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(54) **Support device for rung ladders and apparatus for access to a loft**

(57) A support device for rung ladders comprises at least fixing means (2) to a floor (F) of a raised room (R), a support element (3) for a rung ladder (L) and constrain-

ing means (4) between the fixing means (2) and the support element (3), designed to allow the support element (3) various height positions and various angles relative to the floor (F).

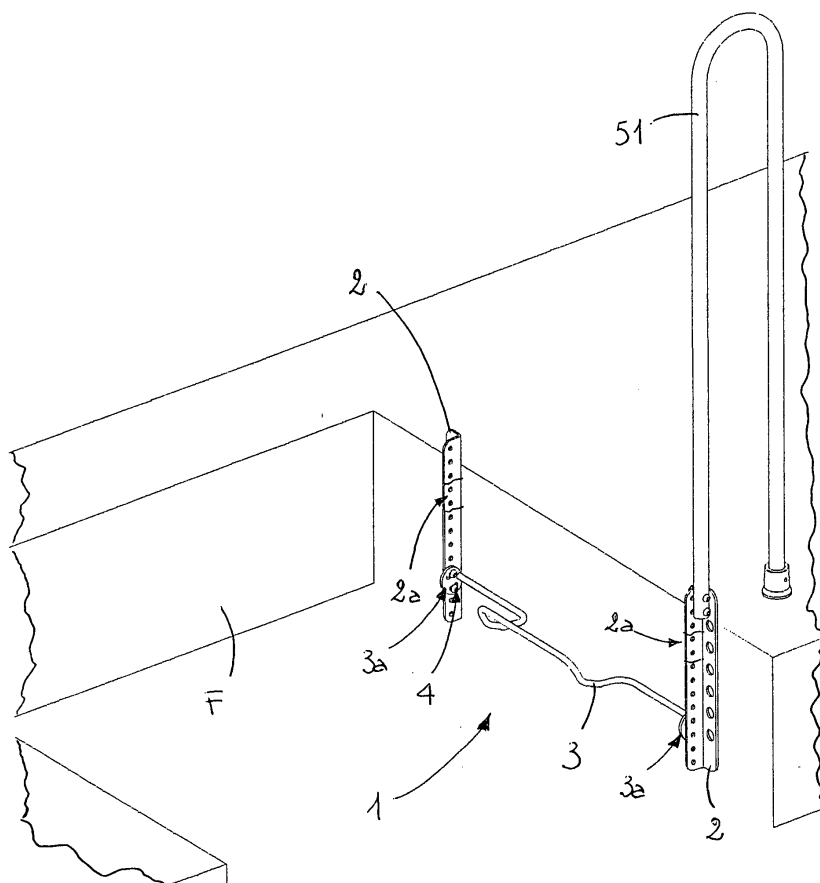


FIG. 7

Description

[0001] The present invention relates to a support device for rung ladders and a relative apparatus for access to raised rooms.

[0002] In recent decades, the requirements imposed by the increasingly small size of living spaces provided a significant incentive for the reduction of the dimensions of many home furnishing accessories.

[0003] The traditional solution adopted in civil buildings for access to raised rooms involves the use of ladders: the above-mentioned trend also had repercussions in this sector, meaning that there is an increasing tendency to find solutions which allow the best possible space saving.

[0004] With particular reference to access to lofts, which are usually rooms that are not visited often and do not require fixed structures for this purpose, the solutions currently most widespread involve the use of trapdoors built into openings in the floor of the loft and supporting a retractable rung ladder, irremovably constrained to the trapdoor.

[0005] Such trapdoors exploit the presence of a single door hinged at the shortest side which, once opened downwards, allows the ladder to be rotated downwards still in its most compact position and then allows the ladder to be extended downwards until it reaches the floor.

[0006] This equipment is produced and marketed with standard dimensions: therefore, it may be used in the optimum way when installed during construction of a building. Vice versa, if it has to be used in buildings that have already been constructed, in many cases this requires reciprocal adjustment of the dimensions of the opening in the floor and/or the dimensions of the single door of the trapdoor: both of these operations are rather complex, since the former requires expensive work on building structures and the latter necessitates the production of products outside mass-production.

[0007] Moreover, the single door is quite extended and when opened may strike the person opening the trapdoor and in any case remain for a certain time in a position which may result in personal injury.

[0008] Finally, but not last in terms of importance, these structures require a ladder to be kept constrained in a position in which it is not used very much, since, as already indicated, access to lofts and other similar rooms is sporadic, when in contrast the presence of such an accessory in other contexts could be more useful and it could be used more often.

[0009] The aim of the present invention is, therefore, to eliminate the above-mentioned disadvantages.

[0010] This aim is achieved thanks to the possibility of using the invention in any context, whether or not it is integrated in a trapdoor.

[0011] The main advantage is basically the fact that the rung ladder, whether it is retractable or not, is in this way released from the trapdoor and from the need to be in any event constrained to a fixed structure, although maximum reliability and safe use are still guaranteed.

Therefore, the ladder can be used for access to lofts and similar rooms, but also when required in other domestic situations.

[0012] In addition to this, the invention may be used with ladders with various heights, and therefore at various angles to the floor, and having rungs with various depths.

[0013] Moreover, the trapdoor in which the invention can be incorporated has two doors hinged along the longer side, meaning that, once opened downwards, they remain at a height such that it is very unlikely that they will cause personal injury. The presence of the two doors, sized according to requirements, also facilitates adaptability to openings in the floor with different dimensions and integration in buildings that have already been constructed.

[0014] Finally, the apparatus used also allows any absence of parallelism between the opposite sides of the opening in the floor in which the trapdoor is installed to be overcome.

[0015] Further advantages and features of the invention are more evident in the detailed description which follows, with reference to the accompanying drawings, which illustrate a preferred embodiment without limiting the scope of the invention, in which:

- Figure 1 is a perspective assembly view of the invention in an operating situation;
- Figures 2 and 3 are perspective views of the invention according to two different methods of use;
- Figures 4 and 5 are side views of the invention, respectively in the two different methods of use illustrated in Figures 2 and 3;
- Figure 6 is an exploded view of the invention illustrated in Figure 1;
- Figure 7 is a side perspective view of the invention;
- Figure 8 illustrates an enlarged detail of the invention illustrated in Figure 7.

[0016] As can be seen from the drawings, the invention relates to a support device for rung ladders and a corresponding apparatus for access to raised rooms. The support device (1) comprises at least fixing means (2) to a floor (F) of a raised room (R), a support element (3) for a rung ladder (L) and constraining means (4) between the fixing means (2) and the support element (3), so as to allow the support element (3) at least various angles relative to the floor (F). This possibility, illustrated in Figures 2 to 5, advantageously allows the invention to be adapted to rungs with various depths and to ladders (L) at various angles to the floor (F), and therefore even with various heights.

[0017] The fixing means (2) and the support element (3) comprise complementary surfaces (2a, 3a) shaped in such a way as to allow relative rotations of the fixing means (2) and the support element (3) even under the action of the constraining means (4), which, as illustrated in Figures 7 and 8, may consist of adjustable screws or devices with a similar function. The complementary sur-

face (2a) of the fixing means (2) comprises at least one pair of aligned holes (21a) and the complementary surface (3a) of the support element (3) comprises a pair of slots (31a), designed to allow rotations of corresponding amplitude for the support element (3) relative to the fixing means (2). The fixing means (2) preferably comprise a plurality of complementary surfaces (2a) of the type described, so that the support element (3) can achieve various height positions.

[0018] The operating configuration of the support element (3), that is to say, its angular position and installation height, is therefore defined relative to the ladder (L) which is used and maintained once and for all, remaining unchanged until the ladder is changed. Nevertheless, the position of the support element (3) can be adjusted according to altered operating conditions.

[0019] Supporting means (5) may be connected to the support device (1), said means designed to facilitate ascent and descent on the ladder (L).

[0020] For example, in the accompanying drawings, the supporting means (5) are represented by at least one grip (51), which can be constrained to the fixing means (2).

[0021] The support device (1) for rung ladders (S) described above may be integrated, as illustrated in Figure 1, in an apparatus (10) for access to raised rooms, in the form of a trapdoor communicating between two rooms (R, R') located one above the other.

[0022] The apparatus (10) for access to raised rooms also comprises two doors (7, 8) with complementary dimensions for covering the entire gap forming the opening in the floor (F), so as to limit their downward projection from the ceiling of the lower room (R'). The doors (7,8) are hinged to the floor (F) at the longer side.

[0023] The apparatus (10) also appropriately comprises two shoulders (11), consisting of a pair of boards to be fixed to the floor (F), on which the hinges for application of the doors (7, 8) are fixed, a section (9), which can be constrained to a free end (7a; 8a) of a door (7; 8), allowing closure of any gap between the doors (7, 8) caused if the opening in the floor is out of square at all, and a fixing unit (12), consisting of a plate (13) for fixing to the floor (F), to which hook supports (14) for the doors (7, 8) are constrained, allowing the doors to be kept closed when the trapdoor does not need to be used.

[0024] The presence of these complementary elements allows local intervention when there is any type of operating fault or mechanical breakage.

[0025] The invention described may be modified and adapted without thereby departing from the scope of the inventive concept.

[0026] Moreover, all details of the invention may be substituted by technically equivalent elements.

[0027] Obviously, in practice modifications and/or improvements are possible, all covered by the claims herein.

Claims

1. A support device for rung ladders, **characterised in that** it comprises at least fixing means (2) to a floor (F) of a raised room (R), a support element (3) for a rung ladder (L) and constraining means (4) between the fixing means (2) and the support element (3), allowing the support element (3) at least various angles relative to the floor (F).
2. The support device according to claim 1, **characterised in that** the fixing means (2) and the support element (3) comprise complementary surfaces (2a, 3a) shaped in such a way as to allow relative rotations of the fixing means (2) and the support element (3) even under the action of the constraining means (4).
3. The device according to claim 2, **characterised in that** the complementary surface (2a) of the fixing means (2) comprises at least one pair of aligned holes (21a) and the complementary surface (3a) of the support element (3) comprises a pair of slots (31a), designed to allow rotations of corresponding amplitude for the support element (3) relative to the fixing means (2).
4. The support device according to claim 1, **characterised in that** the fixing means (2) comprise a plurality of complementary surfaces (2a) designed to allow the support element (3) various height positions.
5. The support device according to claim 1 or 2, **characterised in that** it comprises supporting means (5) designed to facilitate ascent and descent on the ladder (L).
6. The support device according to claim 5, **characterised in that** the supporting means (5) comprise at least one grip (51), which can be constrained to the fixing means (2).
7. An apparatus for access to raised rooms, in the form of a trapdoor communicating between two rooms (R, R') located one above the other, **characterised in that** it comprises a support device (1) for rung ladders (L) in accordance with at least one of the foregoing claims.
8. The apparatus for access to raised rooms according to claim 7, **characterised in that** it comprises two doors (7, 8) with complementary dimensions, limiting their downward projection from the ceiling of the lower room (R').
9. The apparatus for access to raised rooms according to claim 8, **characterised in that** the doors (7, 8) are hinged to the trapdoor (6) at the longer side.

10. The apparatus for access to raised rooms according to claim 8, **characterised in that** it comprises a section (9) which can be constrained to a free end (7a; 8a) of a door (7; 8), being designed to close any gap between the doors (7, 8).

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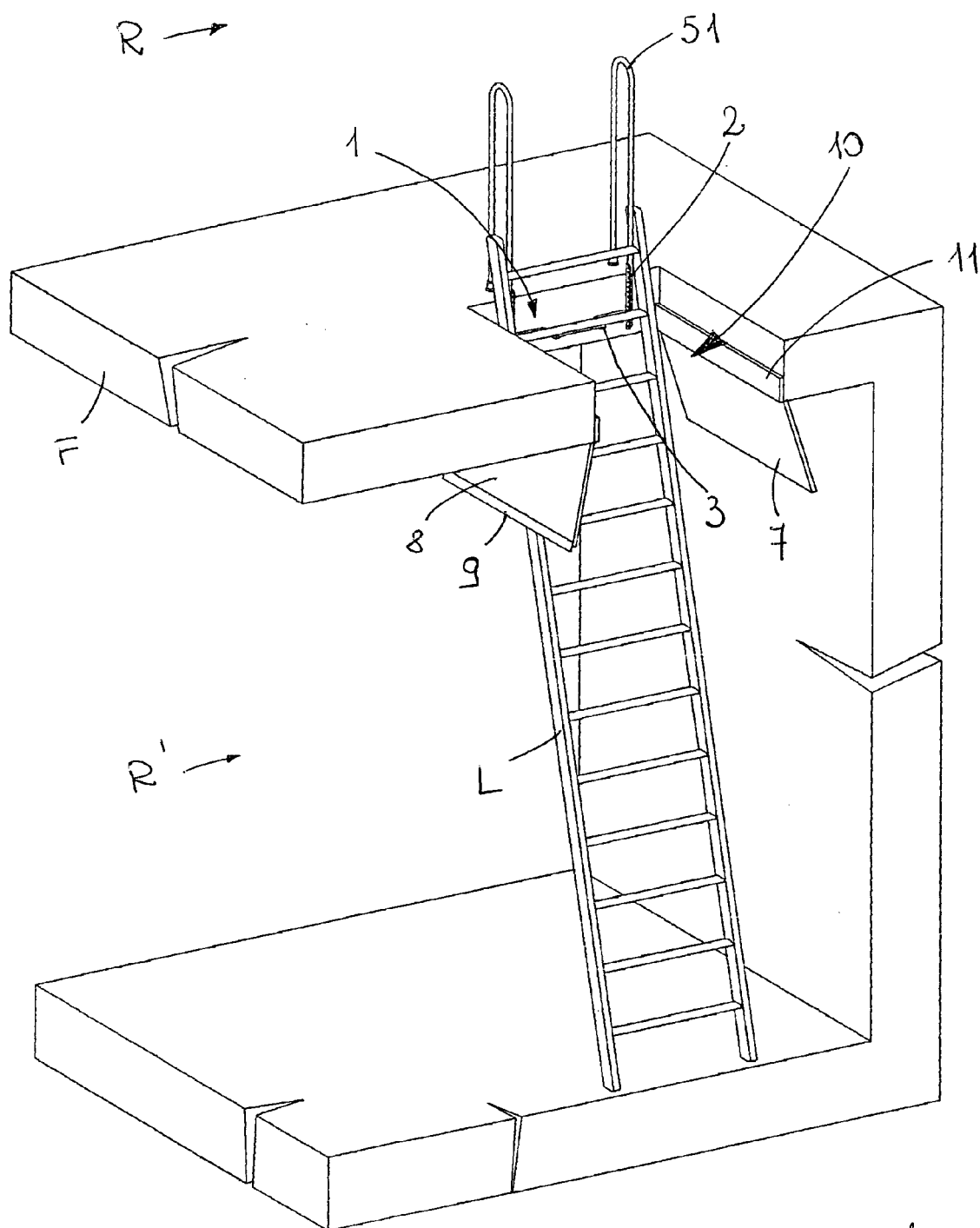


FIG. 1

FIG. 2

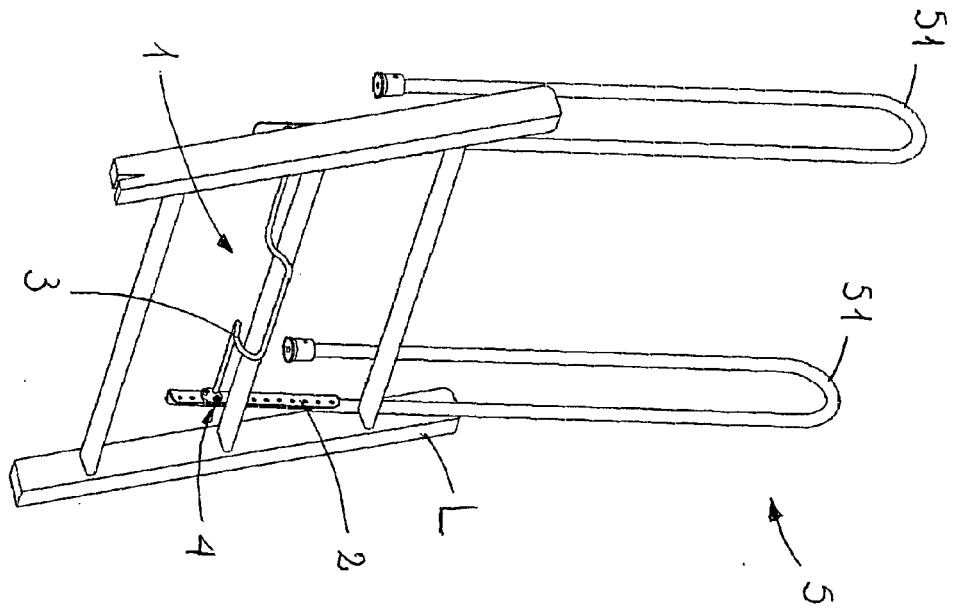
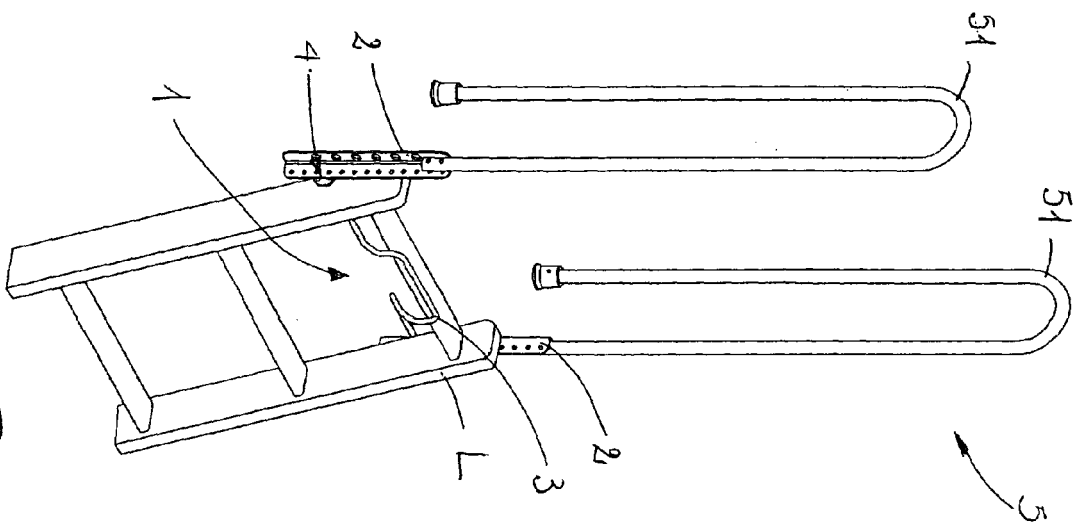


FIG. 3



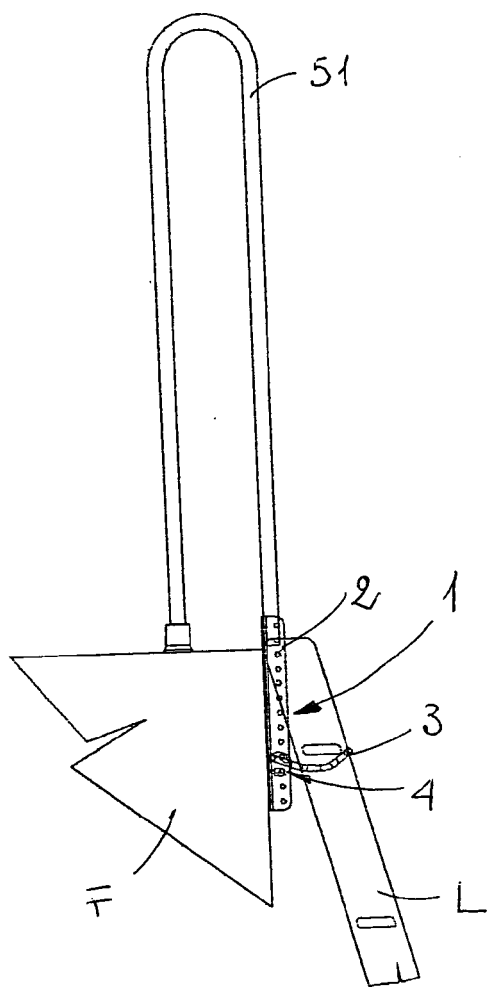


FIG. 4

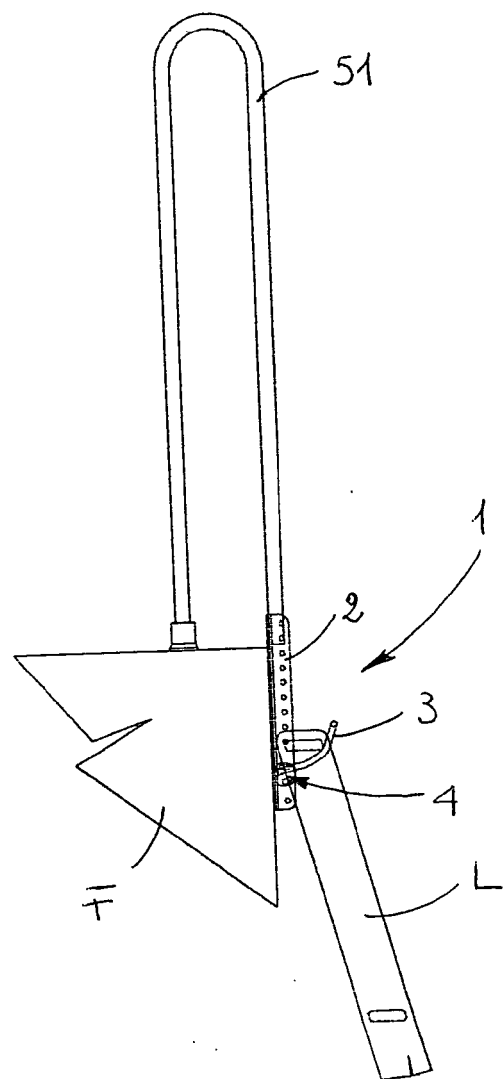


FIG. 5

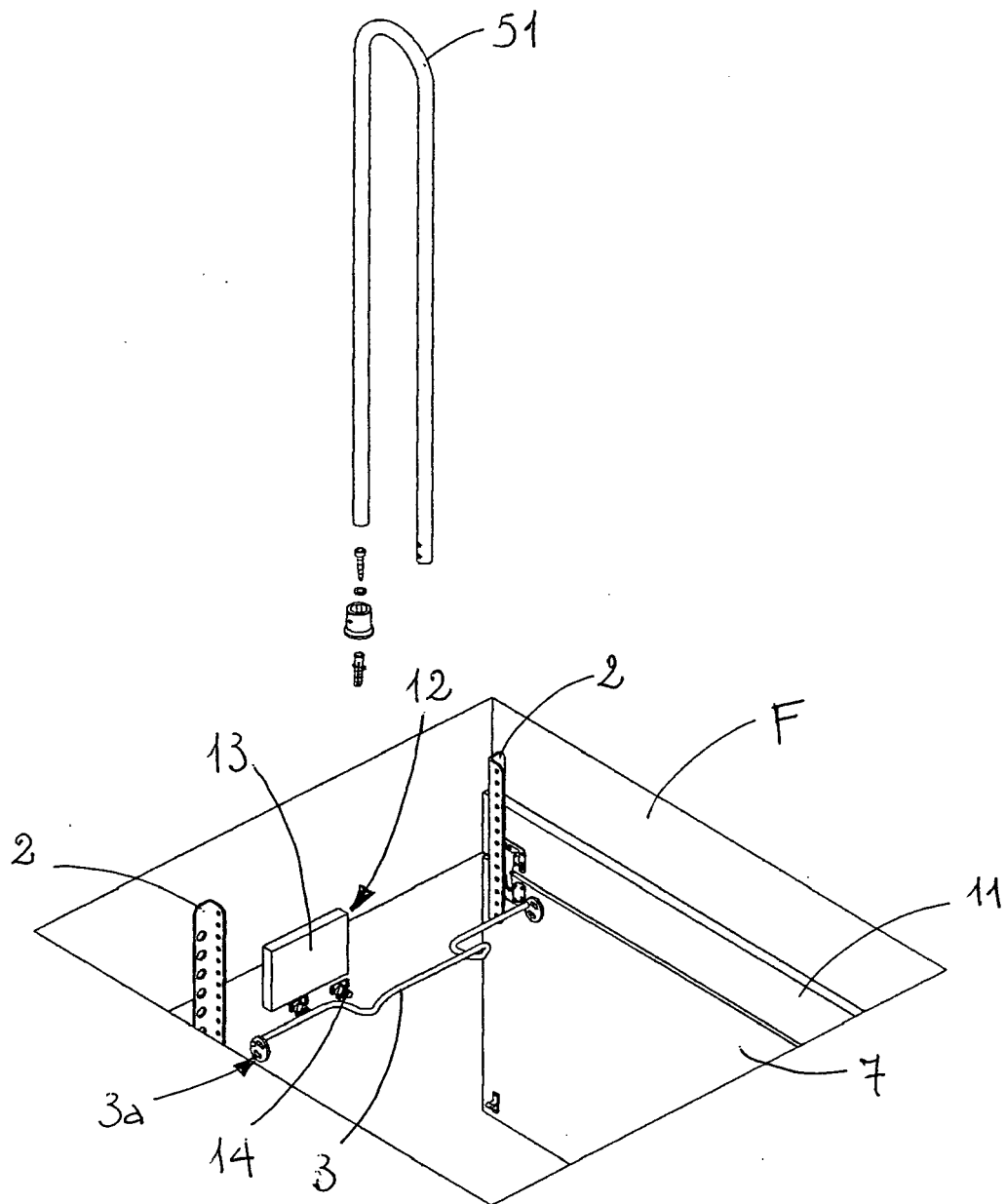
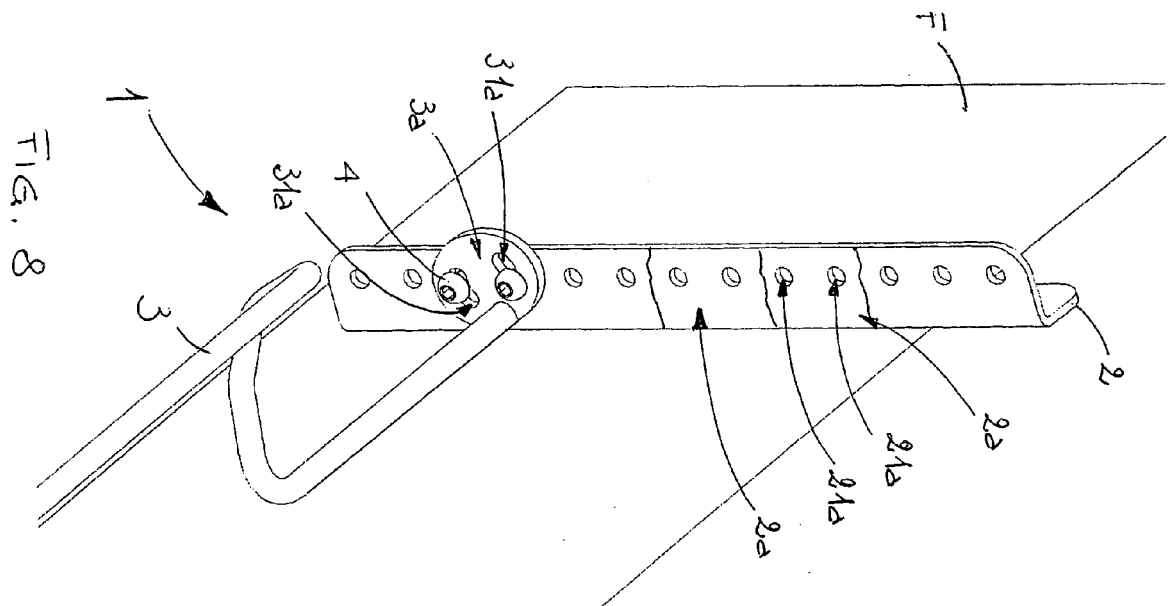
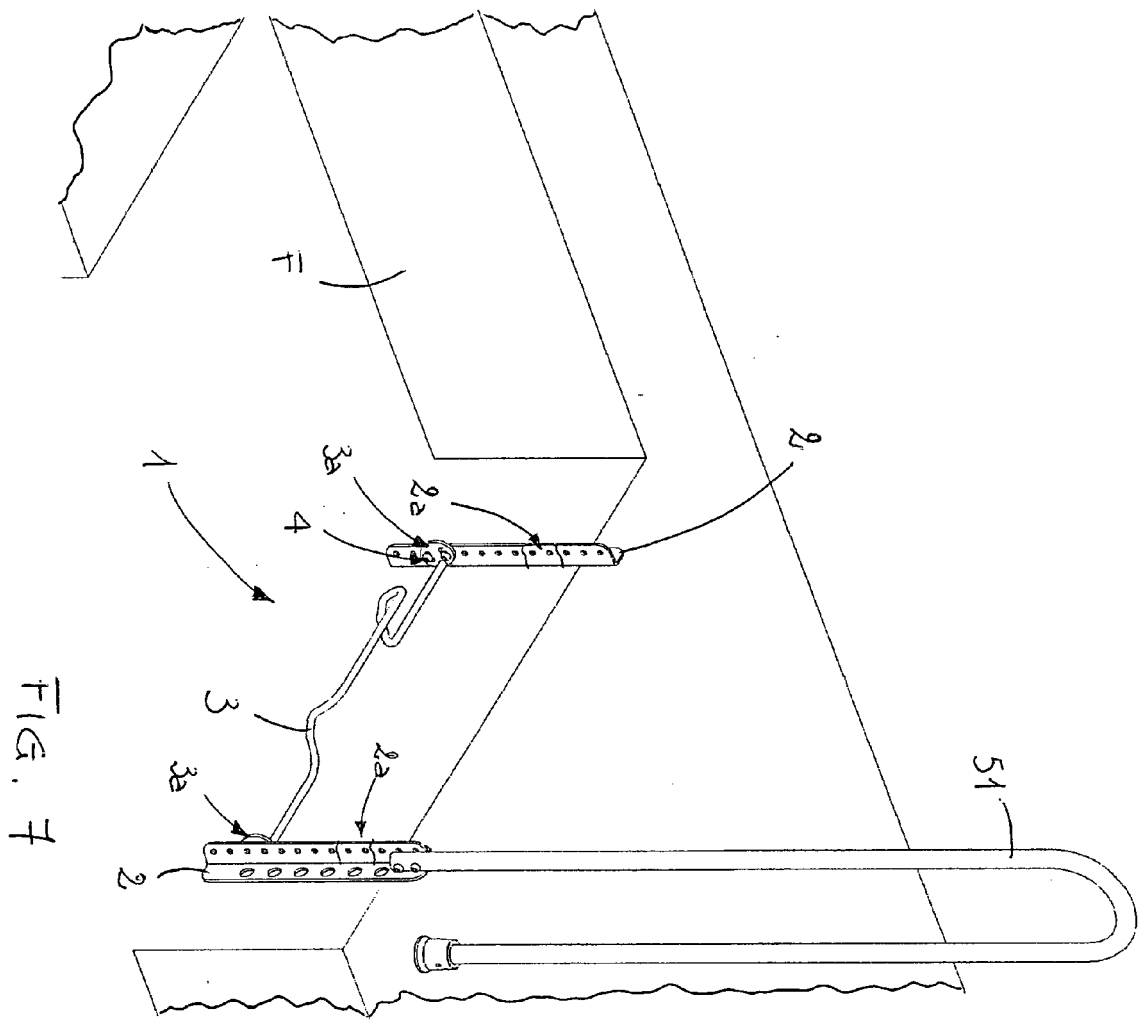


FIG. 6





European Patent
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Application Number
EP 06 42 5002

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Place of search Munich		Date of completion of the search 27 June 2006	Examiner Vratsanou, V
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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