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(54) Assembly of receiving rail and one or more supporting arms

(57) The invention relates to an assembly of a vertical receiving rail and one or more supporting arms, the receiving rail comprising a base part having spaced-apart holes, the base part being provided with raised edge portions in longitudinal direction at both sides and the raised edge portions being provided with legs facing one another and the supporting arm being provided with at least one shaft end intended for being received within a hole in said base part and one engaging member intended for reaching behind at least one of the legs facing one another. The engaging member is brought into engagement with the receiving rail by sticking it into the receiving rail in a first position and subsequently rotating it across a 90° angle to a second position, the engagement position.

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Description

[0001] The present invention relates to an assembly of a vertical receiving element and one or more supporting arms, in -which said receiving element and supporting arm have been arranged in such a way that a supporting arm can be coupled to the receiving element in one or more positions.

[0002] Such an assembly, to be used as shelf supports for e.g. book shelves, stock shelves, displays and the like, is known per se. A well-known embodiment comprises vertical profile elements and supporting arms provided with hook members intended for mounting in the vertical profile elements. To that end, slots or keyholes for said hook members have been provided in the vertical profile elements in a spaced-apart relationship. With this type of systems, the hook members of each support arm should be put into the dedicated slots and keyholes simultaneously, which is not always easy. If a support arm should be displaced later on, practice has shown that it is also often difficult to remove a support arm with both hook members from the slots or holes simultaneously. A further disadvantage of this type of systems is the hardly attractive appearance, as a result of which they are considered suitable for only a limited number of applications.

[0003] The object of the invention is to provide an assembly of supporting arms and vertical elements which does not have such disadvantages and in which it is possible to mount the supporting arms simply in the desired position and in which the position of the supporting arm is always locked as well.

[0004] Accordingly, according to the invention it is provided for, that the receiving element comprises a receiving rail having a base portion with spaced-apart holes therein, the base portion is at both sides in longitudinal direction provided with raised edge portions and said edge portions are provided with legs facing one another, in which said supporting arm is provided with at least one shaft end for being received in a hole in the base portion and one engaging member intended for engaging behind at least one of the legs facing one another.

[0005] The assembly according to the invention has the advantage that the coupling means in the form of shaft ends and enganging members can successively be engaged with the receiving rail and that this need not happen simultaneously. Further, the shape of the receiving rail having raised edge portions and legs facing one another realizes a particularly attractive design in which the coupling means are hidden from view as much as possible.

[0006] According to a first simple embodiment, it is provided for, that the supporting arm is provided with one shaft end and one engaging member both engaging the vertical receiving rail at the height of a same position. There, according to a further development, it is provided for that the engaging member is a substantially elongate member, its length being greater than the distance between het legs of the receiving rail facing one another and the width is smaller than the distance between the raised edge portions of the receiving rail.

[0007] This supporting arm can be mounted in a desired position in the receiving rail simply by sticking the shaft end into a hole in the base portion of the receiving rail and subsequently rotating the supporting arm across a 90°-angle. This simple embodiment with one point of engagement on the receiving rails is intended for moderate loads.

[0008] With a next embodiment, the supporting arm is provided with one shaft end and one engaging member engaging the vertical receiving rail at the level of spaced-apart first and second positions. Such a supporting arm having spaced-apart points of engagement is intended for a higher load than the previous embodiment. This supporting arm can be brought into the receiving rail by bringing the engaging member - with a supporting arm being positioned transverse to the receiving rail - between the raised edges of the receiving rail and subsequently rotating across 90°, whereupon the shaft end situated at a lower point can be stuck into the desired hole in the receiving rail. With this last movement, in which the shaft end is brought from outside the receiving rail into the desired hole, a tilting around the longitudinal axis of the engaging member occurs.

[0009] Said supporting arm can also be brought into the receiving rail by sliding the engaging member into the receiving rail from below or above and subsequently sticking the shaft end into the desired hole. Obviously, this is only possible if the top or bottom side of the receiving rail is freely accessible and if another supporting arm has not already been mounted between an end of the receiving rail and the desired position for the supporting arm newly to be mounted.

[0010] According to yet another embodiment, the supporting arm is provided with two shaft ends and one engaging member, in which one shaft end and the engaging member engage the vertical receiving rail at the height of one the same position and one shaft end engages the vertical receiving rail at the height of a second position spaced from a first position. With this embodiment, the supporting arm is supported at two points spaced-apart, in which the engaging member mounted at the upper shaft end provides for that the supporting arm can not move from the receiving rail. This embodiment is suited for higher loads than the preceding embodiments.

[0011] Mounting this supporting rail into the receiving rail occurs by subsequently inserting the upper shaft end, rotating the supporting arm across 90° as a result of which it engages the receiving rail below the legs facing one another and inserting the lower shaft end into a further hole in the receiving rail.

[0012] With the embodiment of the supporting arm in which the supporting arm should be tilted around the longitudinal axis of the engaging member for being able to insert the lower shaft end into a hole in the receiving

rail it is provided for that the upper shaft end is of such diameter and length that tilting of the supporting arm across a predetermined angle in case of a shaft end inserted in an opening in the receiving rail is possible. With the simple embodiment of the supporting arm, which is provided with one shaft end and one engaging member, both engaging the vertical receiving rail at the level of the same position, it is preferably provided for that the diameter of the round shaft end corresponds exactly to the diameter of the receiving hole for a best possible fit.

[0013] The shape of the engaging member is very important for a proper coupling of a supporting arm to a receiving rail. To that end, the length of the engaging member can be chosen such, that in case of a supporting arm coupled to a receving rail, said engaging member abuts the inner sides of the raised edges and the height of at least parts of the engaging member abuts the base portion and the bottom sides of the legs of the receiving rail facing one another. A preferred embodiment has opposite ends of circular cross-section.

[0014] According to the invention, likewise a number of embodiments for the supporting arm for the described assembly of receiving rail and supporting arm are provided. The most simple embodiment already mentioned before comprises a substantially single elongate arm having an end provided with a shaft end and an engaging member being transverse to said shaft end.

[0015] A further embodiment of a supporting member likewise comprises one single supporting arm which is however mounted perpendicularly to a further part being provided with spaced-apart shaft end(s) and engaging member. This embodiment is clearly more stable than the simple embodiment mentioned above.

[0016] A further embodiment comprises a supporting arm and a supporting part or suspension part mounted across an angle to it, an engaging member being mounted at the outer end of the supporting arm or suspension part, respectively, and is mounted to at least one of the outer ends of supporting arm and support part of suspension part. Through this, a stable supporting or suspension construction is provided for supporting shelves or similar components, for example.

[0017] Instead of a construction made of tubular or profile parts, one could also provide for a supporting arm being substantially plate-shaped, with an engaging member being mounted at a first point and shaft end being mounted at the first point and/or at the second point. Such a supporting arm represents a simple supporting structure, however, with a supporting edge mounted on it, one can simply provide for a suspension structure for e.g. a shelf or similar component.

[0018] For being able to furter stabilize the coupling of a supporting arm with a receiving rail in the sense that lateral movements of a supporting arm are prevented as much as possible, according to another elaboration it is further provided for, that a rib having a width equal to the distance between the legs of the receiving rail facing one another is mounted on one of the outer ends of a supporting arm that will engage the receiving rail.

[0019] Hereinbelow, the invention will be explained further by way of the examples illustrated in the drawing, in which:

figs. 1A-E show views of a first embodiment of a supporting arm;
figs. 2A-E show views and a cross-section of a first embodiment of a supporting arm with receiving rail;
figs. 3A-E show views of a second embodiment of a supportting arm;
figs. 4A-E show views and a cross-section of a second embodiment of a supporting arm with receiving rail;
figs. 5A-E show views of a third embodiment of a support-ting arm; and
figs. 6A-E show views and a cross-section of a third embodiment of a supporting arm with receiving rail.

[0020] The constituent parts of the various embodiments of the supporting arm illustrated in the figures are indicated by the same reference numbers where they are corresponding parts.

[0021] Figs. 1A-E show views of a first embodiment of a supporting arm 1 which is comprised of a carrying part 2 and a supporting part 3. Here, the parts 2 and 3 consist of round tube parts, but may just as well comprise rectangular tube parts, solid rods, U- or T-profile parts. The tube parts are connected to one another according to the known technique.

[0022] A shaft end 4 is mounted at the free outer end of the carrying part 2 and a shaft end 5 at the free outer end of the supporting part 5. Through an adapter 7, the shaft end 5 is connected to the supporting part 3 in such a way that it can simply be secured to the supporting part in parallel to the upper shaft end 4. An engaging member 6, in the given example comprising a round shaft part 6 protruding to both sides, is mounted at the free outer end of the carrying part 2, transversely to the shaft end 4.

[0023] In the views and cross-section according to figs. 2A-E the first embodiment of support arm 1 is illustrated as it is mounted in receiving rail 8. The receiving rail 8 comprises a base portion 9 with spaced-apart holes 10 for receiving shaft ends 4, 5 therein. Raised edges 11, 12 having legs 13, 14 turned towards one another are mounted at both sides of the base portion 8. The space between the base part 9 and the legs 13, 14 facing one another is intended for receiving engaging member 6.

[0024] The diameter of said engaging member 6 is smaller than the distance between the legs 13, 14 facing each other and the length is such that said member does not or does abut the inner sides of the raised edge parts 11, 12. The dimensions of receiving rail and the engaging member are further preferably such that the engaging member will be trapped between the base part and the inner side of the legs 13, 14 facing one another.

[0025] Figs. 3A-E show views of a second embodiment of the supporting arm, in which supporting arm 21 differs from the first embodiment in that only one engaging member 6 is mounted at the free outer end of the carrying part 2. Through adapter 7, a shaft end 5 is mounted at the free outer end of the supporting part 3. In this embodiment, the position of the supporting arm 21 in the receiving rail 8 is determined by the chosen hole 10 for the shaft end 5, in which the support arm 21 is held in the receiving rail 8 with the engaging member 6. Figs. 4A-E show the accompanying views and cross-section of a supporting arm 21 received within receiving rail 8.

[0026] Figs. 5A-E and figs. 6A-E show views and a cross-section of a third embodiment of a supporting arm differing from the second embodiment in that the carrying part 2 and the supporting part 3 of the supporting arm 31 are now made of a tubular part having a rectangular cross-section. Instead of the illustrated configuration, it is also possible to replace the supporting part 3 by a suspension part engaging the top side of a carrying part 2. The engaging member 6 will then be secured to the free outer end, possibly through an adapter 7, of the supension part and a shaft end 4, 5 is secured at the free outer end of the supporting part 3. Obviously, a shaft end 4, 5 can be additionally secured at the free outer end of the suspension part in this construction.

Claims

1. Assembly of a vertical receiving element and one or more supporting arms, in which said receiving element and supporting arm have been arranged in such a way that a supporting arm can be coupled to the receiving element in one or more positions, **characterized in that** the receiving element comprises a receiving rail having a base portion with spaced-apart holes therein, the base portion is at both sides in longitudinal direction provided with raised edge portions and said edge portions are provided with legs facing one another, in which said supporting arm is provided with at least one shaft end for being received in a hole in the base portion and one engaging member intended for engaging behind at least one of the legs facing one another.

2. Assembly according to claim 1, **characterized in that** the supporting arm is provided with one shaft end and one engaging member both engaging the vertical receiving rail at the height of a same position.

3. Assembly according to claim 1, **characterized in that** the supporting arm is provided with one shaft end and one engaging member engaging the vertical receiving rail at the level of spaced-apart first and second positions.

4. Assembly according to claim 1, **characterized in that** the supporting arm is provided with two shaft ends and one engaging member, in which one shaft end and the engaging member engage the vertical receiving rail at the height of the same first position and one shaft end engages the vertical receiving rail at the height of a second position spaced from said first position.

5. Assembly according to claims 3-4, **characterized in that** the position where the engaging member engages the receiving rail is the uppermost position of the two engaging positions.

6. Assembly according to claims 1-5, **characterized in that** the shaft end of a supporting arm having one single shaft end and the uppermost shaft end of a supporting arm having two spaced-apart shaft ends is substantially of circular cross-section.

7. Assembly according to claim 6, **characterized in that** the uppermost shaft end of a supporting arm having two spaced-apart shaft ends has such a diameter and length that tilting of the supporting arm across a predetermined angle with a shaft end being inserted in an opening in the receiving rail is possible.

8. Assembly according to claims 1-7, **characterized in that** the engaging member is a substantially elongate member, its length being greater than the distance between het legs of the receiving rail facing one another and the width is smaller than the distance between the raised edge portions of the receiving rail.

9. Assembly according to claim 8, **characterized in that** the length of the engaging member is smaller than or equal to the distance between the raised edge portions of the receiving rail.

10. Assembly according to claim 6, **characterized in that** the height of the engaging member is at least partly smaller than or equal to the distance between the base part of the receiving rail and the legs facing one another.

11. Supporting arm for an assembly according to claims 1-10, **characterized in that** it comprises substantially one single elongate arm having its outer end provided with a shaft end and an engaging member being transverse to the shaft end.

12. Supporting arm for an assembly according to claims 1-10, **characterized in that** it substantially comprises a first part provided with spaced-apart mounted shaft end or shaft ends and an engaging member and a second part, the carrying part,

mounted across a right angle to said first part.

13. Supporting arm for an assembly according to claims 1-10, **characterized in that** it substantially comprises a supporting arm and a supporting part or suspension part mounted across an angle on said supporting arm, with an engaging member being mounted at the outer end of the supporting arm or suspension part, and a shaft end being mounted on at least one of the outer ends of supporting arm and supporting part or suspension part.

14. Supporting arm for an assembly according to claims 1-10, **characterized in that** it is substantially plate-shaped with an engaging member being mounted on a first point and a shaft end being mounted on the first point and/or the second point.

15. Assembly or supporting arm according to one or more of the preceding claims 1-4, **characterized in that** a rib having a width equal to the distance between the legs of the receiving rail facing one another is mounted on one of the outer ends of a supporting arm that will engage the receiving rail.

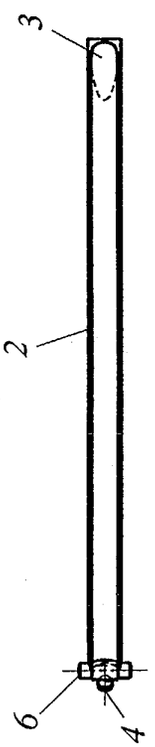

FIG. 1B

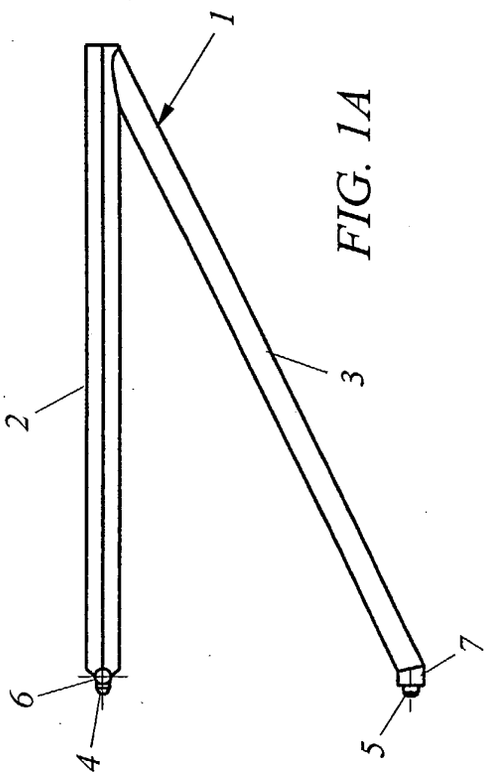

FIG. 1A

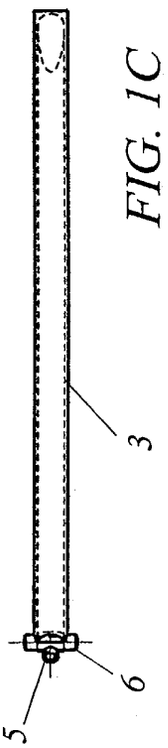

FIG. 1C

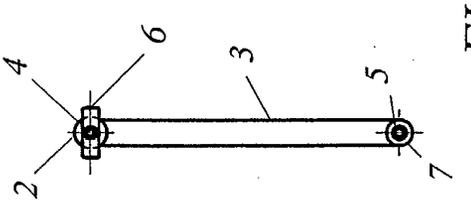

FIG. 1E

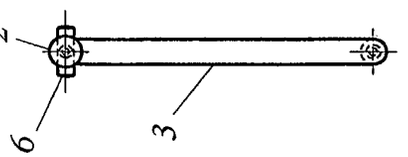

FIG. 1D

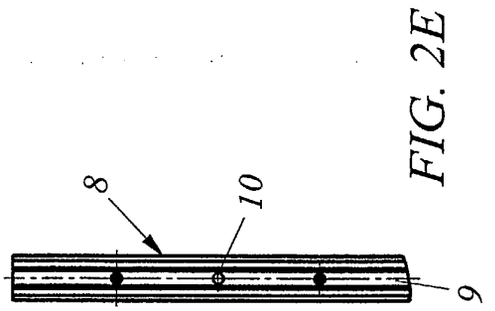

FIG. 2E

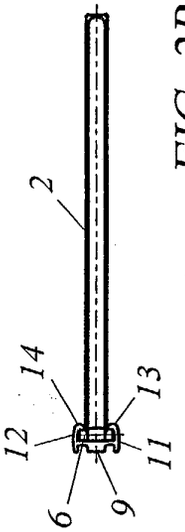

FIG. 2B

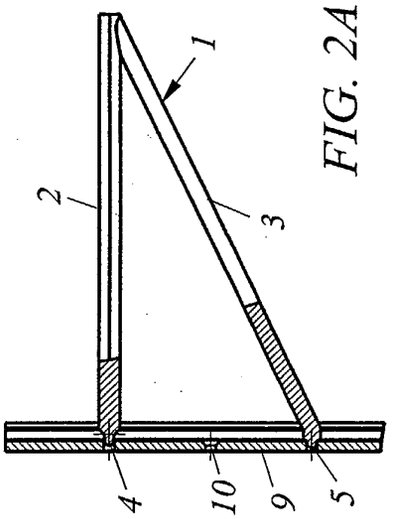

FIG. 2A

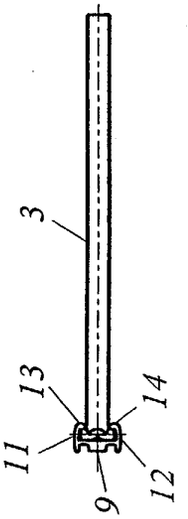

FIG. 2C

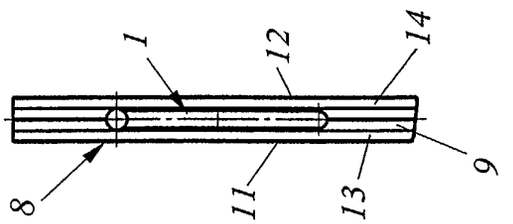

FIG. 2D

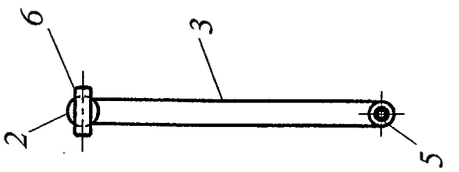

FIG. 3E

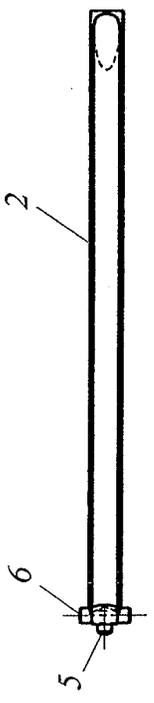

FIG. 3B

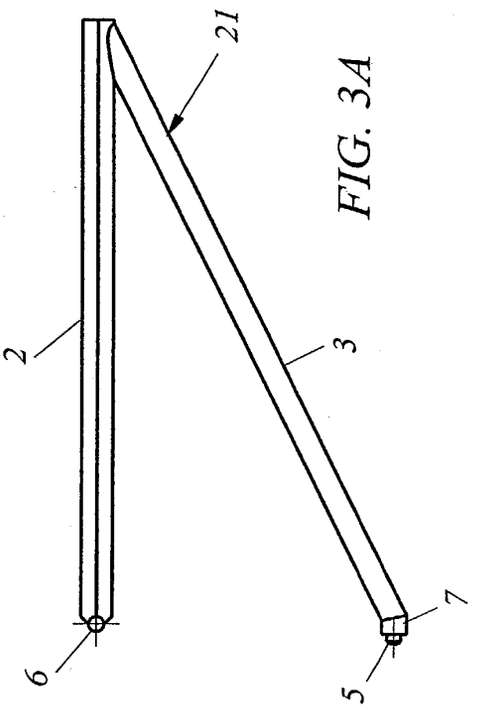

FIG. 3A

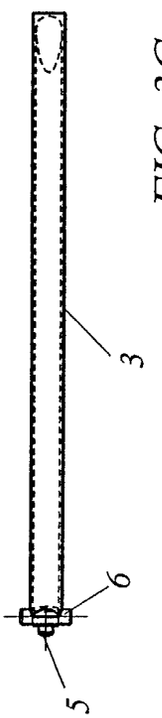

FIG. 3C

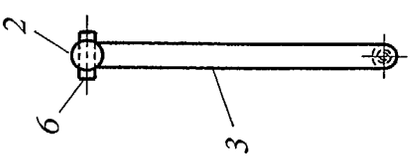

FIG. 3D

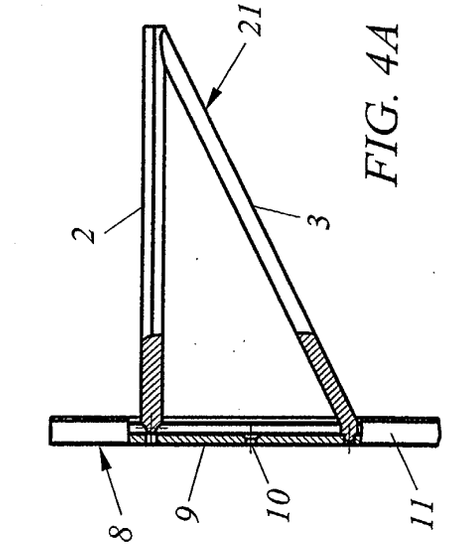

FIG. 4E

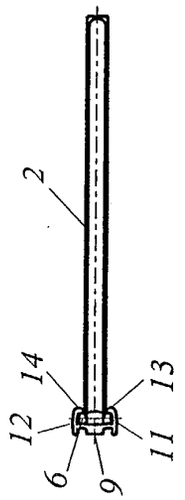

FIG. 4B

FIG. 4A

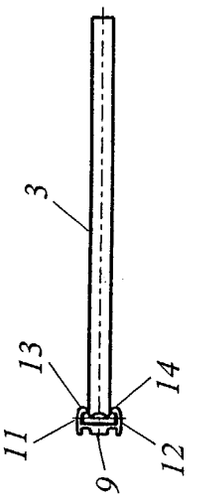

FIG. 4C

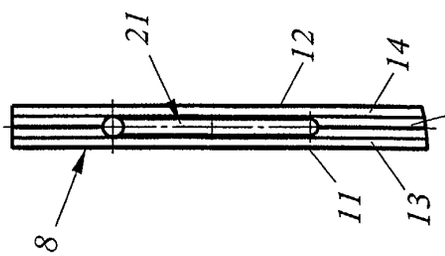

FIG. 4D

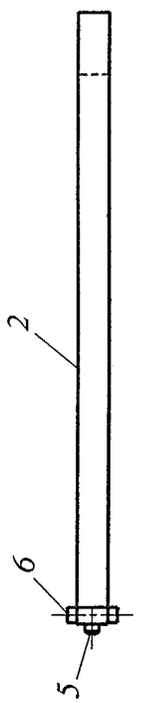

FIG. 5B

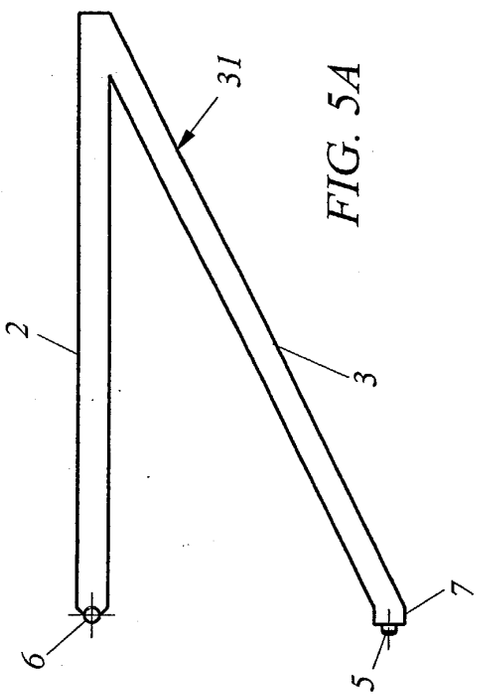

FIG. 5A

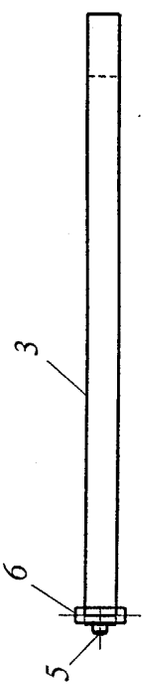

FIG. 5C

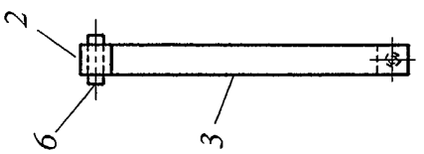

FIG. 5D

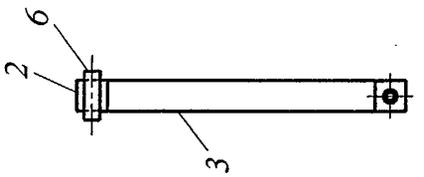

FIG. 5E

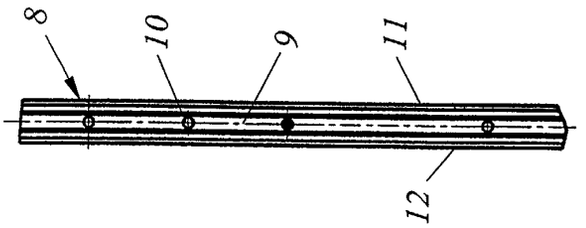

FIG. 6E

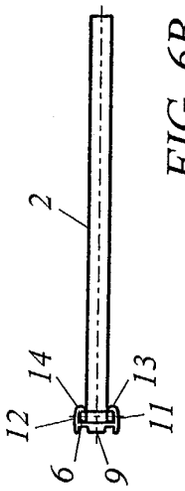

FIG. 6B

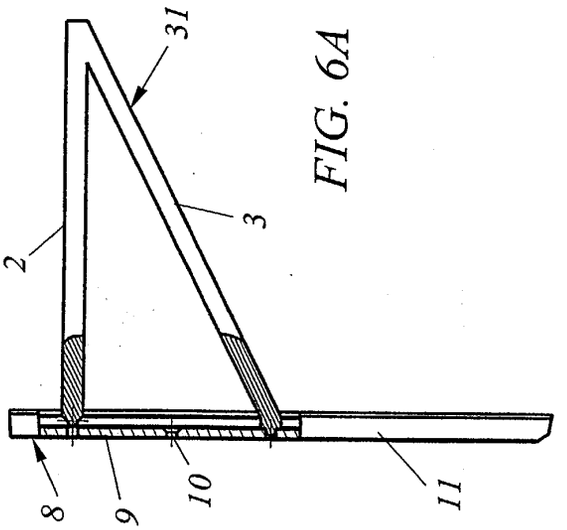

FIG. 6A

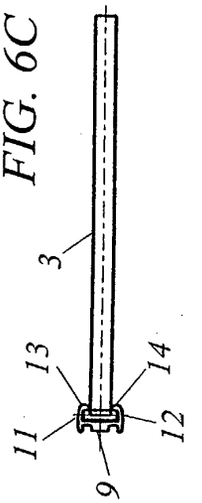

FIG. 6C

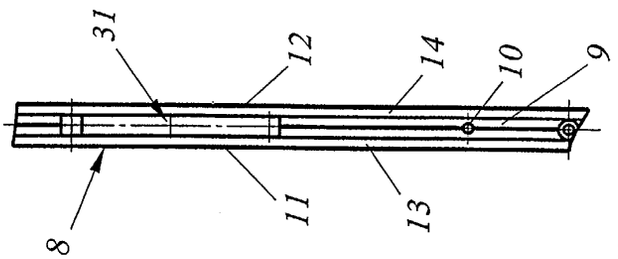

FIG. 6D

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 07 5573

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 85 06 151 U (BRENNEISEN GMBH) 15 May 1985 (1985-05-15) * page 5, last paragraph - page 7, paragraph 1; figures 1-3 *	1-3	A47B57/56
X	WO 94 23613 A (WORRALLO A C) 27 October 1994 (1994-10-27) * page 7, line 20 - page 8, line 11; figure 1 *	1,2	
A	LU 41 174 A (SOCIÉTÉ D'INSTALLATIONS GÉNÉRALES ET D'AGENCEMENTS COMMERCIAUX) 30 March 1962 (1962-03-30) * page 2, last paragraph - page 3, paragraph 4; figures 1-5 *	1,2,8	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 June 2003	Jones, C

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 07 5573

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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03-06-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 8506151 U	15-05-1985	DE 8506151 U1	15-05-1985
WO 9423613 A	27-10-1994	AU 6583694 A	08-11-1994
		WO 9423613 A1	27-10-1994
		NZ 265396 A	24-10-1997
		NZ 328729 A	27-05-1998
LU 41174 A	30-03-1962	FR 80081 E	08-03-1963
		FR 1290869 A	20-04-1962
		LU 41174 A1	30-03-1962

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