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EUROPEAN PATENT APPLICATION

21 Application number: 85300759.9

51 Int. Cl.⁴: **E 04 B 5/57**

22 Date of filing: 05.02.85

43 Date of publication of application:
13.08.86 Bulletin 86/33

84 Designated Contracting States:
DE FR IT

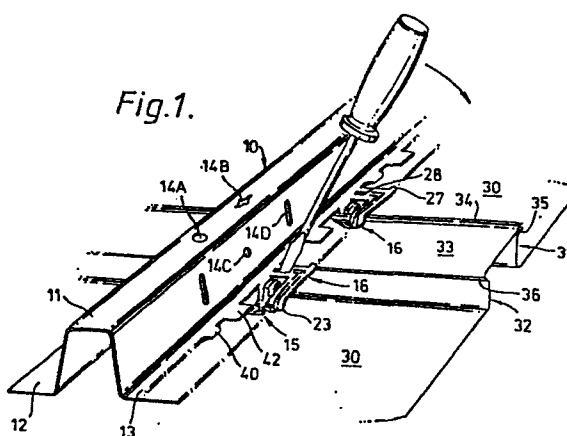
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54 **Panelling and carriers therefor.**

57 A carrier for supporting panelling, the panels of which have a main panel portion 30 which has inturned side portions 31, 32 on each of two opposite sides, and one side portion 31 has, at its free edge, a rim 35 whilst the other side portion 32 has at its free edge an arm 33 turned away from the one side portion. The carrier is of any suitable form and can include one or more side flanges 12, 13 although this is not necessary. The plurality of pairs of lugs 15, 16 are provided on the body or on the or each flange, the pairs of lugs being longitudinally spaced from one another and the centre lines of the lugs of a pair being laterally spaced. The lugs of a pair are of two types, the first type 15 being substantially rigid and including a tongue 17 spaced from the adjacent flange surface to accommodate the rim 35 of one panel and the arm 33 of an adjacent panel and the second type of lug 16 is mounted on the body or the flange 12, 13 to urge the arm 33 and rim 35 of two adjacent panels against the tongue of the first type of lug. One of the lugs of a pair may be used to form a retaining element 27 which can be bent down, when it is not being used to support the rim and flange of a particular panel, so that it can retain the side portion of a panel which is being supported by an adjacent pair of lugs 15, 16.



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The present invention relates to a panelling system and to carriers for supporting a panelling system.

One type of panelling system has panels which are each formed with a main, substantially flat, panel portion, which has an inturned side portion on each of two opposite sides. One of these side portions has, at its free edge, a rim which is turned inwards and the other side portion has, at its free edge, an arm which is turned away from the one side portion.

These panels are conventionally mounted on carriers which themselves are mounted on a wall or ceiling structure to be clad by the panelling. The flanges of the carriers are conventionally provided with lugs, usually bent down and back parallel to the flanges in the same direction. A panel is mounted with the arm being supported on one lug and the rim on the adjacent lug and the next panel is then introduced, so that its arm engages above the rim of the already fitted panel and abuts against the flange, the rim and arm being urged upwardly by the resilience of the lug. This arrangement is generally satisfactory, at least in the short term, in that it provides a pleasant appearance to the panelling, the arm in each case bridging the gap between the main panel portions, so that the carriers cannot be seen.

Various problems arise with this construction. Firstly, in order to ensure that the panels are held

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firmly, the lugs are made resilient and urge the panels up against the flanges of the carriers. It will be appreciated that if the panels are removed on one or two occasions to attend to wiring or plumbing or the like
5 behind the panelling, then the lugs will become progressively weakened and experience has shown that very often they tend to snap off. This is, of course, totally unsatisfactory.

An example of such a system is illustrated in
10 GB-2118988A. In this arrangement, a general purpose carrier is provided which may receive different panels, that is panels of a different shape and or dimensions, and which can also cope with a variety of installation requirements, such as severe fire regulations. To achieve
15 this general purpose carrier, several widths and shapes of panels are available to cooperate with one type of carrier, often in the form of single and multiple pitch panels spanning one or more sets of lugs based at regular intervals along the carrier. Increased fire resistance
20 regulations, for certain kinds of installations are met by optional locking elements which may be in the form of tabs, which are to be bent behind an internal panel side portion if positive locking of such panel is desired.

Although such further provisions render a
25 certain carrier more generally usable and obviate the need

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for further types of carriers, they also account for increased costs and decreased stability of the assembly.

In general, therefore, such carriers may be considered to comprise an elongate body securable to a support structure; a plurality of lugs on said body, the lugs being arranged in at least one series of pairs, the pairs of lugs of the or each series being spaced from one another along the length of the carrier, the first lug of each pair being substantially rigid and including a tongue spaced from the adjacent body portion to accommodate in the thus formed space the rim of one panel and the arm of an adjacent panel, the second lug of a pair being adapted to hold the arm and rim of adjacent panels in place on the tongue of the first lug.

In order to overcome the problem of increased cost and decreased stability of such device, it is now proposed, according to the present invention, for a retaining element to be provided on said body and to be positionable, after the rim of one panel and the arm of an adjacent panel have been inserted in said space, behind the other portion of said adjacent panel to prevent the arm from disengaging from the space and for the retaining element to be formed by one of the lugs of an adjacent pair of lugs. Usually the first lug of a pair is rigid and the second lug of a pair is resilient and advantageously the retaining element is

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formed by the second or resilient lug of a pair. It is also conceivable that it could be formed by a first more rigid lug of a pair.

With such a construction the total cost can be significantly reduced while providing the necessary flexibility of operation.

Advantageously the lug forming the retaining element is provided with a hole into which may be inserted a screwdriver or similar tool by means of which said lug may be bent to extend in a plane different from that in which it would normally extend to cooperate with the other lug of the pair, so that, when so bent, said retaining element can engage behind said side portion. Thus, the second lug which is not being used as part of a pair of lugs to support a panel, can readily be bent, usually downwardly, so that the retaining element surface of this second or other lug can abut against the side portion of the adjacent panel to hold said side portion and its associated arm in place.

Preferably the first and second lugs are formed by punching out of one or more flanges associated with said body, whereby the first lugs include a connecting portion and said tongue and are provided with a reinforcing rib whereby the second lug includes a connecting portion and a leg, the leg being positioned to hold the arm and the rim of adjacent panels

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in place on the tongue of the associated first lug.

Desirably the body comprises two flanges each of which is provided with a series of pairs of lugs.

5 The leg may have, adjacent to its free end, a shaped portion adapted to engage behind a projecting part formed on the arm of the panel to prevent rattling.

The invention also relates to a panelling system comprising panels which each have a main panel portion with an inturned side portion having, at its free edge, a
10 rim turned towards the other side portion and the side portion having, at its free edge, an arm turned away from the one side portion, a plurality of carriers each comprising an elongate body securable to a support structure, a plurality of lugs being arranged in at least
15 one series of pairs, the pairs of lugs of the or each series being spaced from one another along the length of the carrier, the first lug of each pair being substantially rigid and including a tongue spaced from the adjacent body portion to accommodate in the thus formed
20 space the rim of one panel and the arm of an adjacent panel, the second lug of a pair being adapted to hold the arm and the rim of adjacent panels in place on the tongue of the first lug.

According to this aspect, the present invention

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proposes a retaining element is provided on said body and is positionable, after at least the arm of an adjacent panel have been entered in said space behind the other side portion of said adjacent panel to prevent the arm
5 from disengaging from the space and the width of the panels between side portions is greater than the pitch between the pairs of lugs, and the retaining element is formed by one of the lugs of an adjacent pair of lugs to that pair which is holding at least the arm of an adjacent
10 panel, whereby the retaining element on one of the lugs of a pair which is intermediate where the pairs of lugs supporting the panel, can engage behind the side portion, to prevent the arm of that panel from disengaging from said space.

15 In order that the present invention may more readily be understood, the following description is given, merely by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a schematic perspective view showing
20 a panel ceiling structure using a carrier according to the invention, with two panels mounted thereon and with the retaining element about to be bent in place; and

Figure 2 is a schematic side elevation of the ceiling structure of Figure 1 with the lug forming the
25 retaining element shown bent into place.

Referring to the drawings, there is illustrated

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a carrier 10 which comprises a body 11 of inverted U-shaped cross-section provided with two side flanges 12 and 13 which extend outwardly away from one another from the free ends of the U-shaped cross-section body. As can be seen more clearly in Figure 1, the body has openings 14A, 14B to enable the carrier to be supported, openings 14C for the passage of bars to interconnect adjacent carriers and openings 14D for ease of reference in cutting a carrier to the length corresponding to that of a full panel.

The flanges 12 and 13 are each provided with a longitudinally extending row of lugs. The lugs alternate so that they include a first type of lug 15 and a second type of lug 16.

Both the lugs 15 and 16 are punched out of the flanges 12 and 13. The lugs 15 are rigid lugs and consist of a connecting portion 18 and a tongue 17. Both the connecting portion and tongue are reinforced by a rib 19. It will be noted that the free end 20 of the tongue is bent down to provide a curved end portion extending away from the flange 12, 13.

The lugs 16 have a connecting portion 22 and an elongate leg 24 having a reinforcing rib 25. On the right as seen in Figure 2, the lug 16 forms a retaining element 27. As shown, the retaining element 27 is defined by a notch 29 removed from the right side of lug 16. It is

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contemplated, however, that the notch could be omitted and the right hand side of the lug 16 could be straight and this straight side then form the retaining element.

Adjacent the junction of the connecting portion
5 22 with the flange 12, 13, the connecting portion 22 is provided with a hole 28. Adjacent to or at its free end the leg 24 is provided a curved projection 23.

As shown in Figure 1, the panels which the carrier supports include a main portion 30 which is
10 substantially flat and side portions 31 and 32. One side portion 31 has an inturned rim 35. The other side portion 32 is provided with an arm 33 which extends away from the side portion 31 and is formed, adjacent its free end, the projecting part in the form of a bead 34. At the
15 junction of the side portions 32 with the arm 33, there is formed a backturned ledge 36.

In order to mount the panels on the carrier, the first of the panels is engaged so that its arm 33 is above one rigid lug 15 and the rim 35 is above another of the
20 lugs 15 and the panel is moved to the right, as seen in Figure 2. The next panel is then taken and its arm 33 is pushed over the rim 35 of the previously assembled panel and so that its bead 35 engages the leg of the lug 16 thereabove. The leg, being somewhat longer than the
25 tongue, is resilient and flexed upwardly until the bead 34 has moved beyond the projection 23 which then snaps down

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behind the bead. At the same time, the rim 35 engages behind the next tongue 18. The panelling system is built up successively in this way.

The curved down end portion 20 facilitates the introduction of the arm 33 and of the rim 35.

It will be appreciated that the pitch of the panels is such that they are greater than the pitch and, as shown, equal to two or more pitches between adjacent sets of lugs 15, 16. As can be seen, for example, in Figure 2, the lugs 15, 16 of the right hand pair are used to support the left side of the right panel 30 and the right side of the left panel 30 and the left hand of the lugs 15 shown in Figure 2 is not used at all, but rather the left hand panel 30 is supported at its free end by another pair of lugs 15, 16 (not shown). Now in order to hold the assembled panels in place, a screwdriver is inserted, as shown in Figure 1, into the hole 28 and is rotated slightly as shown by the arrow in Figure 1, so that the left hand of the lugs 16 illustrated in Figure 2 is bent down so that it extends in a substantially vertical plane, that is somewhat under the associated rigid first lug 15 of that pair. In this position, the retaining element 27 can abut against the side portion 32 to prevent the side portion from moving to the left, thereby retaining the panels in position even though they may be subjected to wind or to buckling from overheating

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for example as a result of fire. Rattling of the panels is also reduced by the ledge 36 engaging in the notch 29 above retaining element 27.

It will be seen that further tabs 40 of
5 trapezium cross-section are also provided bent down slightly from the associated flange 12, 13 and these limit the movement of the panel arm towards the carrier body under wind load. The additional tab 42 which remains has no function and is only left remaining as a result of
10 punching out from the original flange 12, 13.

The construction of the carrier according to the present invention makes it suitable for use with various panels of different panel width. It also reduces the overall cost of the carrier due to its general simplicity.
15 The locking option which is available due to forming the retaining elements 27 integrally with either the lug 16, as shown, or with the lug 15, is only available for panels having a width spanning a multiple pitch. However, other panels having the same pitch as the pitch between the
20 lugs, can be mounted but the locking or retaining facility would then not be available.

While the carrier 10 has been shown as having two flanges 12, 13, the invention also contemplates the use of only one flange, with the carrier body 10 of L- or
25 other cross-section, as well as the carrier body having no flanges at all. For example, the body could then be of

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inverted U- or V- cross-section, with the lugs formed in the lower edges of the inverted U- or V- cross-section body.

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CLAIMS

1. A carrier (10) for a panelling system, the panels of which have a main panel portion (30) with an inturned side portion (31,32) on each of said two opposite sides, one side portion (31) having, at its free edge, a rim (35) turned towards the other side portion (32), and the other side portion (32) having, at its free edge, an arm (33) turned away from the one side portion (31), said carrier (10) comprising a elongate body (11) securable to a support structure; a plurality of lugs (15,16) on said body, the lugs being arranged in at least one series of pairs, the pairs of lugs of the or each series being spaced from one another along the length of its carrier, the first lug (15) of each pair being substantially rigid and including a tongue (17), spaced from the adjacent body portion to accommodate in the thus formed space the rim (35) of one panel and the arm (33) of an adjacent panel, the second lug (16) of a pair being adapted to hold the arm (33) and rim (35) of adjacent panels in place on the tongue (17) of the first lug (15) characterised in that a retaining element (27) is provided on said body and is positionable, after at least the arm (33) of an adjacent panel has been inserted in said space, behind the other side portion of said adjacent panel to prevent the arm from disengaging from said space, and in that said retaining element (27) is formed by one of the lugs of an

adjacent pair of lugs.

2. A carrier according to claim 1, characterised in that the lug (15,16) forming said retaining element (27) is provided with a hole (28) into
5 which may be inserted a screwdriver or similar tool, by means of which said lug may be bent to extend in a plane different from that in which it would normally extend to cooperate with the other lug of the pair, so that, when so bent, said retaining element can engage behind said other
10 side portion.

3. A carrier according to claim 1, wherein said carrier is to cooperate with a panel having at or near the junction of the other side portion (32) with the arm (33) a ledge (36) directed inwardly towards the one
15 side portion (31) of the panel, characterised in that the lug (16) forming the retaining element (27) is provided with a notch (29) which defines therebelow the retaining element (27), the notch (28) accommodating the ledge, which is blocked against downward movement by the
20 retaining element therebelow, so the panel may be retained.

4. A carrier according to claim 1, 2 or 3, characterised in that the second lug (16) of a pair is resilient.

25 5. A carrier according to any preceding claim, characterised in that the first and second lugs (15,16)

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are formed by punching out, whereby the first lugs (15) include a connecting portion (19) and said tongue (17) and are provided with a reinforcing rib (18) and whereby the second lug (16) includes a connecting portion (22) and a leg (24), the leg (24) being positioned to hold the arm (33) and the rim (35) of adjacent panels in place on the tongue (17) of the associated first lug (15).

6. A carrier according to claim 5, characterised in that the leg (24) has, adjacent to or at its free end, a shaped portion (23) adapted to engage behind a projecting part (34) formed on the arm (33) of a panel at or near the free end of said arm.

7. A carrier according to any preceding claim, characterised in that said retaining element (27) is formed integrally with the second lug of a pair.

8. A carrier according to any preceding claim characterised in that the lugs are punched out from one or two flanges (12,13) formed on the carrier body.

9. A carrier according to claim 8, characterised in that the body comprises two flanges each of which is provided with a series of pairs of lugs.

10. A carrier according to any preceding claim, said carrier being designed to cooperate with panels of a given width, characterised in that the pitch of the pairs of lugs is such that for each such panel to be mounted on the carrier a retaining element is available.

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11. A panelling system comprising two panels which each have a main panel portion (30) with an inturned side portion (31) having at its free edge, a rim (35) turned towards the other side portion (32), and the side portion (32) having, at its free edge, an arm (33) turned away from the one side portion, a plurality of carriers (10) each comprising an elongate body (11) securable to a support structure, a plurality of lugs (15,16) being arranged in at least one series of pairs, the pairs of lugs of the or each series being spaced from one another along the length of the carrier, the first lug (15) of each pair being substantially rigid and including a tongue (17) spaced from the adjacent body portion to accommodate in the thus formed space the rim (35) of one panel and the arm (33) of an adjacent panel, the second lug (16) of a pair being adapted to hold the arm (33) and the rim (35) of adjacent panels in place on the tongue of the first lug (15) characterised in that a retaining element (27) is provided on said body and is positionable, after at least the arm (33) of an adjacent panel has been inserted in said space, behind said other side portion of said adjacent panel to prevent the arm from disengaging from said space and in that the width of the panels between side portions is greater than the pitch between the pairs of lugs, and in that said retaining element (27) is formed by one of the lugs of an adjacent pair of lugs to that

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pair which is holding at least the arm (33) of an adjacent panel, whereby the retaining element (27) on one of the lugs of a pair which is intermediate the pairs of lugs supporting the panel engages behind the side portion (32) to prevent the arm of that panel from disengaging from said space.

Fig. 1.

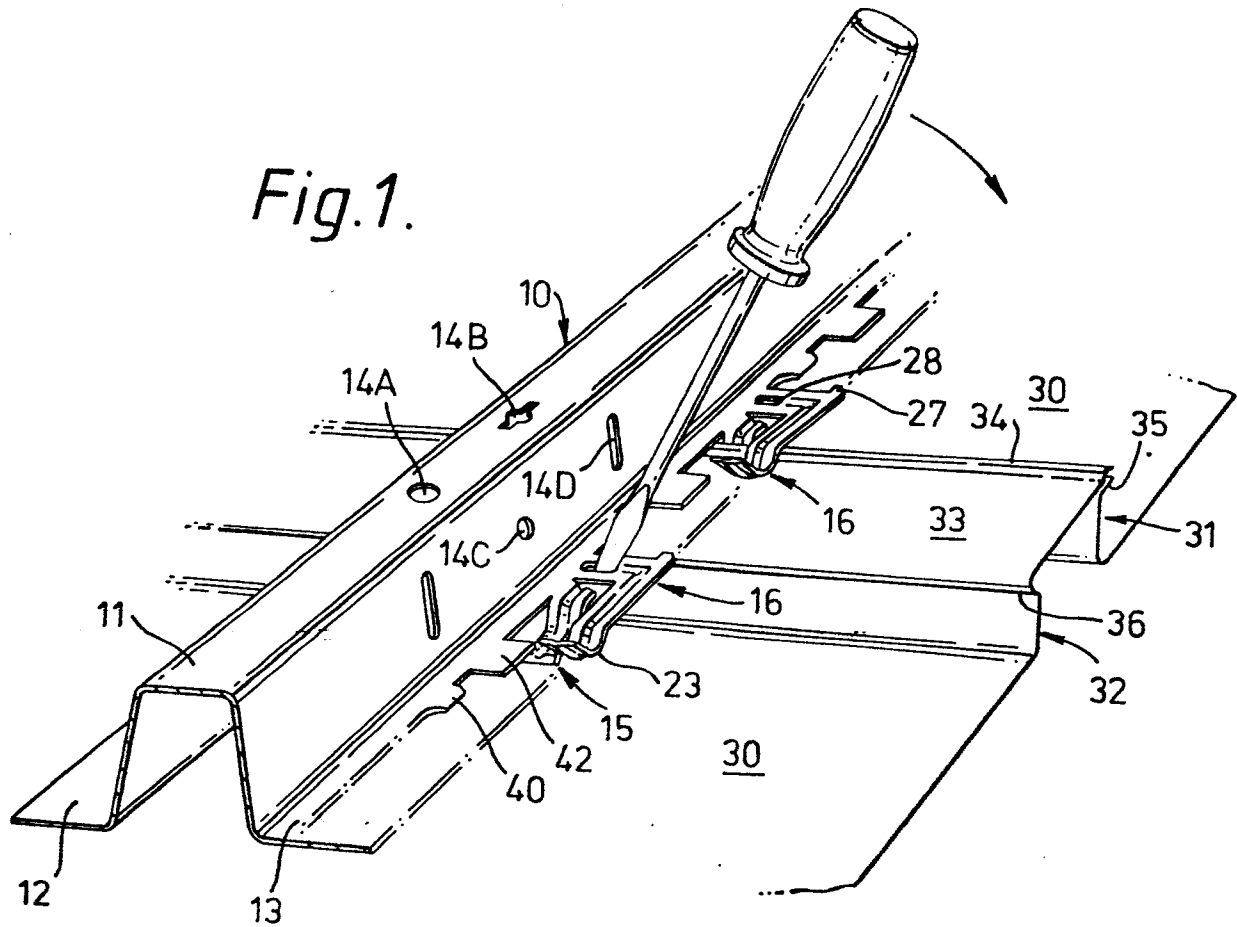
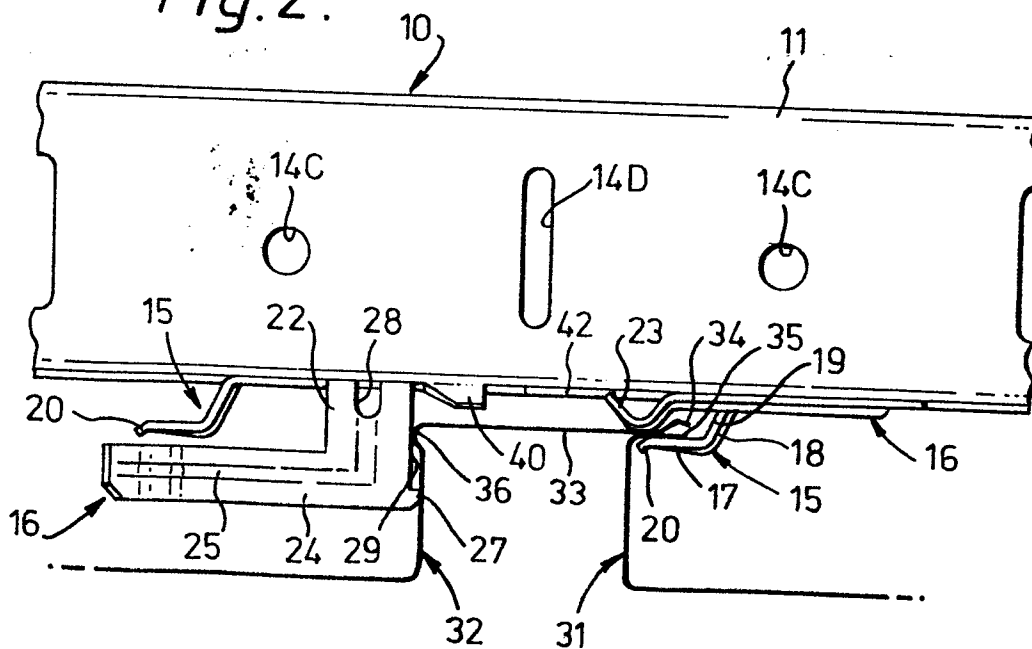


Fig. 2.





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. 4)
D, A	GB-A-2 118 988 (HUNTER DOUGLAS INDUSTRIES BV) * complete document *	1, 5, 11	E 04 B 5/57
A	FR-A-2 484 505 (HUNTER DOUGLAS INDUSTRIES BV) * complete document *	1, 11	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 04 B 5/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 19-09-1985	Examiner PAETZEL H-J
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	