



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.09.2004 Bulletin 2004/39

(51) Int Cl.7: **E05C 9/04**, E05B 1/00

(21) Application number: **03079062.0**

(22) Date of filing: **22.12.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

(72) Inventor: **Comunello, Vittorio**
36027 Rosà (Vicenza) (IT)

(74) Representative: **Gerbino, Angelo et al**
Jacobacci & Partners S.p.A.
Via Berchet 9
35131 Padova (IT)

(30) Priority: **18.03.2003 IT PD20030024 U**

(71) Applicant: **Fratelli Comunello S.p.A.**
36027 Rosa (IT)

(54) **Door and associated opening means**

(57) The present invention relates to a door comprising one or more leaves (A, A1) provided with a locking device (BV) comprising at least one bar (BV). Means (C) for operating the locking device (BV) so as to move the bar (B) between a locking position and an unlocking position and opening/closing means (1) integral with the

leaf (A1) are envisaged. The opening/closing means (1) are independent of the locking device (BV) and comprise a guide portion (2), which is mechanically associated with fixing means (V) and able to receive slidably the bar (B), and a gripping portion (3) rigidly associated with the guide portion (2).

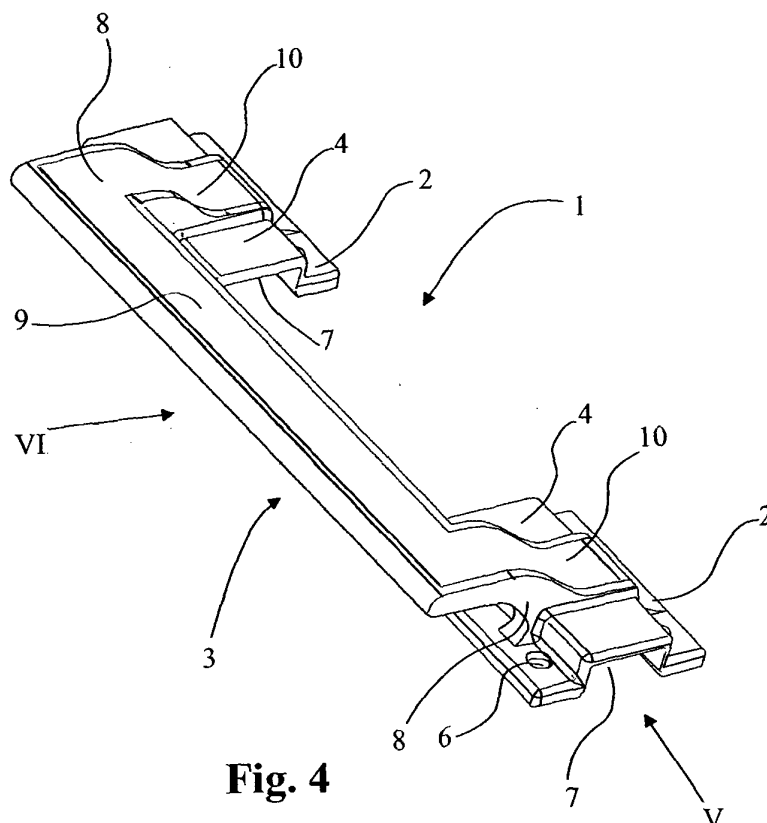


Fig. 4

Description

[0001] The present invention relates to a door and the associated opening/closing means.

[0002] Doors comprising hinged panels or separate leaves, which are opened by means of folding together, simple lateral sliding or rotation about an end pivot and are equipped with locking devices comprising one or more closing bars, are known. These bars include in their structure opening/closing means which allow a person to manoeuvre the door manually.

[0003] For a better understanding of the state of the art and the problems relating thereto, a door, in particular of the type opened by means of folding, will be described, as illustrated in Figure 1 of the accompanying drawings.

[0004] A door of the type comprising sliding panels with a folding-up movement is used for closing large openings, for example in industrial warehouses, and is characterized by compact dimensions when open. Owing to the possibility of folding up the leaves onto themselves, it is possible to reduce as far as possible the otherwise considerable amount of space which must be left free for opening and closing the doors used for large openings.

[0005] The door shown in Figure 1 comprises three leaves A, A1 consisting of a panel and connected together by hinges (not shown in the Figures). The hinging system and the movement devices envisage in particular a top and bottom sliding guide (not shown in the Figures). The door is equipped with a locking device BV with associated operating means C and opening/closing means M.

[0006] In greater detail, the device for locking this door envisages two vertical bars B which, by means of sliding inside guides G, may assume an active working position for locking and a passive unlocking position. The two bars are constrained to an operating means C which is known *per se* and cause the bars B to assume the two working positions, imparting to them an opposite relative movement.

[0007] In the active position, the two bars, projecting respectively beyond the bottom edge B1 and the top edge BS of the leaf A1, engage inside two slots (not shown) formed in the structure which delimits the opening to be closed by the door. In this position the door is locked in the closed position.

[0008] In the passive position, the two bars B, which are retracted inside the edges of the leaves, do not engage inside the slots, allowing unlocking of the door. The unlocked door, still in the closed position, may thus be opened.

[0009] Opening and closing of this type of door is performed by means of application of a force F, with a direction parallel to the sliding guides, which causes the movement of the leaves. The opening/closing means consist of a seat S for gripping and applying the force, which is formed by shaping in the manner of a handle a

section of one of the two bars B of the locking device BV.

[0010] A drawback of this solution is that the force F, necessary for moving the whole weight of the door, being applied to the shaped section S of one of the two bars, is transmitted to the leaf A1 by means of the locking device BV and, in particular, by means of the operating means C and the guides G. The efficiency and intact condition of the locking device, the associated operating means and the guides may be adversely affected by the forces applied during use. The force F applied to the opening means M may produce, in fact, on the bar B a twisting moment which must be resisted by the guides G and by the internal mechanism of the operating means C.

[0011] The same drawback arises in doors which are opened by means of simple lateral sliding and are equipped with similar bar-type locking devices. The force required to cause sliding of the whole door is transmitted to the body of the door by means of the locking device.

[0012] The main object of the present invention is therefore that of designing a door which is able to overcome the drawbacks of the known art discussed above.

[0013] Another object of the invention is that of designing a door provided with opening/closing means which can be easily manufactured and assembled.

[0014] According to the invention, these objects are achieved by means of such a door comprising:

- at least one leaf;
- a locking device mounted on said leaf and comprising at least one bar;
- means for operating the locking device so as to move said bar between a locking position and an unlocking position; and
- opening/closing means integral with said leaf;

said door being characterized in that said opening/closing means are independent of the locking device.

[0015] The invention also relates to opening/closing means to be used in the abovementioned door.

[0016] Further advantages and characteristic features of the present invention will become obvious from the following detailed description provided by way of a nonlimiting example, with reference to the accompanying drawings, in which:

Figure 1 (already described) is an overall view of a door designed in accordance with the known art, in particular of the type opened by means of folding, with associated opening/closing means;

Figure 2 is an overall view of a door, in particular of the type opened by means of folding, with associated opening/closing means, according to the present invention;

Figure 3 is a view of the means for opening the door according to the invention in the assembled condition;

Figure 4 is a view of the means for opening the door according to the invention in the unassembled condition;

Figure 5 is a side view of the opening means in the direction of the arrow V shown in Figure 4;

Figure 6 is a view of the opening means in the direction of the arrow VI shown in Figure 4;

Figure 7 shows preferred positions for assembly of the means for opening the door according to the invention.

[0017] With reference to Figure 2, the door, which in this preferred embodiment is of the type with sliding panels which are opened by means of folding, comprises three panel type leaves A, A1 which are hinged together in a manner known per se and a mechanism for the folding movement (not shown in the Figures) designed still in accordance with the known art. The door with associated opening/closing means 1 also comprises a locking device BV consisting of vertical bars B with guides G and associated operating means C.

[0018] With reference to Figures 3, 4, 5 and 6, the opening/closing means 1 comprise two guide portions 2, a gripping portion 3 and fixing means V.

[0019] Each guide portion 2 is shaped in the manner of a bracket with an arched body 4 from the ends of which respective lugs 5 protrude, said lugs being provided with two through-holes 6 which receive the means V for fixing to the leaf A1. The fixing means V may be, for example, screws or bolts. In embodiments not shown, the holes may vary both in terms of their number and in terms of their arrangement. The arched body 4 of each guide portion 2 defines with its walls a recess 7 having a profile complementing that of the bar B of the locking device BV.

[0020] The gripping portion 3 is a C-shaped handle with two arms 8 connected to a cross-piece 9 which allows gripping and application of the force necessary for opening the door. A guide portion 2 is integral with the distal ends of each arm 8. At these ends, opposite to those connected to the cross-piece 9, each arm 8 extends parallel to the cross-piece with a portion 10 which, with its bottom part, defines a profile complementing the upper surface of the arched body 4 of the guide portion 2. The connection between one arm 8 and a portion 2 may be performed by means of force-fitting or hot-shrinking. Advantageously it is also possible to form as one piece by means of die-casting the gripping portion 3 with the associated guide portions 2.

[0021] The opening means 1 are fixed to the leaf A1 in the vicinity of the means C for operating the locking device BV and in such a way that the axis X of the recess 7 in a guide portion 2 coincides with the axis Y of the bar B. The opening/closing means 1 thus also act as guides for the bar B of the device BV owing to the recess 7 of the guide portions 2.

[0022] Figure 7 shows preferred assembly positions of the opening means 1 with respect to the operating

means C. The opening means 1 may be fixed to the leaf A1 both above and below the operating means C. It is possible to arrange, moreover, the means 1 so that the cross-piece 9 is located on the same side (relative to the bar B) as the lever L of the operating means C. Preferably, the position of the opening means 1 is such that, after operation of the operating means C, the means 1 can be easily accessed by a person operating the door.

[0023] Therefore, with the present invention, at the moment of opening or closing of the door, it is avoided that the locking device BV and the associated operating means C are subject to unnecessary and damaging stresses, the opening/closing means 1 being independent of the locking device. Owing to the abovementioned guide portions 2 and the associated fixing means V it is in fact possible to fix the opening means 1 directly onto a leaf A, A1, without interfering with operation of the locking device and ensure that said means 1 resist any twisting moment which, in the prior art, was instead opposed by the operating means C.

[0024] The opening/closing means 1 according to the present invention are easy to manufacture, inexpensive and simple to assemble.

[0025] The present invention, moreover, indirectly results in simplification of production of the bars B for the locking devices, since it is no longer necessary to shape suitably one of the two bars in order to form the gripping seat S.

Claims

1. Door comprising:

- at least one leaf (A,A1);
- a locking device (BV) mounted on said leaf (A1) and comprising at least one bar (B);
- means (C) for operating the locking device (BV) so as to move said bar (B) between a locking position and an unlocking position; and
- opening/closing means (1) integral with said leaf (A1);

said door being **characterized in that** said opening/closing means (1) are independent of the locking device (BV).

2. Door according to Claim 1, **characterized in that** said opening/closing means comprise:

- fixing means (V) for fastening said means (1) to the leaf (A1);
- at least one guide portion (2) mechanically associated with said fixing means (V) and able to slidably receive said bar (B); and
- a gripping portion (3) rigidly associated with said guide portion (2).

3. Door according to Claim 2, **characterized in that** said guide portion (2) is shaped in the manner of a bracket with an arched body (4) from the ends of which respective lugs (5) protrude, said lugs being provided with at least one through-hole (6) which receives said means (V) for fixing to the door (A1). 5
4. Door according to Claim 3, **characterized in that** said arched body (4) defines with its walls a recess (7) having a profile complementing that of the bar (B) of the device (BV) for locking the door, said recess (7) acting as a guide for the bar (B). 10
5. Door according to any one of Claims 2 to 4, **characterized in that** said gripping portion (3) is a handle. 15
6. Door according to any one of Claims 2 to 5, **characterized in that** said gripping portion (3) is C-shaped with two arms (8) connected to a cross-piece (9) which acts as a grip, respective guide portions (2) being integral with the distal ends of the arms (8). 20
7. Door according to any one of Claims 2 to 6, **characterized in that** said gripping portion (3) is formed as one piece with the respective guide portions (2). 25
8. Door according to any one of the preceding claims, **characterized in that** said opening/closing means (1) are fixed to the leaf (A1) in the vicinity of said means (C) for operating the locking device (BV). 30
9. Door according to any one of the preceding claims, **characterized in that** it is a door which is opened by means of folding. 35
10. Door according to any one of Claims 1 to 8, **characterized in that** it is a door which is opened by means of lateral sliding. 40
11. Door according to any one of Claims 1 to 8, **characterized in that** it is a door which is opened by means of rotation about an end pivot. 45
12. Opening/closing means for use in a door according to any one of the preceding claims. 50
13. Opening/closing means for use in a door according to any one of the preceding claims, **characterized in that** said means comprise a handle. 55

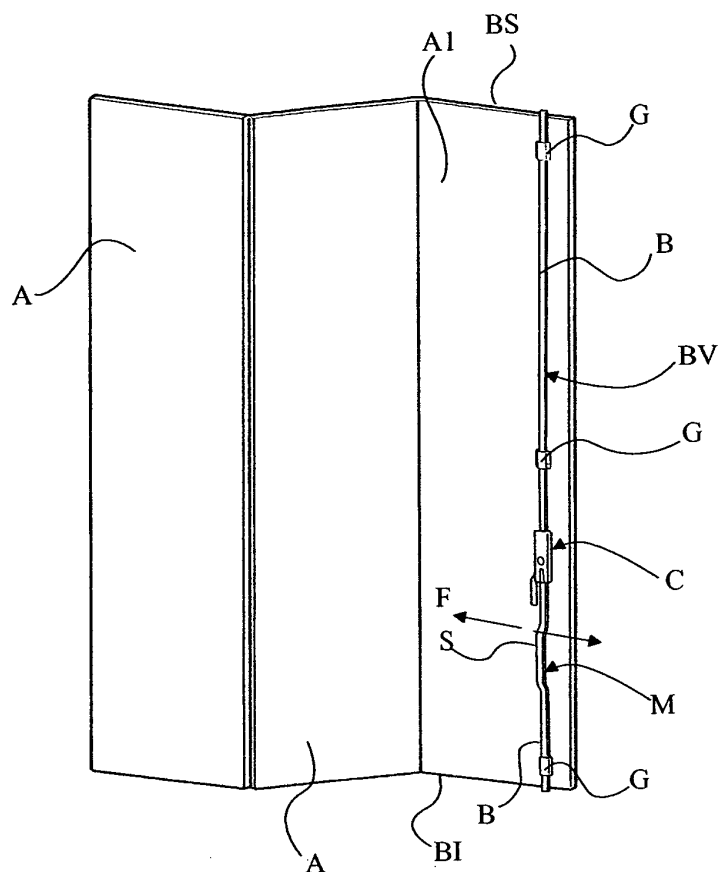


Fig. 1
(prior art)

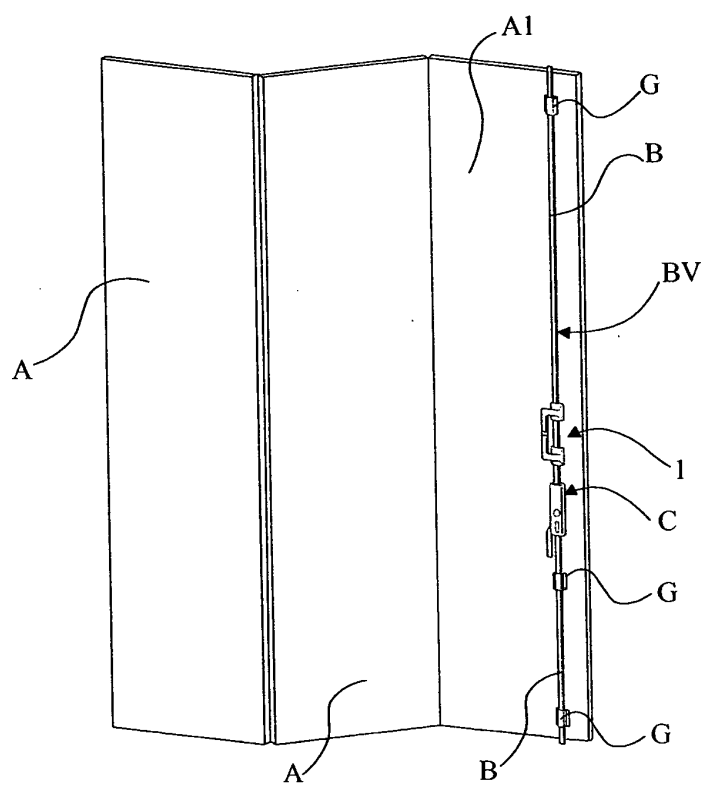
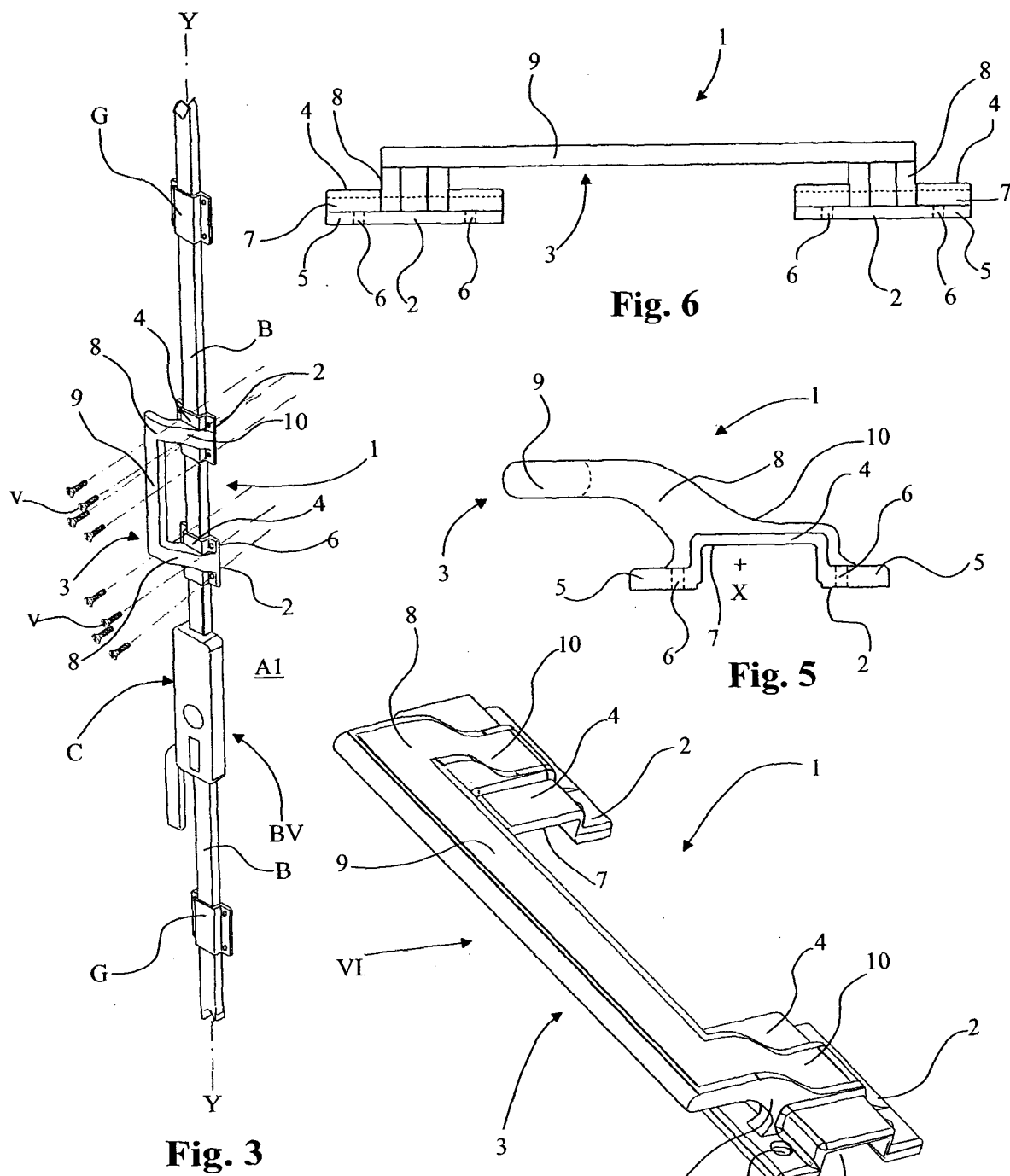


Fig. 2



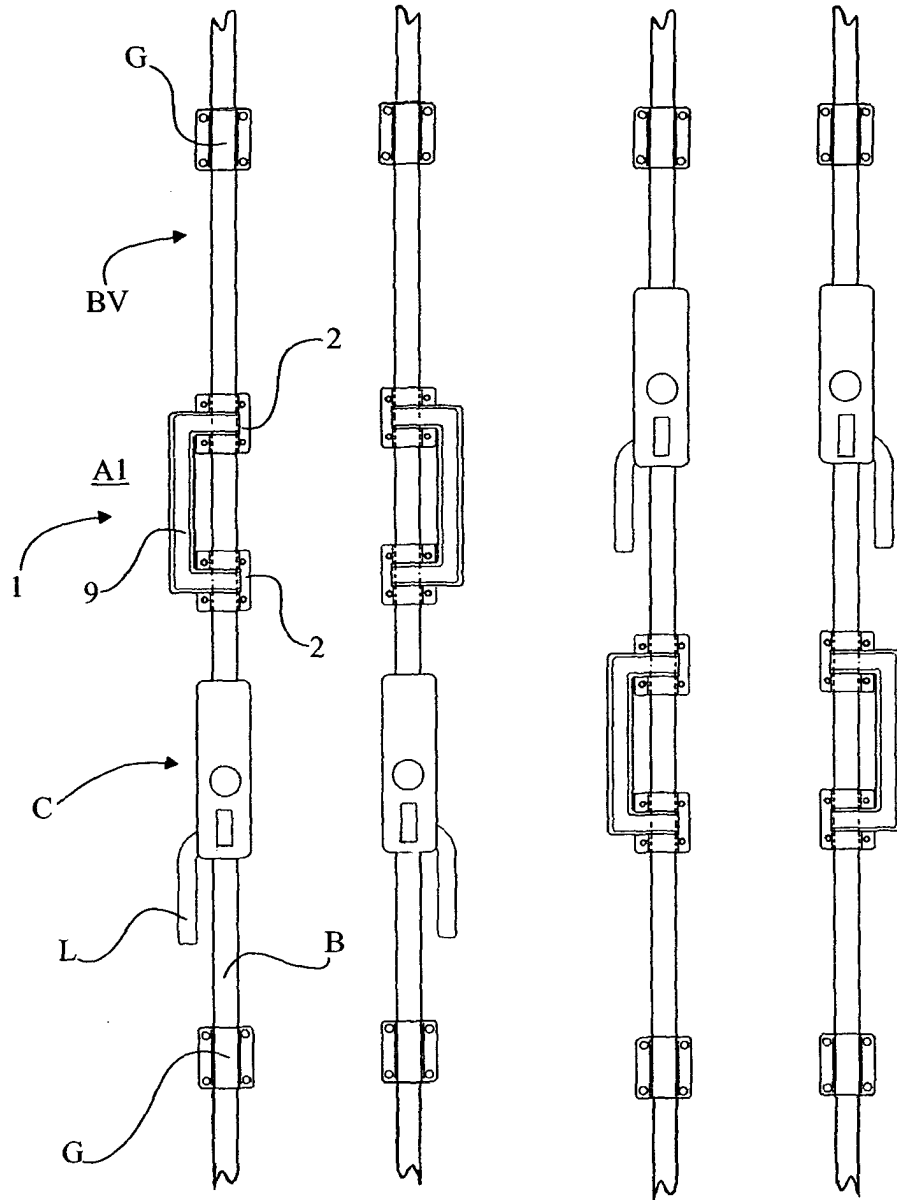


Fig. 7