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(54) System of interconnectable wall parts, floor parts or roof parts

(57) The invention relates to a system of panels that may be coupled, comprising panels (1), on one side provided with a row of pins (3), each provided with a head, on the other side provided with blocks (15), slidable mounted inside a tubular section (5), each provided with a keyhole slot (16) and a wedge-shaped part(10). The blocks (15) are mutually coupled and they are coupled to a block (18) provided with an internal threading, to which a pulling force can be exerted with a bolt (6). This results in the wedge-shaped parts (10) being pulled behind the heads.

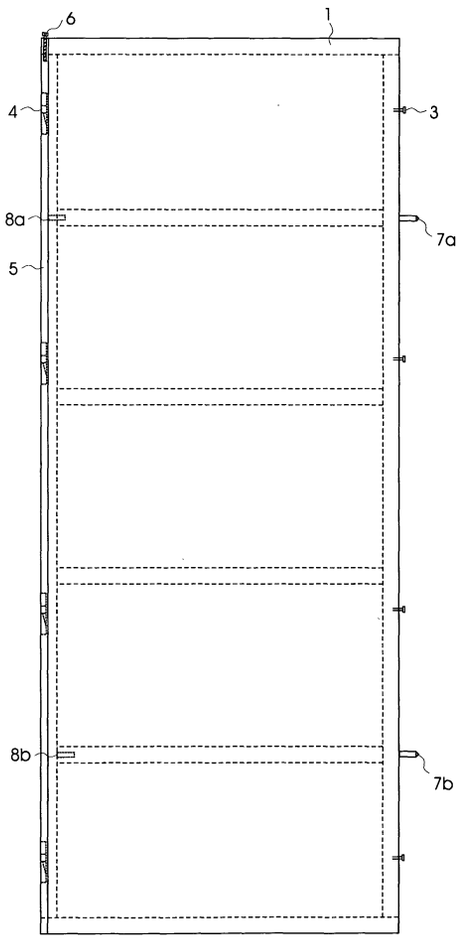

Fig. 2

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Description

[0001] The invention relates to a system of interconnectable wall parts, floor parts or roof parts, comprising panels, each panel being provided on at least one side with a first coupling element comprising a row of pins, each pin having a head, and/or a second coupling element, comprising a row of objects provided with keyhole slots, suitable for receiving and securing the first coupling element of an adjacent panel. The panels are preeminently suitable for putting up temporary partitions fast and easy, like for example on an exhibition, but they may also be used advantageously in an open-plan office, where a separation is needed that can be changed easily. Moreover, they are very useful for building temporary housings for example for events or in disaster areas. The system is characterised in that the second coupling element comprises a tubular section, in which a row of mutually coupled blocks is shiftable accommodated, each provided with a keyhole slot and a wedge, in such a manner that a rigid connection may be obtained by a single sliding movement.

[0002] From US-2,863,532 a system of interconnectable wall parts is known in which the second coupling element is designed as a slidable bar, provided with keyhole slots, in which leaf springs realise a firm but still flexible interconnection.

[0003] A favourable embodiment of the inventive system in which the sliding movement can be accomplished in a simple and yet powerful manner is characterised in that a block provided with an internal threading is also shiftable accommodated near an end of the tubular section, coupled to a row of mutually coupled blocks, and to a bolt, connected to the tubular section, for shifting the mutually coupled blocks. Preferably, a block is provided with a keyhole slot and a wedge which is designed in such a manner that when the bolt is tightened, a wedge will shift underneath a head of a pin and the head will be pulled inside the second coupling element.

[0004] A further favourable embodiment is characterised in that a panel provided with a groove, in which the second coupling element is accommodated in such a manner that it is located entirely within the panel, as a result of which the coupled panels will fit snugly together.

[0005] A further favourable embodiment is characterised in that the first coupling element is provided with at least one davel pin and the second coupling element with at least one hole that can accommodate the at least one davel pin or that the second coupling element is provided with at least one davel pin and the second coupling element of at least one hole that can accommodate the at least one davel pin. This is for example of importance for panels which are placed in line, in which case the surfaces will be positioned now precisely in one plane, such that apparently one single, continue surface will be obtained.

[0006] The invention also relates to a wall part, a floor part or a roof part, as part of a system as described in the above.

[0007] The invention also relates to a second coupling element, suitable to be used in a wall part, a floor part or a roof part as part of a system as described in the above.

[0008] The invention relates also to a stand, comprising a beam which is operationally vertically placed, having three, four, five or six sides, provided with coupling elements suitable for coupling to wall parts, floor parts or roof parts as described in the above. It is possible now to build wall structures in which at least for the enclosed angles the panels will fit snugly together.

[0009] The invention also relates to a method for coupling two panels, positioned in one plane. The inventive method is characterised in that the two panels are brought into a desired position in which a row of pins provided with heads of a first panel are inserted onto a row of holes of a second panel, after which, by turning a screwed joint which forms part of the second panel, a row of mutually coupled blocks, each provided with a keyhole slot and a wedge is tightened, as a result of which the pins are pulled into the second panel and secured.

[0010] The invention also relates to a method for coupling panels under a previously determined angle. The inventive method is characterised in that the panels are brought into a desired position, in which sides of panels to be coupled are positioned against a stand and in which a row of pins provided with heads of a side of a panel are inserted onto a row of holes of the stand, or in which a row of pins provided with heads of a side of the stand are inserted into a row of holes in a side of a panel, after which by turning a screwed joint which forms part of a panel or of the stand, a row of mutually coupled blocks, each provided with a keyhole slot and a wedge is tightened, as a result of which the pins of a panel are pulled into and secured into a corresponding side of the stand or as a result of which the pins of a side of the stand are pulled into and secured into a corresponding side of the panel.

[0011] The invention will now be further explained with a reference to the following figures, in which:

- Fig. 1A schematically shows a known system in front view, provided with panels and stands;
- Fig. 1B schematically shows a possible system according to the invention in front view;
- Fig. 2 schematically shows a panel provided with coupling elements and davel pins in front view;
- Fig. 3A shows the coupling elements more in detail;
- Fig. 3B schematically shows three mutually coupled panels in top view;
- Fig. 4A schematically shows part of a tubular section in front view;
- Fig. 4B schematically shows this part of a tubular section in side view;
- Fig. 4C schematically shows part of the mechanism

of the second coupling part in front view;

Fig. 4D schematically shows this part of the mechanism in side view.

[0012] Fig. 1A schematically shows a known system in front view, provided with panels and stands, like this is known for example from the patent US-2,863,532, cited in the introduction, where two panels 1a,1b are coupled with the aid of a stand 2. The panels normally consist of a frame made of wood, shown with broken lines, on both sides covered with a suitable top layer, but they may consist of solid material as well. For coupling purposes, the panels 1a, 1b are provided on both sides with first coupling elements consisting of a row of pins 3, each provided with a head, while stand 2 is provided on both sides with second coupling elements consisting of a row of keyhole slots, not shown in this figure. The disadvantage is that for a coupling of two panels in fact two coupling actions have to take place, which demands additional time and material. Moreover it is difficult to create a single, continuous surface with panels coupled in this way, while for example for a stand on a fair this is highly desirable.

[0013] Fig. 1B schematically shows a possible system according to the invention in front view, where two panels 1a,1b are coupled directly. For that purpose, every panel is provided on one side with first coupling element 3, consisting of a row of pins, each provided with a head, while the other side is provided with second coupling elements consisting of a row of keyhole slots, not shown in this figure.

[0014] Fig. 2 schematically shows a panel 1 provided with first coupling elements and davel pins in front view. On one side, panel 1 is provided with a first coupling element 3 consisting of a row of pins, each provided with a head, while on the other side panel 1 is provided with a second coupling element 4 consisting of a row of mutually coupled blocks, each provided with a keyhole slot and with a wedge, which is shiftable accommodated in a tubular section 5. First, two panels are placed one against the other, in such a way that the heads of the pins are inserted into the round holes of the corresponding keyhole slots. Next, the blocks are pulled upwards with the aid of a bolt 6, in the process of which slotted openings of the keyhole slots, each provided with a wedge, are shifted underneath the heads and in this manner pull the panels together. In order to realise a very precise mutual positioning, panel 1 may be provided with for example two davel pins 7a,7b, while the opposite side is provided with two corresponding bushes 8a,8b into which the davel pins of a neighbouring panel may be fitted.

[0015] Fig. 3A shows the coupling elements more in detail, with a pin 3, provided with a head, which is in the shown embodiment screwed into a metal bush 9, which metal bush is fixed into the panel, for example screwed or press fitted, and with tubular section 5, in which by way of illustration a pin 3 of a neighbouring panel is shown, which pin 3 is kept in place with the aid of a wedge-shaped part 10, which forms part of a block which in turn forms part of the second coupling element 4. Tubular section 5 mounted inside a groove that has been milled into panel 1.

[0016] Fig. 3B schematically shows four mutually coupled panels 1a,1b,1c,1d, and stands 11a,11b which are used to couple the panels. Stands 11a,11b are also provided with first and second coupling elements. When the coupling elements are tightened, the panels precisely fit together and the stands are invisible, at least in the spaces 12a,12b. It is also possible to fabricate stands with a triangular, pentagonal or hexagonal cross section, in which case the panels may be arranged star-shaped, again without the stand being visible.

[0017] Fig. 4A schematically shows part of a tubular section 5 in front view, provided with holes 13 through which pins, provided with heads from the first coupling element may pass when two panels are placed one against the other. Tubular section 5 is moreover provided with mounting holes 14a,14b, for mounting it into a grove, milled into panel 1.

[0018] Fig. 4B schematically shows this part of a tubular section 5 in side view, with holes 13,14a,14b.

[0019] Fig. 4C schematically shows part of the mechanism of the second coupling part 4 in front view, consisting of a block 15, provided with a wedge-shaped part 10 with which the head of a pin that has been inserted into a keyhole slot 16 can be secured. Block 15 is connected to the other blocks via a rod 17 which form part of coupling element 2 and to a block 18 which is provided with an internal threading, which may be pulled upwards with the aid of a bolt 6 in order to make the connection with the wedge-shaped parts, or which may be pushed down in order to release the connection. For that purpose, bolt 6 is mounted for rotation onto a lid 19, which in turn is mounted in tubular section 5.

[0020] Fig. 4D schematically shows this part of the mechanism in side view, with block 15 with wedge-shaped part 10, block 18 provided with an internal threading and bolt 6. By way of illustration, also an uncoupled pin provided with a head is shown, positioned such that it may be inserted into keyhole slot 16.

[0021] Tubular section 5, blocks 15 and 18, rods 17 and lid 19 may be fabricated for example of aluminium, in which case the rods 17 can be screwed into the blocks. If desired, blocks 15 and 18 may be fabricated of a hard, smooth synthetic material, so that the friction between tubular section 5 and the blocks is minimised. Pins 3 are preferably made of steel.

Claims

1. System of interconnectable wall parts, floor parts or roof parts, comprising panels, each panel being provided on at least one side with a first coupling element comprising a row of pins, each pin having

a head, and/or a second coupling element, comprising a row of objects provided with keyhole slots, suitable for receiving and securing the first coupling element of an adjacent panel, **characterised in that** the second coupling element comprises a tubular section, in which a row of mutually coupled blocks is shiftable accommodated, each provided with a keyhole slot and a wedge, in such a manner that a rigid connection may be obtained by a single sliding movement.

2. System according to claim 1, **characterised in that** a block provided with an internal threading is also shiftable accommodated near an end of the tubular section, coupled to a row of mutually coupled blocks, and to a bolt, connected to the tubular section, for shifting the mutually coupled blocks.

3. System according to claim 2, **characterised in that** a block provided with a keyhole slot and a wedge is designed in such a manner that when the bolt is tightened, a wedge will shift underneath a head of a pin and the head will be pulled inside the second coupling element.

4. System according to claim 1, **characterised in that** a panel provided with a groove, in which the second coupling element is accommodated in such a manner that it is located entirely within the panel.

5. System according to claim 1, **characterised in that** the first coupling element is provided with at least one davel pin and the second coupling element with at least one hole that can accommodate the at least one davel pin or that the second coupling element is provided with at least one davel pin and the second coupling element of at least one hole that can accommodate the at least one davel pin.

6. Wall part, floor part or roof part, as part of a system according to one of the previous claims.

7. Second coupling element, suitable to be used in a wall part, a floor part or a roof part as part of a system according to one of the claims 1 to 5.

8. Stand, comprising a beam which is operationally vertically placed, having three, four, five or six sides, provided with coupling elements suitable for coupling to wall parts, floor parts or roof parts according to claim 6.

9. Method for coupling two panels, positioned in one plane, **characterised in that** the two panels are brought into a desired position in which a row of pins provided with heads of a first panel are inserted onto a row of holes of a second panel, after which, by turning a screwed joint which forms part of the second panel, a row of mutually coupled blocks, each provided with a keyhole slot and a wedge is tightened, as a result of which the pins are pulled into the second panel and secured.

10. Method for coupling panels under a previously determined angle, **characterised in that** the panels are brought into a desired position, in which sides of panels to be coupled are positioned against a stand and in which a row of pins provided with heads of a side of a panel are inserted onto a row of holes of the stand, or in which a row of pins provided with heads of a side of the stand are inserted into a row of holes in a side of a panel, after which by turning a screwed joint which forms part of a panel or of the stand, a row of mutually coupled blocks, each provided with a keyhole slot and a wedge is tightened, as a result of which the pins of a panel are pulled into and secured into a corresponding side of the stand or as a result of which the pins of a side of the stand are pulled into and secured into a corresponding side of the panel.

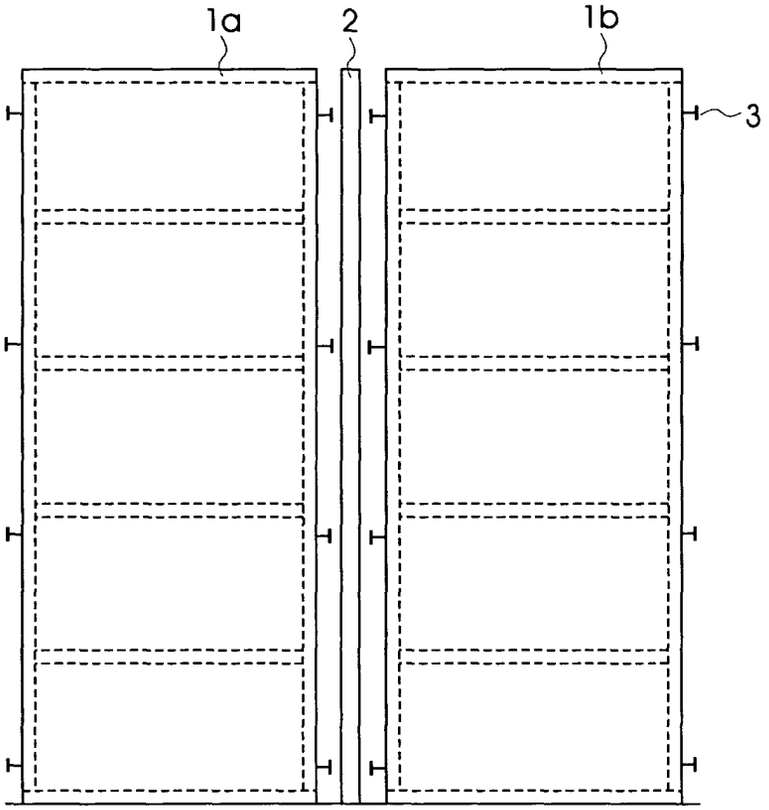

Fig. 1A

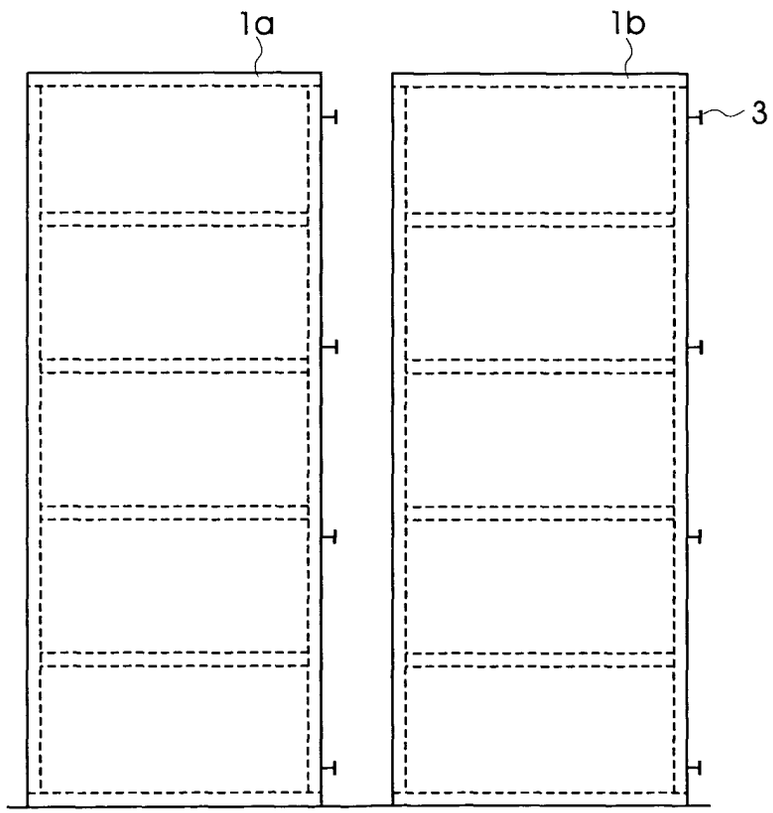

Fig. 1B

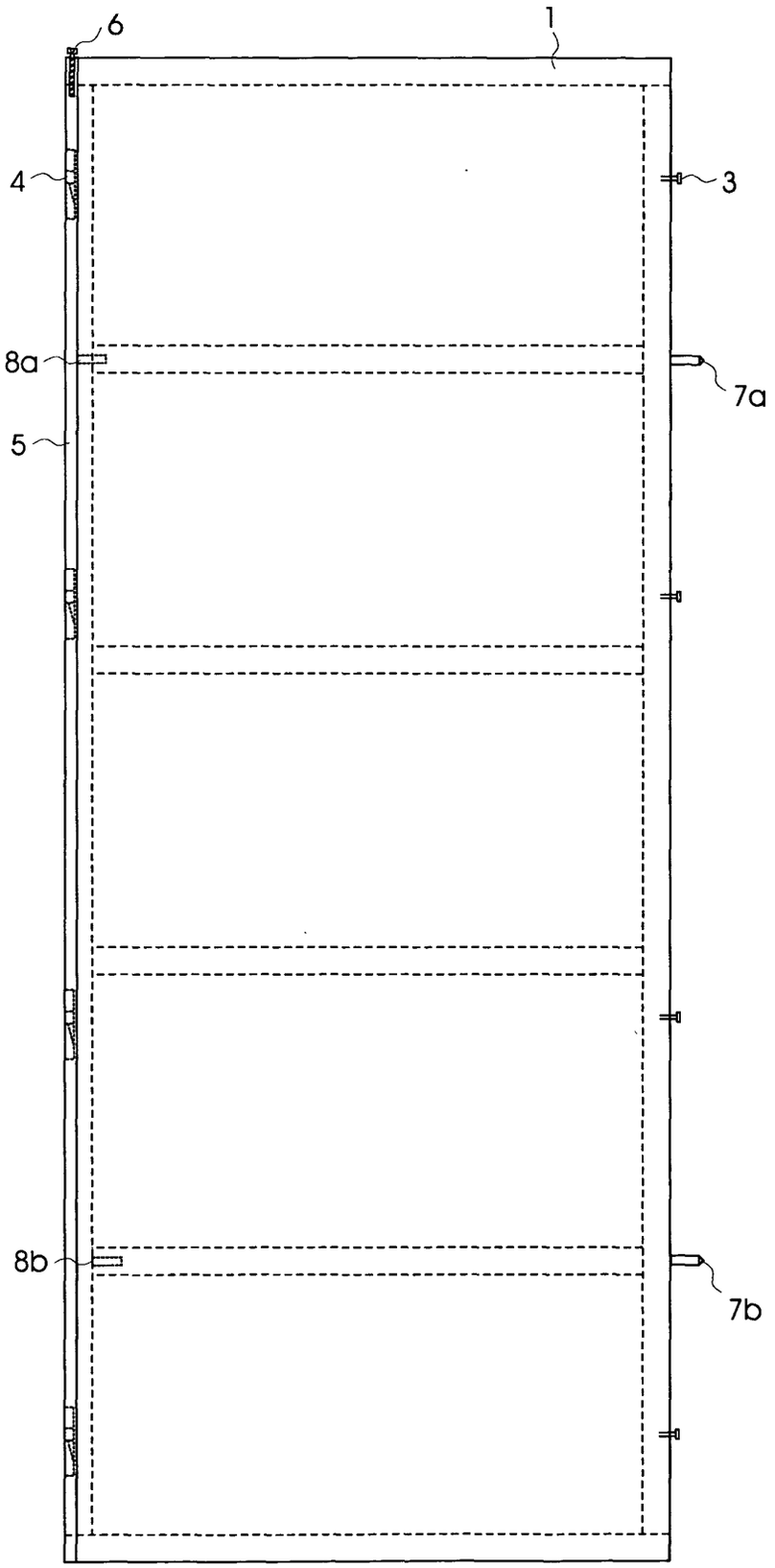

Fig. 2

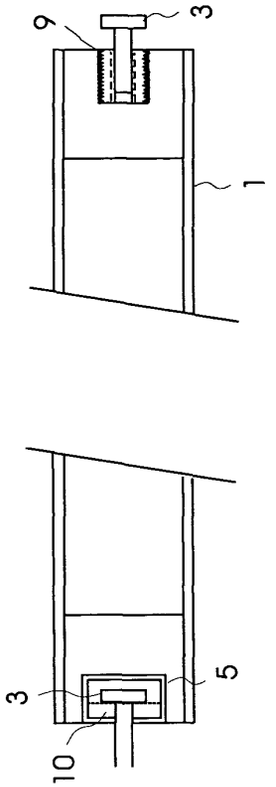

Fig. 3A

Fig. 3B

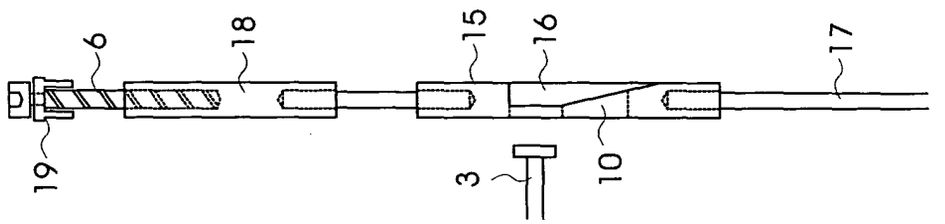

Fig. 4D

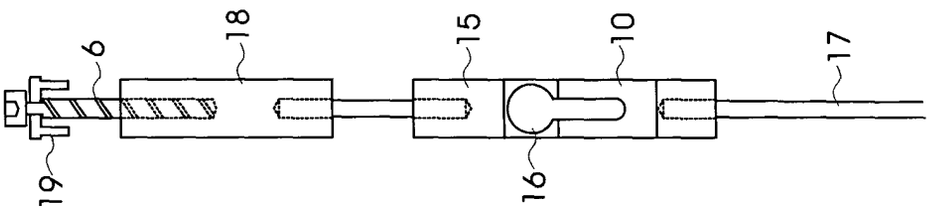

Fig. 4C

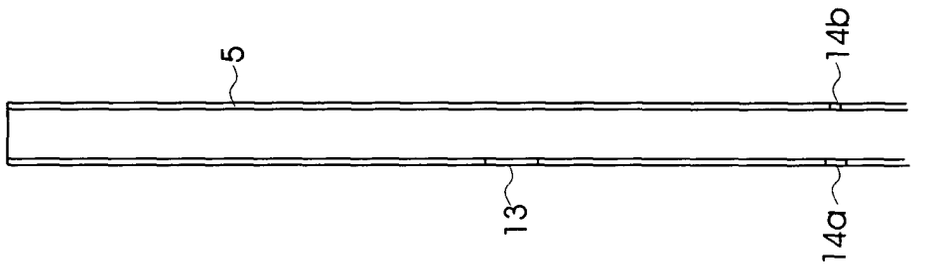

Fig. 4B

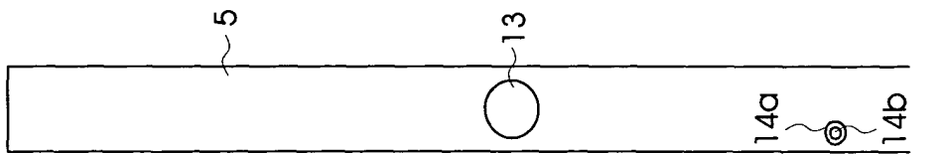

Fig. 4A

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 07 7999

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)
A	US 4 642 963 A (BORGES ANTHONY A) 17 February 1987 (1987-02-17) * column 2, line 63 - column 4, line 27; figures 7,10-12 *	1-10	E04B2/74
X,D	US 2 863 532 A (FRENCH WILLIAM G) 9 December 1958 (1958-12-09) * claim 1; figures 6-8 *	8	
A	BE 869 049 A (S.A. PRB) 16 November 1978 (1978-11-16) * page 5, line 13 - page 7, line 24; figures 1-5 *	1-10	
A	US 2 323 674 A (PURKISS ROBERT B) 6 July 1943 (1943-07-06) * figures 1-4 *	1-10	
A	US 4 821 788 A (NELSON LEROY O) 18 April 1989 (1989-04-18) * figure 6 *	2	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	28 October 2003	Rosborough, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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28-10-2003

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