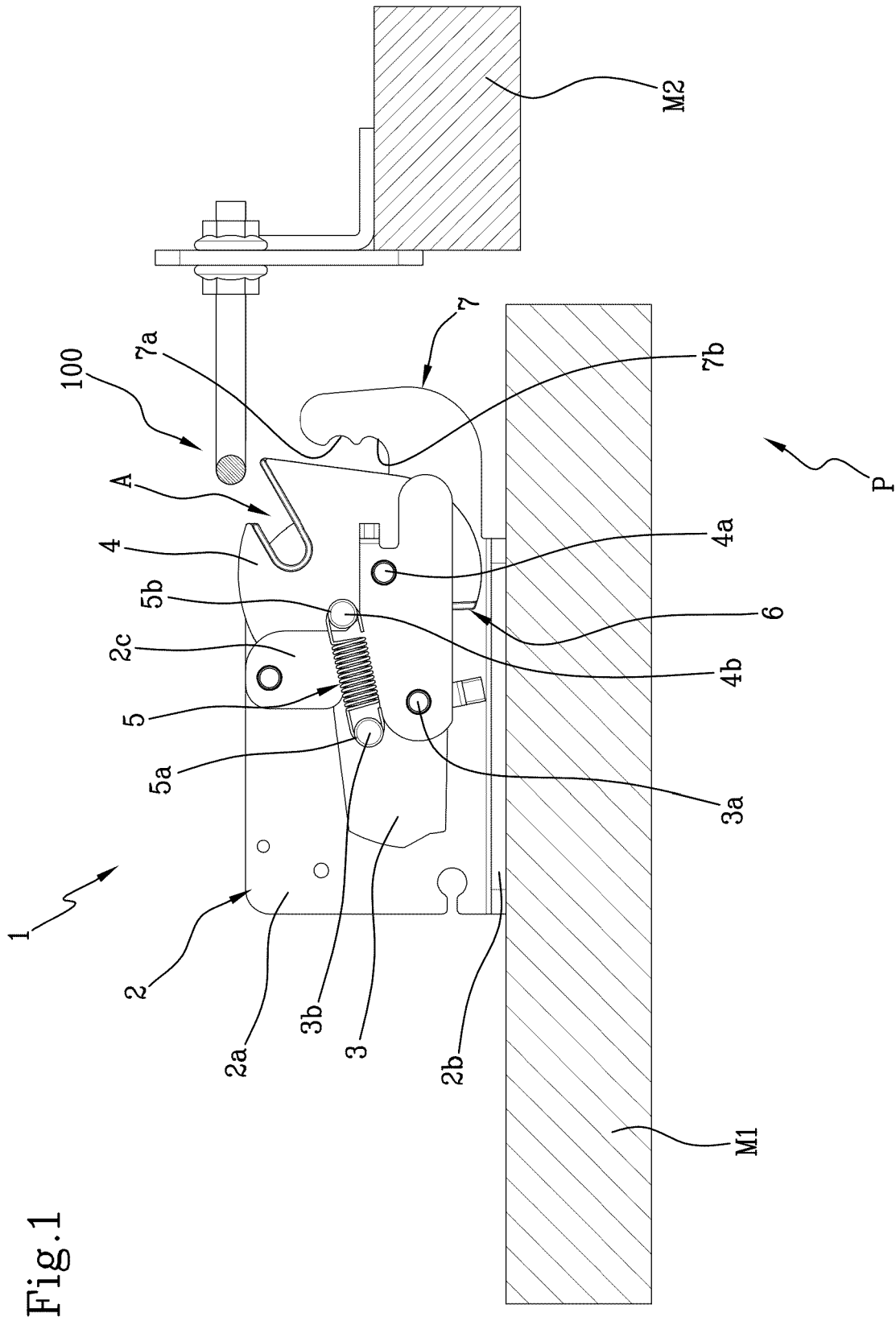


Fig.1

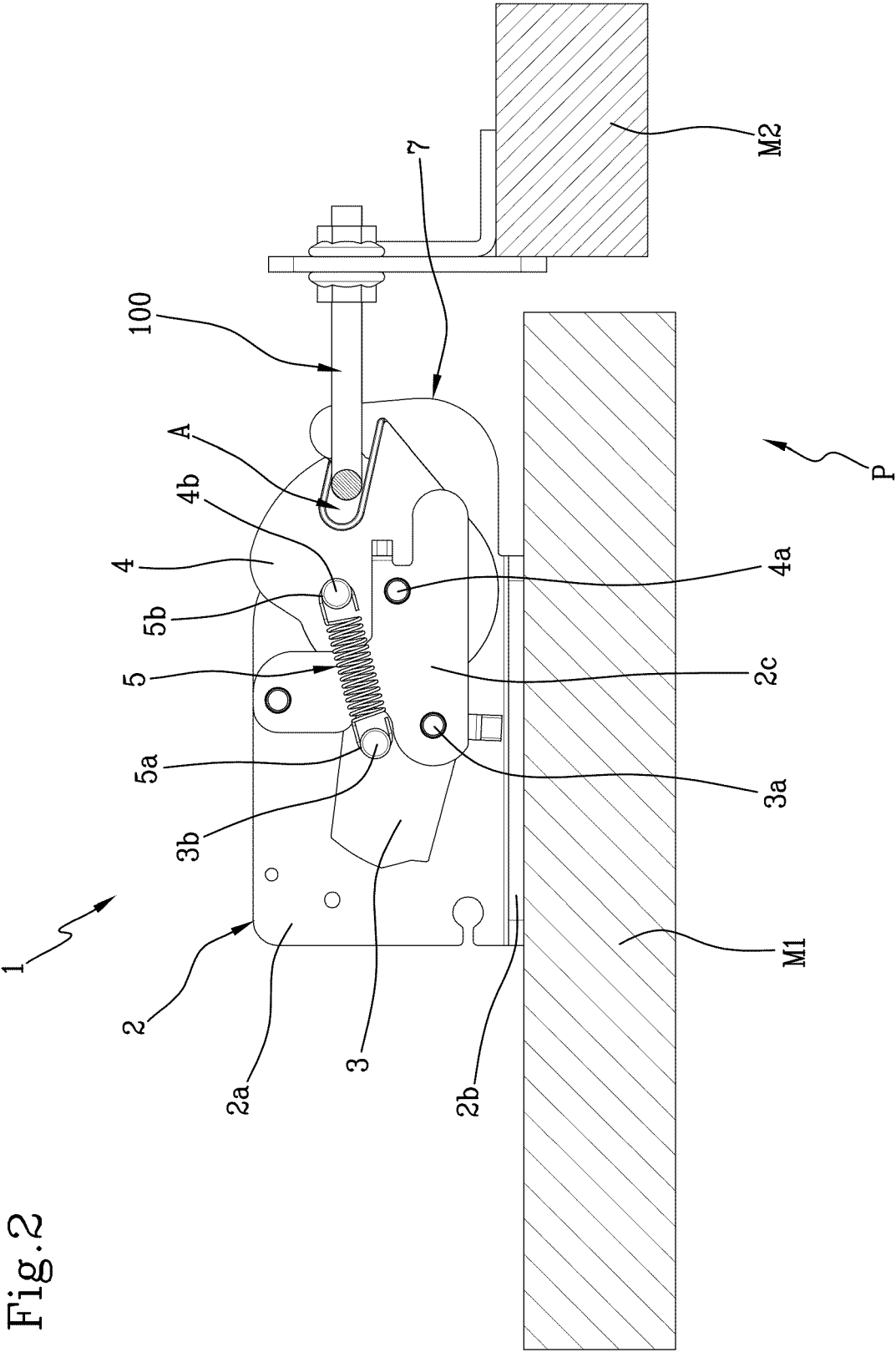
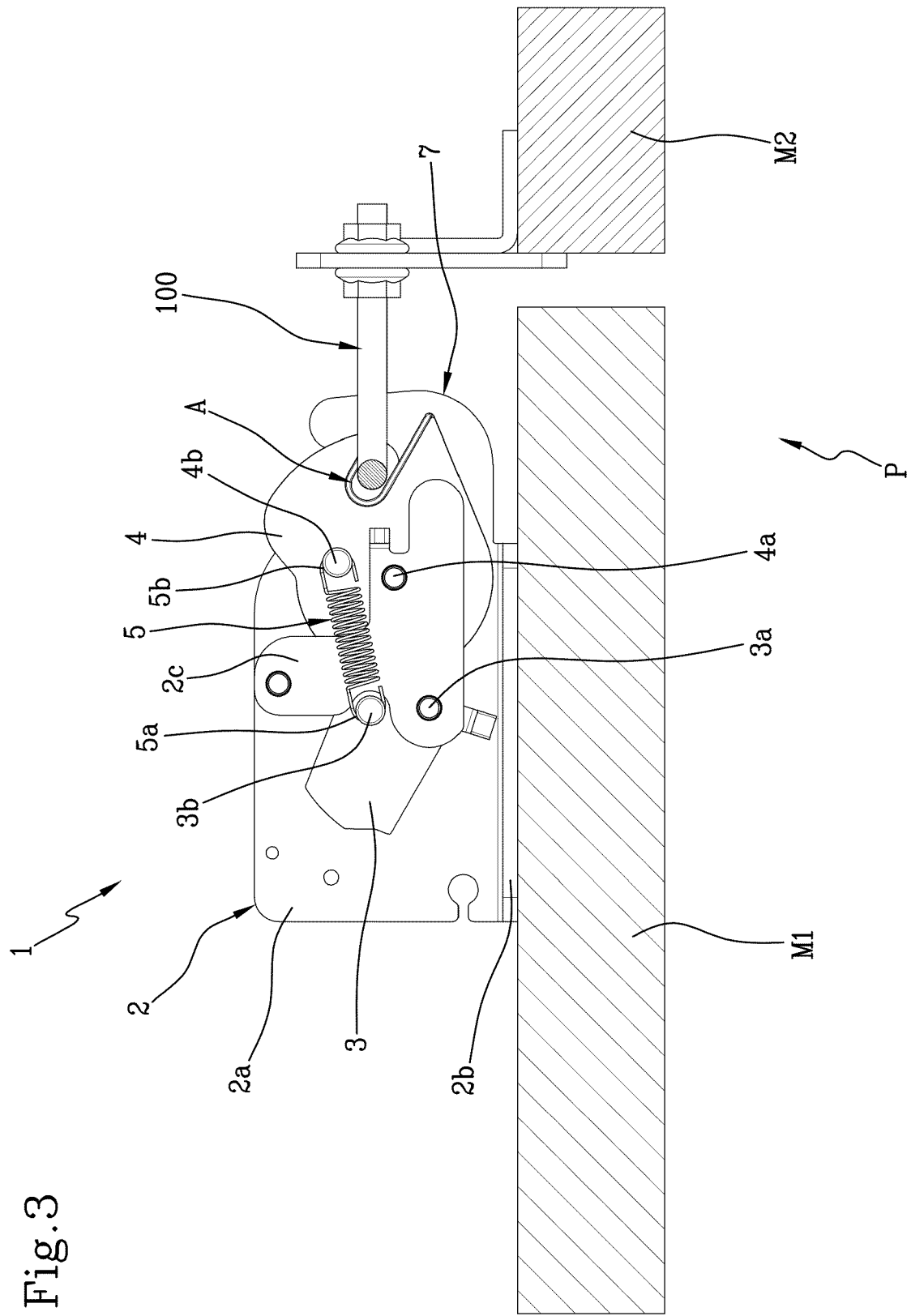


Fig.2

Fig. 3





EUROPEAN SEARCH REPORT

Application Number

EP 25 21 3859

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			TECHNICAL FIELDS SEARCHED (IPC)
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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 2026	Boufidou, Maria
CATEGORY OF CITED DOCUMENTS			
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EP 25 21 3859

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