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(71) Applicant: **Satech Safety Technology S.p.A.**
23885 Calco (Lecco) (IT)

(72) Inventor: **Fumagalli, Daniele**
23856 Galbiate (LC) (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Dr. Modiano & Associati SpA
Via Meravigli 16
20123 Milano (IT)

(54) **Intrusion prevention enclosure**

(57) An intrusion prevention enclosure, of the type which comprises a plurality of modular panels (2) and uprights (3) which can be mutually associated in a predefined ordered manner so as to provide a barrier structure, comprising means (4) for connecting at least one panel (2) to at least one of the uprights (3) which are adapted to allow the preset angular arrangement of the panel (2) about an axis which is substantially vertical with respect to the upright (3), the connecting means (4) comprising at least one main body (5) which is equipped with at least one substantially vertical articulation pivot (6), which is inserted in at least one bush (7) which is inserted by interlocking in at least one respective open end (8a) of at least one lateral post (8) of the panel (2), the bush (7) being able to rotate about the articulation pivot (6), so as to allow the preset angular arrangement of the panel (2) about a substantially vertical axis, and the connecting means (4) comprising elements for detachably fixing the main body (5) to a stem (3a) of the upright (3).

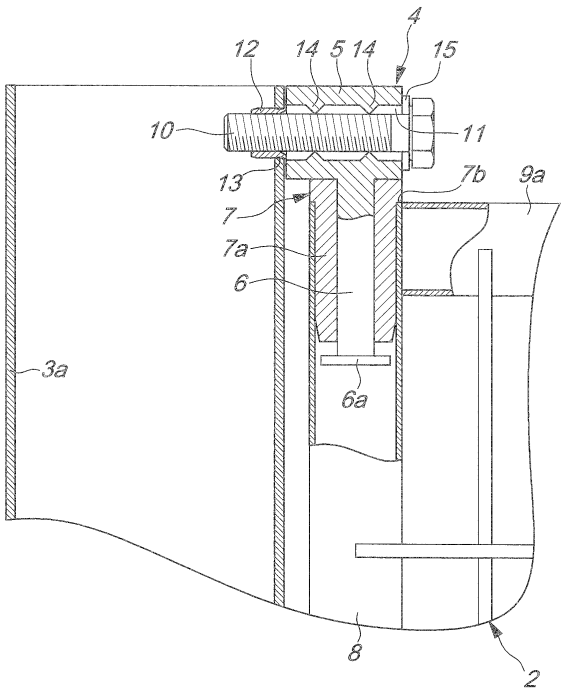

Fig. 2

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Description

[0001] The present invention relates to an intrusion prevention enclosure.

[0002] Intrusion prevention enclosures are known which are used to prevent the uncontrolled access of people, animals, vehicles or others to specific areas; this need usually arises from two basic reasons: preventing uncontrolled access to sites where situations causing danger or inconvenience to assigned personnel occur (industrial ovens, presses, more or less rapidly rotating parts, machines with optical, acoustic, inhalable, dazing emissions) or preventing intruders from being able to remove or damage products, devices or apparatuses on sale or in operation (thefts, vandalisms, unauthorized or dangerous uses).

[0003] These intrusion prevention enclosures are usually constituted by a plurality of modular panels and uprights which can be mutually associated in a predefined ordered manner, so as to form a barrier structure.

[0004] However, known types of enclosure do not allow to arrange at an angle, about a vertical axis, the panels with respect to the uprights at any preset angle at the operator's discretion, for example depending on the contingent assembly requirements.

[0005] The aim of the present invention is to meet the mentioned requirements, by providing an intrusion prevention enclosure which allows angular arrangement, about a vertical axis, of the panels with respect to the uprights at any preset angle at the operator's discretion.

[0006] Within this aim, an object of the present invention is to provide an intrusion prevention enclosure whose assembly is simple and requires rapid execution times without the possibility of losing the components.

[0007] Another object of the invention is to provide an intrusion prevention enclosure which is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0008] This aim and these and other objects which will become better apparent hereinafter are achieved by an intrusion prevention enclosure, of the type which comprises a plurality of modular panels and uprights which can be mutually associated in a predefined ordered manner so as to provide a barrier structure, characterized in that it comprises means for connecting at least one panel to at least one of said uprights which are adapted to allow the preset angular arrangement of said panel about an axis which is substantially vertical with respect to said upright, said connecting means comprising at least one main body which is equipped with at least one substantially vertical articulation pivot, which is inserted in at least one bush which is inserted by interlocking in at least one respective open end of at least one lateral post of said panel, said bush being able to rotate about said articulation pivot, so as to allow the preset angular arrangement of said panel about a substantially vertical axis, and said connecting means comprising elements for detachably fixing said main body to a stem of said upright.

[0009] Further characteristics and advantages of the invention will become better apparent from the following detailed description of two preferred but not exclusive embodiments of an intrusion prevention enclosure according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a side elevation view of a panel and an upright of the intrusion prevention enclosure, according to the invention, which are associated by way of connecting means;

Figure 2 is a partially sectional side elevation detail view of the detail II of Figure 1;

Figure 3 is a partially sectional side elevation view of a second embodiment of the enclosure according to the invention.

[0010] With reference to the figures, the reference numeral 1 generally designates an intrusion prevention enclosure, according to the invention, of the type which comprises a plurality of modular panels 2 and of uprights 3 which can be mutually associated in a predefined ordered manner so as to provide a barrier structure which is arranged conveniently according to requirements.

[0011] The enclosure 1 comprises means 4 for connecting at least one panel 2 to at least one upright 3, which are adapted to allow the preset angular arrangement of the panel 2 about a substantially vertical axis with respect to the upright 3. The connecting means 4 comprise at least one main body 5, which is equipped with at least one substantially vertical articulation pivot 6, which is inserted in at least one bush 7 which is inserted by interlocking in at least one respective open end 8a of at least one lateral post 8 of the panel 2.

[0012] The bush 7 can rotate about the articulation pivot 6 so as to allow the preset angular arrangement of the panel 2 about a substantially vertical axis.

[0013] The connecting means 4 further comprise means for detachably fixing the main body 5 to a stem 3a of the upright 3.

[0014] In greater detail, the panels 2 have a preferably rectangular opening C made of materials such as for example metal net with wires which are welded electrically at the nodes and along the perimeter, which is delimited by metal profiles having a tubular cross-section which comprise an upper cross-member 9a and a lower cross-member 9b, which are butt-welded at their sides against the lateral portions of the two lateral posts 8 of the panel 2, so that the two posts 8 have open ends 8a at the top and at the bottom.

[0015] The panels 2 can have even large dimensions, and in one intended embodiment they have horizontal wires which are more spaced than the vertical wires, and an intermediate reinforcement cross-member 9c.

[0016] Each of the uprights 3 comprises a ground contact base 3b which is substantially rectangular and is adapted to allow optimum adaptation to the ground, which is often not flat but uneven.

[0017] The vertical stem 3a having a substantially square transverse cross-section is welded above the base 3b.

[0018] In greater detail, the connecting means 4 comprise two main bodies 5 for each respective panel 2: the pivot 6 of a first body 5 associated with the panel 2 in an upper region is directed downward and is accommodated in a respective bush 7, which is inserted by interlocking in a corresponding upper open end 8a of the post 8, the pivot 6 of a second body 5 associated below the panel 2 is directed upward and is accommodated within a respective bush 7, which is inserted by interlocking in a corresponding lower open end 8a of the post 8, so as to support the panel 2 so that it can rotate about a substantially vertical axis which passes through the articulation pivots 6.

[0019] Each of the bushes 7 comprises an end portion 7a whose cross-section is substantially complementary to the cross-section of the posts 8, can be inserted detachably by interlocking in the respective open end 8a of the posts 8, and comprises a shoulder 7b for stopping against the respective open end 8a.

[0020] The pivot 6 conveniently comprises a terminal retention head 6a, which is adapted to avoid its accidental extraction from the bush 7.

[0021] In a first preferred embodiment, the fixing elements are of the screw type and can comprise for example a screw 10 which is inserted in a through hole 11 of the main body 5 and is screwed into a respective threaded hole provided in the stem 3a of the upright 3 at a preset height.

[0022] Preferably, the screw 10, inserted in the through hole 11 of the main body 5, can be screwed into a respective internally threaded bush 12, which is rigidly coupled to an opening 13 provided on the stem 3a of the upright 3 at a preset height, as shown in Figure 2.

[0023] The through hole 11 comprises advantageously at least one substantially circumferential internal protrusion 14 and preferably comprises a plurality of suitably distributed internal protrusions 14 which are suitable for centering and retaining the screw 10: the internal protrusions 14 have a substantially triangular cross-section, having a vertex which is adapted to engage within respective threads of the screw 10, so as to prevent its extraction from the hole 11 even after it has been unscrewed, for example for maintenance, from the bush 12. For example, the circumferential protrusions 14 are distributed within the hole substantially like discontinuous rings, four angularly equidistant protrusions for each ring.

[0024] A washer 15 is interposed between the head of the screw 10 and the main body.

[0025] In a further preferred embodiment, shown in Figure 3, the fixing elements comprise a contoured protrusion 16, which protrudes from the main body 5 and can be engaged detachably by interlocking in a contoured wing 17, which is associated with a stem 3a of the upright 3 at a preset height.

[0026] Preferably, the contoured wing 17 is provided peripherally on at least one collar 18 which can be arranged at adjustable heights along the stem 3a, and in particular each one of the wings 17 has a substantially L-shaped cross-section, with one side associated with the collar 18 and the other side free and affected by a recess 19 for coupling to the protrusion 16 of the main body 5.

[0027] Conveniently, the protrusion 16 comprises a first portion 16a, which is adapted to mate within the recess 19, and an expanded end portion 16b, which is adapted to prevent the accidental extraction of the protrusion 16.

[0028] The fixing means comprise a plurality of collars 18, which can be arranged at adjustable heights along the stems 3a, and each collar 18 is provided with a peripherally distributed plurality of wings 17, which can engage the respective protrusions 16. The wings 17 can comprise two recesses 19 each.

[0029] Each collar 18 has a transverse cross-section which is shaped substantially complementarily with respect to the cross-section of the stem 3a and comprises two folded end flaps 20, which substantially face each other and are perforated for fastening to the stem 3a at the preset height by means of provided closure elements (not shown in the figures), for example of the screw type.

[0030] Effectively, two collars 18, an upper one and a lower one, are associated with each stem 3a: conveniently, the upper collar 18 has the wings 17 which are arranged downward and the lower collar 18 has the wings 17 which are arranged upward, so as to allow their mating with the respective tabs 16 and support the panel 2 so that it can rotate about the vertical axis formed by the two articulation pivots 6.

[0031] Favorably, the connecting means 4 can be made of metal or of a material such as plastics, for example reinforced polymer.

[0032] In practical operation, during the assembly of the enclosure 1 the connection means 4 are associated with the open ends 8a of a lateral post 8 of the panel 2, with the pivots 6 of the main bodies 5 inserted within the bushes 7, which are inserted by interlocking within the open ends 8a, and are associated with the stems 3a of the uprights 3 by way of the described fixing elements.

[0033] If the fixing elements comprise the screws 10, said screws are screwed, as described, within the bushes 12 rigidly coupled within the openings 13 provided at preset heights along the stem 3a.

[0034] If the fixing elements comprise the collars 18, the protrusion 16 of the main body 5 associated with the lower open end 8a of the post 8 is inserted in the recess 19 of the wing 17 of the lower collar 18, which is fastened at the chosen height along the stem 3a, and the collar 18 arranged in an upper region on the stem 3a is made to slide downward along it, so as to allow the mating of the respective recess 19 of a wing 17 thereof with the protrusion 16 of the main body 5 which is associated with the upper open end 8a of the post 8, and is then fastened to the upright 3 so as to support the panel 2.

[0035] In both cases, the panel 2 is supported so that it can rotate by the upright 3 about the vertical axis formed by the articulation pivots 6 and can be oriented advantageously at a preset angle with respect to the upright 3 at the operator's discretion.

[0036] In practice it has been found that the invention fully achieves the intended aim and objects, since the intrusion prevention net 1, according to the invention, allows angular arrangement, about a vertical axis, of the panels 2 with respect to the uprights 3 at any preset angle at the operator's discretion.

[0037] Moreover, the components of the enclosure 1 cannot be lost; in particular for the first described embodiment, the protrusions 14, by engaging in respective threads of the screw 10, positively prevent the extraction of the screw from the hole 11, preventing its loss even after it has been unscrewed from the bush 12 to remove the panel 2 from the upright 3, for example for maintenance or repositioning requirements of the enclosure 1.

[0038] The enclosure 1, constituted advantageously by a small number of components which can be assembled conveniently, is quick and easy to assemble even on the part of a single operator, with evident gains in economic terms and in terms of installation times.

[0039] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0040] In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0041] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0042] In practice, the materials used, as well as the shapes and dimensions, may be any according to requirements and to the state of the art without thereby abandoning the scope of the protection of the appended claims.

[0043] The disclosures in Italian Patent Application No. BO2006A000769 from which this application claims priority are incorporated herein by reference.

[0044] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An intrusion prevention enclosure, of the type which comprises a plurality of modular panels (2) and uprights (3) which can be mutually associated in a predefined ordered manner so as to provide a barrier structure, **characterized in that** it comprises means (4) for connecting at least one panel (2) to at least one of said uprights (3) which are adapted to allow the preset angular arrangement of said panel (2) about an axis which is substantially vertical with respect to said upright (3), said connecting means (4) comprising at least one main body (5) which is equipped with at least one substantially vertical articulation pivot (6), which is inserted in at least one bush (7) which is inserted by interlocking in at least one respective open end (8a) of at least one lateral post (8) of said panel (2), said bush (7) being able to rotate about said articulation pivot (6), so as to allow the preset angular arrangement of said panel (2) about a substantially vertical axis, and said connecting means (4) comprising elements for detachably fixing said main body (5) to a stem (3a) of said upright (3).

2. The enclosure according to claim 1, **characterized in that** said connecting means (4) comprise at least two main bodies (5) for each respective panel (2), the pivot (6) of a first body (5) associated in an upper region with said panel (2) being directed downward and being accommodated in a respective bush (7) which is inserted by interlocking in a corresponding upper open end (8a) of said post (8), the pivot (6) of a second body (5) associated in a lower region with said panel (2) being directed upward and being accommodated in a respective bush (7), which is inserted by interlocking in a corresponding lower open end (8a) of said post (8), so as to support said panel (2) so that it can rotate about a substantially vertical axis which passes through said pivots (6).

3. The enclosure according to one or more of the preceding claims, **characterized in that** each of said bushes (7) comprises at least one end portion (7a), whose cross-section is substantially complementary to the cross-section of said posts (8), can be inserted detachably by interlocking within said open ends (8a) of said posts (8), and comprises a shoulder (7b) for stopping against the respective open end (8a) of said post (8).

4. The enclosure according to one or more of the preceding claims, **characterized in that** said pivot (6) comprises a terminal retention head (6a), which is adapted to avoid its accidental extraction from said bush (7).

5. The enclosure according to one or more of the preceding claims, **characterized in that** said fixing elements are of the screw type and comprise at least one screw (10), which is inserted in at least one through hole (11) of said main body (5) and is

screwed into a respective threaded hole provided in said stem (3a) of said upright (3) at a preset height.

6. The enclosure according to one or more of the preceding claims, **characterized in that** said fixing elements are of the screw type and comprise at least one screw (10), which is inserted in at least one through hole (11) of said main body (5), which is screwed into at least one respective internally threaded bush (12), which is rigidly coupled to an opening (13) which is provided in said stem (3a) of said upright (3) at a preset height.

7. The enclosure according to one or more of the preceding claims, **characterized in that** said through hole (11) of said main body (5) comprises at least one internal protrusion (14), which is adapted to center and retain said screw (10) within said body (5).

8. The enclosure according to one or more of the preceding claims, **characterized in that** said through hole (11) comprises a distribution of internal protrusions (14) which are adapted to center and retain said screw (10) within said body (5), each of said protrusions (14) having a substantially triangular cross-section, the vertex of the triangle being adapted to engage within at least one respective thread of said screw (10), so as to prevent its accidental extraction from said hole (11).

9. The enclosure according to one or more of the preceding claims, **characterized in that** said fixing elements comprise at least one contoured protrusion (16) which protrudes from said main body (5), said contoured protrusion (16) being detachably engageable by interlocking within at least one contoured wing (17) which is associated with at least one of said stems (3a) of said uprights (3) at a preset height.

10. The enclosure according to one or more of the preceding claims, **characterized in that** said fixing elements comprise at least one contoured protrusion (16), which protrudes from said main body (5) and is detachably engageable by interlocking in at least one contoured wing (17) provided peripherally on at least one collar (18) which can be arranged at adjustable heights along said stems (3a) of said uprights (3).

11. The enclosure according to one or more of the preceding claims, **characterized in that** each of said wings (17) has a substantially L-shaped cross-section, with one side associated with said collar (18) and the other side free and affected by a recess (19) for mating with said protrusion (16) of said main body (5), said protrusion (16) comprising a first portion (16a) which is adapted to mate within said recess (19) and an enlarged end portion (16b) which is adapted to avoid the accidental extraction of said protrusion (16).

12. The enclosure according to one or more of the preceding claims, **characterized in that** said fixing means comprise a plurality of collars (18) which can be arranged at adjustable heights along said stems (3a), said collars (18) having a peripherally distributed plurality of said wings (17) which can engage said respective tabs (16) of said main bodies (5).

13. The enclosure according to one or more of the preceding claims, **characterized in that** each of said collars (18) has a transverse cross-section which is shaped substantially complementary with respect to the cross-section of said stem (3a) and comprises two substantially facing perforated end flaps (20) for fastening to said stem (3a) at the preset height by means of provided closure elements.

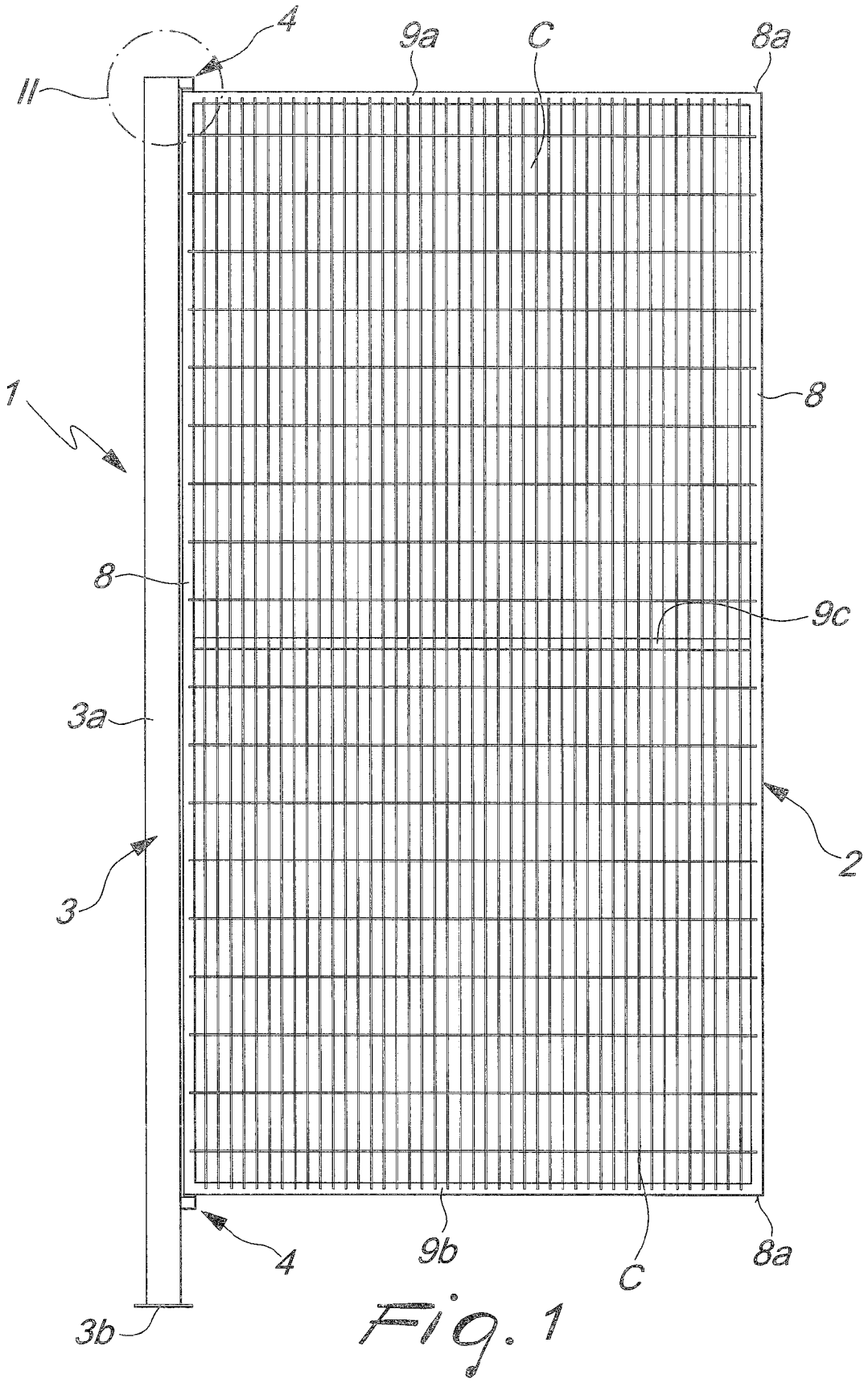

Fig. 1

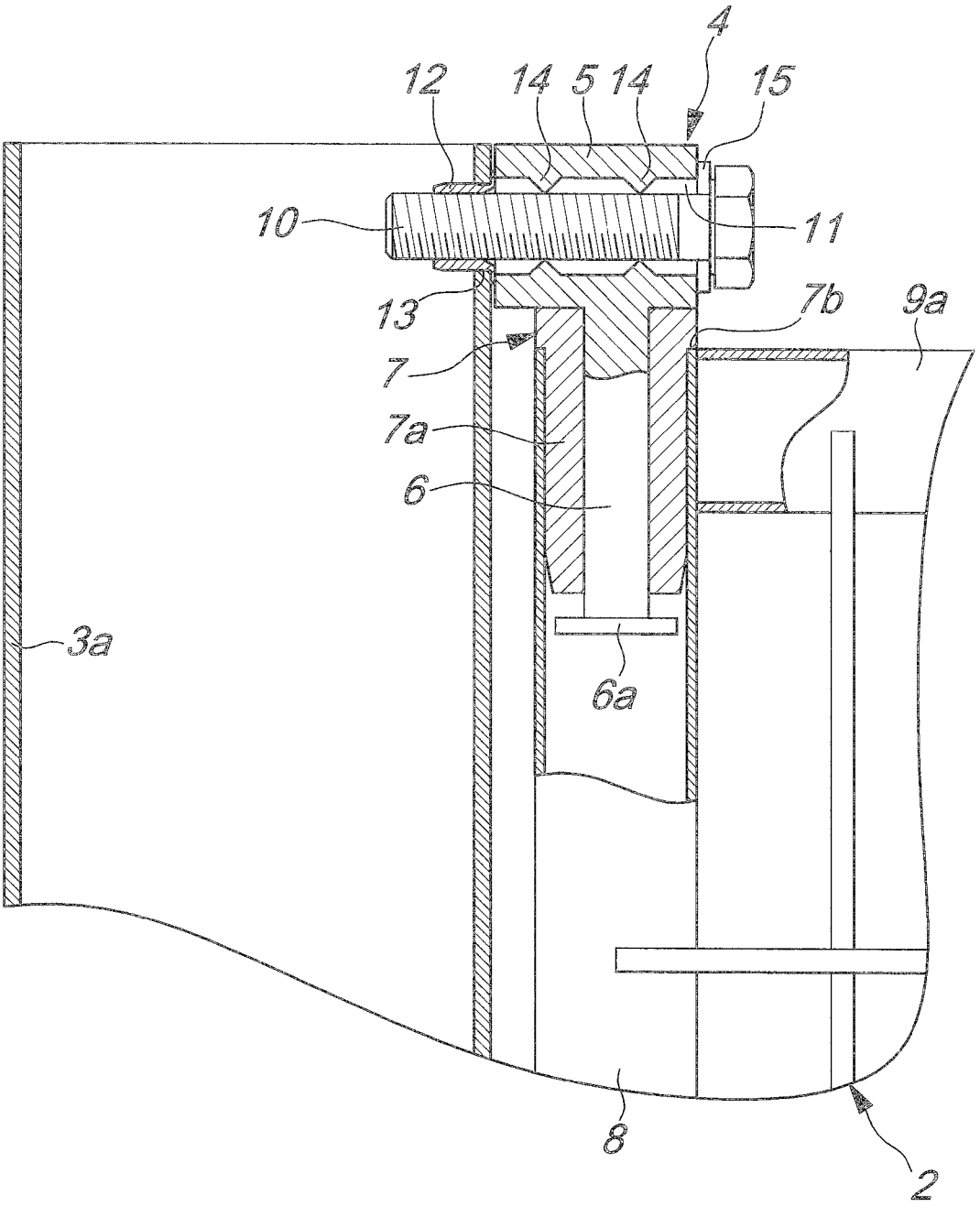

Fig. 2

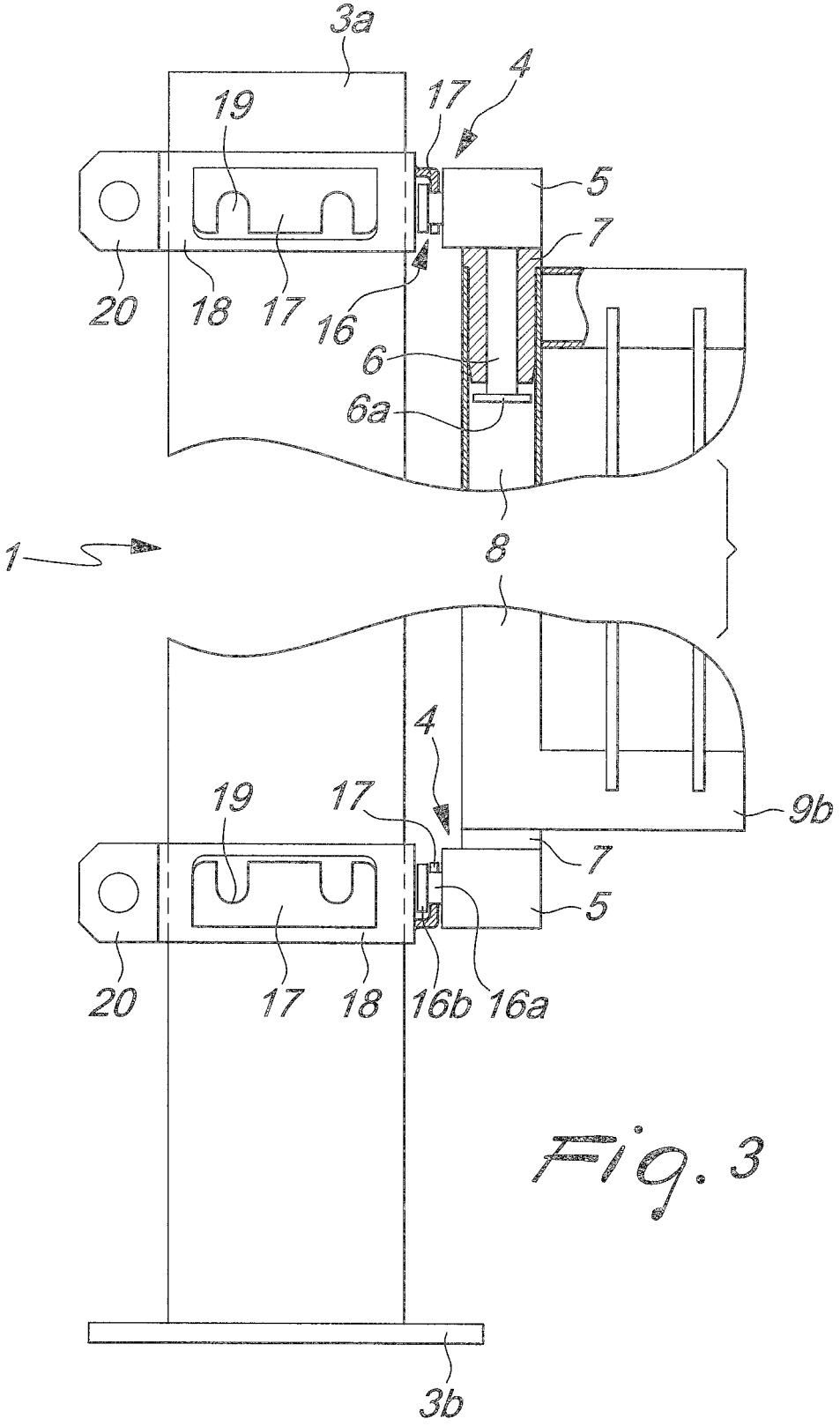

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 7606

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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
Munich	30 January 2008	Di Renzo, Raffaele

CATEGORY OF CITED DOCUMENTS

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