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(54) **Draft excluder particularly for wood doors**

(57) A draft excluder, particularly for wood doors, includes a fixed profile with a substantially U-shaped transverse cross-section, which can be accommodated in a recess formed at the lower edge of a door, a movable profile which is provided with a sealing means and is inserted at least partially within the fixed profile, to which it is functionally connected by a means for automatic movement, which allows it to pass from a raised position to a lowered position during the closure of the door. An expansion-type coupling means is associated with the fixed profile in order to allow its anchoring within the recess, passing, during anchoring, from a closed condition, in which the means does not protrude from the fixed profile, to an open condition, in which the means protrudes laterally from the fixed profile, interfering with the recess.

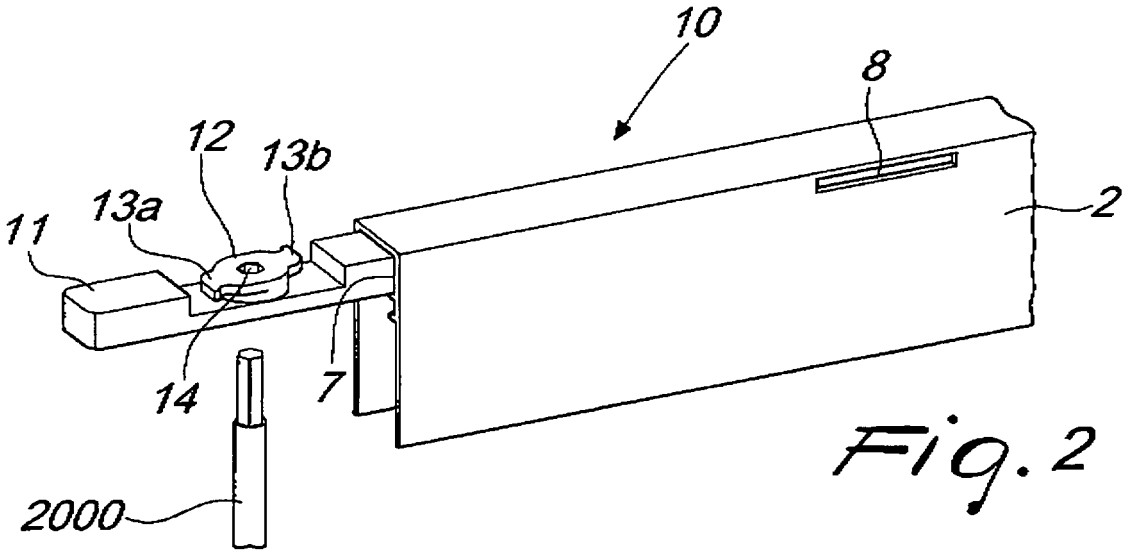


Fig. 2

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Description

[0001] The present invention relates to a draft excluder particularly for wood doors.

[0002] As is known, in order to fill the gap between the floor and the door lower edge, a draft excluder, which descends in a guillotine-like fashion when the door closes, is often installed on the lower edge of the door.

[0003] Such excluder is generally constituted by a fixed profile and a movable profile; the movable profile is lowered by a mechanism when the door is closed, so as to move the gasket that covers the movable profile into contact with the floor.

[0004] With particular reference to wood doors, draft excluders are usually inserted in receptacles, which have a transverse cross-section which is substantially complementary to the cross-section of the draft excluder and are formed by milling the lower edge of the doors.

[0005] According to a first assembly system both the movable profile and the mechanism that actuates it are extracted from the fixed profile, so as to be able to fix the fixed profile to the door and then reassemble the draft excluder completely.

[0006] Such system forces to initially partially disassemble the draft excluder to install it and then reassemble it, and is slow and uneconomical.

[0007] An alternative assembly system is based instead on the use of draft excluders which have preassembled self-drilling screws, which are screwed by means of a power screwdriver to the door, anchoring the fixed profile.

[0008] Such simple and quick solution has drawbacks: the screws may break when they encounter a knot or particularly hard wood, and it is also necessary to use a power tool in order to make the installation process easier.

[0009] It should also be noted that the use of self-drilling screws can lead to fraying of the gasket that covers the movable profile and to the formation of shavings which might enter the mechanism of the draft excluder, hindering its correct operation.

[0010] The aim of the invention is to solve the problems described above by providing a draft excluder which allows the simplest and quickest possible installation without resorting to drilling or to the use of power tools.

[0011] Within the scope of this aim, an object of the invention is to provide a draft excluder in which, in order to proceed with installation, it is not necessary to disassemble the movable profile and the mechanism that actuates it, while the possibility to extract it completely, even after installation, is ensured.

[0012] Another object of the invention is to provide a draft excluder which can be easily disassembled if needed.

[0013] Another object of the invention is to provide a draft excluder which is sturdy and also economic.

[0014] The above aim, as well as the objects mentioned and others which will become better apparent hereinafter, are achieved by a draft excluder, particularly for wood doors, comprising a fixed profile with a substantially U-shaped transverse cross-section, which can be accommodated in a recess formed at the lower edge of a door, a movable profile which is provided with a sealing means and is at least partially inserted within said fixed profile, said movable profile being functionally connected to said fixed profile by a means for automatic movement, in order to pass from a raised position to a lowered position during the closure of said door, characterized in that it comprises an expansion-type coupling means associated with said fixed profile in order to allow its anchoring within said recess, said expansion-type coupling means passing, during anchoring, from a closed condition, in which said means does not protrude from said fixed profile, to an open condition, in which said means protrudes laterally from said fixed profile, interfering with said recess.

[0015] Further characteristics and advantages will become better apparent from the following detailed description of preferred but not exclusive embodiments of a draft excluder according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a draft excluder according to the invention;

Figure 2 is an enlarged-scale perspective view of a component of the draft excluder of the preceding figure;

Figure 3 is an enlarged-scale perspective view of the component of the preceding figure in an example of operation;

Figure 4 is a partially sectional plan view of the draft excluder according to the invention applied to a door, with the component of Figure 2 in the closed condition;

Figure 5 is a partially sectional plan view of the draft excluder according to the invention applied to a door, with the component of Figure 2 in the open condition;

Figure 6 is a perspective view of a further embodiment of the draft excluder according to the invention;

Figure 7 is an enlarged-scale perspective view of a component of the embodiment of the preceding figure;

Figure 8 is an enlarged-scale perspective view of the component of the preceding figure in an example of operation;

Figure 9 is a partially sectional plan view of the draft excluder of Figure 6 applied to a door, with the component of Figure 7 in the closed condition;

Figure 10 is a partially sectional plan view of the draft excluder of Figure 6 applied to a door, with the component of Figure 7 in the open condition;

Figure 11 is a perspective view of a further embodiment of the draft excluder according to the invention;

Figure 12 is a sectional front view of the draft excluder of Figure 11 applied to a door, with a component

in the closed condition;

Figure 13 is a sectional plan view of the draft excluder of Figure 11 applied to a door, in which the component of Figure 12 is in the open condition.

[0016] With reference to Figures 1 to 5, a draft excluder, generally designated by the reference numeral 1, has a fixed profile 2, which has a substantially U-shaped transverse cross-section and is accommodated within a recess 1001 which is provided at a lower edge of a door 1000, and a movable profile 3, which is provided with a sealing means 4 and is at least partially inserted within the fixed profile 2.

[0017] The movable profile 3 is functionally connected to the fixed profile 2 by means of an automatic movement means 5 which, during the closure of the door 1000, allows the movable profile 3 to pass from a raised position, in which the movable profile 3 and the sealing means 4 are spaced from the floor, to a lowered position, in which the movable profile 3 and the sealing means 4 are in contact with the floor.

[0018] In the case of wood doors, the recess 1001, in which the fixed profile 2 is accommodated, is obtained by means of a milling performed beforehand on the lower edge of the door 1000, with a transverse cross-section which is substantially complementary to the transverse cross-section of the fixed profile 2.

[0019] According to the invention, the draft excluder 1 includes an expansion-type coupling means 10 arranged at its end and slidingly associated with a sliding guide 7, which is formed at a back 6 of the fixed profile 2 and is provided with a plurality of openings 8 formed on opposite sides of the sliding guide 7 so as to face each other.

[0020] The expansion-type coupling means 10 is constituted by a pair of substantially mutually identical devices, which are capable of passing from a closed condition, in which they do not protrude from the contour of the fixed profile 2, to an open position, in which they protrude at least partially laterally from the fixed profile 2, interfering with the recess 1001 and consequently fixing the draft excluder 1 to the door 1000.

[0021] According to a first embodiment, each of the devices that constitute the expansion-type coupling means 10 is formed by a base support 11, with a transverse cross-section which is substantially complementary to the transverse cross-section of the sliding guide 7, and by an engagement member, which in practice is constituted by a pawl 12 which is rotatably joined to the base support 11.

[0022] Two diametrically opposite protrusions 13a and 13b protrude from the pawl 12 and are positioned substantially at the openings 8. The pawl 12 is provided with a shaped portion 14, or with a notch. Through the open side of the fixed profile 2, the shaped portion 14 allows to impart thereto a rotation by using a suitable tool 2000, constituted by a simple hex key.

[0023] With a rotation of substantially a quarter turn, transition in fact occurs from the closed condition, in which the protrusions 13a and 13b do not protrude from the contour of the fixed profile 2, to the open condition, in which the protrusions 13a and 13b protrude at least partially from the fixed profile 2 through the openings 8 and interfere with the recess 1001, fixing the draft excluder 1 to the door 1000.

[0024] According to a further aspect of the invention, illustrated in Figures 6 to 10, each of the devices that constitute the expansion-type coupling means, here designated by the reference numeral 110, is composed of a base support 111, which has a transverse cross-section which is substantially complementary to the transverse cross-section of the sliding guide 7, and an engagement member, which is constituted by an eccentric member 112 which is rotatably joined to the base support 111, is provided with two diametrically opposite cams 115a and 115b, and is functionally connected to a pair of hooks 113a and 113b, which in turn are articulated with respect to the base support 111 I substantially at the two ends thereof.

[0025] A shaped portion or notch 114 is provided on the eccentric member 112 and, through the open side of the fixed profile 2, allows to impart thereto a rotation by using a suitable tool 2000, which is constituted by a simple hex key.

[0026] With a rotation of substantially one eighth of a turn, transition is in fact achieved from the closed condition, in which the hooks 113a and 113b do not protrude from the contour of the fixed profile 2, to the open condition, in which the hooks 113a and 113b, pushed by the cams 115a and 115b of the eccentric member 112, protrude from the fixed profile 2 through the openings 8 and interfere with the recess 1001, fixing the draft excluder 1 to the door 1000.

[0027] The hooks 113a and 113b can be simply in contact with the eccentric member 112 or, preferably, can be articulated to the eccentric member 112 at the two cams 115a and 115b.

[0028] This last refinement, not shown in the accompanying figures, allows to engage the hooks 113a and 113b with the recess 1001 by means of a rotation of substantially one eighth of a turn, and also allows optionally to disengage them by means of an opposite rotation.

[0029] According to a further aspect of the invention, shown in Figures 11 to 13, each of the devices that constitute the expansion-type coupling means, designated by the reference numeral 210, comprises a base support 211, which has a transverse cross-section which is substantially complementary to the transverse cross-section of the sliding guide 7, and an engagement member constituted by a pair of mutually facing sliders 212a and 212b, which are transversely and slidingly associated with the base support 211, and between which a wedge 213 is interposed.

[0030] With a translational motion of the wedge 213 in a direction which lies transversely to the sliding direction of the sliders 212a and 212b, in practice the transition occurs from the closed condition, in which the sliders

212a and 212b do not protrude from the contour of the fixed profile 2, to the open condition, in which the sliders 212a and 212b, spaced apart by the wedge 213, protrude at least partly from the fixed profile 2 through the openings 8 and interfere with the recess 1001, fixing the draft excluder 1 to the door 1000.

[0031] In the embodiments shown in Figures 6 to 13, the members that correspond to the members that have already been described with reference to the embodiment shown in Figures 1 to 5, have been designated by the same reference numerals.

[0032] The operation of the draft excluder according to the invention is evident from what has been described and illustrated, and in particular it is evident that it is sufficient to arrange the expansion-type coupling means, designated respectively by the reference numerals 10, 110 and 210, inside the sliding guide 7 at the openings 8 and then, by means of a tool 2000, constituted by a hex key or a screwdriver, impart respectively a rotation substantially of a quarter turn to the pawl 12, a rotation of substantially one eighth of a turn to the eccentric 112, or a translational motion in a direction which lies transversely to the sliding direction of the sliders 212a and 212b to the wedge 213, so as to cause the at least partial protrusion from the fixed profile 2 of the engagement members that will interfere with the recess 1001 and consequently fix the draft excluder 1 to the door 1000.

[0033] The tool 2000 used to make the engagement members pass from the closed condition to the open condition in practice is inserted in through holes 9, which are formed both on the sealing means 4 and on the movable profile 3 and allow to anchor to the door 1000 the draft excluder 1 even when the excluder is already completely assembled.

[0034] In practice it has been found that the draft excluder according to the invention fully achieves the intended aim and objects, since its installation is simple and quick and does not require the use of power tools.

[0035] Also, in order to proceed with the installation of the draft excluder according to the invention it is not necessary to disassemble the movable profile and the mechanism that actuates it, although they are completely extractable even after installation.

[0036] This application claims the priority of Italian Patent Application No. VI2007A000058, filed on February 28, 2007, the subject matter of which is incorporated herein by reference.

Claims

1. A draft excluder, particularly for wood doors, comprising a fixed profile with a substantially U-shaped transverse cross-section, which can be accommodated in a recess formed at the lower edge of a door, a movable profile which is provided with a sealing means and is at least partially inserted within said fixed profile, said movable profile being functionally connected to said fixed profile by a means for automatic movement, in order to pass from a raised position to a lowered position during the closure of said door, **characterized in that** it comprises an expansion-type coupling means associated with said fixed profile in order to allow its anchoring within said recess, said expansion-type coupling means passing, during anchoring, from a closed condition, in which said means does not protrude from said fixed profile, to an open condition, in which said means protrudes laterally from said fixed profile, interfering with said recess.

2. The draft excluder according to the preceding claim, **characterized in that** it comprises a sliding guide which is formed within said fixed profile at its back, said expansion-type coupling means being slidingly associated with said sliding guide.

3. The draft excluder according to one or more of the preceding claims, **characterized in that** said sliding guide comprises a plurality of mutually facing openings formed on opposite sides of said sliding guide.

4. The draft excluder according to one or more of the preceding claims, **characterized in that** said expansion-type coupling means comprises at least one base support which is joined to at least one engagement member, the transverse cross-section of said base support being substantially complementary to the transverse cross-section of said sliding guide, said engagement member being movable in order to pass from said closed condition to said open condition.

5. The draft excluder according to one or more of the preceding claims, **characterized in that** said engagement member comprises at least one pawl which is rotatably joined to said base support, said engagement member passing from said closed condition to said open condition, in which a portion of said pawl protrudes from said fixed profile through said openings, with rotations of said pawl substantially of a quarter turn.

6. The draft excluder according to one or more of the preceding claims, **characterized in that** said pawl comprises a shaped portion which allows to impart a rotation thereto.

7. The draft excluder according to one or more of the preceding claims, **characterized in that** said engagement member comprises an eccentric member provided with at least one cam, which is rotatably joined to said base support and is functionally connected to at least one hook which is articulated to said base support, said engagement member passing from said closed condition to said open condition,

in which a portion of said hook protrudes from said fixed profile through said openings, with rotations of said eccentric member substantially of one eighth of a turn.

8. The draft excluder according to one or more of the preceding claims, **characterized in that** said hook is articulated to said eccentric member at said cam.

9. The draft excluder according to one or more of the preceding claims, **characterized in that** said eccentric member comprises a shaped portion which allows to impart a rotation thereto.

10. The draft excluder according to one or more of the preceding claims, **characterized in that** said engagement member comprises at least one pair of sliders which are slidingly and transversely joined to said base support and a wedge which is interposed between said sliders, said engagement member passing from said closed condition to said open condition, in which a portion of said sliders protrudes from said fixed profile through said openings, with a translational motion of said wedge along a direction which lies transversely to the sliding direction of said sliders.

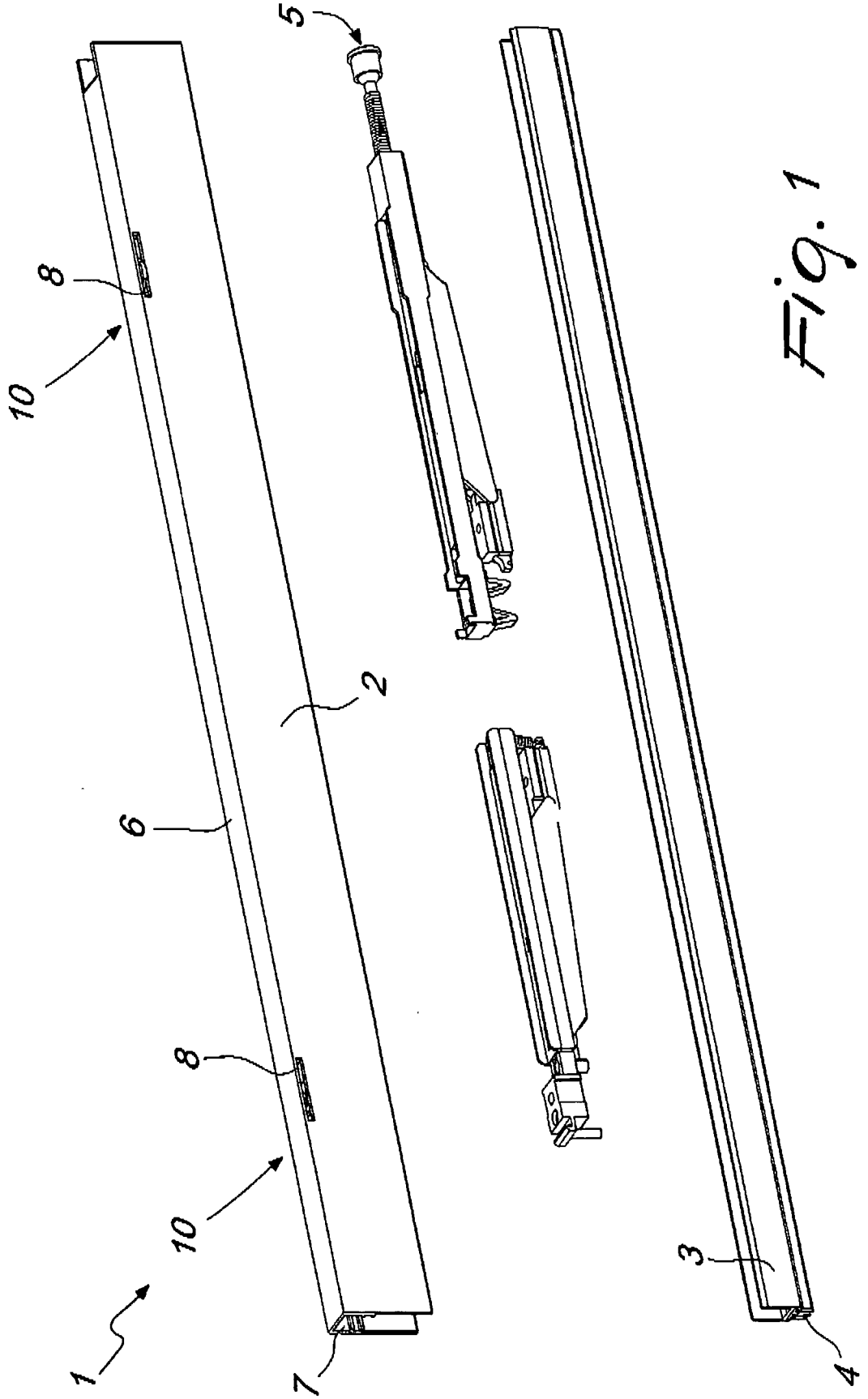


Fig. 1

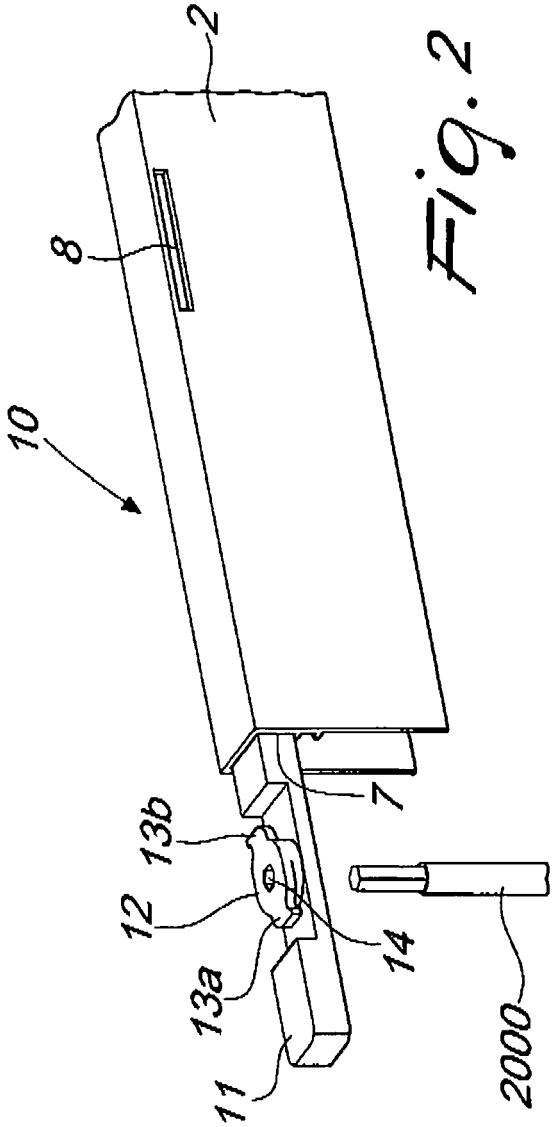


Fig. 2

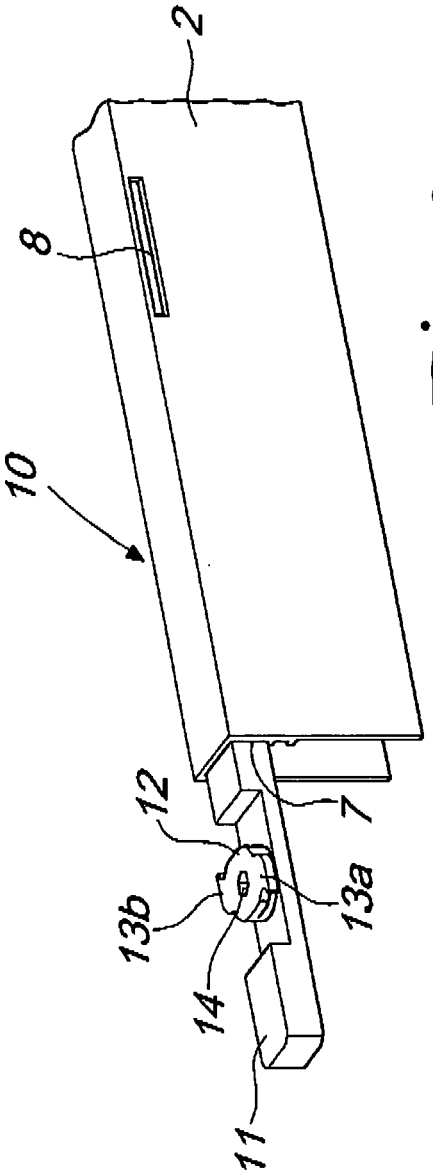


Fig. 3

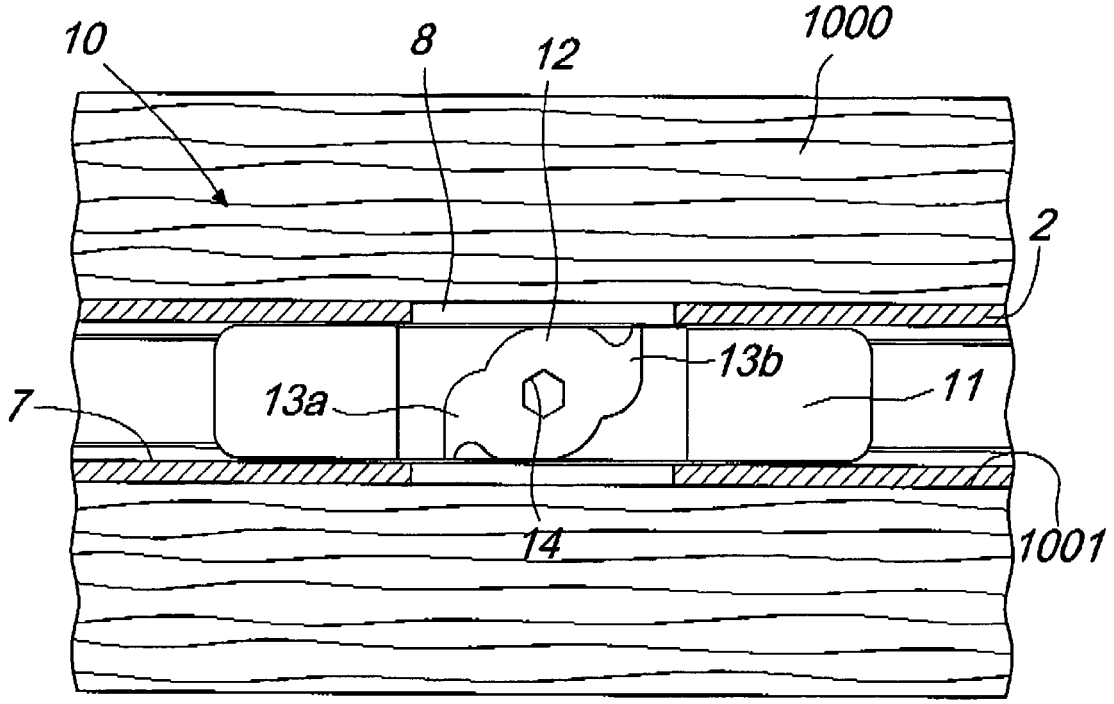

10
8
12
1000
2
13b
11
13a
7
14
1001

Fig. 4

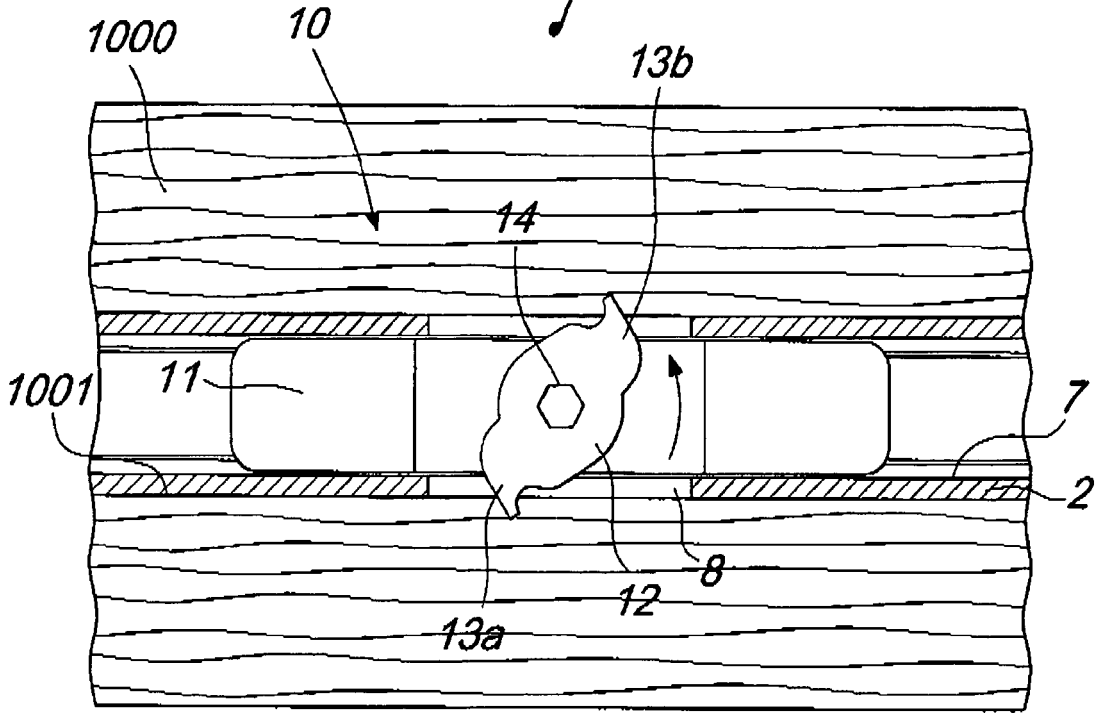

1000
10
13b
14
1001
11
7
2
8
12
13a

Fig. 5

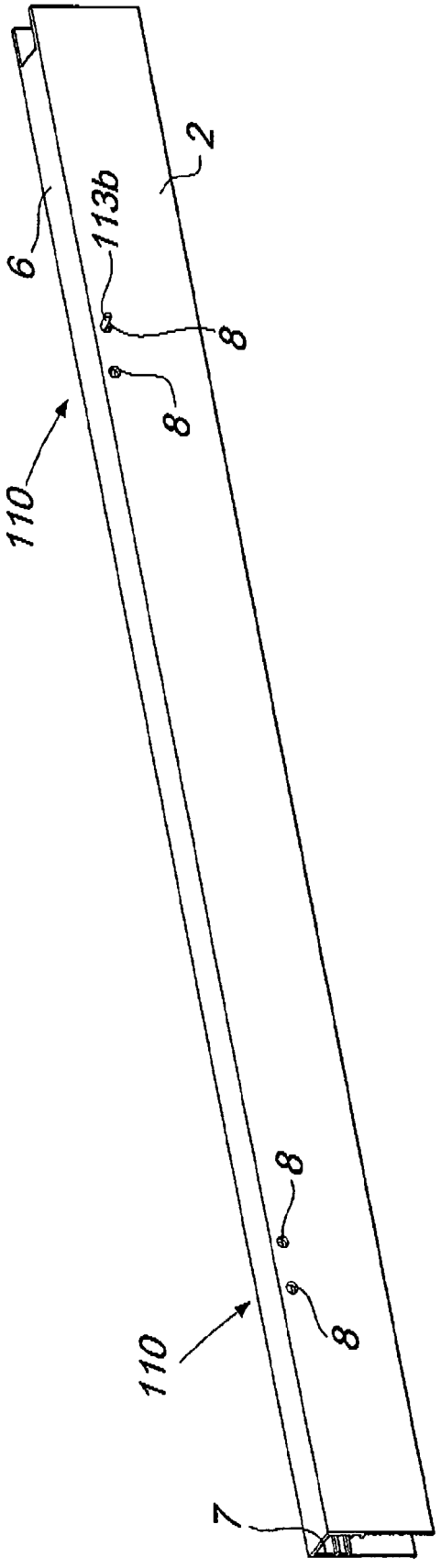


Fig. 6

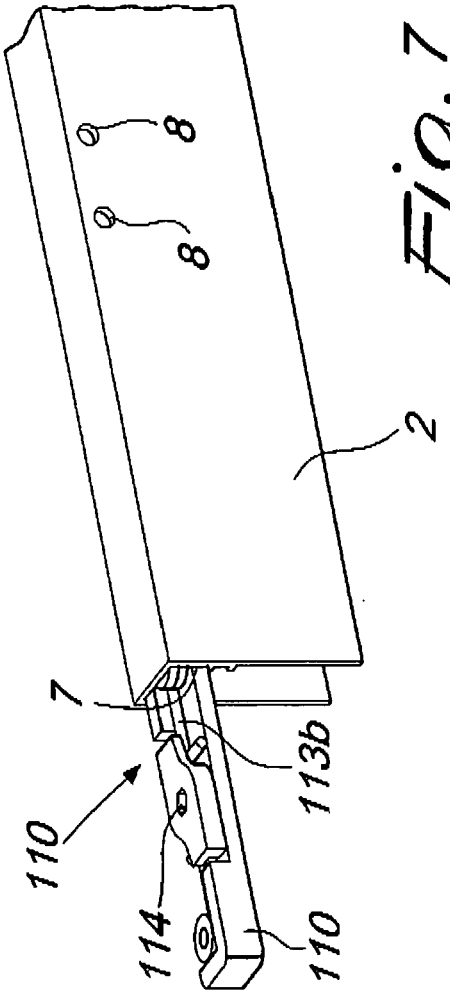


Fig. 7

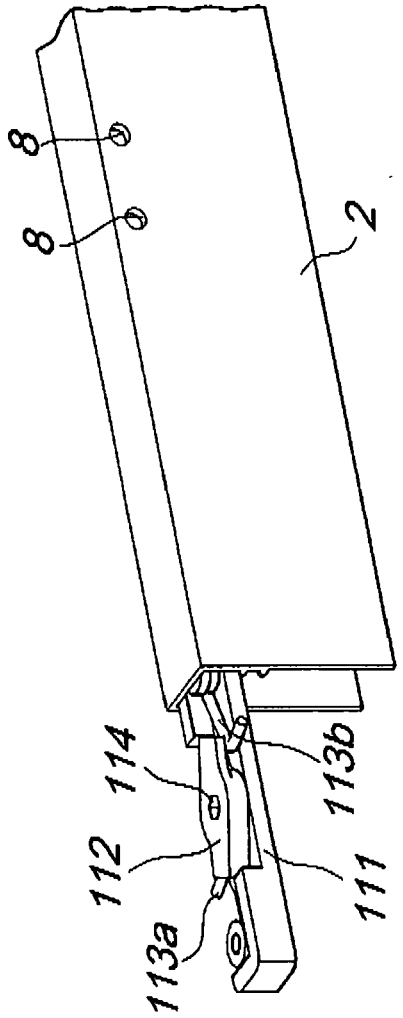


Fig. 8

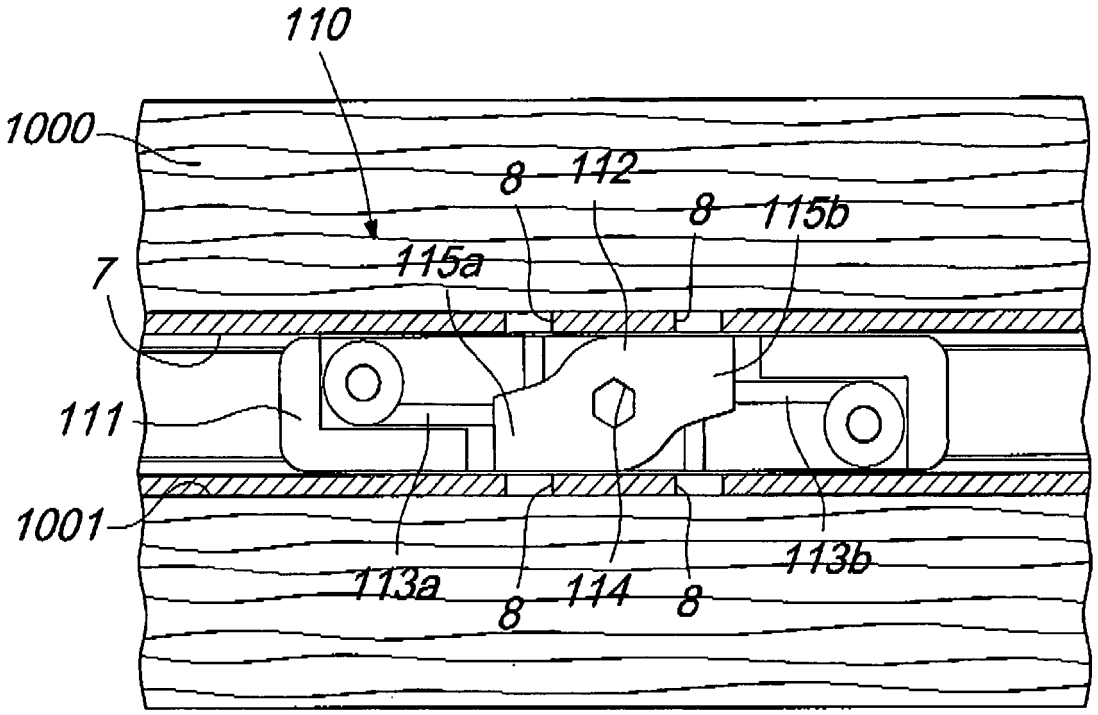

110
1000
8
112
8
115b
115a
7
111
1001
113a
8
114
8
113b

Fig. 9

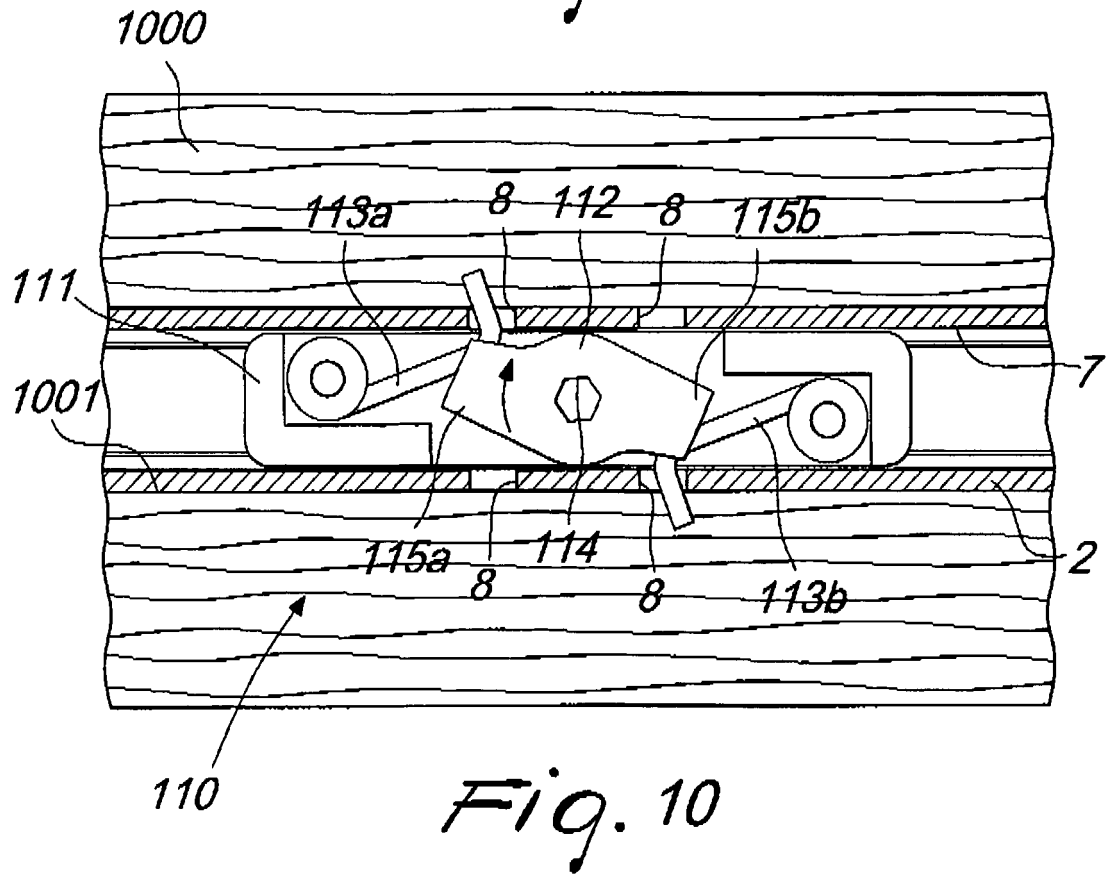

1000
113a
8
112
8
115b
111
7
1001
115a
8
114
8
113b
2
110

Fig. 10

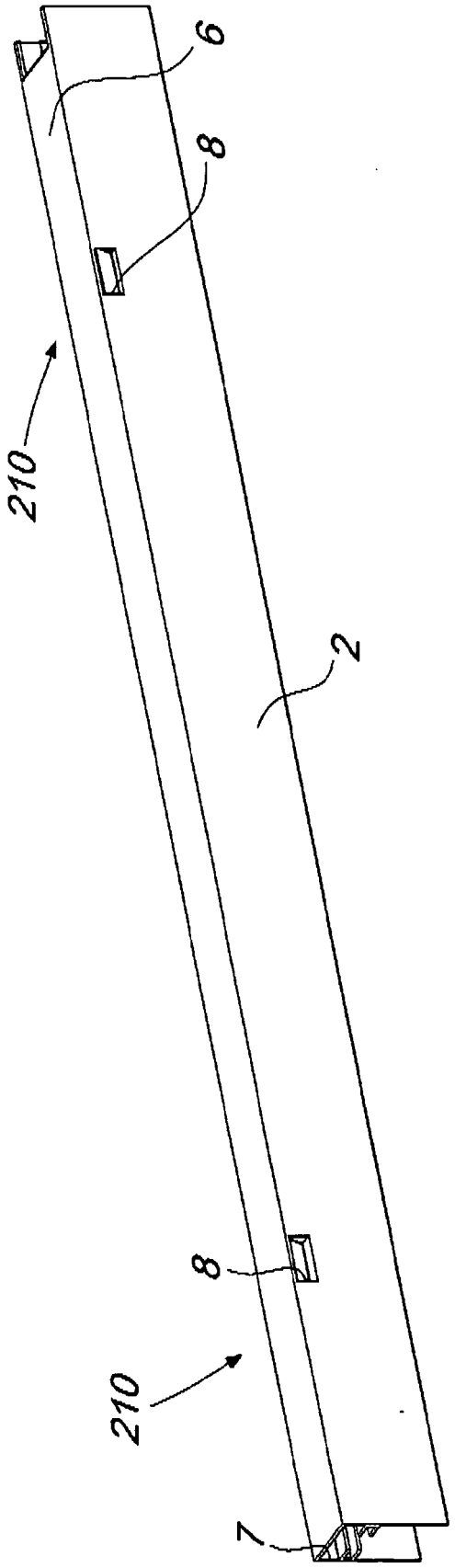


Fig. 11

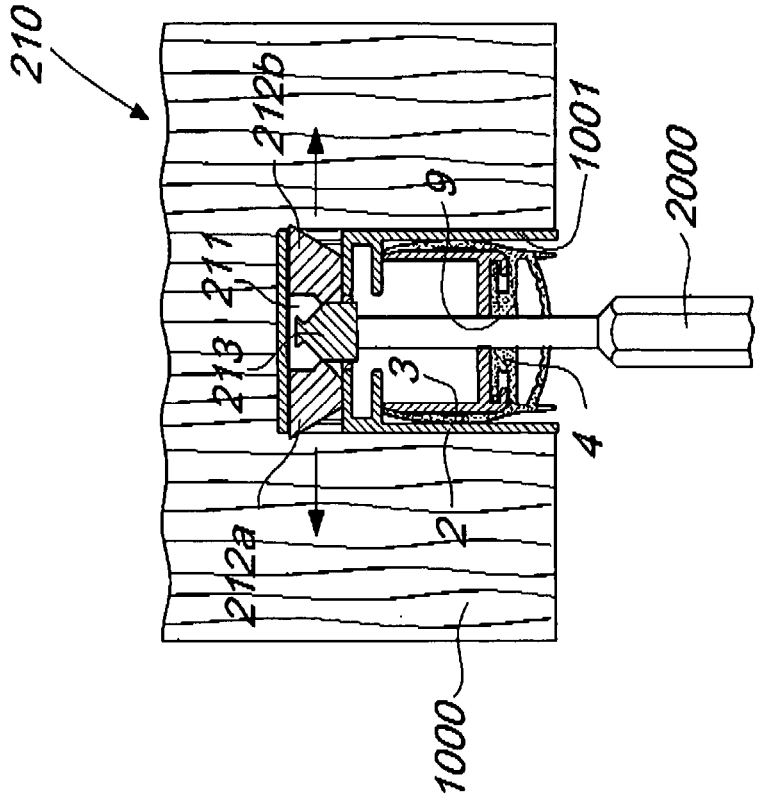

210
212b
1001
2000
9
211
213
3
4
2
212a
1000

Fig. 13

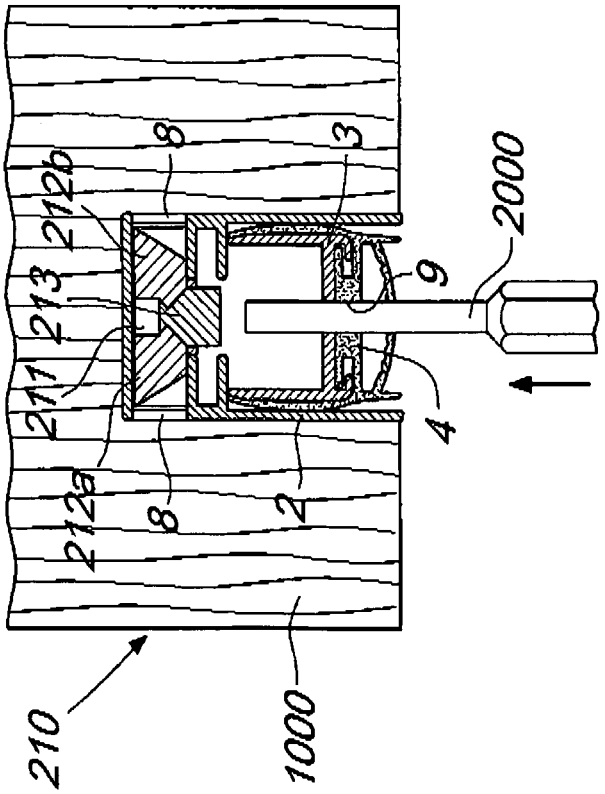

8
3
212b
2000
213
9
211
4
212a
8
2
210
1000

Fig. 12

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT VI20070058 A **[0036]**