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(54) Folding awning

(57) A folding awning (1) comprises at least one pair of cross-members (5a, 5b), movable along a pair of guides (4) between a first, gathered, position and a second, extended, position, and a sheet (6) extending between said pair of cross-members (5a, 5b) and secured thereto, the sheet comprises at least one drainage section (11a, 5b) in which the length of said sheet (6) in a plane (XY) transverse to the pair of cross-members (5a, 5b) is greater than the distance between the cross-members (5a, 5b) so as to form a drainage channel (12) between the cross-members (5a, 5b), and the awning (1) additionally comprises tensioning means (20) secured to said sheet (6) at at least one securing point (21) in the region of the drainage channel (12) so as to place the sheet (6) under tension at least in the second, extended, position.

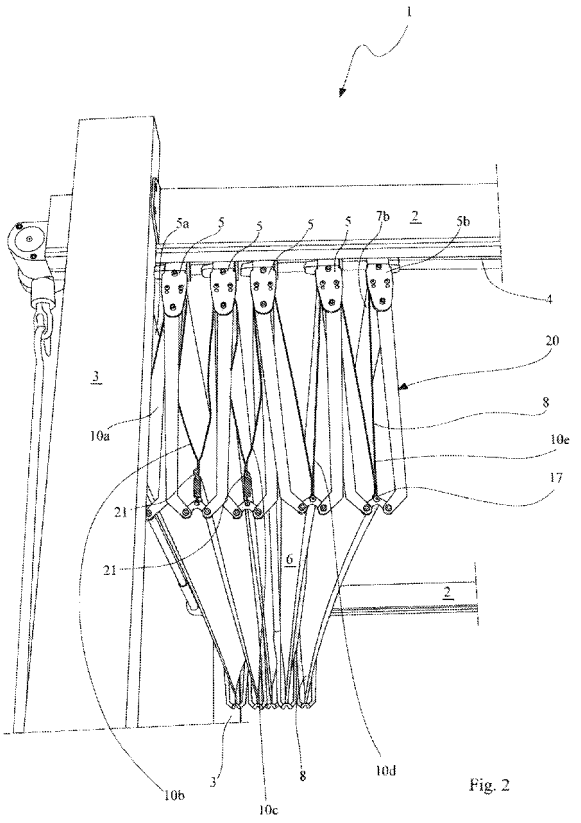

Fig. 2

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Description

[0001] The subject of the present invention is an improved folding awning, of the type including the features mentioned in the preamble of the main claim.

[0002] Folding awnings are distinguished from those termed roll-up awnings in that, in the gathered position, that is, when the awning is in the non-operative position, the sheet of the awning is folded in pleats, suspended between adjacent cross-members, which are movable along a plurality of guides in order to bring the sheet from the gathered position to an extended operative position.

[0003] The present invention is particularly, although not exclusively, suitable for folding awnings provided with horizontal or approximately horizontal guides.

[0004] For such awnings with approximately horizontal guides there is in particular the problem of drainage of the water from the upper surface of the sheet.

[0005] In known embodiments, one of which is shown in Figure 1, one solution to the problem provides for the use of a sheet which, in the extended position, is taut in the region of one lateral edge thereof, parallel to the guides, and slack in the region of the opposite lateral edge. In this way, at the slack edge, the sheet, having a length greater than the distance between the cross-members, is disposed so as to form a drainage channel extending between said cross-members and inclined from the taut edge towards the slack edge.

[0006] The main drawback of such a solution lies in the fact that in the region of the slack lateral edge the sheet is subject to the action of the wind also in the extended position.

[0007] In particular, when the wind is strong, the drainage channel could be significantly deformed, so as to prejudice its drainage capacity.

[0008] The principal problem of the present invention is that of providing an awning of the aforesaid type structurally and functionally designed in such a way as to make it possible to remedy the drawbacks mentioned with reference to the prior art cited.

[0009] This problem is solved by the invention with an awning produced in accordance with the following claims.

[0010] The features and advantages of the invention will become clearer from the detailed description of an exemplary embodiment thereof, illustrated by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view from above of a known folding awning;
- Figure 2 is a side view of the awning of the present invention in a gathered position;
- Figure 3 is a side view of the awning of Figure 2 in an extended position;
- Figure 4 is a side view of a component of the awning of Figure 3;
- Figure 5 is a side view of the component of Figure 4 in the gathered position of Figure 2;
- Figures 6, 8 and 10 are three side views of three respective alternative embodiments of the awning of Figure 2;
- Figures 7, 9 and 11 are three side views of the awnings of Figures 6, 8 and 10, respectively, in the extended position corresponding to that of Figure 3;
- Figure 12a is a section along the line XII-XII of a detail of the awning in Figure 11;
- Figure 12b is a section of an alternative embodiment of the detail in Figure 12a;
- Figure 13 is an axonometric view of the awning of Figure 2 in the extended position.

[0011] In Figures 2 to 12a,b, the reference 1 indicates as a whole an awning of the folding type with a support structure 1a formed by a pair of longitudinal members 2, each of which is supported by a pair of pillars 3, which bear on an area of ground S, holding up the awning 1.

[0012] The awning 1 protects the area of ground S from the rays of the sun and from rainwater. The longitudinal members 2 are substantially parallel to the area of ground S. On the lower face of the longitudinal members 2 there is fitted or provided a respective guide 4. Supported between the guides 4 are cross-members 5, the first and the last of which, indicated respectively by 5a and 5b, respectively define a rear face and a front face of the awning 1.

[0013] The cross-member 5a is fixed, while the cross-members 5, 5b are movable along the guides 4 between a first, gathered, position (Figure 2) and a second, extended, position (Figure 3). The awning 1, in general, may also be used in a semi-extended intermediate position, comprised between the first and the second position.

[0014] Secured to the cross-members 5, 5a, 5b is a sheet 6 delimited by a rear face edge 7a in the region of the cross-member 5a, a front edge 7b in the region of the cross-member 5b, and two lateral edges 8 in the region of the guides 4.

[0015] The sheet 6 is divided into portions (five portions 10a,b,c,d,e in the exemplary embodiment of Figures 2 and 3), each of which extends between a pair of consecutive cross-members and is secured to the latter.

[0016] Each of the portions 10a,b,c,d,e comprises two drainage sections 11a,b, extending respectively from a central region of the sheet 6 to each of the lateral edges 8. In each drainage section 11a,b, the length of the sheet 6 in a plane XY transverse to the cross-members 5, 5a, 5b (plane of Figure 3) is greater than the distance between two consecutive cross-members 5,5a,5b, so as to form a drainage channel 12 between each pair of consecutive cross-members 5, 5a, 5b.

[0017] The drainage channel 12 is bounded by two folds 13a,b of each portion 10a,b,c,d,e of the sheet 6, which are joined to each other by means of stitching, or by adhesive means, or by thermowelding in the region of a bottom line 16 of the drainage channel 12. The bottom line 16 is curved, with the concavity facing towards the area of ground S, and comprises two ends 14 in the region

of the lateral edges 8 and a high point 15, in a central area of the sheet 6, which separates the two drainage sections 11a,b from each other.

[0018] Each portion 10a,b,c,d,e of the sheet 6, in the region of the bottom line 16, comprises a slot 17 extending along said drainage channel 12 from one of the lateral edges 8 to the other. Each portion 10a,b,c,d,e of the sheet 6 comprises a rod-like elongate stiffening element 18 for the bottom line 16, inserted into the slot 17.

[0019] According to an alternative embodiment of the invention, the sheet 6 comprises a single drainage section, with a drainage channel inclined from one of the lateral edges to the other, in a similar manner to the known awning 100 of Figure 1. In the latter case the bottom of the drainage channel is rectilinear.

[0020] The awning 1 comprises tensioning means 20 secured to the sheet 6 at at least one securing point 21 in the region of the drainage channel 12 so as to place the sheet 6 under tension when it is in the second, extended position or, according to an alternative embodiment of the invention, when it is any position between the semi-extended position and the extended position.

[0021] The tensioning means 20 are located in the region of both the lateral edges 8, as shown in the appended drawings, or in the region of only one of the lateral edges, as in the version similar to that of the awning 100 of Figure 1. Alternatively, in an alternative version which is not shown, the tensioning means 21 may be located in an intermediate position between the lateral edges 8.

[0022] The tensioning means 20 comprise a kinematic mechanism 22, located in the region of the lateral edge 8, movable in the plane XY, and secured to both of a pair of consecutive cross-members 5, 5a, 5b. The kinematic mechanism 22 is of the quadrilateral type comprising a pair of cranks 23, each of which is hinged at one of its ends 23a to a respective cross-member of a pair of consecutive cross-members 5, 5a, 5b and a connecting rod 24 secured to the cranks 23 by means of a pair of respective hinges 25. Each of the portions 10a,b,c,d,e of the sheet 6 is secured to the connecting rod 24 at the securing point 21, located on the elongate element 18, in the region of one end of the bottom line 16 of the drainage channel 12.

[0023] Between the securing point 21 and the connecting rod 24 a resilient element, formed by the spring 26, is interposed.

[0024] In the gathered position (Figure 5) the spring 26 is slackened, while in the extended and/or intermediate position the spring 26 is tensioned.

[0025] According to other alternative embodiments of the invention, as an alternative to the presence of the spring 26, the kinematic mechanism 22 comprises a resiliently deformable element. Between the resiliently deformable elements it is possible to use a telescopic crank 23 with springing between the two mutually slidable parts, or a crank divided into two parts which are connected to each other by means of a resilient hinge.

[0026] According to other alternative embodiments, as an alternative to the use of resilient elements, the securing point 21 is connected directly to the connecting rod 24 (portions 10d,e of the sheet 6 in Figure 2) and the sheet 6 is made of elastic fabric.

[0027] When passing from the gathered position to the extended position, the sheet 6 is tensioned as a result of the connection between the securing point 21 and the tensioning means 20. Any excess tension on the sheet which could lead to its breakage are avoided as a result of the presence of the spring 26 or of another resiliently deformable element of the tensioning means 20 or of the use of an elastic sheet.

[0028] In the alternative embodiments of Figures 6 to 12a,b, the tensioning means 20 comprise a tensioning element 27a,b,c extending in a transverse direction with respect to the cross-members 5,5a,5b, that is, in a direction substantially parallel to the guides 4. The tensioning element 27a,b,c is secured at least at one point to the pillars 3 of the one support structure 1a of the awning 1.

[0029] According to the alternative embodiment of Figures 6 and 7, the tensioning element 27a is formed by a metal cable comprising two opposed ends 28a,b secured to the structure 1a by means of two respective constraints 29a,b of resilient type, formed by a pair of springs secured to two respective pillars 3 in the region of two respective supports 30a,b. The metal cable 27a is returned in two pulleys 31a,b respectively secured to the pillars 3 which bear the supports 30a,b and located in an intermediate position between the sheet 6 and the supports 30a,b, respectively.

[0030] The metal cable 27a is secured to the securing points 21 of each of the portions 10a,b,c,d,e of the sheet 6, passing via a plurality of pulleys 32 respectively integral with the securing points 21.

[0031] When passing from the gathered position (Figure 6) to the extended position (Figure 7), the correct tensioning of the sheet 6 is ensured by suitable selection of the length of the cable 27a and the rigidity of the constraints 29a,b.

[0032] According to an alternative embodiment of the invention which is not shown, the metal cable 27a is secured to the structure 1a by means of two respective constraints of rigid type and the sheet 6 is made of elastic fabric.

[0033] According to an alternative embodiment of the invention which is not shown, in place of the metal cable 27a an elastic cable is used, secured to the structure 1a by means of two respective constraints of rigid type.

[0034] According to the alternative embodiment of Figures 8 and 9, the tensioning element is formed by a metal cable 27b comprising two opposed ends 33a,b, respectively rigidly secured to a pillar 3 of the support structure 1a, and free. The end 33b is secured to a counterweight 34.

[0035] The metal cable 27b is secured to the securing points 21 of each of the portions 10a,b,c,d,e of the sheet 6, passing via a plurality of pulleys 32 respectively integral with the securing points 21, in a similar manner to the

variant of Figures 6 and 7 described above.

[0036] When passing from the gathered position (Figure 8) to the extended position (Figure 9), the correct tensioning of the sheet 6 is ensured by suitable selection of the length of the cable 27b and the counterweight 34.

[0037] According to the alternative embodiment of Figures 10 and 11, the tensioning element 27c is formed by a rigid profile section movable in a vertical direction, orthogonal to the cross-members 5,5a,5b, to the guides 4 and to the ground S. The rigid profile section 27c is secured to the support structure 1a in the region of its two opposed ends 35a,b by means of two respective resilient constraints 36a,b, formed by a pair of springs secured to two respective pillars 3 in the region of two respective supports 37a,b.

[0038] When passing from the gathered position (Figure 10) to the extended position (Figure 11), the correct tensioning of the sheet 6 is ensured by suitable selection of the rigidity of the resilient constraints 36a,b.

[0039] The section 38 of the rigid profile section 27c is solidly rectangular (Figure 12a) or, according to the alternative embodiment of Figure 12b, comprising a gutter profile 39, suitable for collecting the water which falls from the drainage channel 12 in the region of the lateral edges 8.

[0040] According to an alternative embodiment of the invention which is not shown, the rigid profile section 27c is secured to the structure 1a by means of two respective constraints of rigid type and the sheet 6 is made of elastic fabric.

[0041] Other alternative embodiments may comprise combinations of those described above. For example, one of the variants may comprise the use of a combined system of a cable with springs (as in Figures 6 and 7) of counterweights (as in Figures 8 and 9) while another of the variants may comprise an awning with tensioning means comprising a cable and springs (as in Figures 6 and 7) and the simultaneous presence of a sheet made of elastic fabric.

[0042] The invention thus solves the problem of ensuring the correct tensioning of the sheet and in particular of the drainage channel in all operating conditions. The tensioning ensures the substantial indeformability of the sheet with respect to the action of the wind, with a consequent improvement in the efficiency of the drainage.

[0043] The aesthetic appearance of the sheet is also improved.

Claims

1. Folding awning (1) comprising at least one pair of cross-members (5a, 5b), at least one of said cross-members (5b) being movable along at least one pair of guides (4) between a first, gathered, position and a second, extended, position, and at least one sheet (6) extending between said pair of cross-members and secured thereto, said sheet comprising at least a drainage section (11a,b) in which the length of said sheet (6) in a plane (XY) transverse to said pair of cross-members (5a, 5b) is greater than the distance between said cross-members (5a, 5b) so as to form a drainage channel (12) between said cross-members, **characterized in that** it comprises tensioning means (20) secured to said sheet (6) at at least one securing point (21) in the region of said drainage channel (12) so as to place said sheet (6) under tension in at least said second, extended, position, said tensioning means (20) comprising a kinematic mechanism (22) secured to both said cross-members (5a, 5b) and movable in said transverse plane (XY).

2. Folding awning (1) according to claim 1, wherein said at least one securing point 8(1) is located in the region of an end (14) of a bottom line (16) of said drainage channel (12).

3. Folding awning (1) according to claim 1 or 2, wherein said kinematic mechanism (22) is of the quadrilateral type comprising a pair of cranks (23) each of which is hinged at one of its ends (23a) to a respective cross-member of said pair of cross-members (5a, 5b) and a connecting rod (24) secured to said cranks (23) by means of a pair of respective hinges (25), said sheet (6) being secured to said connecting rod (24) at said at least one securing point (21).

4. Folding awning (1) according to claim 3, wherein a resilient element (26) is interposed between said securing point (21) and said connecting rod (24).

5. Folding awning (1) according to claim 1, wherein said kinematic mechanism (22) comprises a resiliently deformable element.

6. Folding awning (1) according to claim 1 or 2 or 3, wherein said tensioning means (20) comprise a tensioning element (27a,b,c) extending in a transverse direction with respect to said cross-members (5a, 5,5b), said tensioning element (27a,b,c) being secured at least at one point to a support structure (1a) for said awning (1).

7. Folding awning (1) according to claim 6, wherein said tensioning element (27a) is formed by a metal cable comprising two opposed ends (28a,b) secured to said structure (1a) by means of two respective constraints (29a,b), at least one of said constraints being of resilient type, said cable (27a) being secured to said at least one securing point (21) for said sheet (6).

8. Folding awning (1) according to claim 6, wherein said tensioning element (27b) is formed by a metal cable comprising two opposed ends (33a,b), one of said ends (33a) being rigidly secured to said support

structure, and the other of said ends (33b) being secured to a counterweight (34), said cable (27b) being secured to said at least one securing point (21) for said sheet (6).

9. Folding awning (1) according to claim 6, wherein said tensioning element (27a) is formed by an elastic cable comprising two opposed ends secured to said structure (1a) by means of two respective rigid constraints, said cable (27a) being secured to said at least one securing point (21) for said sheet (6).

10. Folding awning (1) according to claim 6, wherein said tensioning element (27c) is formed by a rigid profile section movable in a vertical direction orthogonal to said cross-members (5a, 5, 5b) and to said guides (4), said rigid profile section (27c) being secured to said support structure (1a) in the region of its two opposed ends (35a,b) by means of two respective resilient constraints (36a,b), said rigid profile section (27c) being secured to said at least one securing point (21) for said sheet (6).

11. Folding awning (1) according to claim 6, wherein said rigid profile section (27c) comprises a gutter (39) suitable for collecting the water which falls from said drainage channel (12).

12. Folding awning (1) according to one or more of the preceding claims, wherein said sheet (6) comprises a slot (17) extending along said drainage channel (12), a rod-like elongate stiffening element (18) being inserted into said slot (17).

13. Folding awning (1) according to one or more of the preceding claims, wherein said sheet (6) is made of elastic fabric.

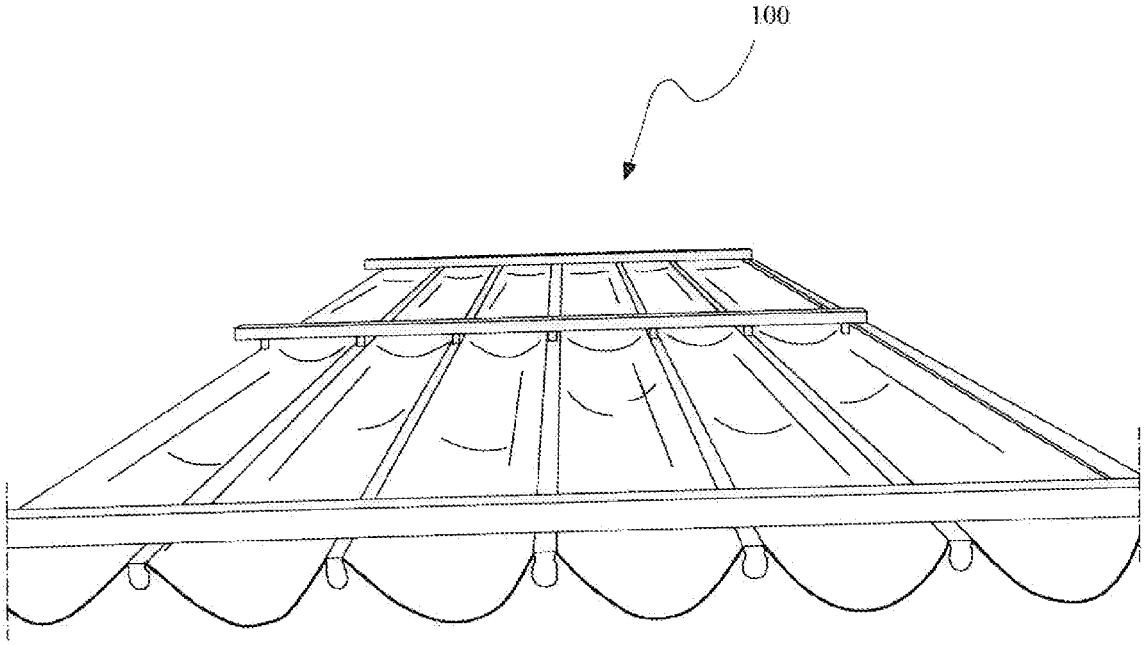

Fig. 1

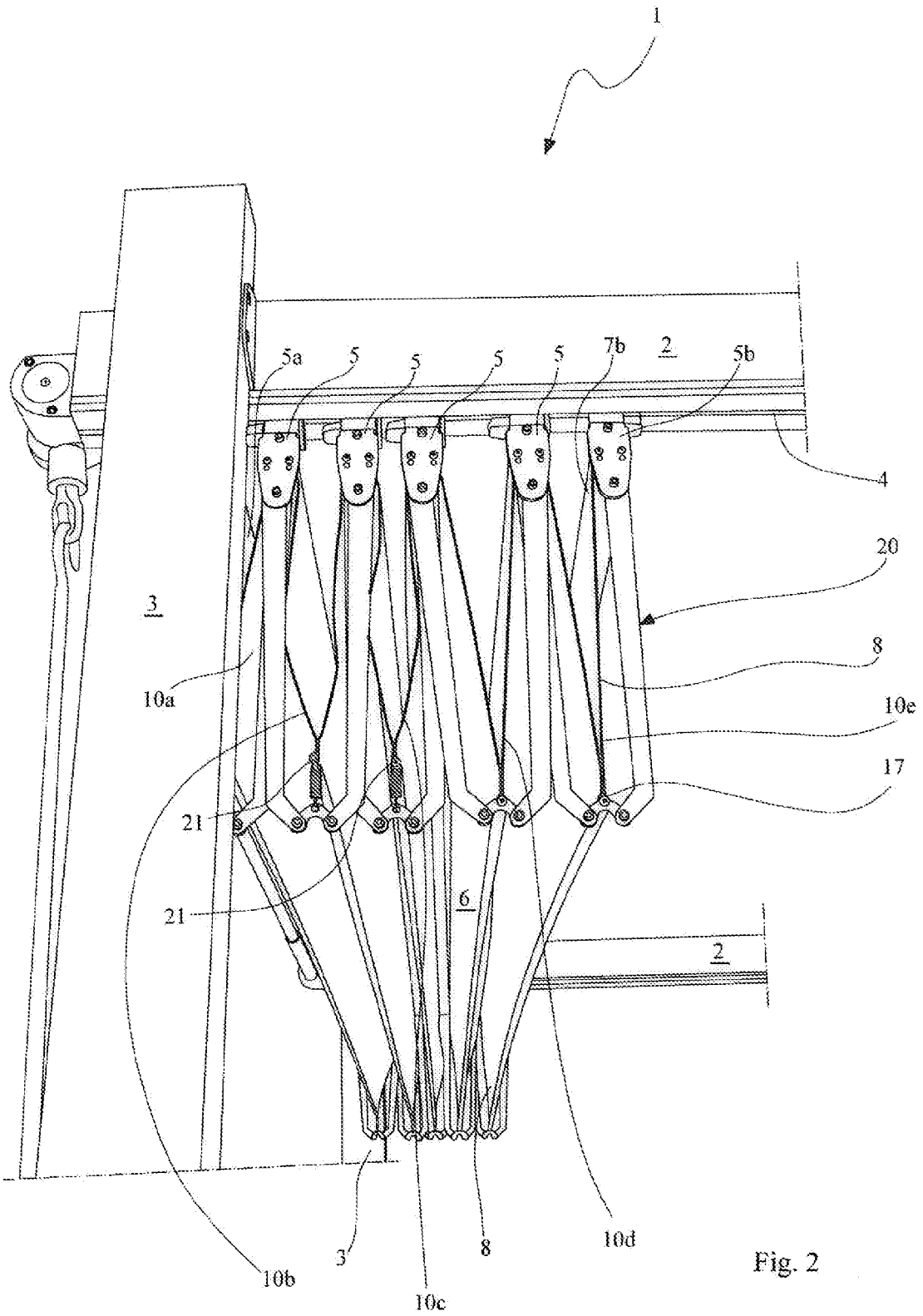

Fig. 2

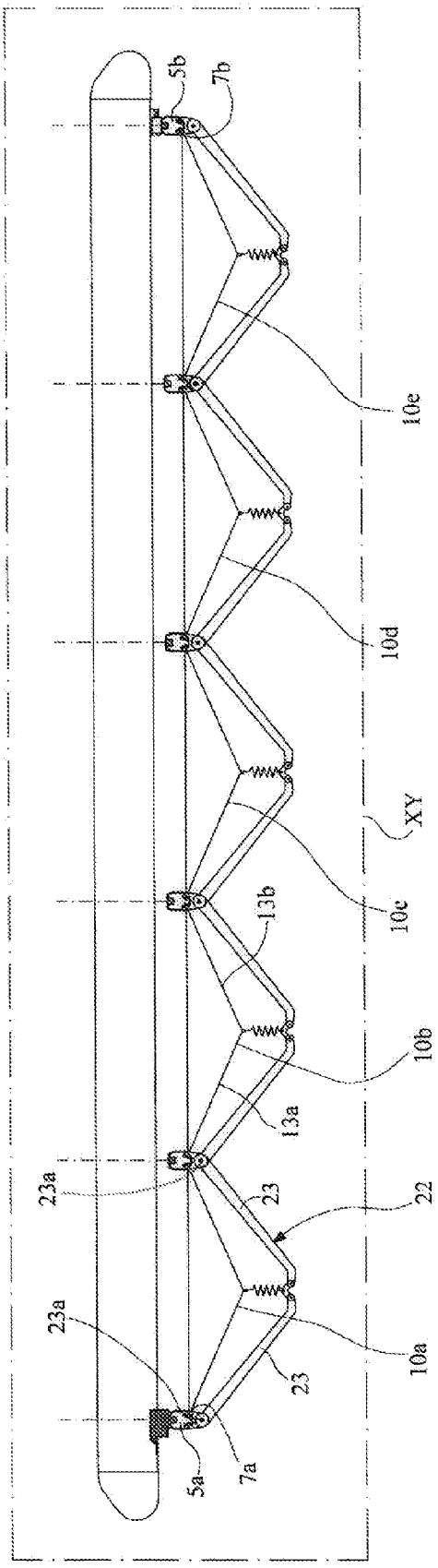

Fig. 3

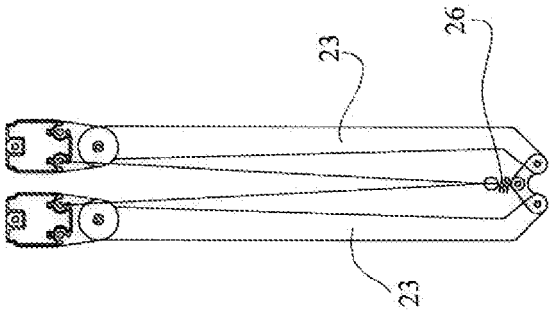

Fig. 5

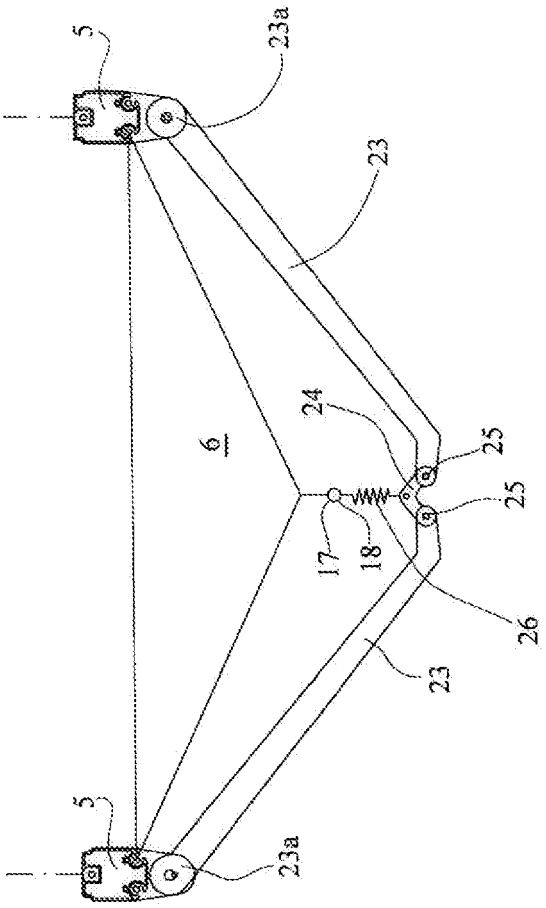

Fig. 4

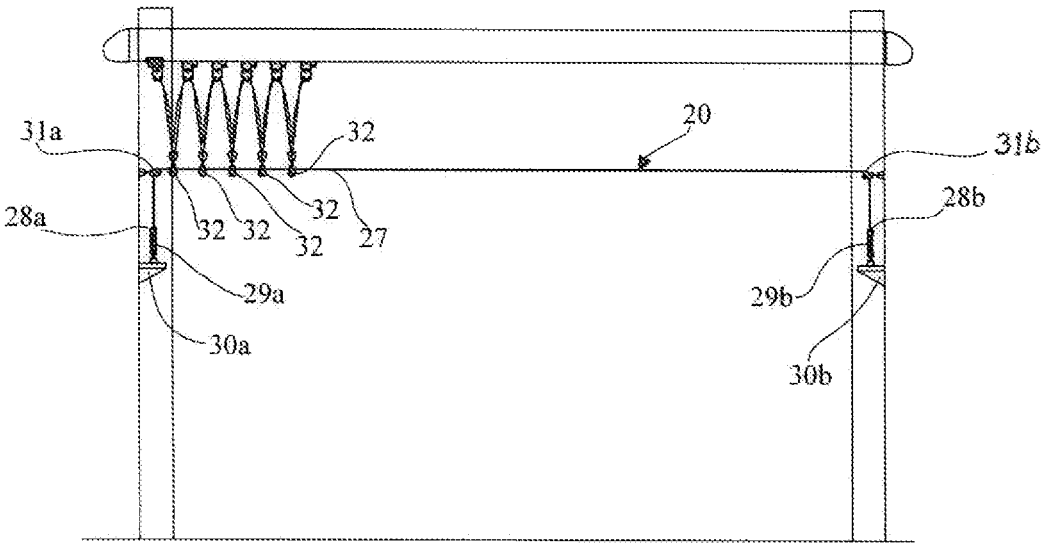

Fig. 6

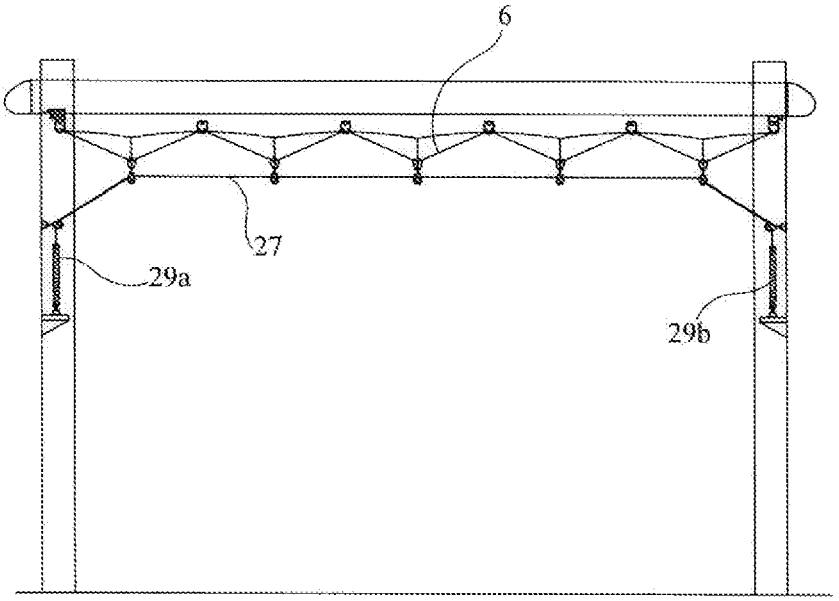

Fig. 7

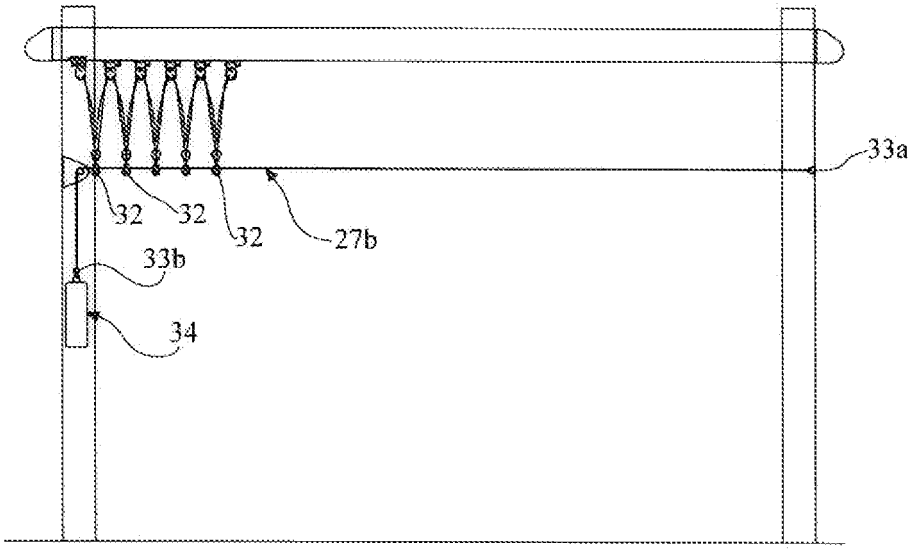

Fig. 8

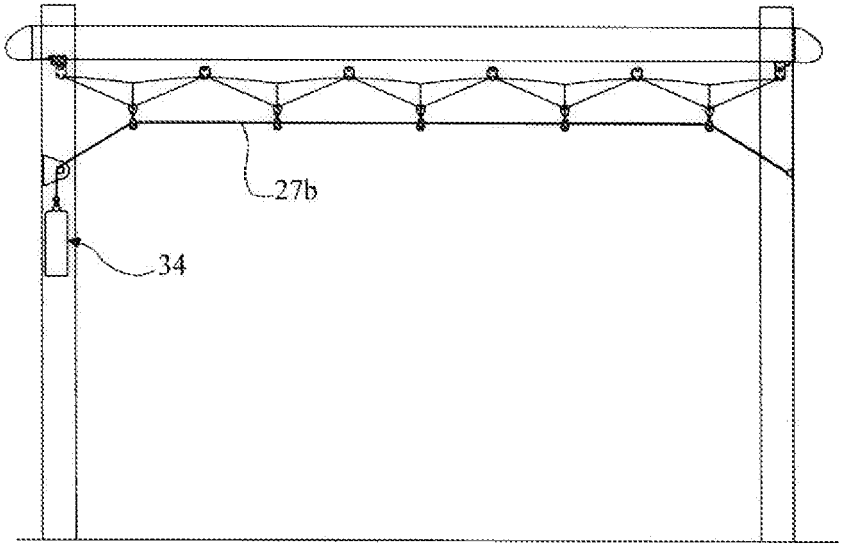

Fig. 9

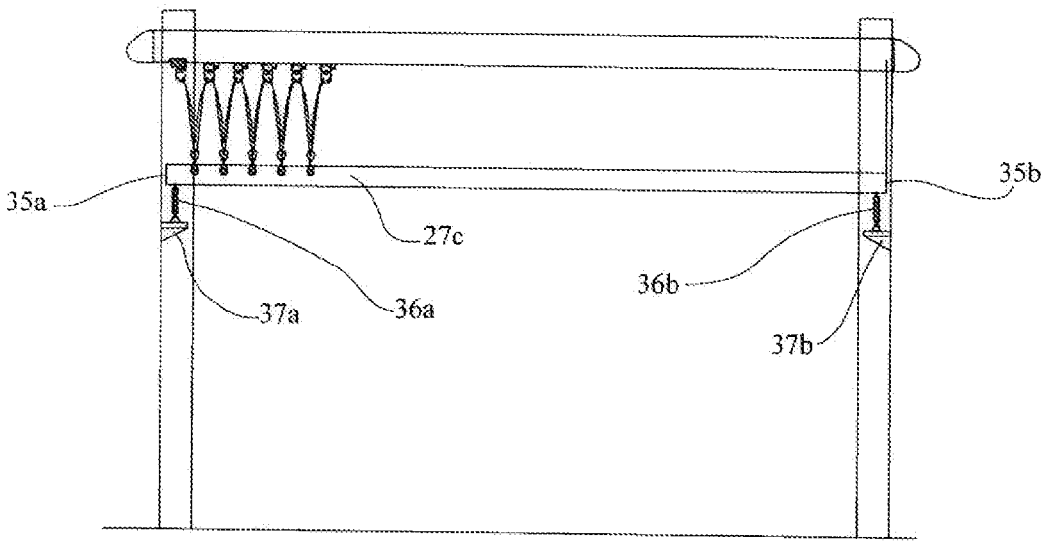

Fig. 10

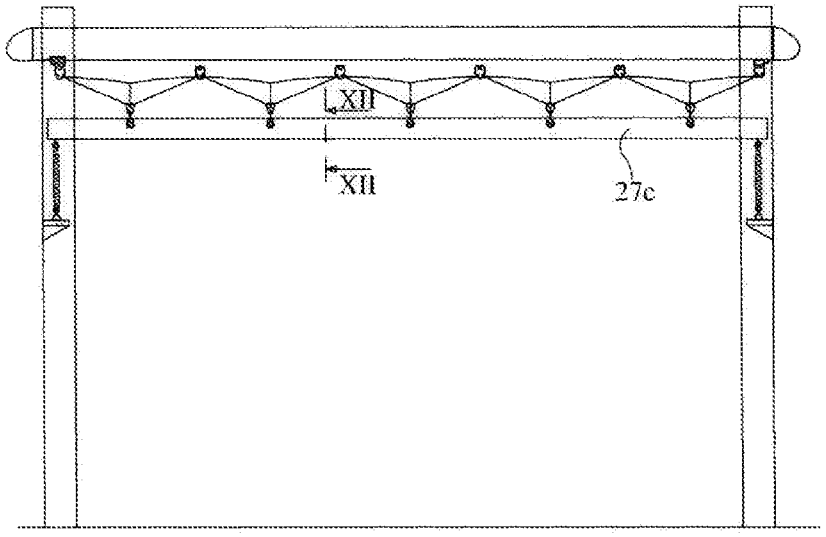

Fig. 11

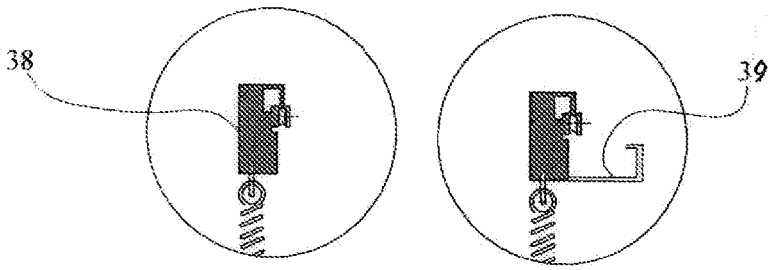

Fig. 12a

Fig. 12b

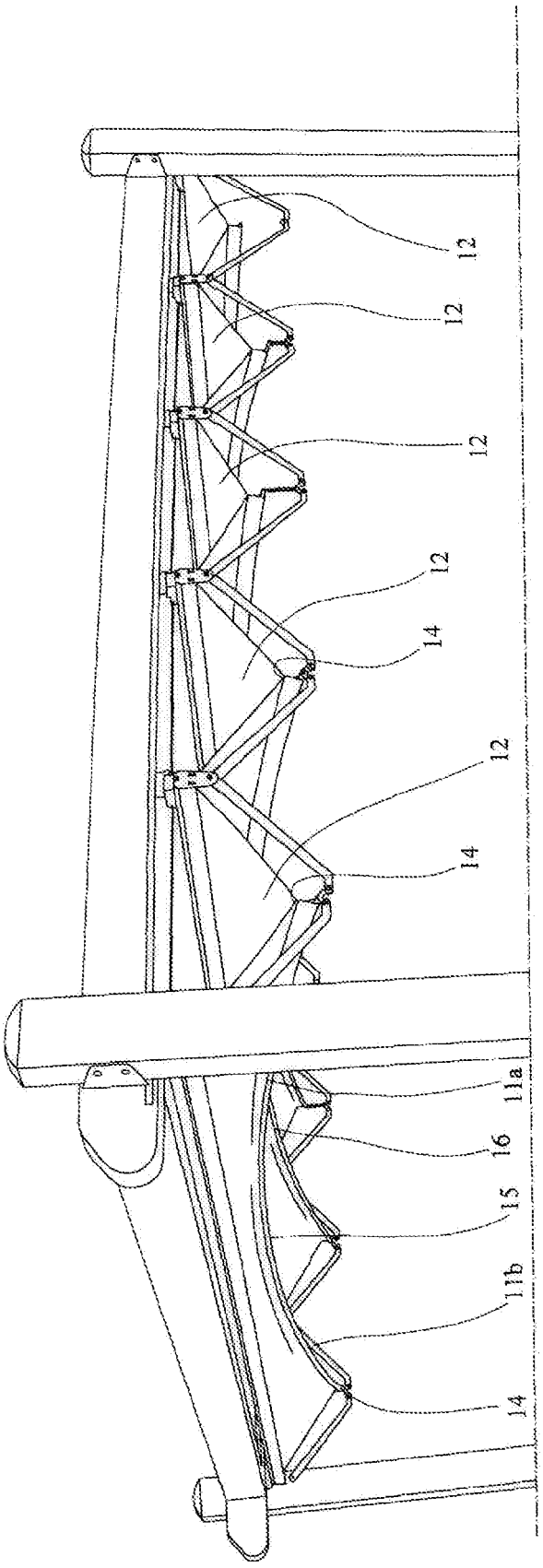

Fig. 13

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EUROPEAN SEARCH REPORT

Application Number
EP 10 17 1894

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2004/003536 A1 (STEFAN ROBERT [DE]) 8 January 2004 (2004-01-08) * the whole document *	1-13	INV. E04F10/02
A	FR 2 840 339 A1 (PEREZ CLAIRE [FR]) 5 December 2003 (2003-12-05) * the whole document *	1-13	
A,P	JP 2010 065513 A (SHIMA SEIKI MFG) 25 March 2010 (2010-03-25) * the whole document *	1-13	

TECHNICAL FIELDS SEARCHED (IPC)

E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 November 2010	Cornu, Olivier

CATEGORY OF CITED DOCUMENTS

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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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29-11-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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FR 2840339 A1	05-12-2003	NONE	
JP 2010065513 A	25-03-2010	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82