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(54) Coupling device

(57) The invention relates to a device for coupling a generally plate-like structural element, for instance an exterior facing panel, a frame, a window structure or the like, to a bearing structure, comprising a number of vertical bearing columns such that the element is supported by two bearing columns, which device comprises:

a coupling block for non-movable connection to a bearing column by means of connecting means and having a guide surface inclining upward at an angle in forward direction; and
a first slide which is slidable over said first guide surface and which can be blocked in a chosen position relative to the coupling block by means of first adjustable stop means, which slide comprises a first support for supporting a structural element,
such that the height of the first support is adjustable by adjusting the first stop means.

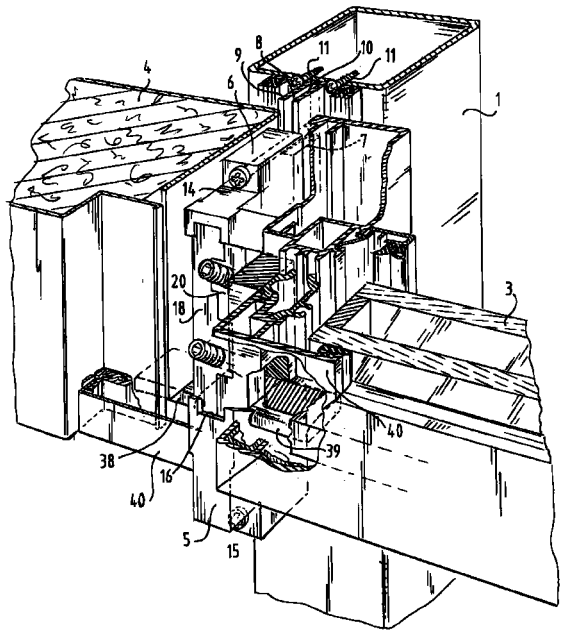

FIG.2

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Description

[0001] For some building constructions use is made of a spatial structure comprising a number of vertical bearing columns. Other structural parts are or can be coupled to such bearing columns, for instance horizontal connecting beams, supports for floors and the like.

[0002] During construction of such a building structure structural elements such as exterior facing panels, frames, window structures or the like have to be coupled to the described basic structure.

[0003] In the construction of such a building structure it is perceived as a problem that the structural elements forming part of the final building structure can only be positioned precisely in the desired mutual relation with the utmost care and precision in construction, for instance in the case of right-angled elements in a precise geometric pattern within which said elements fit with close tolerances.

[0004] It is an object of the invention to offer provisions with which structural elements can be positioned with a high degree of precision relative to a bearing structure in very simple manner. In respect of the above the invention provides a device for coupling a generally plate-like structural element, for instance an exterior facing panel, a frame, a window structure or the like, to a bearing structure, comprising a number of vertical bearing columns such that the element is supported by two bearing columns, which device comprises:

a coupling block for non-movable connection to a bearing column by means of connecting means and having a guide surface inclining upward at an angle in forward direction; and
a first slide which is slidable over said first guide surface and which can be blocked in a chosen position relative to the coupling block by means of first adjustable stop means, which slide comprises a first support for supporting a structural element,
such that the height of the first support is adjustable by adjusting the first stop means.

[0005] According to another aspect of the invention the device comprises a second slide which is slidable over said first guide surface and which can be blocked in a chosen position relative to the coupling block by means of adjustable second stop means, which second slide comprises a second support for supporting another structural element,

such that the respective heights of the first and second supports are adjustable by adjusting the first and second stop means.

[0006] Two structural elements can be supported simultaneously at different heights with such a device.

[0007] It is generally noted that the maximum height difference to be accommodated is determined by the dimensioning of the device.

[0008] The latter described embodiment can advantageously be embodied such that the two slides have complementary forms such that they are slidable along one another in the direction defined by said first guide surface. This embodiment ensures that the transmission of forces between the diverse loaded components is very good, so that mechanically the device behaves more or less as a monolithic block.

[0009] The latter described embodiment can for instance be embodied such that each of the slides has a second guide surface which is parallel to said first guide surface and along which is slidable a third guide surface present on the other slide.

[0010] In a practical embodiment the device according to the invention has the special feature that the stop means comprise screw means. Screw means have the practical advantage that any position can be realized within the adjustment range of the device.

[0011] The device as described with the screw means can display the special feature in accordance with determined aspects of the invention that the screw means comprise a screw which can be operated from the front side of the device and which co-acts with a nut forming part of the associated slide, the free end of which screw can press against a stop surface forming part of the coupling block such that by turning the screw the slide slides over the first guide surface and changes the height of the support.

[0012] Both the screw and the nut are manufactured from a material which is sufficiently strong mechanically. A strong metal such as steel is for instance very suitable.

[0013] The whole device can be manufactured from such a strong material. Since this entails considerable production costs and the device is thereby in danger of becoming mechanically over-dimensioned, the device can have the special feature in the practical embodiment that the nut is embedded in the slide.

[0014] This latter variant can particularly have the special feature that the slide is manufactured by moulding or injection-moulding, and the nut is an insert piece. Diverse suitable materials can be considered for the slide. In the latter described embodiment the device can have the feature that the slide consists substantially of optionally reinforced plastic. Aluminium is also suitable as construction material.

[0015] The invention will now be elucidated with reference to the annexed drawings. Herein:

fig. 1 shows a partial view of an exterior facing structure with a number of devices according to the invention;
fig. 2 shows a partly cut-away perspective view of a device according to the invention;
fig. 3 is a partly transparent, perspective view of the device of fig. 2; and
fig. 4 is a partly transparent, exploded view of the

slides of the device of fig. 3.

[0016] Fig. 1 shows a bearing structure comprising a number of vertical bearing columns, two of which are drawn. These are designated with the reference numerals 1, 2. Arranged between columns 1, 2 are plate-like structural elements, in this case window structures 3 and exterior facing panels 4, which have mutually equal dimensions. An exterior wall is thus formed in the manner shown in fig. 1. Structural elements 3, 4 are supported by bearing columns 1, 2 via devices 5 according to the invention.

[0017] As shown in fig. 1, each device 5 is constructed such that it is suitable for bearing a respective structural element on either side such that two devices 5, each arranged in this case on an adjacent column, bear a structural element on their lower corner zones. The structural, elements are further fixed relative to bearing columns 1, 2 by means of fixation and covering means (not shown).

[0018] Fig. 2 shows on larger scale the manner in which structural elements 3, 4 are supported by bearing column 1 via the device 5 according to the invention. For the sake of clarity reference is also made to figures 3 and 4 which show the structure of device 5 in more detail.

[0019] Device 5 comprises a coupling block 6 with an elongate vertical protrusion 7 which can be received fittingly in the space 8 bounded by two vertical elongate profile plates 9, 10 connected to column 1 by means of screws 11. Coupling block 6 has two horizontal continuous holes 12, 13 which are situated respectively above and below the ends of protrusion 7 and which serve to accommodate respective self-tapping screws 14, 15 for rigid coupling of coupling block 6 to profile plates 9, 10, and thereby to bearing column 1.

[0020] Coupling block 6 has a guide surface 16 inclining upward at an angle of about 45° in forward direction. This surface co-acts slidably with the lower guide surface 17 (see also fig. 4) of a first slide 18 and the lower guide surface 19 of a second slide 20. Slides 18, 19 have contact faces directed towards each other which are generally designated respectively 21 and 22 in fig. 4 and have mutually complementary shapes. These contact surfaces 21, 22 co-act slidably with each other. They comprise respective surfaces 23, 24, 25, 26 and 27, 28, 29, 30 which extend parallel to surfaces 16, 17, 19. This structure achieves that slides 18, 20 are placed for sliding and for transmitting forces mutually and relative to coupling block 6.

[0021] In order to realize a chosen position along the guide surface 16 of each of the slides 18, 20, a non-round nut 31, 32 is embedded respectively in each plastic slide 18, 20, with which nut co-acts a continuous respective screw 33, 34 which can be operated from outside.

[0022] As fig. 4 shows, screws 33, 34 are of the socket type and the free end respectively 35, 36 of screws 33, 34 protrudes outside the respective slides 18, 20 such that it can co-act supportingly with the relevant surface 37 of coupling block 6.

[0023] By turning screw 33 respectively 34 while maintaining the contact between respective end 35, 36 and surface 37 respectively 38, the longitudinal position of respective slide 18, 19 is adjusted. Due to the inclining position of guide surface 16 there occurs not only a per se non-relevant horizontal displacement of the relevant slide 18, 19 but also a vertical displacement thereof, which is important for the vertical adjustment option according to the invention.

[0024] Slides 18, 19 bear respective supports 38, 39 for supporting a structural element 3, 4.

[0025] In the manner shown particularly clearly in fig. 2, the structural element 3, 4 in question can thus be adjusted to the desired height.

[0026] By means of generally strip-like covering and fixation structures, generally designated with 40, the edges of structural elements 3, 4 are covered with sealing fixation relative to bearing columns 1, 2.

Claims

1. Device for coupling a generally plate-like structural element, for instance an exterior facing panel, a frame, a window structure or the like, to a bearing structure, comprising a number of vertical bearing columns such that the element is supported by two bearing columns, which device comprises:

a coupling block for non-movable connection to a bearing column by means of connecting means and having a guide surface inclining upward at an angle in forward direction; and
a first slide which is slidable over said first guide surface and which can be blocked in a chosen position relative to the coupling block by means of first adjustable stop means, which slide comprises a first support for supporting a structural element,
such that the height of the first support is adjustable by adjusting the first stop means.

2. Device as claimed in claim 1, comprising a second slide which is slidable over said first guide surface and which can be blocked in a chosen position relative to the coupling block by means of adjustable second stop means, which second slide comprises a second support for supporting another structural element,

such that the respective heights of the first and second supports are adjustable by adjusting the first and second stop means.

3. Device as claimed in claim 2, wherein the two slides have complementary forms such that they are slid-

able along one another in the direction defined by said first guide surface.

4. Device as claimed in claim 3, wherein each of the slides has a second guide surface which is parallel to said first guide surface and along which is slidable a third guide surface present on the other slide.

5. Device as claimed in claim 1 or 2, wherein the stop means comprise screw means.

6. Device as claimed in claim 5, wherein the screw means comprise a screw which can be operated from the front side of the device and which co-acts with a nut forming part of the associated slide, the free end of which screw can press against a stop surface forming part of the coupling block such that by turning the screw the slide slides over the first guide surface and changes the height of the support.

7. Device as claimed in claim 6, wherein the nut is embedded in the slide.

8. Device as claimed in claim 7, wherein the slide is manufactured by moulding or injection-moulding, and the nut is an insert piece.

9. Device as claimed in claim 8, wherein the slide consists substantially of optionally reinforced plastic.

10. Device as claimed in claim 8, wherein the slide consists substantially of aluminium.

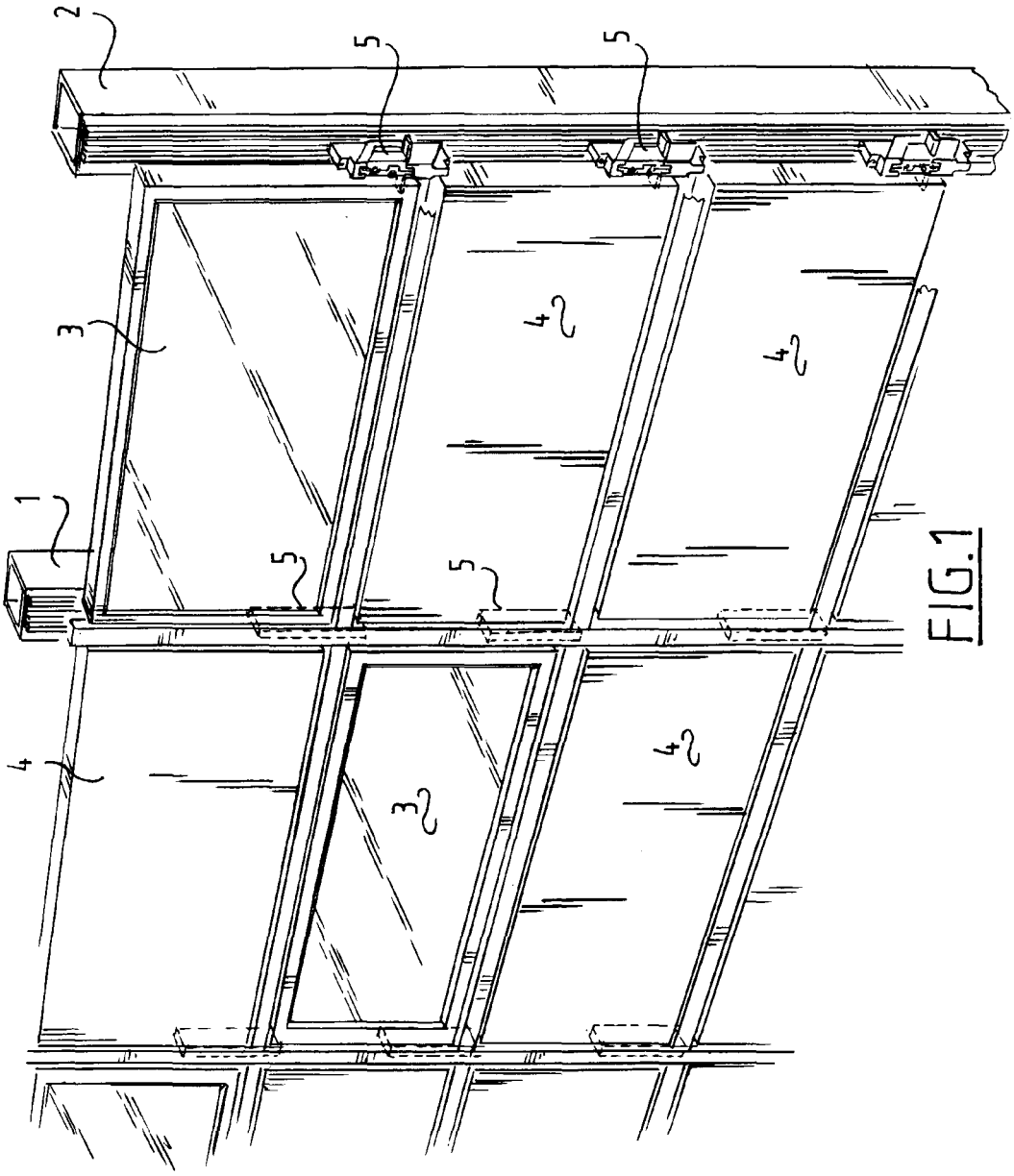

FIG.1

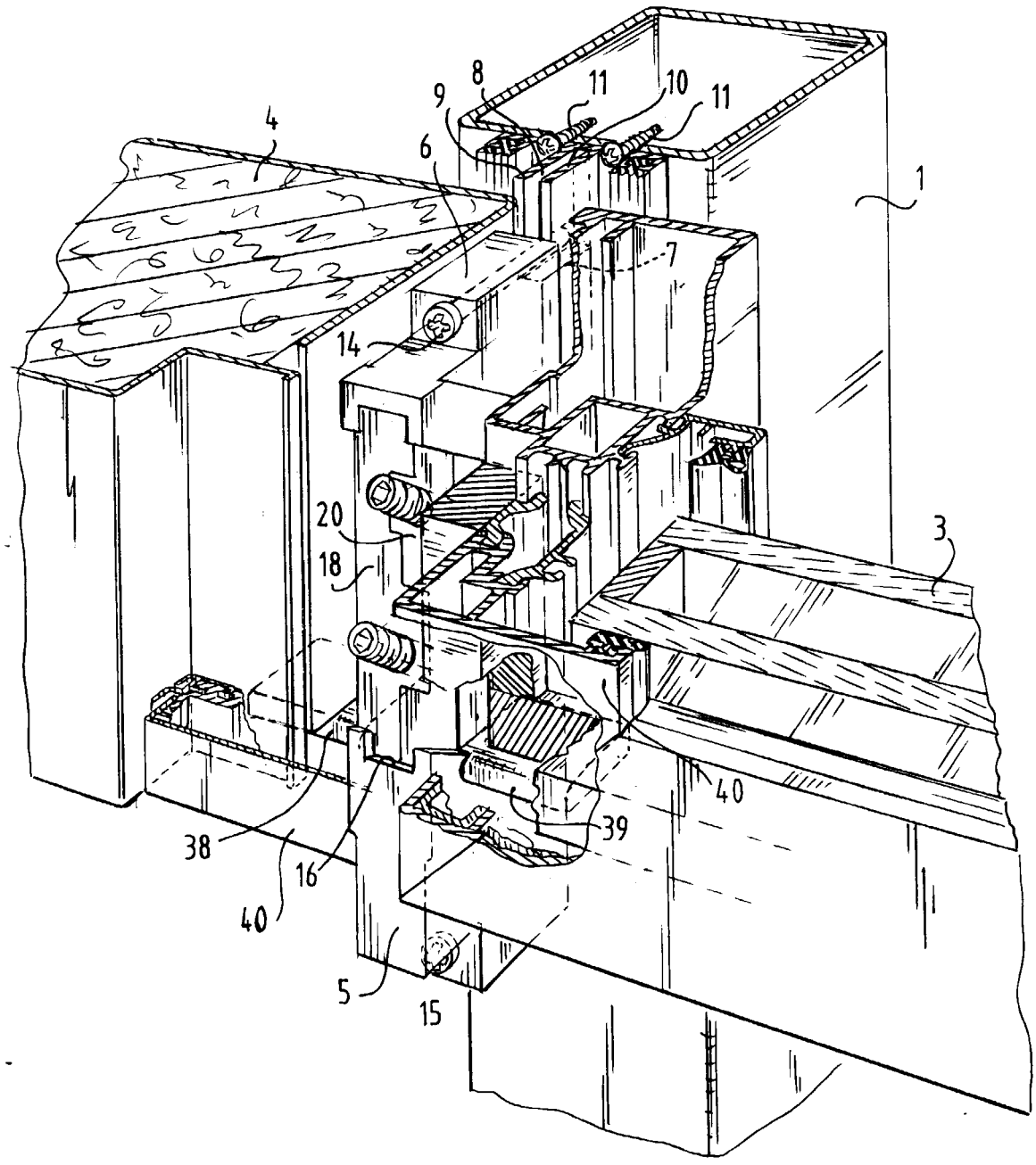

FIG.2

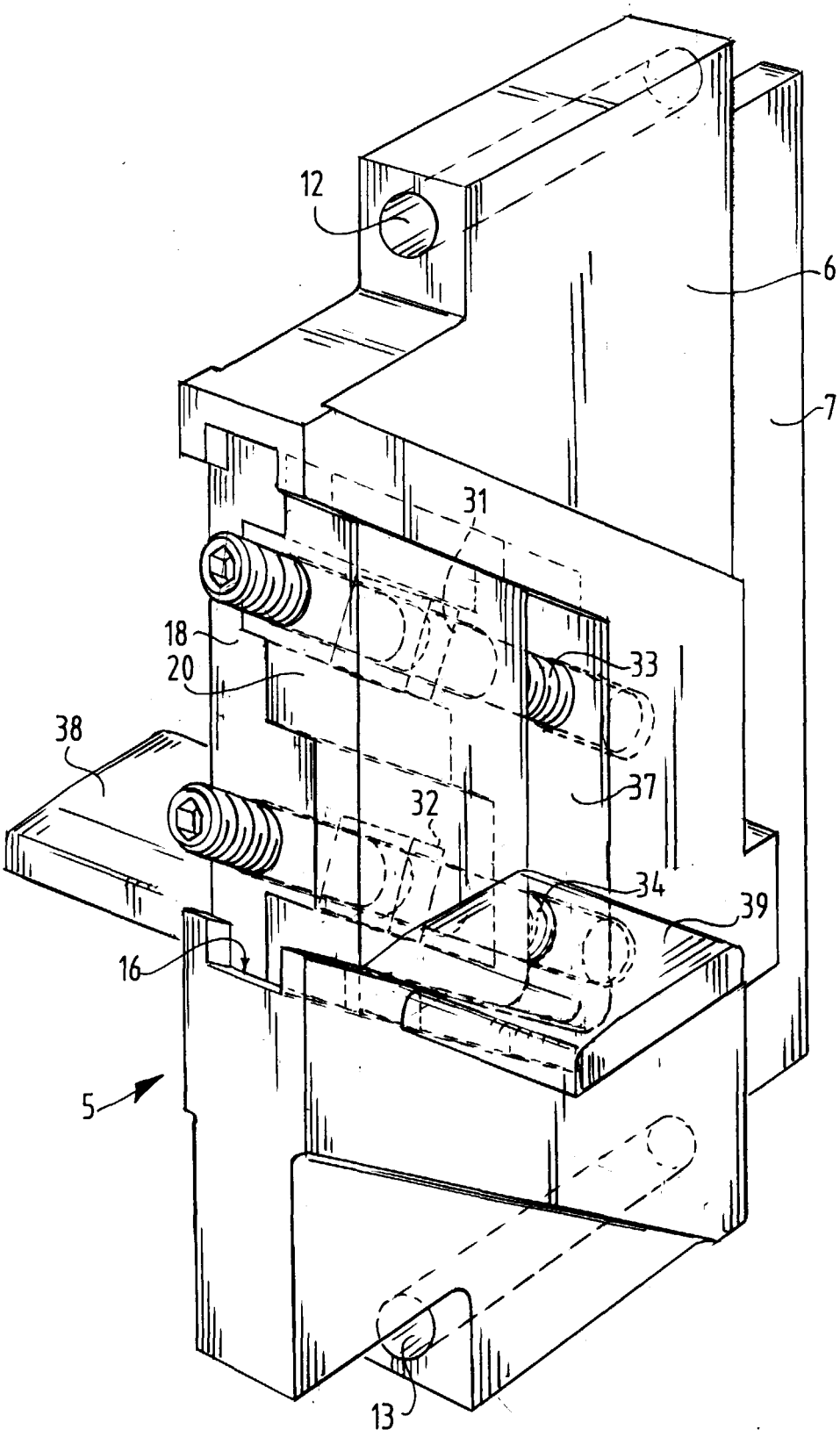

FIG.3

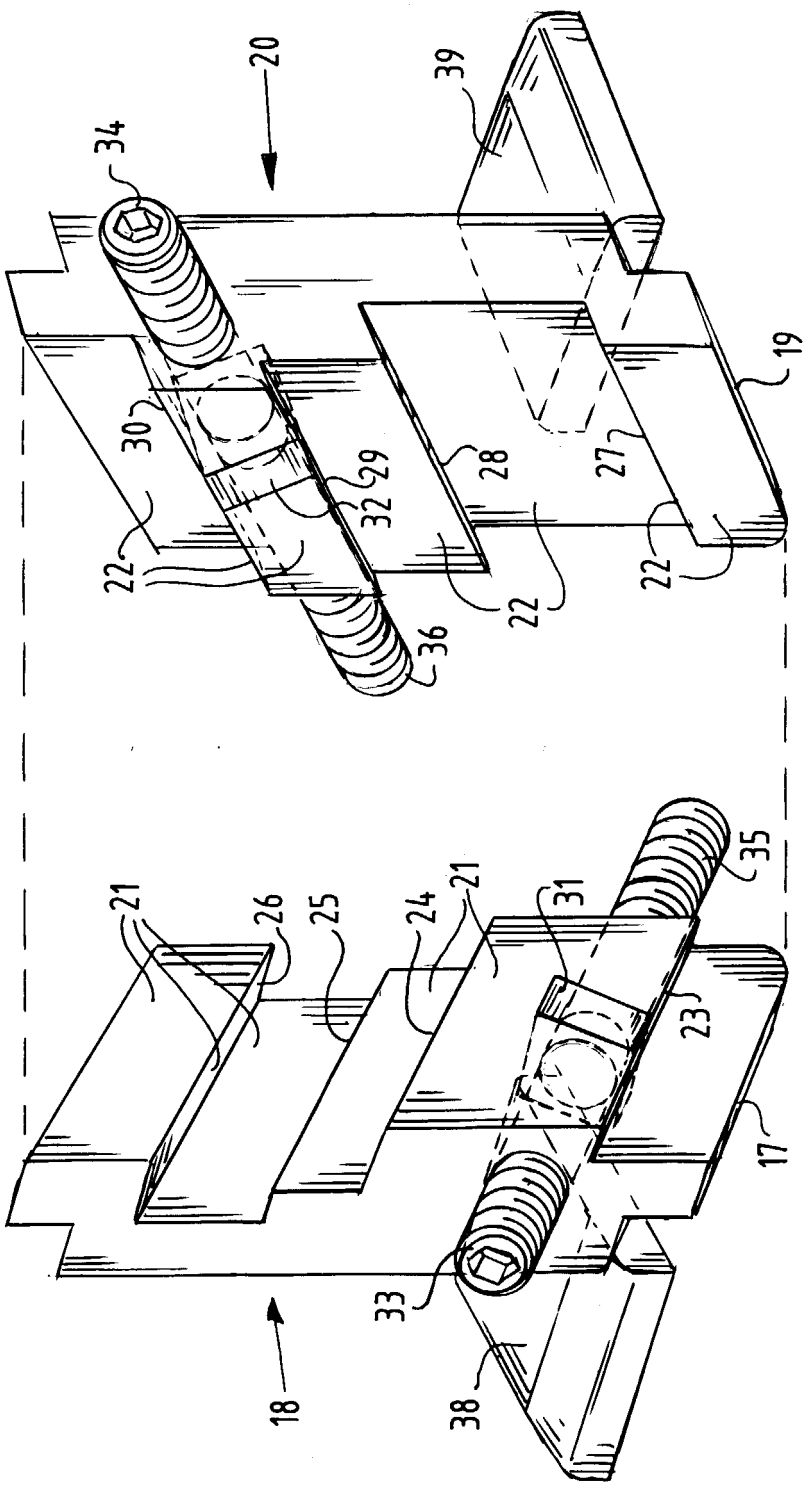

FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 1524

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	EP 0 438 649 A (SCHUECO INT KG) 31 July 1991 (1991-07-31) * the whole document *	1	E04B2/90 E06B1/60
A	US 3 640 043 A (QUERFELD HERMANN ET AL) 8 February 1972 (1972-02-08) * the whole document *	1	
A	US 4 873 805 A (TING RAYMOND M L) 17 October 1989 (1989-10-17) * column 4, line 25 - column 6, line 40; figures 1-6 *	1	
A	EP 0 476 289 A (HARTMANN & CO W) 25 March 1992 (1992-03-25) * column 4, line 57 - column 6, line 38; figures 1-3 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04B
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 July 2000	Vrugt, S

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 20 1524

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12-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0438649 A	31-07-1991	DE 9000835 U	05-04-1990
		AT 95265 T	15-10-1993
		DE 59002937 D	04-11-1993
		DK 438649 T	21-02-1994
		FI 910382 A,B,	27-07-1991
		NO 177830 B	21-08-1995
US 3640043 A	08-02-1972	AT 315437 B	15-04-1974
		CH 524747 A	30-06-1972
		DE 1933085 A	15-04-1971
		FI 49207 B	31-12-1974
		FR 2048049 A	19-03-1971
		GB 1313770 A	18-04-1973
US 4873805 A	17-10-1989	NONE	
EP 0476289 A	25-03-1992	DE 9011805 U	12-12-1991
		AT 136085 T	15-04-1996
		DE 59107610 D	02-05-1996

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