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(54) Cover for Scaffolding

(57) Cover (1) for scaffolding (2) arranged in an overhanging position on a building (3) which is undergoing construction work and presenting an upper peripheral edge (4), the cover (1) being provided with a support frame (9) which can be coupled to a top (8) of the tubular scaffolding (2) itself, and an inclined covering shelf (10), which is connected in such a way that it may be selectively disengaged from the frame (9), and which extends starting from at least the upper peripheral edge (4) into space and at least beyond the tubular scaffolding (2).

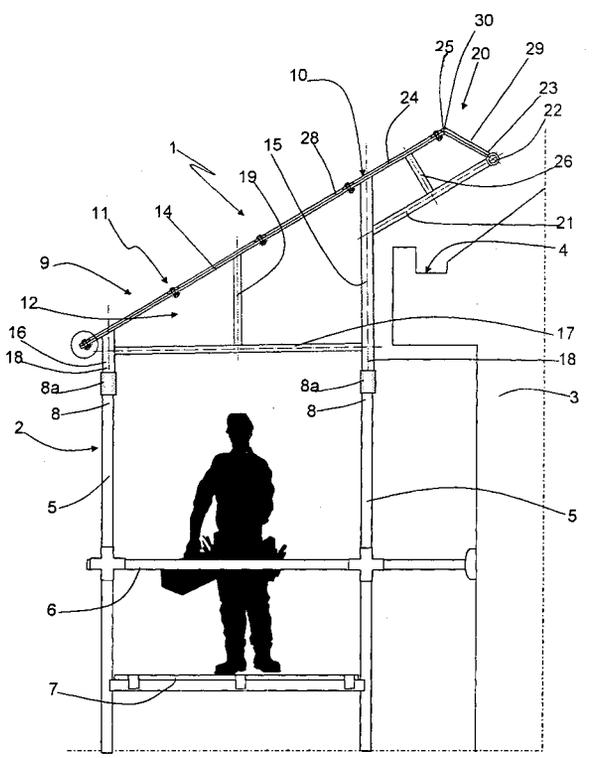

Fig. 1

EP 1 460 202 A1

Description

[0001] The present invention relates to a cover for scaffolding.

[0002] In the construction field, scaffolding is assembled on the ground in front of a building which is undergoing restructuring or other kinds of work and either connects a series of linear tubular metallic sections to each other or a number of prefabricated frames, which are anchored to the building itself in such a way as to create a complex structure on several working levels which extend from the ground to at least a top of the building.

[0003] In scaffolding of the type which has just been described above, the cover of the tubular scaffolding itself is arranged substantially in correspondence with the top of the building, and is generally defined by the last working level, which functions as a cover. This kind of cover, however, presents some disadvantages which, briefly, may be summed up in its inadequate capacity to provide protection from atmospheric agents, above all rainfall, and its inadequate capacity to provide drainage of the rainfall itself and, finally, considering that usually this last working level is normally in an exposed position in relation to an outline of the building, in the sail effect that such a last working level can exercise on the entire scaffolding above all when air currents, even of moderate intensity, occur.

[0004] The aim of the present invention is to produce a cover for scaffolding, which will be able to provide effective protection from atmospheric agents such as rainfall for the tubular scaffolding beneath it and which will also be able to provide drainage and will, above all, guarantee the static and dynamic safety of the relative tubular scaffolding even when air currents of considerable intensity occur.

[0005] According to the present invention a cover for scaffolding will be produced which is arranged in an overhanging position on a building which is undergoing construction work and presenting an upper peripheral edge, the cover being characterised by the fact that it comprises a support frame which may be coupled to a top of the tubular scaffolding itself, and an inclined covering shelf, which is connected in such a way that it may be selectively disengaged from the said frame, which extends starting from at least the upper peripheral edge into space and at least beyond the tubular scaffolding.

[0006] The present invention will now be described with reference to the attached drawings, which illustrate some non-limiting forms of embodiment of the present invention, and in which;

- FIGURE 1 illustrates, with some parts removed for reasons of clarity, a first preferred form of embodiment of a cover for scaffolding;
- FIGURE 2 illustrates, on an enlarged scale and with some parts in section and some parts removed for reasons of clarity, a detail of the cover shown in FIGURE 1;
- FIGURE 3 is a plan view from above, with some parts removed for reasons of clarity, of the cover shown in FIGURE 1;
- FIGURE 4 is a plan view from above, with some parts removed for reasons of clarity, of a second preferred form of embodiment of the cover shown in FIGURE 1;
- FIGURE 5 is a plan view from above, with some parts removed for reasons of clarity, of a third preferred form of embodiment of the cover shown in FIGURE 1;
- FIGURE 6 is a perspective view from above, with some parts removed for reasons of clarity, of a fourth preferred form of embodiment of the cover shown in FIGURE 1;
- FIGURE 7 is a perspective view from above of a detail shown in FIGURE 6,; and
- FIGURES 8 and 9 are views on a reduced scale and, respectively, a lateral elevation view and a perspective view of an application of the cover shown in FIGURES 6 and 7.

[0007] With reference to FIGURE 1, the number 1 refers to a cover in its entirety for scaffolding 2.

[0008] The scaffolding 2 is frontally anchored to a building 3, which is undergoing construction work, and presents an upper peripheral edge which is defined, as in the example illustrated, by a gutter channel. The scaffolding 2 comprises a number of vertical piers 5, which are placed at regular intervals with equal modular spans, usually equal to 1.8 metres, and they are connected to each other by means of horizontal braced stringers 6 in order to support a number of working levels 7 which are arranged at substantially regular intervals one from the other. The piers 5 present respective base portions (which are not illustrated) which are connected to the ground by means of pins or strips, and respective top portions 8 which are connected to the cover 1, and which are constrained to the cover 1 itself by means of joints 8a of a well-known type.

[0009] The cover 1 comprises a support frame 9 which is mounted on and constrained to the portions 8, and an inclined covering shelf 10, which is connected in such a way that it may be selectively disengaged from the frame 9, and which extends starting from at least the channel 4 into space and at least beyond the scaffolding 2.

[0010] Finally, the cover 1 comprises a dynamic connecting device 11, which is interposed between the frame 9 and the shelf 10 themselves in order to connect the frame 9 and the shelf 10 to each other in such a way that they may be dynamically disengaged from each other.

[0011] According to the illustration which is shown in FIGURE 3, the frame 9 comprises two lateral walls 12 which are arranged at a distance one from the other which is equal to the above-mentioned modular span, and a number of connecting strap irons 13, which con-

nect the two walls 12 and which are transverse to the two walls 12 themselves.

[0012] The walls 12 are produced by means of linear elements which are connected to each other, and each comprises an upper cross member 14 which is connected to the cross member 14 of the other wall 12 by means of the strap irons 13, and two linear tubular base elements 15 and 16, which are engaged in the piers 5, and of which the element 15 presents a length which is greater than a length of the element 16, and is arranged directly facing the building 3. Furthermore, each wall 12 comprises a respective lower cross member 17, which is arranged transverse to the relative elements 15 and 16, and is firmly connected to both the relative elements 15 and 16 in order to define, furthermore, a respective lower engaging portion 18 for mounting the cover 1 onto the scaffolding 2 and anchoring the cover 1 by means of the joints 8a.

[0013] Finally, each wall 12 comprises an intermediate linear tubular element 19, which is interposed in an intermediate position between the relative elements 15 and 16 parallel to the elements 15 and 16, and which connects the cross members 14 and 17 to each other.

[0014] The different lengths of the elements 15 and 16 confer on the walls 12 an external perimeter shape which is substantially trapezoid, and impose on the relative cross member 14 a determined inclination into space, or rather opposite the building 3, and in relation to the relative cross member 17.

[0015] Furthermore, the frame 9 comprises a projecting portion 20, which is firmly connected to the elements 15 in order to extend opposite the elements 16 in relation to the elements 15 themselves in such a way as to be arranged at least beyond the channel 4, and comprising two tubular uprights 21 which are parallel to the cross members 14, and a tubular support rod 22 which is transverse to the uprights 21 and which is integral with a top edge 23 of the shelf 10. The uprights 21 are engaged on one side by the elements 15 and on the opposite side by the rod 22, which is in turn connected to a terminal end portion 24 of each of the cross members 14. In particular, each portion 24 extends in such a way as to project beyond the relative element 15, and presents a respective elbow 25, which makes the relative cross member 14 and also the shelf 10 curve towards the rod 22.

[0016] Finally, the portion 20 comprises, for each upright 21, a reinforcing element 26 which is arranged along the relative upright 21 transverse to the upright 21 itself, and integral with both the latter and with the relative portion 24.

[0017] The inclined covering shelf 10 is produced by means of a continuous sheet of waterproof material, and is suitable for being rolled up into a sheltering configuration around the rod 22, as it is also suitable for being arranged in an operational shielding position, with the respective lateral edges 27 along the cross members 14 and in contact with the cross members 14 themselves and constrained thereto by the device 11.

[0018] The shelf 10 comprises a main surface 28 which extends into space in order to cover the scaffolding 2 from above, a secondary inclined surface 29 opposite the surface 28 and which extends beyond the channel 4, and a separating ridge 30 between the two surfaces 28 and 29 identified by the elbows 25, which are arranged substantially in a vertical position on the channel 4 permitting the shelf 10 itself to cover and shield completely the scaffolding 2 from bad weather. In particular, the double surface configuration of the shelf 10, with the surface 28 being of a greater extension in comparison with the surface 29, not only permits the protection of the scaffolding 2 from atmospheric precipitations, but also permits the drainage of such precipitations both towards the channel 4 and towards the outside of the scaffolding 2 itself thus avoiding the necessity to interrupt the construction work in progress.

[0019] When air currents occur which effect the shelf 10, at least the surface 28 tends to exert a bearing force on the entire cover 1, and such force may be conflicted up until a certain safety value both by the weight of the cover 1 itself, as well as by the joints 8a. Once this safety value is surpassed, or rather when a value of the bearing force on the shelf 10 is surpassed, the dynamic connecting device provides for disengaging the shelf 10 from the cross members 14.

[0020] The device 11 is shared by the two walls 12 and by the shelf 10, and, as is better illustrated in FIGURE 2, it comprises, for each cross member 14, a number of pins 31 which are provided with respective blocking heads 32, and, for each edge 27 of the shelf 10, a ceding ring 33 which is engaged to a relative pin 31 in such a way that it may be disengaged from it. In particular, the ceding capacity of the rings 33 is determined by the elasticity of the material from which the rings 33 themselves are made, or by a geometrical conformation of the rings 33 themselves, in relation to the relative heads 32. For example, each ring 33 together with the relative head 32 may be configured as a common, well-known type of pressure fastener. In any case, however, the ceding capacity of the rings 33 determines the maximum bearing force which may be supported by the shelf 10 before it becomes detached from the cross members 14 remaining hooked to the frame 9 only along its own top edge 23 in correspondence with the rod 22.

[0021] Each pin 31 is mounted along the cross member 14 transverse to the cross member 14 itself, and comprises a tubular body 34 which is mounted in a respective passing hole 35 which is obtained through the cross member 14, and a blocking screw 36 which is arranged on an opposite end of the body 34 in relation to that which corresponds to the relative head 32 in order to axially block the body 34 itself in relation to the relative hole 35.

[0022] When in use, the cover 1 is mounted onto the scaffolding 2 in such a way that, as has already been described, the secondary surface 29 extends beyond

the channel 4 of the building 3, and the main surface 28 presents its own overhang into space, or rather towards the external part of the scaffolding 2 itself. The equality of the distance of the walls 12 from the cover 1 and the span of the intervals of the scaffolding 2 is, as aforementioned, a modular measurement in the scaffolding field, and it renders the operations of mounting and anchoring much simpler and faster. Nonetheless, in the case of particular applications, the distance between the two walls 12 may also be of a different measurement in relation to that which has already been described: in such cases, it is sufficient to modify the length of the strap irons 13 and the rod 22.

[0023] Once the cover 1 has been anchored to the scaffolding 2 by means of the joints 8a, the shelf 10 is unrolled from its sheltering configuration around the rod 22 into its operational shielding position, in which the respective edges 27 are arranged along the cross members 14 and in contact with the cross members 14 themselves. During the unrolling operation, the rings 33 are force fit onto the relative pins 31 in such a way as to constrain the shelf 10 to the frame 9.

[0024] In the case of bad weather, the shelf 10 will completely shield all the scaffolding below it, and the position of the surface 29 in relation to the channel 4 will impede any eventual infiltrations between the scaffolding 2 and the building 3 in such a way as to further increase the protection capacity of the cover 1.

[0025] Instead, in the case of the occurrence of air currents or wind, the bearing force exerted by the shelf 10 on the cover 1 is maintained within the safety limits for the scaffolding 2 by means of the passive and dynamic action of the device 11, the rings 33 of which become disengaged from the relative pins 31 once a determined value of the bearing force itself has been surpassed. This value is also influenced by the kind of material from which the shelf 10 is made, in that when the weight of the material is increased, such a value may also be increased.

[0026] According to a form of embodiment which is not illustrated but which is easily understandable from what has been described above, the rod 22 may also be provided with an automatic rolling device which is suitable for rolling the shelf 10 around the rod 22 itself in such a way that it may be controlled by an operator in order to recover the shelf 10, or in such a way that it is not controlled, or rather whenever the shelf 10 is completely detached from the cross members 14 due to the dynamic action of air currents or wind.

[0027] The form of embodiment which is illustrated in FIGURE 4 refers to a cover 1' which is similar to the cover 1, from which the cover 1' differs due to the fact that the inclined covering shelf 10 is not made by means of a continuous sheet of waterproof material, but comprises a number of tapes 40 made of waterproof material.

[0028] The tapes 40 are arranged parallel in relation to each other and in series with the respective lower lateral edges 41 which rest on the two cross members 14. Furthermore, each tape 40 presents a respective longitudinal sheltered edge 42 which is constrained to the cross members 14 in correspondence with the relative edges 41, and a respective exposed edge 43, which is superimposed on the edge 42 of the adjacent tape 40 which is nearest to the ridge 30, and is constrained, in such a way that it may be disengaged, to the cross members 14 themselves in correspondence to the relative edges 41 themselves.

[0029] In particular, in this application of the cover 1', each pin 31 presents an upper portion 44 which is defined as has already been described and which is connected to the edge 43 together with the upper portion 44 of the corresponding pin 31 of the opposite cross member 14 in order to free the edge 43 itself, and a lower portion 45 which is connected to the edge 42 together with the lower portion of the corresponding pin 31 of the opposite cross member 14 in order to block the edge 43 itself. The lower portion 45 comprises an annular flange (which is not illustrated), which is integral with and transverse to the body 34, and which is arranged opposite the edge 43 in relation to the cross member 14 in order to block the edge 43 itself onto the cross member 14 itself.

[0030] In this way, in the case of the activation of the cover 1', or rather in the case of an excessive bearing force on the tapes 40, the edges 43 become disengaged from the cross members 14, and the relative tapes 40 can freely unfold, thus reducing the bearing force on the entire shelf 10 to within acceptable safety values.

[0031] The form of embodiment which is illustrated in FIGURE 5 refers to a cover 1 " which is similar to the cover 1, from which the cover 1" differs due to the fact that the frame 9 comprises a further strap iron 13a, which is integral with and transverse to the cross members 14, and which is arranged in correspondence with the opposite end of the cross members 14 themselves in relation to the ridge 30.

[0032] Furthermore, in the case of the cover 1", the dynamic connecting device 11 is still interposed between the frame 9 and the shelf 10, but it is shared by only one outlet edge 50 of the shelf 10 and by the strap iron 13a.

[0033] The form of embodiment which is illustrated in FIGURE 6 refers to a cover 1'" which is similar to the cover 1, 1' and 1", from which it differs due to the fact that the inclined shelf 10 is produced by means of three tapes 40'" which are made of waterproof material, each of which presents a longitudinal shielded edge 42'" which is anchored in removable fashion to a respective strap iron 13a '", and a longitudinal exposed edge 43'" which is superimposed on the edge 42'", and which is anchored, in such a way that it may be uncoupled, to the same strap iron 13a by means of the interposition of the dynamic connecting device 11 in the configuration described for the cover 1", or rather which is produced by means of a number of pins 31 which are arranged

one after the other along each strap iron 13a "'.

[0034] Each pin 31 blocks the edge 42 "' of a tape 40"' to a strap iron 13a"', and permits the safety hooking to the same strap iron 13a"' of the edge 43"' of the adjacent tape 40 "'.

[0035] In the form of embodiment which concerns the cover 1"', the elements 19 are no longer tubular elements, but are produced by means of linear outlines and, furthermore, the elbow 25 disappears in order to be replaced by a more curved outline of the tape 40"' which is positioned therein, and, as is better illustrated in FIGURE 7, each upright 21, each element 26 and, above all, the terminal end portion 24 of each cross member 14 are replaced by a terminal end portion 24"' which is of a curved shape, and which is coupled to the relative cross member 14 in such a way that it may be uncoupled.

[0036] Furthermore, the two terminal portions 24"' are connected to each other by means of a strap iron 13a in order to block a first tape 40a"' of the three tapes 40"', the relative longitudinal exposed edge 43"' of which is superimposed on a second tape 40b "' of the three tapes 40"' and is blocked onto the strap iron 13a"'. A third tape 40c"' of the three tapes 40"' presents, in its turn, a relative edge 42"' which is inserted in fixed fashion between the strap iron 13a "' and the edge 43"' of the second tape 40b "', and the relative edge 43"' is coupled to the strap iron 13a as in the example which is illustrated n FIGURE 5.

[0037] The two terminal portions 24 "' and the relative strap iron 13a"' define a projecting portion 20"', which may be constrained to the rest of the frame 9, thus permitting the creation of a modular cover 1 "', which is a further alternative form of embodiment of the covers which have been described above, and which permits, as is better illustrated in FIGURES 8 and 9, the construction of a roof 100 with two surfaces, which completely covers a roof 101 of the building 3, and which permits the combination between themselves in modular fashion of two scaffoldings 2 which are arranged opposite the building 3 itself in such as way as to ensure for each modular cover 1"' the same characteristics of static and dynamic sealing even in the case that air currents occur.

[0038] In the case of the roof 100, the modular covers 1"" are supported by a number of inclined uprights 102 for each surface of the roof 100 itself, and they are arranged in correspondence with the ridge of the roof 100 itself and are connected to each other by means of respective connecting portions 24"" which are substantially identical to the portions 24"'.

[0039] In conclusion, and with specific reference to the pins 44, it is possible, in some applications, to produce the rings 33 in magnetic or magnetised material and to replace the heads 32 with plates made of ferrous-magnetic material, or replace the rings 33 and the heads 32 with respective pairs of strips of Velcro.

[0040] It is intended that the present invention should not be limited to the forms of embodiment herein described and illustrated, which are to be considered as examples of forms of embodiment of a cover for scaffolding, and which might instead be subject to further modifications relating to the shape and disposition of the parts and to details pertaining to construction and assembly.

Claims

1. Cover (1) (1') (1") (1"') (1"") for scaffolding (2) arranged in an overhanging position on a building (3) which is undergoing construction work and presenting an upper peripheral edge (4), the cover (1) (1') (1") (1"') (1"") being **characterised by** the fact that it comprises a support frame (9) which may be coupled to a top (8) of the tubular scaffolding (2) itself, and an inclined covering shelf (10), which is connected in such a way that it may be selectively disengaged from the said frame (9), which extends starting from at least the upper peripheral edge (4) into space and at least beyond the tubular scaffolding (2).

2. Cover according to Claim 1, **characterised by** the fact that it comprises dynamic connecting means (11), which are interposed between the support frame (9) and the inclined covering shelf (10) in order to connect, in such a way that it may be dynamically disengaged, the inclined covering shelf (10) to the support frame (9) itself so that it functions in the capacity of a bearing force for the inclined shelf (10).

3. Cover according to Claim 2, **characterised by** the fact that the support frame (9) comprises two lateral walls (12) with a substantially trapezoid peripheral shape, and a number of connecting strap irons (13) between the two lateral walls (12) themselves; each lateral wall (12) being provided with a respective cross member (14), which is connected to the cross member (14) of the other wall by means of the said strap irons (13).

4. Cover according to Claim 3, **characterised by** the fact that the said dynamic connecting means (11) are shared by the frame (9) and the inclined covering shelf (10).

5. Cover according to Claim 4, **characterised by** the fact that the said dynamic connecting means (11) are shared by the said two lateral walls (12) and the inclined covering shelf (10), and are arranged along the said two cross members (14) and along two opposite lateral edges (27) of the inclined shelf (10) itself.

6. Cover according to Claim 4, **characterised by** the

fact that the said dynamic connecting means (11) are shared by one of the said strap irons (13a) and the inclined covering shelf (10), and are arranged along an outlet edge (50) of the inclined shelf (10) itself.

7. Cover according to Claims 5 or 6, **characterised by** the fact that the said dynamic connecting means (11) comprise, for each cross member (14) a number of pins (31) which are provided with respective blocking heads (32), and, for each lateral edge (27), a ceding ring for each pin (31) which is engaged in such a way that it may be disengaged from the pin (31) itself.

8. Cover according to any of the preceding Claims from 3 to 7, **characterised by** the fact that the said lateral walls (12) are produced by means of linear tubular elements (15) (16) (17) (19) which are connected to each other and to the relative cross members (14), and each present two linear tubular base elements (15 16), a first tubular base element (15) of which presents a length which is greater than a length of a second tubular base element (16), and faces the said building (3).

9. Cover according to Claim 8, **characterised by** the fact that the said support frame (9) comprises a projecting portion (20), which is connected to the first linear tubular elements (15) and which extends opposite the second tubular elements (16) in relation to the first tubular elements (15) in order to be arranged at least beyond the upper peripheral edge (4) of the building (3); the projecting portion (20) comprising a support rod (22) which is transverse to the said two cross members (14) and integral with a top edge (23) of the inclined covering shelf (10).

10. Cover according to claim 9, **characterised by** the fact that the said two cross members (14) extend beyond the relative first linear tubular base elements (15) and present a relative elbow (25) for being connected to the said rod (22).

11. Cover according to Claim 10, **characterised by** the fact that the said inclined covering shelf (10) is made of sheet material which is suitable for being rolled in a sheltering configuration around the said support rod (22).

12. Cover according to Claim 10, **characterised by** the fact that the said inclined covering shelf (10) comprises a number of tapes (40) made of waterproof material which are arranged one after the other along the said two cross members (14), and presenting a respective shielding edge (42) which is constrained to the cross members (14) themselves, and a respective exposed edge which is constrained in such a way that it may be disengaged from the cross members (14) themselves by means of the said connecting means (11).

13. Cover according to Claim 11, **characterised by** the fact that the said elbows (25) define on the inclined covering shelf (10) a separating ridge (30) between a main surface (28) which extends into space and a secondary surface (29) which is suitable for extending beyond the said upper peripheral edge (4).

14. Cover according to Claim 11, **characterised by** the fact that the said support frame (9) is a modular frame (9) of a standard width and equal to a base module of the tubular scaffolding (2).

15. Cover according to Claim 8, **characterised by** the fact that the said support frame (9) comprises a projecting portion (20'''), which is connected in such a way that it may be uncoupled from the first linear tubular elements (15) and which extends opposite the second linear tubular elements (16) in relation to the first linear tubular elements (15) themselves.

16. Cover according to Claim 15, **characterised by** the fact that the support frame (9) is not provided with the relative projecting portion (20''') which may be uncoupled and defines a modular cover (1''') which may be connected to further modular covers (1''') in order to create a roof (100) with two connecting surfaces between two scaffoldings (2).

17. Cover according to Claims 8 or 15, **characterised by** the fact that the said inclined covering shelf comprises a number of tapes (40''') made of waterproof material which are arranged one after the other along the said two cross members (14), and presenting a respective longitudinal edge (42''') which is constrained to a respective strap iron (13a'''), and a respective exposed edge (43 ''') which is constrained in such a way that it may be disengaged from a further respective strap iron (13a''') by means of the said connecting means (1).

18. Cover according to Claim 17, **characterised by** the fact that the said dynamic connecting means (11) are shared by each strap iron (13a''') interesting a relative exposed edge (43'''), and are arranged one after the other along the strap iron (13a''') itself.

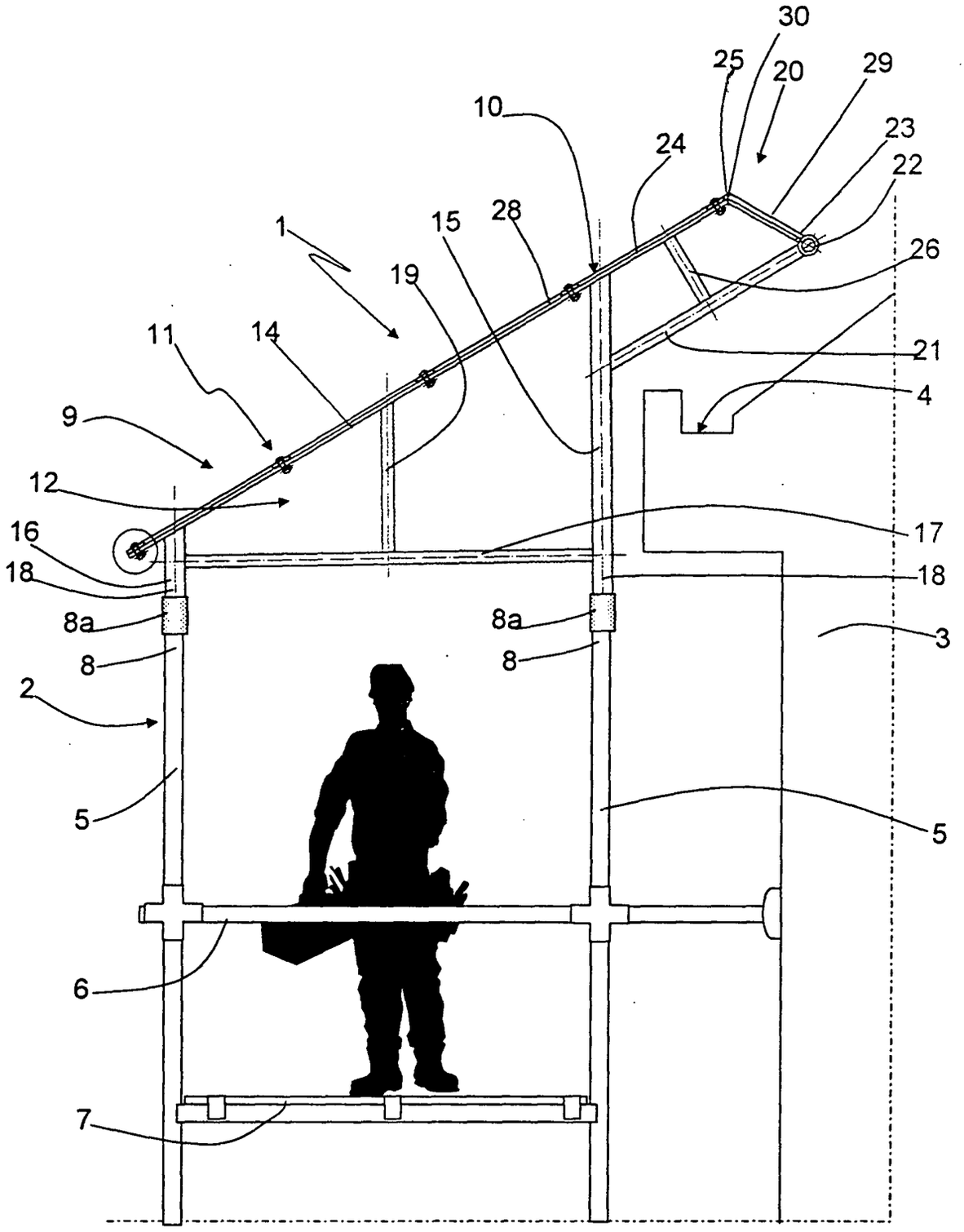
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Fig. 1

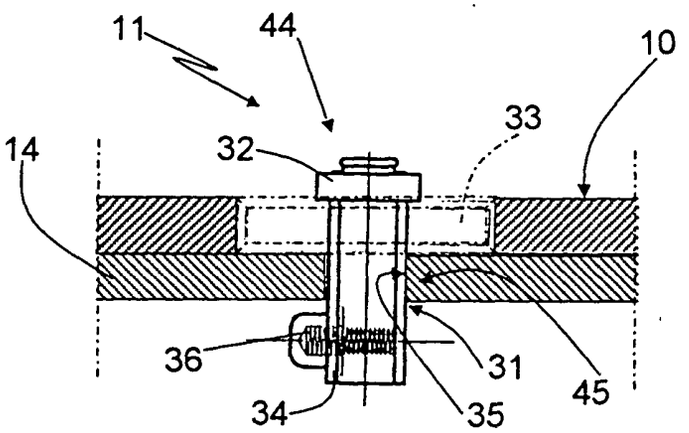

Fig. 2

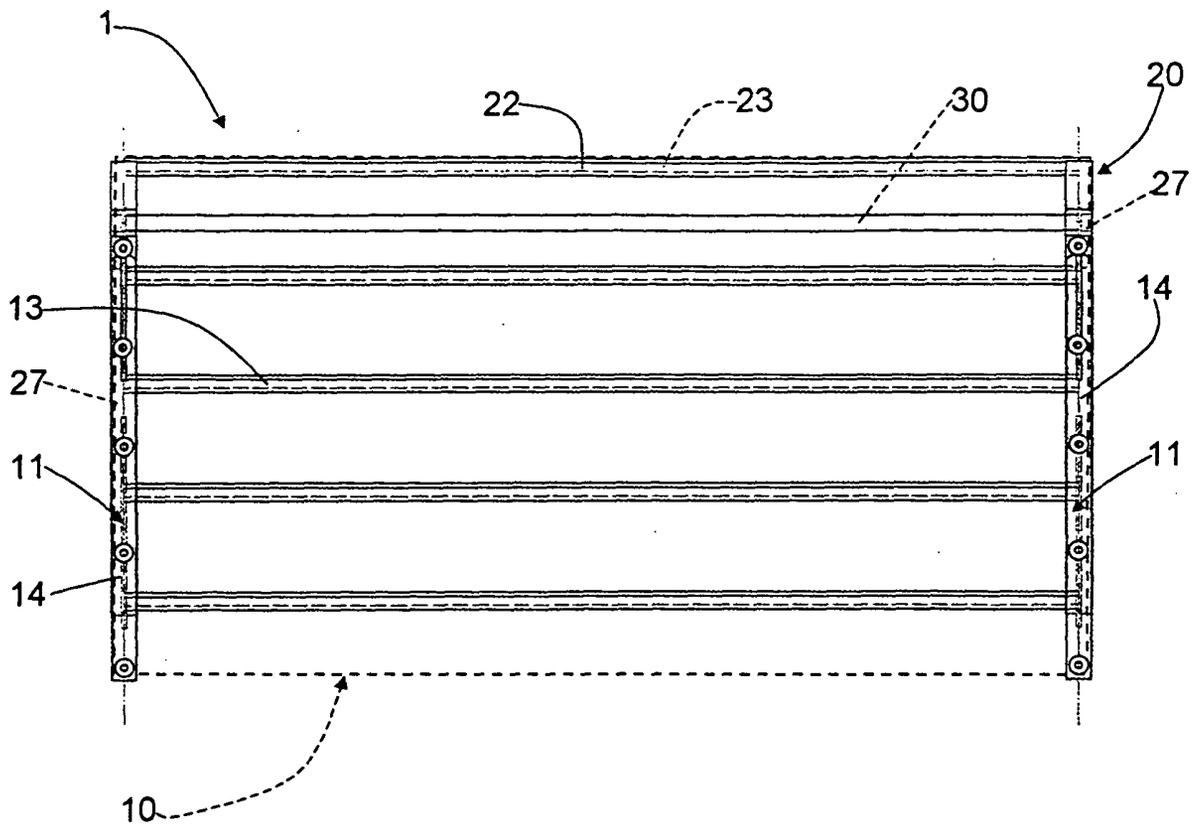

Fig. 3

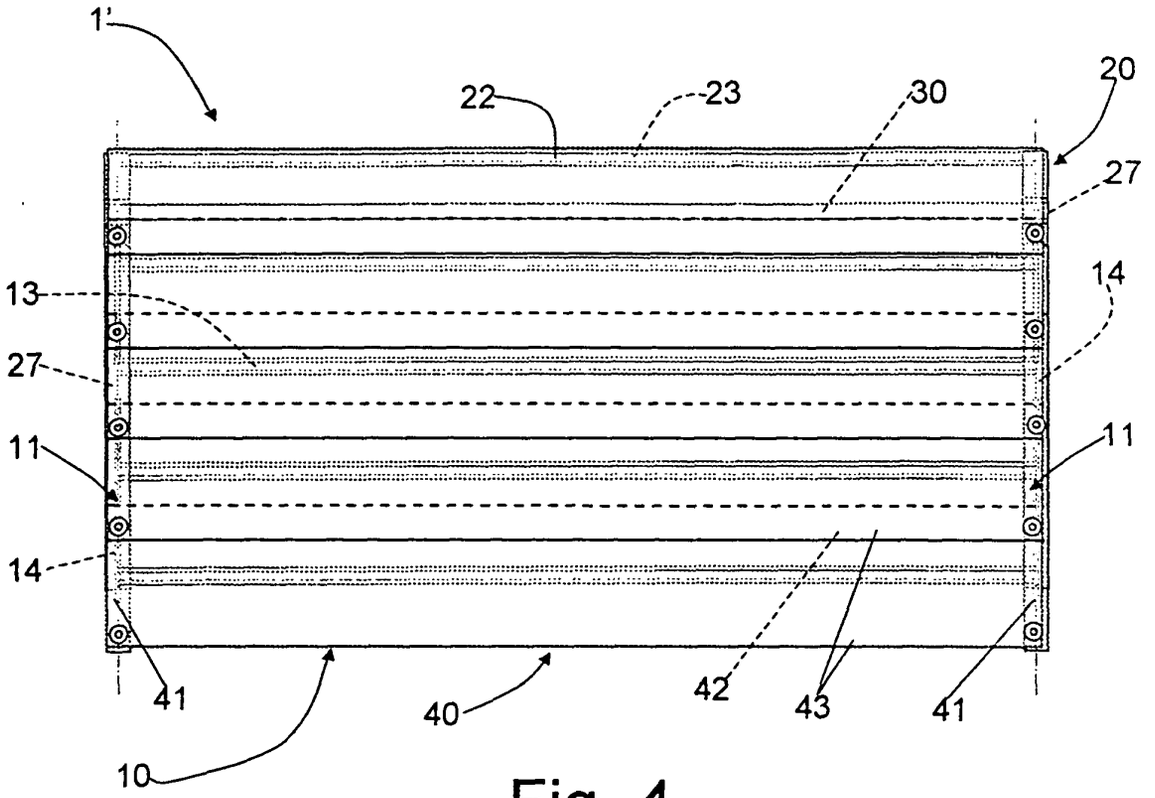
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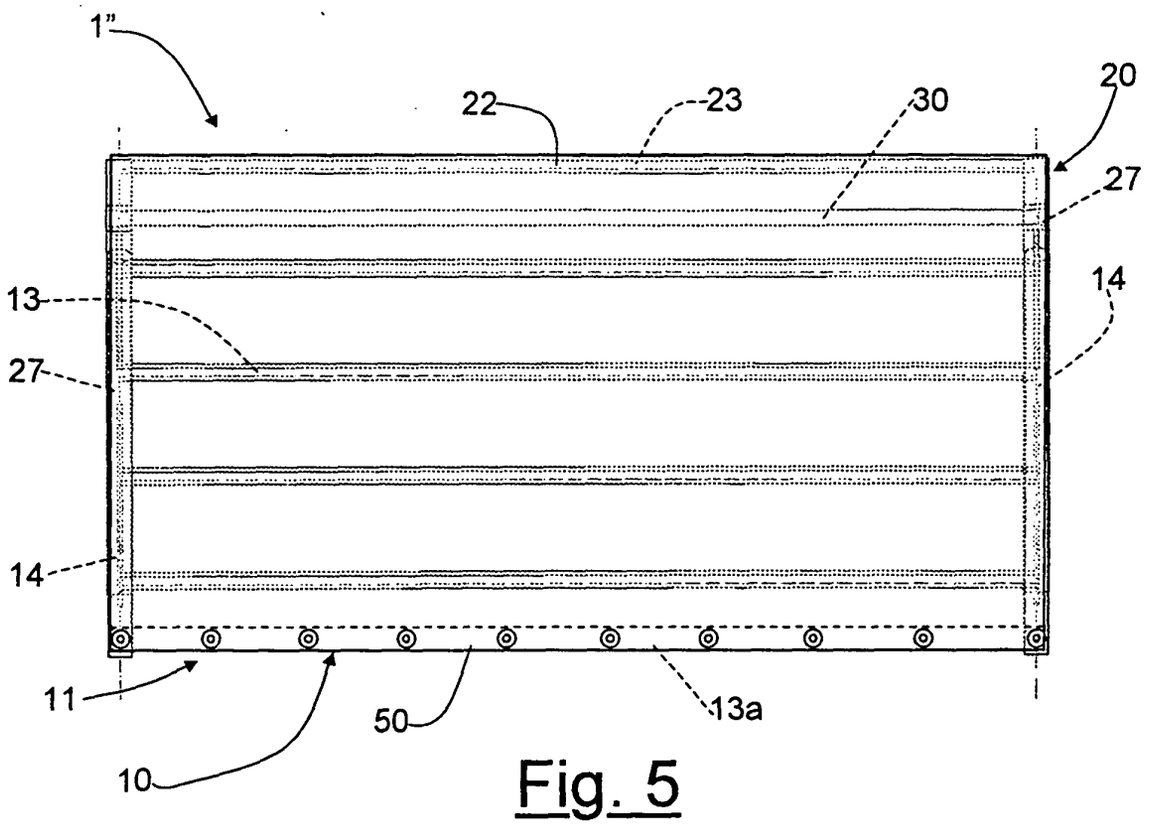
Fig. 4


1"
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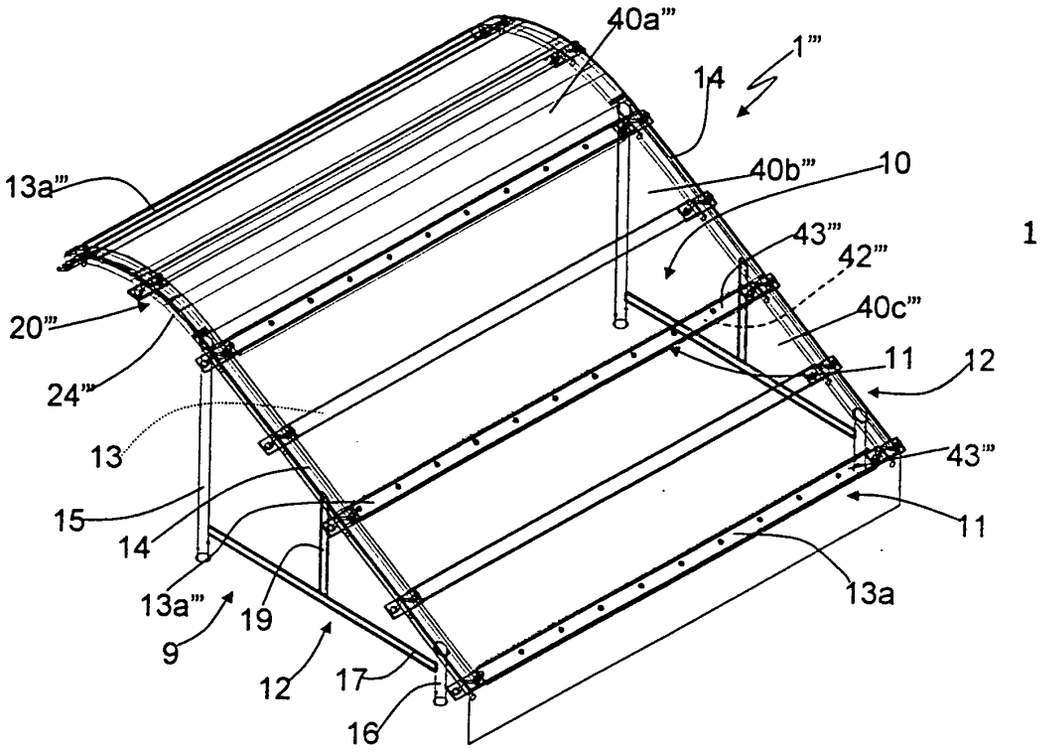
13a
10

Fig. 5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40b'''
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43'''
42'''
20'''
40c'''
24'''
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16

Fig. 6

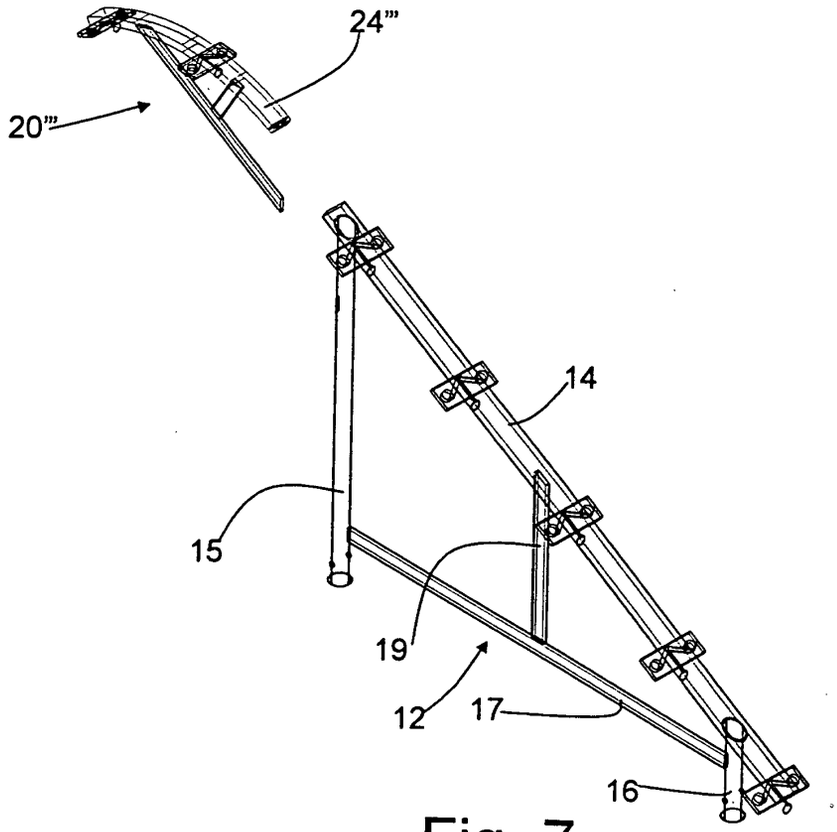
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Fig. 7

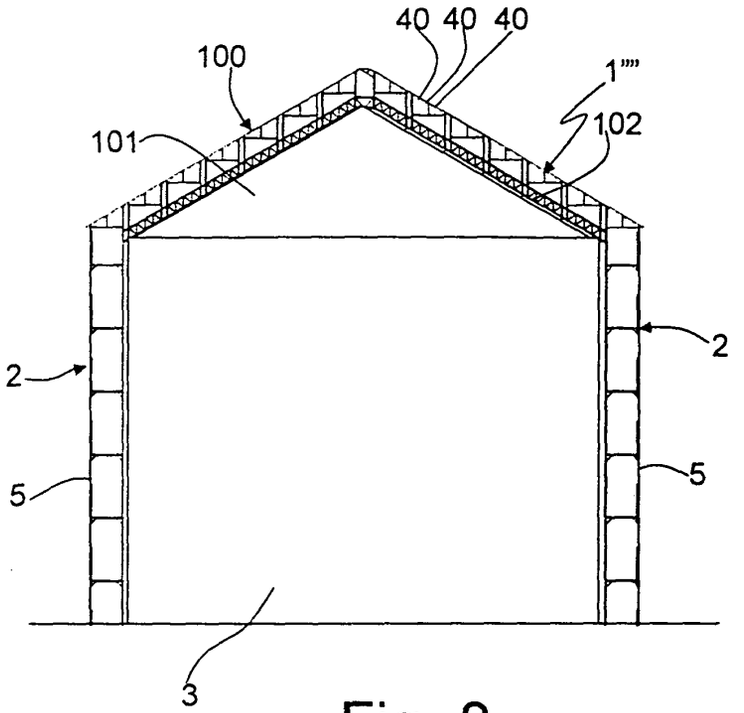

Fig. 8

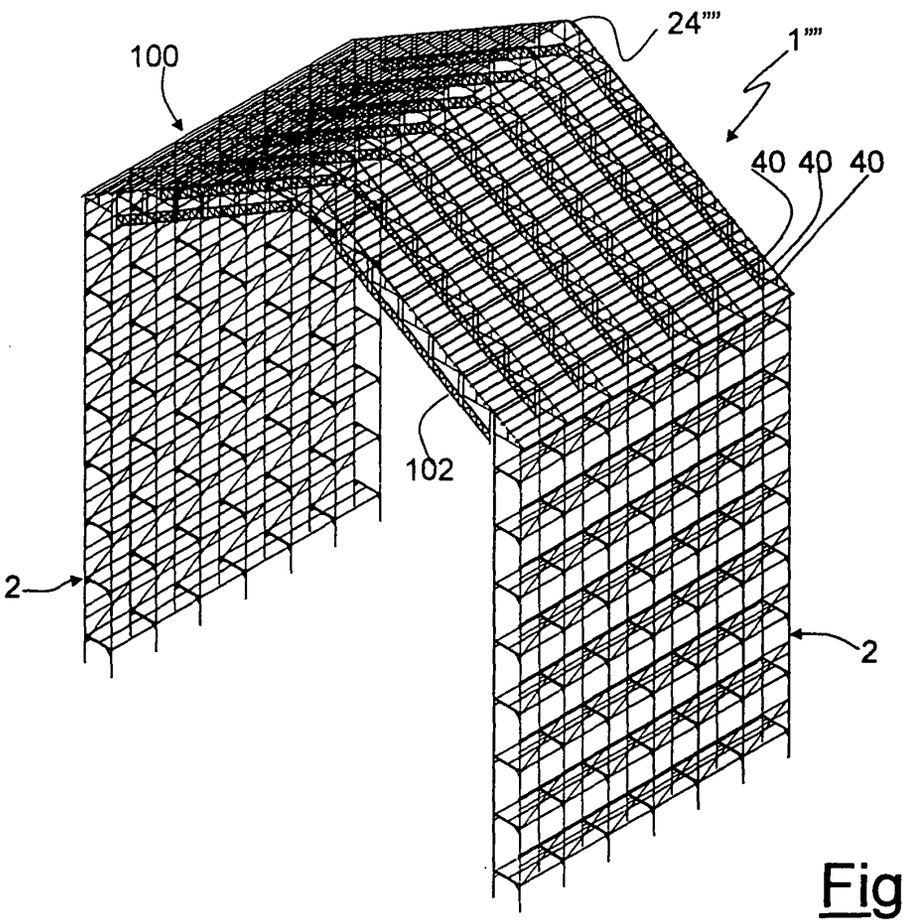

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 04 00 4814

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	21 June 2004	Saretta, G

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EUROPEAN SEARCH REPORT

Application Number
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