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(54) Stopping device for doors and the like

(57) There is provided a stopping device (1) for a door (2) and the like, the door (2) comprising at least one handle (3) and at least one lock (4), the handle (3) being suitable to control the lock (4), the stopping device (1) being disposable in a stop position, in which it is suitable to allow stopping of the door (2) disposed in an open position, and in a released position, in which it is suitable not to interfere with the movement of the door (2), and it is activatable by means of the handle (3).

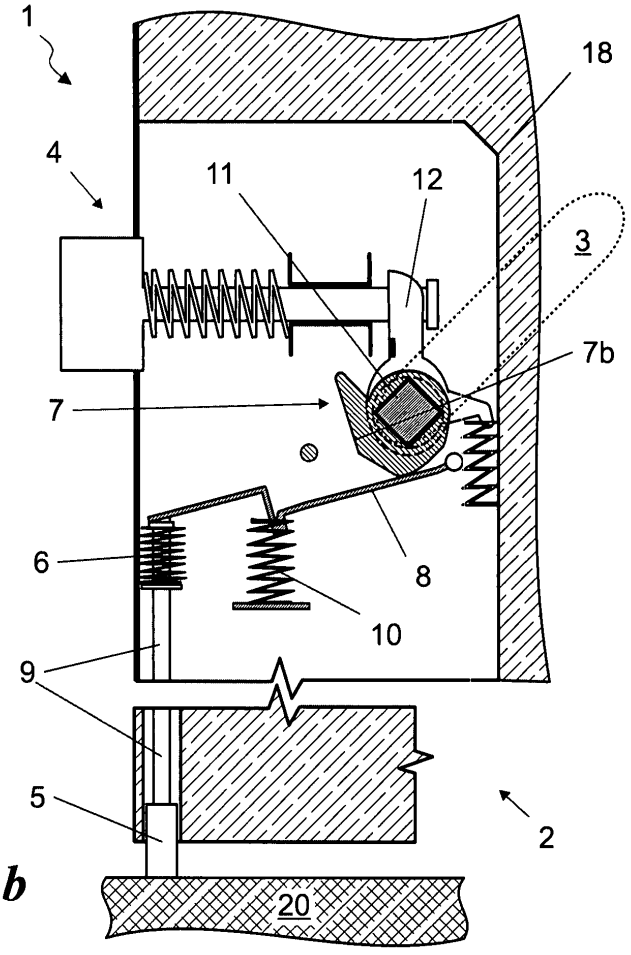

Fig. 1b

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Description

[0001] The present invention relates to a stopping device suitable to allow stopping of a door or the like disposed in an open position of the type specified in the preamble of claim 1.

[0002] Current stopping devices for doors and the like allow a door to be maintained in stable balance in any open position, total or also only partial.

[0003] As it is known, said devices are useful in particular to prevent doors from being closed by gusts of wind or by other phenomena.

[0004] They are generally realized by wedges specifically disposed under the door or by door stopping bodies.

[0005] Moreover, stopping devices which are disposed constrained to the door also exist. These are generally realized by movable plungers placed on the lower portion of the doors. These plungers are generally movable by means of feet. Prior art stopping devices have some important drawbacks.

[0006] In fact, they are inconvenient to position, as they are located on the lower portion of the door.

[0007] A further drawback is given by the fact that known door stopping devices can damage floors, in particular prestigious parquet floors and the like or can also partially obstruct passage through the door.

[0008] Moreover, known stopping devices do not always stop the door adequately in the open position.

[0009] In this situation the technical aim of the present invention is to devise a stopping device for doors able to substantially overcome the aforesaid drawbacks.

[0010] Within this aim an important object of the invention is to produce a stopping device for doors and the like which is simple to activate and deactivate. Another important object of the invention is to obtain a stopping device which does not damage the floors or supporting surfaces of the door.

[0011] A further object of the invention is to obtain a stopping device which allows adequate stopping of the door.

[0012] The technical aim and objects specified are achieved by a stopping device for doors and the like as described in the appended claim 1.

[0013] Preferred embodiments are highlighted in the dependent claims.

[0014] Further characteristics and advantages of the invention are clarified by the detailed description of preferred embodiments of the invention, with reference to the attached drawings, wherein:

Figure. **1a** shows a first example of stopping device according to the invention in a first configuration;
Figure. **1b** shows a first example of stopping device according to the invention in a second configuration;
Figure. **1c** shows a first example of stopping device according to the invention in a third configuration;
Figure. **1d** schematizes the first example of stopping device according to the invention in a fourth configuration;
Figure. **2a** shows a second example of stopping device according to the invention in a first configuration;
Figure. **2b** shows a second example of stopping device according to the invention in a second configuration;
Figure. **2c** shows a second example of stopping device according to the invention in a third configuration; and
Figure. **2d** schematizes the second example of stopping device according to the invention in a fourth configuration;
Figure. **3** is a door including the stopping device according to the invention.

With reference to the aforesaid Figures, the stopping device according to the invention is indicated as a whole with the number **1.**

[0015] It is suitable to be positioned on doors **2** and the like, in particular on doors inside a building, on windows and on other elements yet.

[0016] The door 2 is of the openable type, and in particular rotatable about a rotation axis **2a** defined by the pivots or hinges of the door 2. Therefore, a closed position is defined, in which the door is set against the wall that supports it, and a plurality of open positions, in which the door is not set against the wall and is rotated to a greater or lesser extent with respect thereto. The door is also supported on a floor **20.**

[0017] It comprises at least one lock **4** and at least one handle **3** suitable to control this lock **4.**

[0018] The lock 4 is preferably realized by a lock not equipped with a key or the like and of the type suitable to be closed automatically if the door 2 is placed in the closed position. The door 2 can comprise a second lock, equipped with a key and suitable to allow locking of the door 2.

[0019] The stopping device 1 can be disposed in a stop position (Figs. 1c, 2c), in which it is suitable to allow stopping of the door 2 disposed in an open position.

[0020] The device 1 is therefore suitable to define a position of stable balance for the door 2 disposed in any open position.

[0021] The device 1 is also suitable to be disposed in a released position (Figs. 1a, 2a), in which it is suitable not to interfere with the movement of the door 2 and to allow free movement, opening and closing, of the door 2.

[0022] It is also suitable to be moved by means of the handle 3, also suitable to control the lock 4.

[0023] In particular, the device 1 comprises a stop piston **5** which is movable through the handle 3 in a manner such that at least one component of said movement is in a direction substantially perpendicular to the plane on which the surface of the floor 20 extends.

[0024] Preferably, the stop piston 5 is moved in a direction substantially perpendicular to the plane on which the floor 20 extends, i.e. vertically.

[0025] The stop piston 5 is suitable to exert pressure

on the floor 20, when the stopping device 1 is in a stop position (Figs. 1c, 2c).

[0026] The piston 5 thus stops the movement of the door by means of the friction that is created between the piston 5 and the floor 20.

[0027] In particular, the piston 5 is made of deformable materials and with a high coefficient of friction, such as rubber or other materials, in particular polymer. The stop piston 5 is conveniently connected to a strut **9,** which preferably passed through the whole door 2 from the floor 20 until in proximity of the handle 3 and preferably has a direction parallel to the direction of rotation 2a. The strut 9 can also have particular shapes or an internal slot suitable to allow passage of the second lock without interference therewith. It is preferably disposed inside a suitable opening **2c** present in the door 2 and is preferably guided by shoes or sleeves suitable to allow movement thereof with a low coefficient of friction.

[0028] The strut 9, and the piston 5, are also moved by means of stressing of an elastic element **6,** moved through the handle 3 and connected to the strut 9. This solution allows stopping of the door 2 with optimal forces regardless of the distance 20 of the door 2 and in particular of the piston 5 in the released position, from the floor.

[0029] The device 1 comprises, in detail, an actuator **7,** rotatable together with the handle 3 and a lever **8,** movable by the actuator 7 and suitable to directly stress the elastic element 6.

[0030] Moreover, the lever 8 is movable in opposition to a second elastic element **10** and in a position of stable balance when the stopping device 1 is in a stop position (Figs. 1c, 2c).

[0031] In particular, Figs. 1a-1d show a first example of device 1 according to the invention.

[0032] In this example, the actuator 7 comprises a hole suitable to be connected directly to the stem **11** which allows the handle 3 to control the lock 4.

[0033] The lock 4 instead comprises an activation body **12** constrained to the stem 11 but not fixed thereto, and therefore not directly movable by this stem 11.

[0034] The activation body 12 and the actuator 7 also interfere by means of a plate **13,** integral with the activation body 12.

[0035] The actuator 7 also comprises two arms **7b** and **7c.**

[0036] The first arm 7b is a cam and suitable to move the lever 8, as shown in Figs. 1b and 1c, while the second arm 7c is suitable to move the activation body 12 through the plate 13, as shown in Fig. 3d.

[0037] In said example, moreover, the strut 9 is maintained in a stop position by means of a position of stable balance present between said lever 8 and said actuator 7, as shown in Fig. 1c. In this position, also the handle 3, constrained to the actuator 7, remains in stable balance.

[0038] Finally, an elastic return element **16** suitable to return the activation body 12 to the closed position, is also provided .

[0039] A second example, very similar to the previous one, is shown in Figs. 2a-2d.

[0040] In this example the stem 11, connected directly to the handle 3 is connected integral with an intermediate element **14.**

[0041] The intermediate element 14 is realized by a circular element equipped with a movement tooth **15.**

[0042] The movement tooth 15 is suitable to interact in one direction of rotation exclusively with the device 1 and in particular with the actuator 7 (Figs. 2b-2c) and in the opposite direction of rotation exclusively with the activation body 12, part of the lock 4 (Fig. 2d).

[0043] The actuator 7 is also equipped with a first arm **7d** and with a second arm **7e.** The first arm 7d is suitable to move the lever 8 and to place it in a stop position (Fig. 2c), the second arm 7e realizes a support for an elastic return element 16, suitable to return the actuator 7 and the activation body 12 to the initial position. In this example, stable balance of the lever 8 is obtained by means of positioning of the lever 8 under specific stopping elements **19.**

[0044] The activation body 12 is instead part of the lock 4 and is also suitable to return the device 1 to the released position (Fig. 2d) by means of a release arm **17,** suitable to interfere with the lever 8.

[0045] The opening movement of the lock 4, through the handle 3, therefore also allows, in this case, release of the door 2.

[0046] In both the examples, the handle 3 is therefore rotatable in the direction of rotation **3a.** This rotation is suitable to allow in a first direction, in particular clockwise, opening of the lock 4 and, in a second direction opposite the first, activation of the stopping device 1.

[0047] The device 1 is therefore activatable substantially independently from the lock 4 while being moved by the same handle 3.

[0048] Finally, the majority of the device 1 is contained inside a lock assembly **18** of standard dimensions and type, so that it is unnecessary to produce openings different to those currently in use. In particular, all the elements except for the piston 5 and the strut 9 are contained in the lock assembly.

[0049] Operation of the stopping device, the structure of which is described above, is as follows.

[0050] In a first example, shown in Figs. 1a-1d, control of the lock 4 remains unchanged with respect to conventional locks.

[0051] In particular, by rotating the handle 3 in the first direction of rotation the stem 11 and the actuator 7 are rotated.

[0052] This latter interferes, through the plate 13, with the activation body which moves the lock 4 (Fig. 1 d).

[0053] Instead, to stop the door 2 disposed in an open position, the handle 3 must be turned in said second direction of rotation.

[0054] The handle 3 rotates the stem 11, which in turn moves the actuator 7 which interferes with the lever 8 that activates the strut 9 connected to the stop piston 5

(Fig. 1b).

[0055] When rotation of the handle 3 has reached a right angle (Fig. 1c) the actuator is in stable balance and maintains the door 2 in a stop position.

[0056] The handle 3 also remains in a stop position rotated by a right angle, so that it is simple to see whether the stopping device 1 is activated.

[0057] By rotating the handle 3 in the opposite direction, the door 2 is returned to the released position (Fig. 1 a)

[0058] Also in the second example, shown in Figs. 2a-2d, control of the lock 4 remains unchanged with respect to conventional locks.

[0059] In particular, rotating the handle 3 in the first direction of rotation this rotates the stem 11, connected to the intermediate element 14, which through the movement tooth 15, interferes with the activation body 12 (Fig. 2d), , which moves the lock 4.

[0060] To stop the door 2 it is sufficient to rotate the handle 3 in said second direction of rotation.

[0061] The handle 3 rotates the stem 11 and the intermediate element 14 which, again through the movement tooth 15, interferes with the actuator 7.

[0062] This latter places the lever 8 under the stop elements 16, lowering the stop piston 5 (Fig. 2b).

[0063] Subsequently, the handle 3 returns to the horizontal position and the piston 5 remains in a stop position (Fig. 2c) due to the action of the elastic return element 16.

[0064] To release the door 2 the same movement to open the lock 4 through the handle 3 must be performed.

[0065] In this case the release arm 17 interferes with the lever 8 and returns it to the released position (Fig. 2d).

[0066] The invention achieves important advantages.

[0067] In fact, the device 1 is simple to activate and deactivate and does not require further handles or accessories which can complicate the door 2.

[0068] This device also comprises a piston made of soft material activated through an elastic element 6. Consequently, the device 1 substantially self-adjusts regardless of its initial distance from the floor 20, and does not cause damage to or make cuts in the floor 20.

[0069] These measures also allow the stopping force of the door always to remain between the desired values.

[0070] The invention is susceptible to modifications and variants falling within the inventive concept. All the details can be replaced by equivalent elements and the materials, the shapes and dimensions can be any.

Claims

1. A stopping device (1) for a door (2) and the like, said door (2) comprising at least one handle (3) and at least one lock (4), said handle (3) being suitable to control said lock (4), said stopping device (1) being disposable in a stop position, in which it is suitable to allow stopping of said door (2) disposed in an open position, and in a released position, in which it is suitable not to interfere with the movement of said door (2), **characterized in that** it is activatable by means of said handle (3).

2. The stopping device (1) according to claim 1, wherein said door (2) is movable about a first direction of rotation (2a) and wherein said device (1) comprises a stop piston (5) movable by said handle (3) in a manner such that at least one component of said movement is in a direction substantially perpendicular to the plane on which the surface supporting said door (2) extends.

3. The stopping device (1) according to claim 2, comprising an elastic element (6) stressable through said handle (3) and suitable to move said stop piston (5).

4. The stopping device (1) according to claim 3, comprising an actuator (7), rotatable together with said handle (3).

5. The stopping device (1) according to claim 4, comprising a lever (8), movable by said actuator (7) and suitable to directly stress said elastic element (6).

6. The stopping device (1) according to claim 5, wherein said lever (8) is in stable balance in said stop and released positions.

7. The stopping device (1) according to one or more of the preceding claims, wherein said handle (3) is rotatable in a direction of rotation (3a) suitable to allow opening of said lock (4) by means of a rotation in a first direction and activation of said stopping device (1) by means of a rotation in a second direction, opposite said first direction.

8. The stopping device (1) according to one or more of the preceding claims, activatable independently from said lock (4).

9. The stopping device (1) according to one or more of the preceding claims, wherein the majority of said device (1) is contained inside a lock assembly (18) of standard dimensions and type.

10. A door (2) comprising a handle (3) and at least one lock (4), said handle (3) being suitable to control said lock (4), and a stopping device (1) according to one or more of the preceding claims.

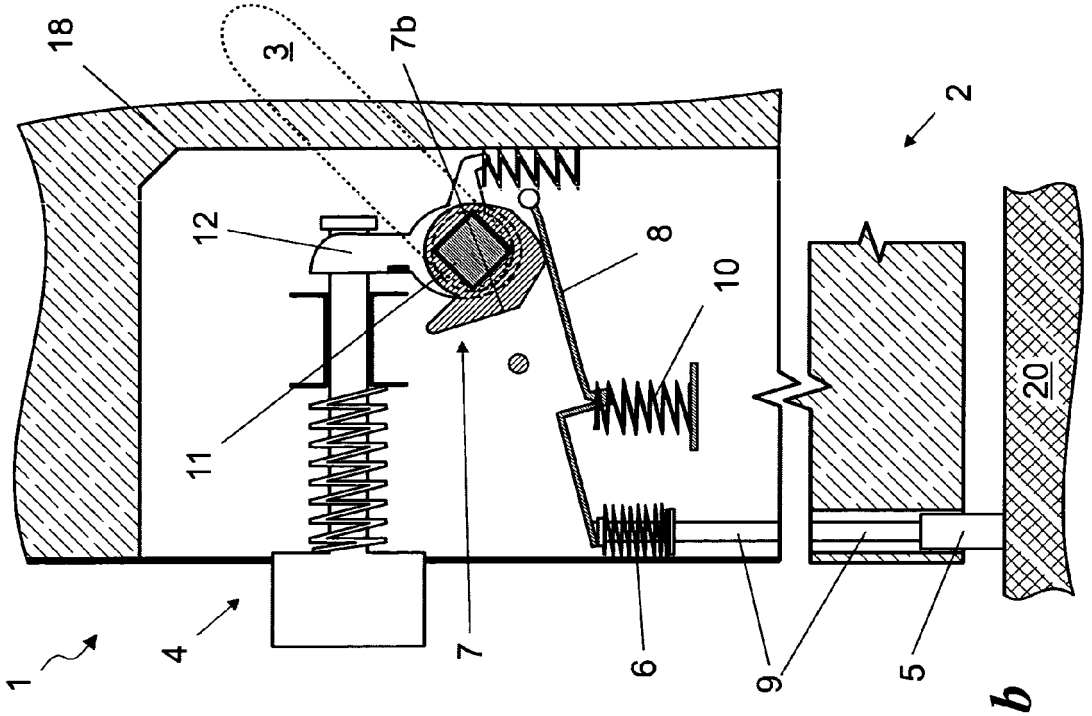
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Fig. 1b

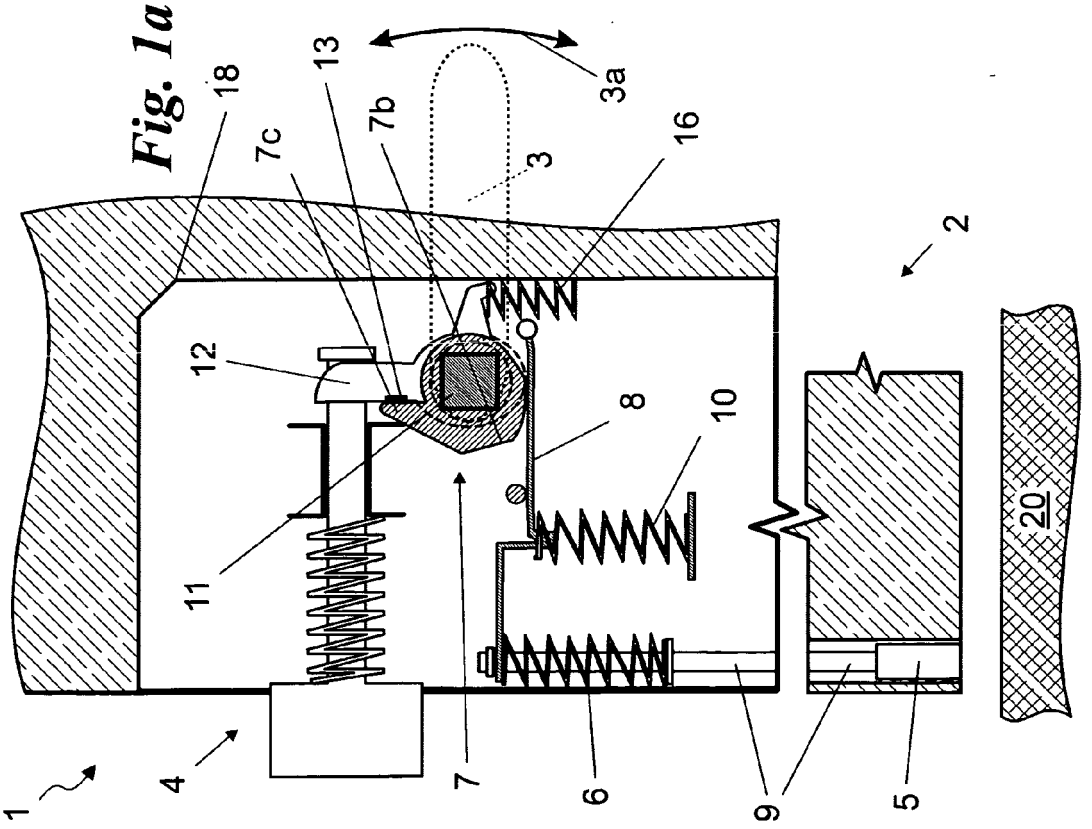
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Fig. 1a

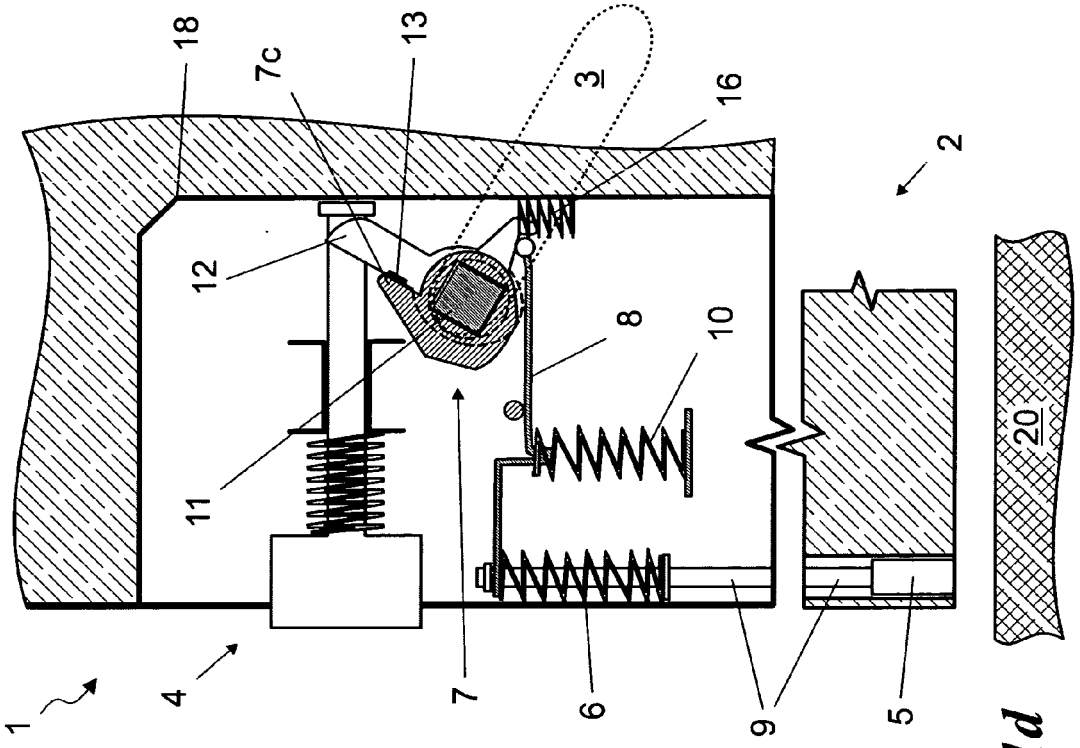
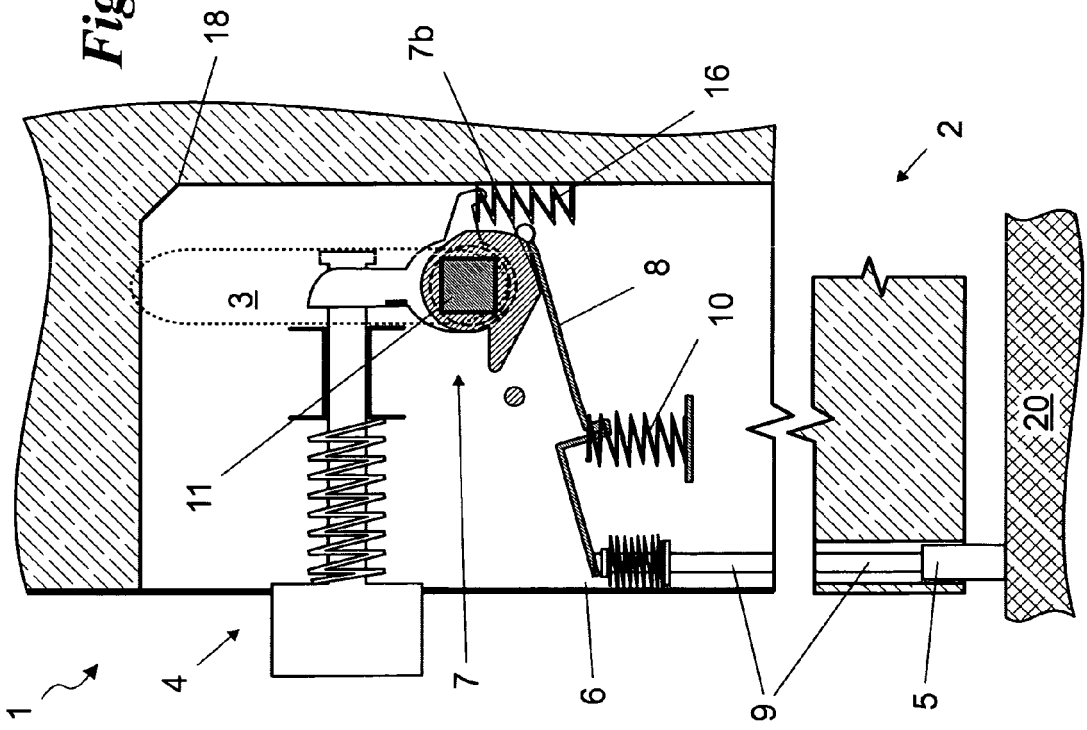


Fig. 1c

Fig. 1d



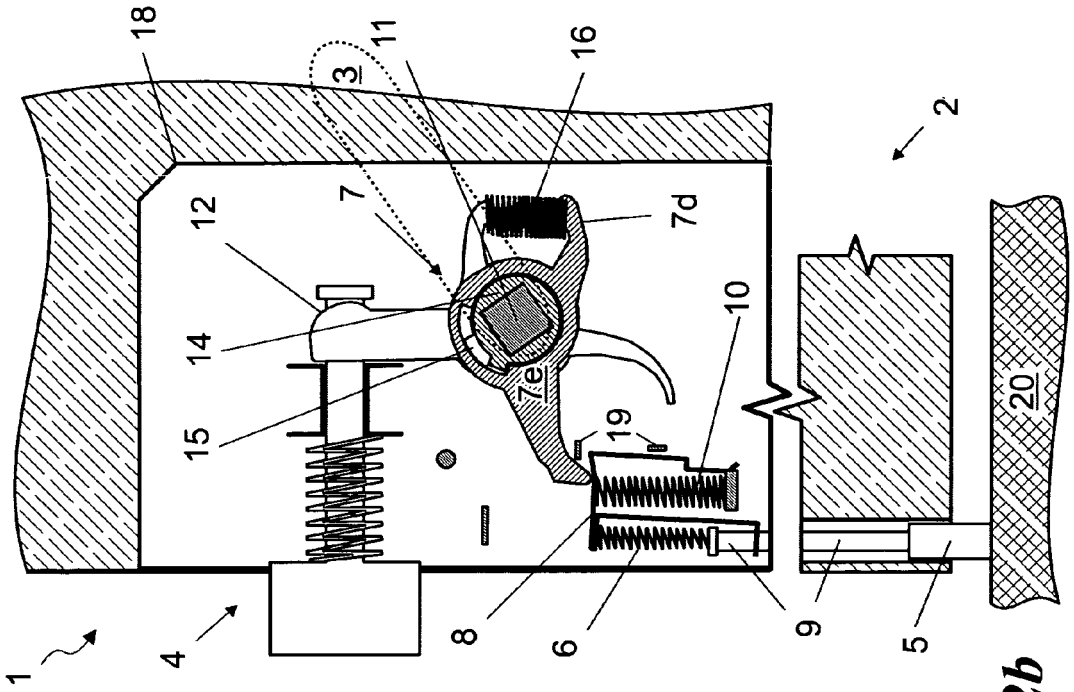

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Fig. 2b

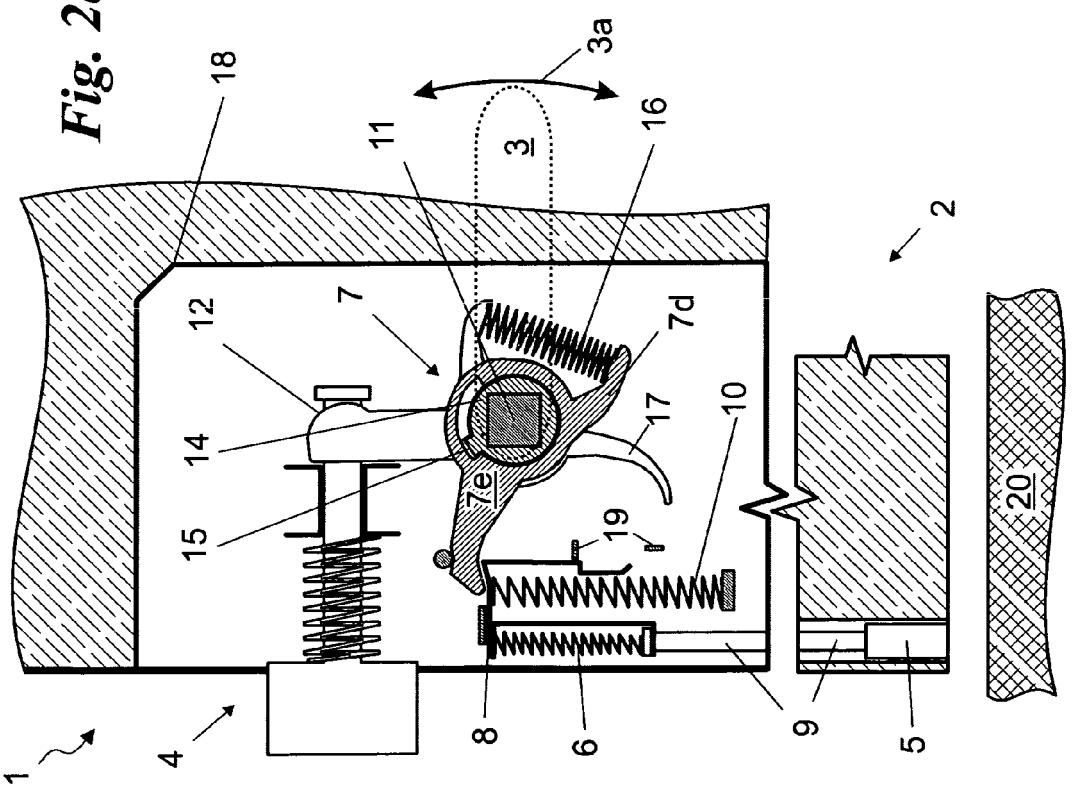
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Fig. 2a

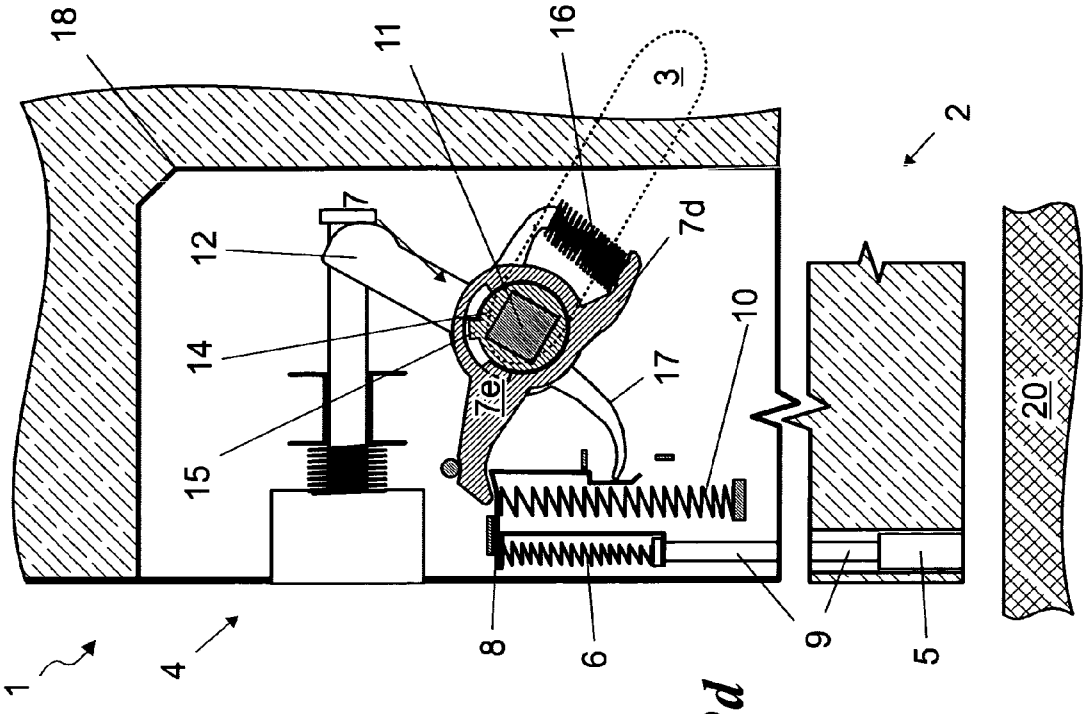
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Fig. 2d

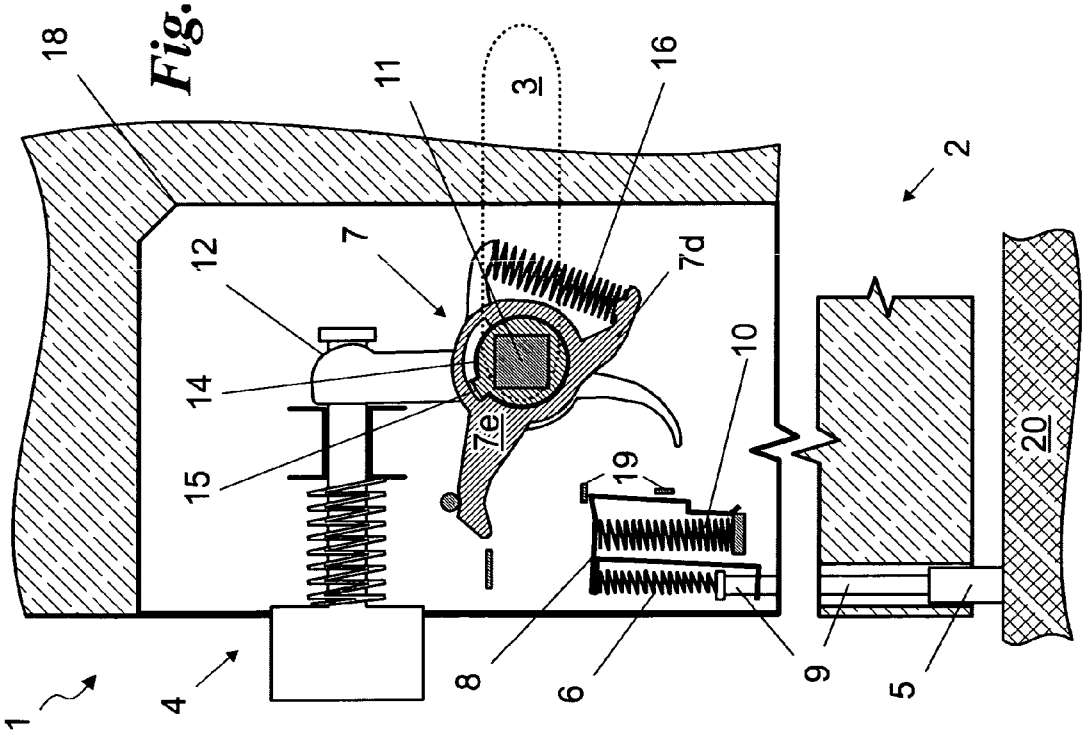
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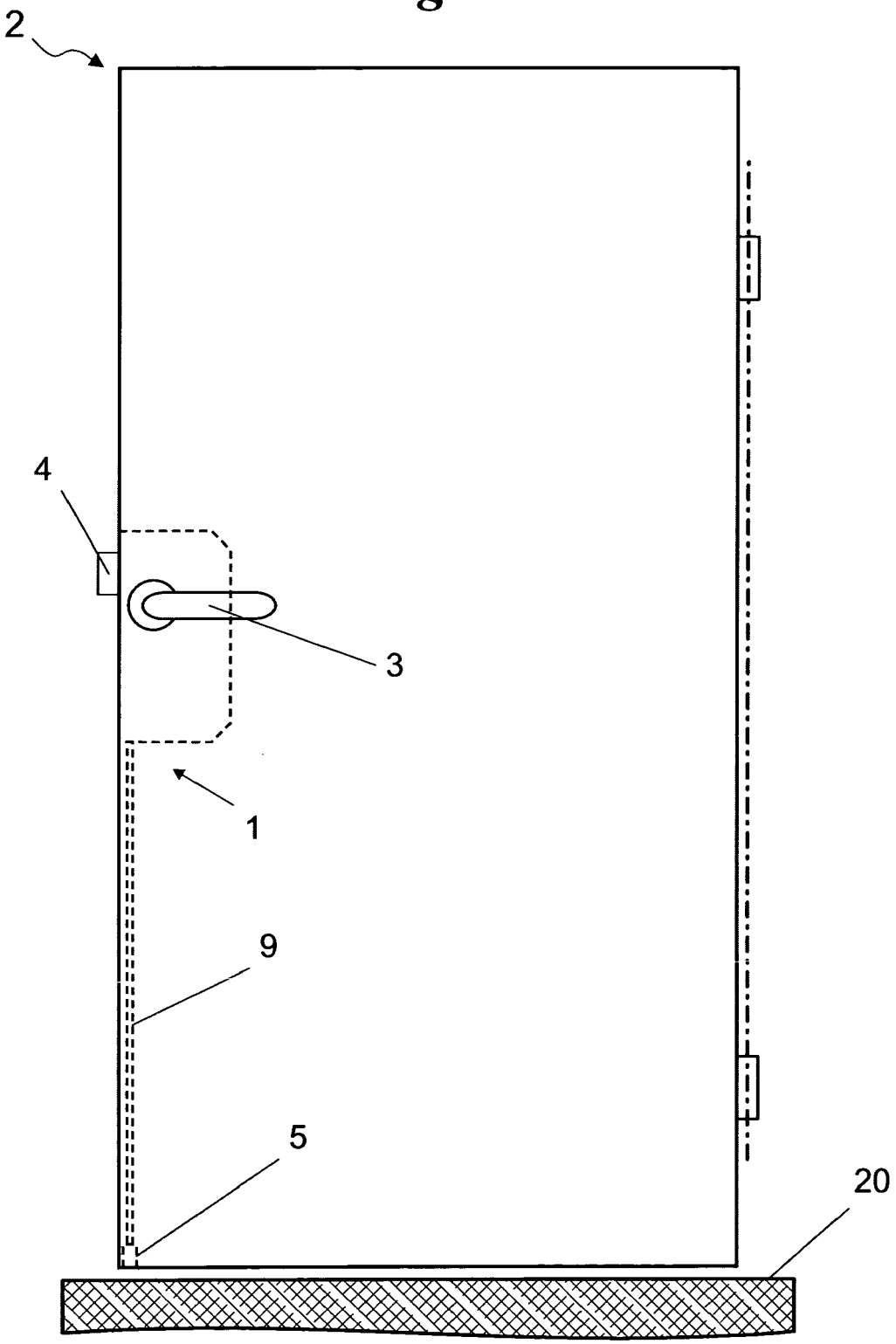
Fig. 2c

Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5242

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	DE 10 2005 039821 A1 (TECHNOHOLZ GMBH [DE]) 8 March 2007 (2007-03-08) * page 4, paragraph 30 - page 5, paragraph 39 *	1-10	INV. E05C17/44
X	DE 203 18 426 U1 (HASTREITER WERNER [DE]) 9 June 2004 (2004-06-09)	1	
A	* the whole document *	2-10	
A	GB 689 336 A (SHLOMO WINNIKOW) 25 March 1953 (1953-03-25) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC) E05C E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 November 2009	Friedrich, Albert

CATEGORY OF CITED DOCUMENTS

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3

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