(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 628 698 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94201623.9**

(51) Int. Cl.[5]: **E06B 11/04**, E06B 11/02

(22) Date of filing: **08.06.94**

(30) Priority: **09.06.93 NL 9300990**

(43) Date of publication of application:
14.12.94 Bulletin 94/50

(84) Designated Contracting States:
BE DE FR GB IT NL

(71) Applicant: **Ruigrok, Franciscus Bernardus Maria**
Zandstraat 53
NL-5691 CD SON (NL)

(72) Inventor: **Ruigrok, Franciscus Bernardus Maria**
Zandstraat 53
NL-5691 CD SON (NL)

(74) Representative: **Vollebregt, Cornelis Jacobus, Ir. et al**
P.O. Box 645
NL-5600 AP Eindhoven (NL)

(54) A gate and a method of producing a carrier for a gate.

(57) The invention relates to a method of manufacturing an elongated carrier (1) for a movable gate intended for closing a passage. The carrier functions to support railings (2) or the like closing means forming part of the gate as well as to connect said gate to a support anchored with respect to the ground, relative to which the gate is movable. The carrier is built up of two vertically spaced-apart beams (4,5) extending parallel to each other, whereby a stress is first set up in at least one of the beams (4,5), whereupon the stressed beam is fixedly connected to the other beam by means of plate-shaped parts (6,7) symmetrically positioned on either side of the beams (4,5).

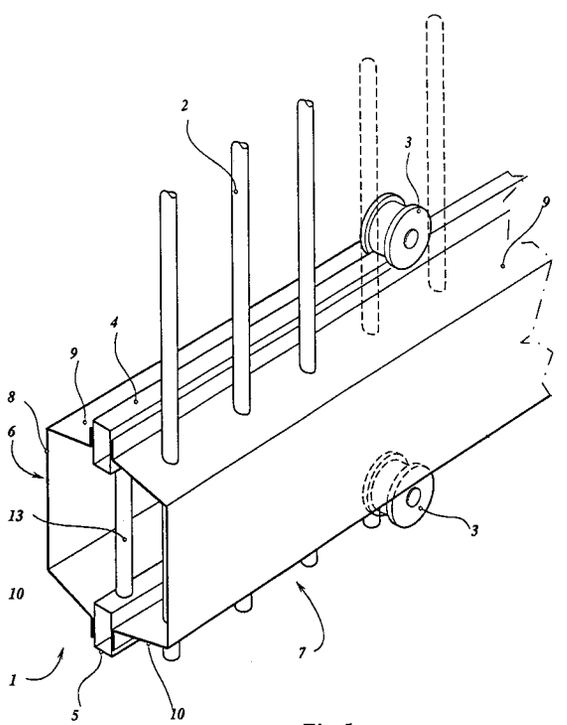

Fig. 1

EP 0 628 698 A1

The invention relates to a method of manufacturing an elongated carrier for a movable gate intended for closing a passage, whereby the carrier functions to support railings or the like closing means forming part of the gate as well as to connect said gate to a support anchored with respect to the ground, relative to which the gate is movable.

From European Patent No. 0 128 248 a gate is known which is provided with a carrier, which is made up of a single beam, in which pretensioned wires are provided, by means of which a pressure load is applied to the beam in order to prevent vertically downward deflection of the beam.

Generally this construction is satisfactory per se, but one drawback is inter alia the fact that tensioning of said wires usually has to take place on the site where the gate is to be placed, which involves extra cost and which furthermore implies the risk that the pretension is not optimally set up.

Furthermore there is always the risk of breaking of the pre-tensioned wires. A further drawback is that an eccentric arrangement of the runners will lead to a disadvantageous loading of the carrier.

According to the invention the carrier is built up of two vertically spaced-apart beams extending parallel to each other, whereby a stress is first set up in at least one of the beams, whereupon the stressed beam is fixedly connected to the other beam by means of plate-shaped parts symmetrically positioned on either side of the beams, said parts are spaced-apart, at least over part of their height, by a distance which is larger than the width of the beams, after which the stress of the stressed beam(s) is released.

When at least one of the beams is correctly stressed the carrier thus obtained will be slightly concave after the stress is released. Upon assembly of the gate it is then possible to arrange that the carrier is positioned in such a manner that the centre of curvature of the slightly concave carrier is located vertically above the carrier. If the carrier should slightly sag under the influence of the weight of the gate, the carrier will take up an at least substantially horizontal position, so that a light-weight an yet easily operated gate has been obtained. It is thereby possible to manufacture the carrier under optimal circumstances, for example in an air-conditioned room, so that the carrier is capable of optimally meeting the requirements made. Furthermore the completed carrier does not contain any pretensioned wires or the like, whilst the work which needs to be carried out on the site where the gate is to be placed is reduced to a minimum. The plate-shaped parts of the carrier thereby provide the required stiffness in horizontal direction as well as a good torsional stiffness.

A further aspect of the invention relates to a gate for closing a passage, whereby the gate is provided with a carrier and with railings or the like closing means connected to said carrier, whilst the carrier movably couples the gate to a support anchored with respect to the ground by means of runners connected to said support, in such a manner that the gate can be opened and closed by moving the carrier relative to the support. A gate of this type, which is known from EP-A-0 128 248, comprises a single prestressed beam, which is supported by runners which are eccentrically arranged with respect to the beam. This results in a disadvantageous loading of the beam, which has an adverse effect on the running qualities of the gate, i.e. the opening and closing of the gate.

According to the invention the carrier is built up of two vertically spaced-apart beams extending parallel to each other, which are interconnected by means of plate-shaped parts symmetrically positioned on either side of said beams, said parts being spaced-apart, at least over part of their height, by a distance which is larger than the width of the beams, whilst the runners are mounted on the support in such a manner, that said runners roll on the upper side of the upper beam and on the bottom side of the lower beam respectively.

In this way a carrier of symmetric design may be obtained, which is advantageously supported by the bearing rollers guiding the carrier during opening and closing of the gate.

The invention will be explained in more detail hereafter with reference to parts of the gate according to the invention diagrammatically illustrated in the accompanying Figures.

Figure 1 is a perspective view of a part of a carrier for a gate according to the invention, with a few railings connected thereto and a few runners guiding the carrier.

Figure 2 is a larger-scale cross-sectional view of Figure 1.

Figure 1 shows part of a carrier 1 arranged horizontally in use, said carrier together with the vertical railings 2 connected thereto forming a gate, in a similar manner as described in the aforesaid European Patent No. 0 128 248. When used as a gate which can be opened and closed the carrier is guided by a plurality of runners 3 secured to supports anchored in the ground, a few of said runners being shown in Figures 1 and 2. Also with regard to a support of the movable gate of this type reference may be made to the aforesaid European Patent No. 0 128 248, which is why it is not considered necessary to discuss this in more detail herein.

As is apparent from Figures 1 and 2 the carrier is provided with two beams 4 and 5, one being positioned directly above the other, which are of

rectangular section in the illustrated embodiment and which are arranged in such a manner that their long sides extend vertically.

The two beams 4 and 5 are interconnected by two plate-shaped parts 6 and 7 positioned on either side of said beams. As appears in particular from Figure 2, each of said plate-shaped parts 6 and 7 is built up of a vertically extending plate portion 8, which is joined at its upper edge by a plate portion 9 sloping upwards in the direction of the beam 4, whilst each plate portion is joined at its lower edge by a plate portion 10 sloping downwards in the direction of the beam 5.

A double-folded plate portion 11 joins the upper edge of the plate portion 9 remote from the plate portion 8, said plate portion 11 abutting against one side of the upper beam 4.

Similarly a double-folded plate portion 12 joins the lower edge of the plate portion 10 remote from the plate portion 8, said plate portion 12 abutting against one side of the lower beam 5.

The plate-shaped parts 6 and 7 are fixed to the upper beam 4 by securing the double-folded plate portions 11 to the beam 4 by means of rivets or the like. Similarly the lower double-folded plate portions 12 are fixed to the lower beam 5 by means of rivets or the like.

As is furthermore shown in the Figures regularly spaced-apart bars 13 are provided between the beams 4 and 5 in order to keep the beams 4 and 5 the desired distance apart, in particular during assembly of the carrier 1. For this purpose the ends of the bars 13 may for example be threaded and be screwed into corresponding threaded holes provided in the beams 4 and 5. Furthermore it is possible to provide the bars 13 with shoulders (not shown), which abut against the boundary surfaces of the beams 4 and 5 facing each other, whilst the ends of the bars 13 extending beyond said shoulders are inserted into corresponding holes provided in the beams 4 and 5.

Furthermore vertically aligned holes are provided in the plate-shaped part 7, more in particular in the plate portions 9 and 10 of the plate-shaped part 7, through which bars 2 forming the railings of the gate are passed, which are secured against shifting in their longitudinal direction by means not shown.

When the carrier 1 is to be assembled a stress will be set up in at least one of the beams 4 and 5, preferably a tensile stress in the upper beam 4. Then the beam 5 will be mounted at the desired distance from the beam 4 by interposing the bars 4, whereupon the beams 4 and 5 are interconnected by securing the plate-shaped parts 6 and 7 to the beams 4 and 5. Then the tensile stress on the beam 4 may be released. Upon releasing of the tensile stress on the beam 4 the carrier thus formed will tend to become slightly concave, in such a manner that the centre of curvature of said hollow carrier, seen in Figures 1 and 2, will be located above the carrier. During normal use the carrier, which is only supported near one end, at least in certain positions, will tend to deflect slightly under the influence of the weight of the gate, which will eventually result in a substantially straight position of the carrier. Another possibility to achieve a similar effect is to apply a pressure load to the beam 5 prior to assembling the beam 5 and the beam 4 into a carrier in the above-described manner. A third possibility is to apply a tensile load to the beam 4 as well as a pressure load to the beam 5 before interconnecting the two beams 4 and 5 in the above-described manner in order to form the carrier 1.

As is apparent from the Figures a symmetric construction of the carrier has been obtained, which carrier is supported in its central longitudinal plane by means of runners 3 rolling on the upper side of the beam 4 and on the bottom side of the beam 5 respectively, as a result of which good running qualities of the beam are obtained.

Both the beams 4 and 5 and the plate-shaped parts 6 and 7 may be made of steel. It is possible thereby to use zinc-plated sheet material for producing the plate-shaped parts 6 and 7, which sheet material is coated with a coating of a desired colour.

For the beams 4 and 5 zinc-plated sections may be used, on which the runners 3 roll. Wear-resistant running surfaces for the runners are thereby obtained, namely shining borders formed by the parts of the beams 4 and 5 extending beyond the plate-shaped parts 6 and 7, which in combination with the coloured plate-shaped parts 6 and 7 may lead to a beautiful aesthetic effect.

By using the construction according to the invention it is thus possible to obtain an inexpensive gate having good running qualities and a beautiful appearance, which is retained also after prolonged use.

In addition to that the construction of the carrier is such that it is very strong and readily made of steel, as a result of which an economical manufacture of the carrier can be realized.

Claims

1. A method of manufacturing an elongated carrier for a movable gate intended for closing a passage, whereby the carrier functions to support railings or the like closing means forming part of the gate as well as to connect said gate to a support anchored with respect to the ground, relative to which the gate is movable, characterized in that the carrier is built up of

two vertically spaced-apart beams extending parallel to each other, whereby a stress is first set up in at least one of the beams, whereupon the stressed beam is fixedly connected to the other beam by means of plate-shaped parts symmetrically positioned on either side of the beams, said parts being spaced-apart, at least over part of their height, by a distance which is larger than the width of the beams, after which the stress of the stressed beam(s) is released.

2. Method according to claim 1, characterized in that a stress is set up in the upper one of said two beams by applying a tensile load to said beam.

3. Method according to claim 1 or 2, characterized in that a stress is set up in the lower one of said two beams by applying a pressure load to said beam.

4. Method according to any one of the preceding claims, characterized in that spacing means are provided between said beams in order to keep the beams correctly spaced-apart when said plate-shaped parts are being provided.

5. A gate for closing a passage, whereby said gate is provided with a carrier and with railings or the like closing means connected to said carrier, whilst the carrier movably couples the gate to a support anchored with respect to the ground by means of runners connected to said support, in such a manner that the gate can be opened and closed by moving the carrier relative to the support, characterized in that said carrier is built up of two vertically spaced-apart beams extending parallel to each other, which are interconnected by means of plate-shaped parts symmetrically positioned on either side of said beams, said parts being spaced-apart, at least over part of their height, by a distance which is larger than the width of the beams, whilst the runners are mounted on the support in such a manner, that said runners roll on the upper side of the upper beam and on the bottom side of the lower beam respectively.

6. Gate according to claim 5, characterized in that said gate is manufactured by carrying out the method according to any one of the claims 1 - 4.

7. Gate according to any one of the claims 5 or 6, characterized in that said plate-shaped parts comprise vertically extending plate portions, which are connected to the upper beam by means of upwardly sloping plate portions joining their upper edges, and which are connected to the lower beam by means of downwardly sloping plate portions joining their bottom edges.

8. Gate according to any one of the claims 5 - 7, characterized in that the ends of said plate-shaped parts are provided with double-folded plate portions, which abut against the beams and which are fixed to said beams.

9. Gate according to any one of the claims 5 - 8, characterized in that the beams extend some distance beyond said plate-shaped parts at the upper and lower sides of the carrier.

10. Gate according to any one of the claims 5 - 9, characterized in that said beams are zinc-plated.

11. Gate according to any one of the claims 5 - 9, characterized in that the railings of said gate are secured to one of said plate-shaped parts.

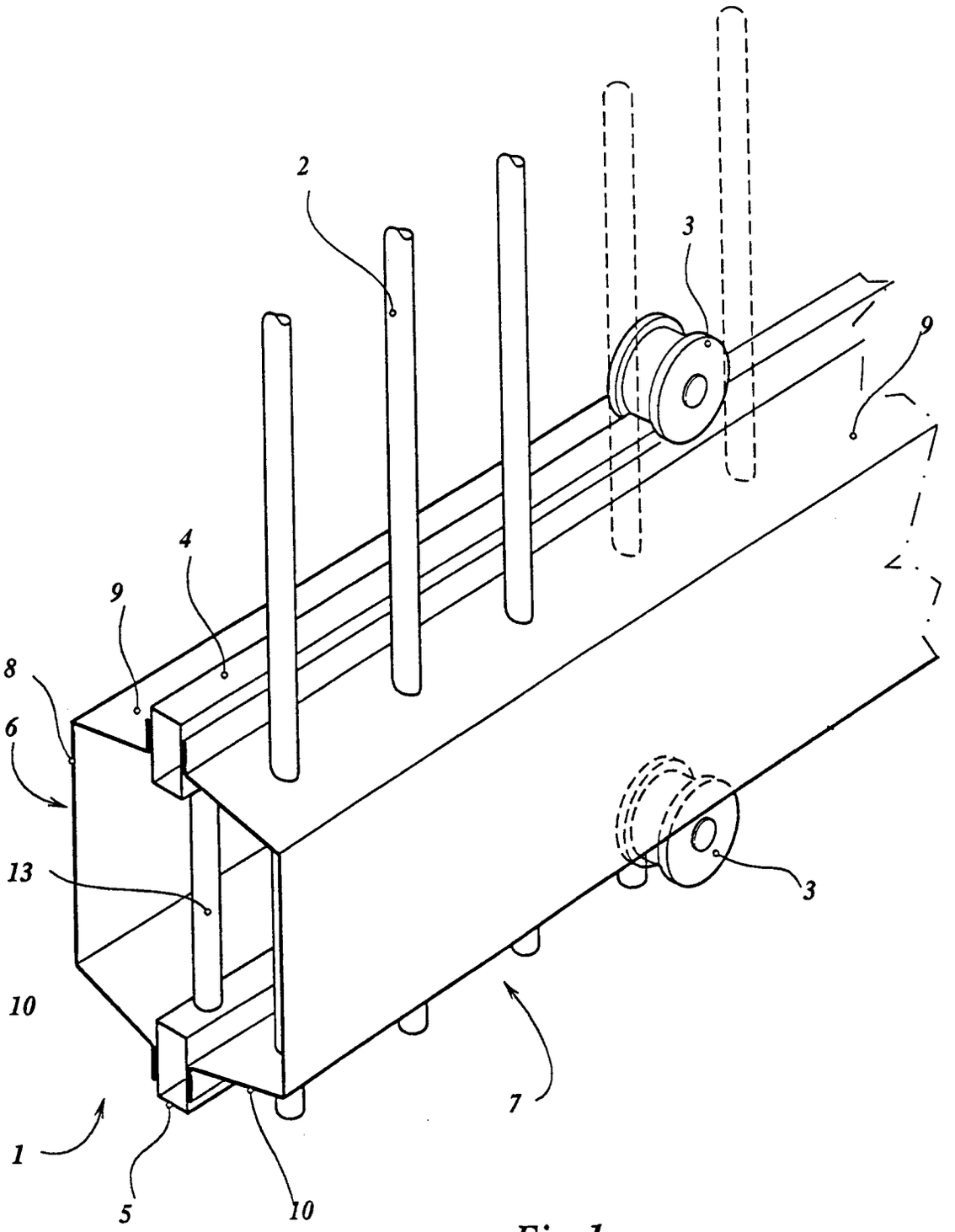

Fig. 1

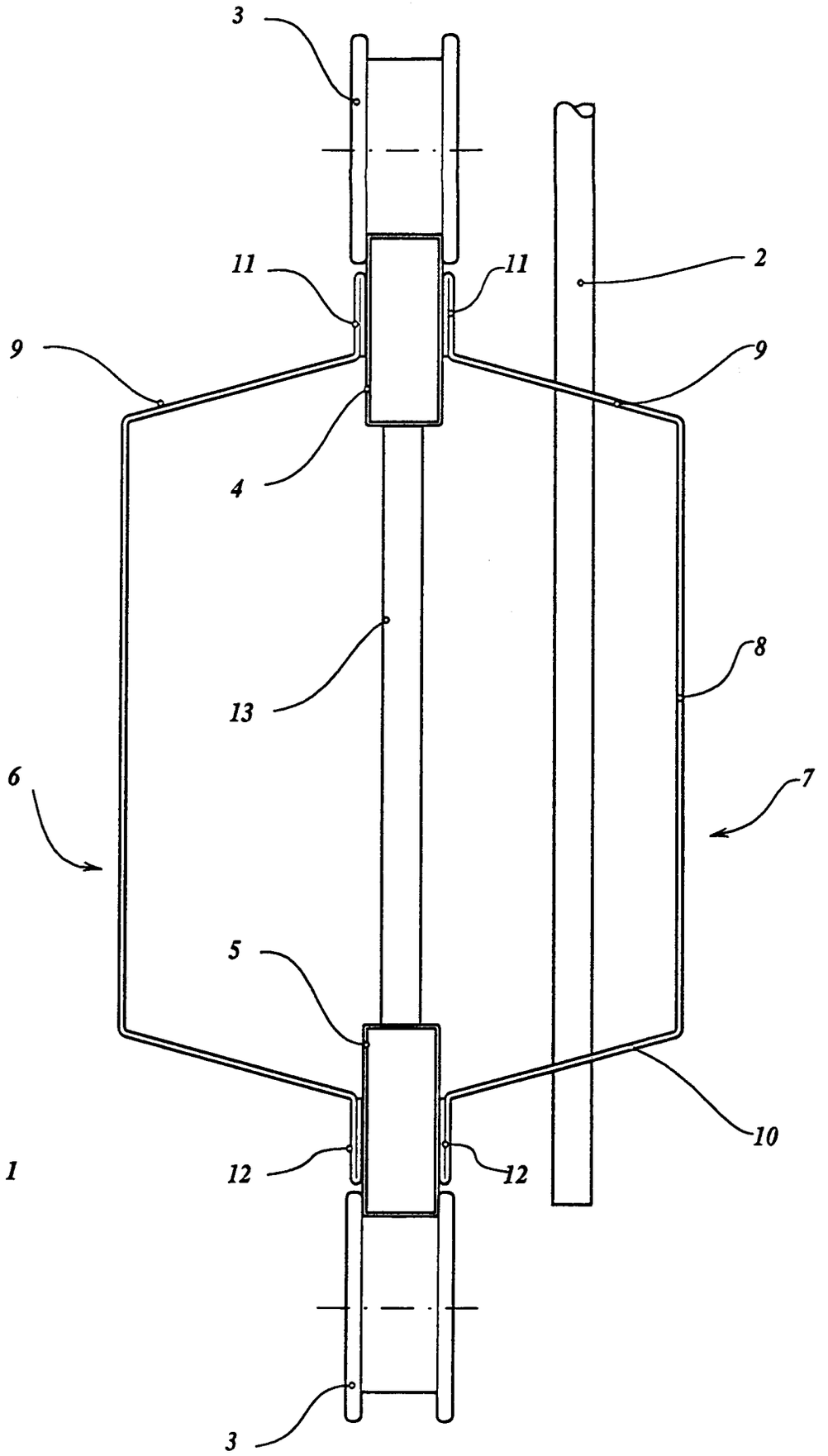

Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 1623

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.5)
A	DATABASE WPI Week 9250, Derwent Publications Ltd., London, GB; AN 92-413004 & NL-A-9 100 726 (W. M. RATTINK) 16 November 1992 * abstract * ---	1,4-7	E06B11/04 E06B11/02
A	DATABASE WPI Week 9304, Derwent Publications Ltd., London, GB; AN 93-033810 & NL-A-9 101 027 (W. M. RATTINK) 4 January 1993 * abstract * ---	1,4-7	
A	AU-B-597 411 (FOLDED WEB BEAMS PTY. LTD.) * the whole document * -----	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

E06B
E05F
E04C
E04H
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 September 1994	Gourier, P

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

EPO FORM 1503 03.82 (P04C01)