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(54) **Roof step unit**

(57) Roof step unit (1) for mounting on a tile-covered roof of a building, wherein the roof step unit includes a step portion (2) with a stepping surface (3) and two sideward end portions (4,5), and one longitudinal engagement unit (6,7), being fastened or fastenable onto each one of said end portions, and being provided with means (8,9) for engagement with support battens. The engagement units (6,7) are swingable relative the respective end portions from: i) a transport position where the engagement units (6,7) are positioned adjacent to each other and extend essentially along a length extension of the step portion (2), to: ii) a mounting position where the engagement units (6,7) extend essentially perpendicular to said length extension of the step portion (2).

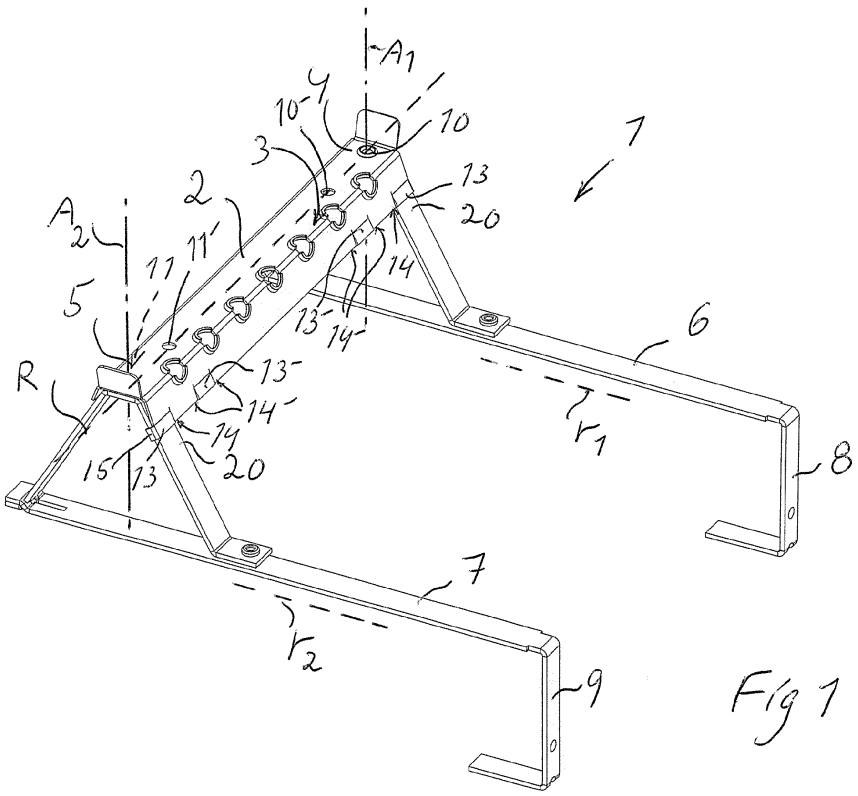

Fig 1

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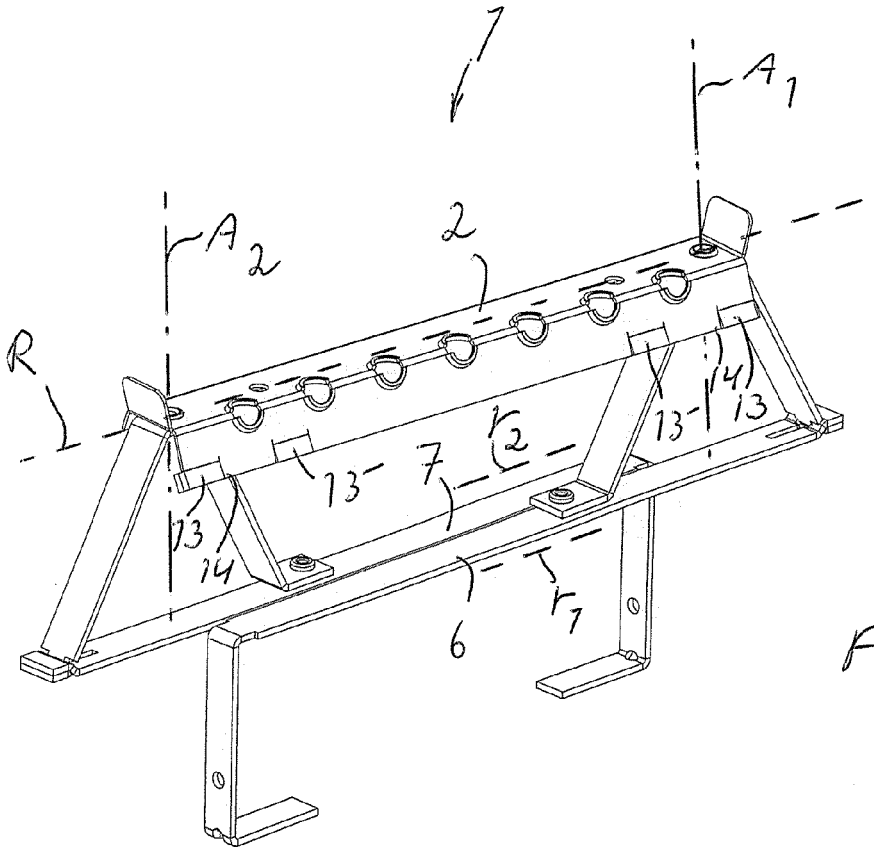

Fig 3

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a roof step unit for mounting on a tile-covered roof of a building, wherein the roof step unit includes a step portion with a stepping surface and two sideward end portions, and one longitudinal engagement unit, being fastened or fastenable onto each one of said end portions, and being provided with means for engagement with support battens.

BACKGROUND OF THE INVENTION

[0002] Existing regulations stipulate that there has to be a possibility for a person, such as for example chimney-sweeper, to walk upon the roof of a building without risk. For that purpose roof ladders and so called roof steps are applied to different types of roofs. Roof steps are usually units having a one step portion giving flexibility for mounting on roof portions of different sizes and configurations. Roof steps according to known art are as a rule adapted to the conditions given by the roof, for example single curved or double curved roof tiles made from concrete or burnt brick.

[0003] In a previously known roof step, a relatively bulky roof step unit, including step portion as well as engagement unit, is already assembled. This roof step works well but can be enhanced concerning handling for the operator and transport because of its size and difficulties of handling and packeting in an acceptable way.

[0004] As technical background can also be mentioned SE 530 554 and the applicant's own SE 524 177 and NO 167 878. The latter documents relate to roof steps which can also be assembled in situ. This has, however, been shown to be problematic and relatively complicated, not least if the assembly is to be made in connection with mounting of the roof step in an often exposed position on a roof.

AIM AND MOST IMPORTANT FEATURES OF THE INVENTION

[0005] The aim of the present invention is to provide a roof step unit wherein the problems of the background art are at least reduced and in particular, the possibilities of effective handling and transport of roof step units are enhanced.

[0006] The above aim is achieved in respect of a roof step unit according to the above wherein the engagement units are swingable relative the respective end portions from:

i) a transport position where the engagement units are positioned adjacent to each other and extend essentially along a length extension of the step portion, to:

ii) a mounting position where the engagement units extend essentially perpendicular to said length extension of the step portion.

[0007] Hereby is achieved that handling of the roof step unit is considerably enhanced for the operator since he can handle essentially more compact and still assembled units during his movements on the roof. At the mounting site, he subsequently only has to swing out the engagement units to the mounting position and do not need to take any assembling measures, such as to assemble loose parts that can be dropped or lost during work. Further, the operator does not have to take any intricate or precision requiring measures such as positioning and tightening screws or the like. These advantages are achieved in respect of a roof step unit that can be made very compact in its transport position and therefore does not require any bulky package, which would otherwise be necessary in respect of an already assembled unit.

[0008] It is preferred that the engagement units are swingable in relation to the respective end portion around a respective axes being perpendicular to the longitudinal extension of the step portion and also that the engagement units are swingable relative to the respective end portion around respective axes being perpendicular to their respective longitudinal extensions, whereby is obtained a construction resulting in a completed product being robust as required and whereby the parts have advantageous movement patterns in respect of each other.

[0009] It is preferred that the roof step unit provides snap-engagement means, that allow the movement of the engagement units from the transport position into the mounting position but prevents movement of the engagement units in the opposite direction. Hereby is ensured that the operator indeed perceives that he has really fulfilled the swing movements. It also accentuates the stability of the unit since in the mounting position unwanted swinging of the parts relative to each other is avoided. The snap-engagement means are suitably comprised by inwardly bent plate metal edge portions on the step portion, the side edges of which cooperating with edges on adjacent portions of the respective engagement unit.

[0010] It is suitable that the step portion provides alternative fastening positions for the respective engagement unit for allowing fastening of the engagement units at a chosen distance from each other.

[0011] It is further preferred that in the transport position, the engagement units lie against each other and extend at a small angle to the longitudinal extension of the step portion. This angle typically depends on the width of material in the engagement units and on that the fastening points for the engagement units on the step portion are lined up in the same manner on the engagement units.

[0012] Preferably each engagement unit provides, in the area where it is fastened or fastenable to the step portion, a frame construction which is tapering in the direction of the step portion. Particularly preferred said

frame construction is tapering in the direction of a fastening portion which comprises a hole for a fastening means for passing through a hole also in the step portion.

[0013] Preferably the step portion is made from a plate metal material having a section of an inverted U-shape with diverging shanks, whereas the engagement units are produced from band-shaped steel or iron.

[0014] Further features and advantages are evident from the following detailed description and the associated drawings showing an embodiment of the invention.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

Fig. 1 shows a perspective view of a roof step unit according to present invention in a mounting position.

Fig. 2 shows a second perspective view of the roof step unit according to the present invention in the mounting position.

Fig. 3 shows a perspective view of the roof step unit according to the present invention in a transport position.

Fig. 4 shows a second perspective view of the roof step unit according to the preset invention in the transport position.

DETAILED DESCRIPTION OF EMBODIMENT

[0016] Fig. 1 shows a roof step unit 1 in a mounting position, wherein the roof step unit 1 includes a step portion 2 with a stepping surface 3 to be stepped on by a user in a mounted position of the roof step unit 1, a first end portion 4 and a second end portion 5. A first engagement unit 6 and a second engagement unit 7 are firmly connected to the step portion 2 in its respective first and second end portions 4 and 5. Further, the engagement units 6 and 7 are connected to the step portion 2 by means of fastening means 10 and 11 respectively, allowing swinging of the engagement units 6 and 7 from a transport position which will be illustrated below to the mounting position shown in Fig. 1.

[0017] On the free ends, at a distance from the step portion 2, the engagement units 6 and 7 provides means 8 and 9 respectively for engagement with support battens, in the form of hook shaped ends to be hooked over tile-carrying support battens in a per se known manner.

[0018] The engagement units are in the shown mounting position locked in this position whereby their length extensions r_1 and r_2 respectively are essentially perpendicular to a length extension R of the step portion 2.

[0019] In the embodiment shown in Fig. 1, the step portion 2 is provided with locking elements in the form of snap-engagement means 14, that are comprised of plate metal edge portions on the step portion 2 shaped somewhat bent inwardly to a certain excess relative to the shaping of the corresponding means 20 on the respective engagement unit. In the shown positions, the first and second engagement units 6 and 7 have been positioned below the respective seat tab 13, which is a cut and somewhat outwardly bent portion of the lower edge of the step portion 2. This results in that during swinging of an engagement unit around its respective axis A_1 and A_2, when the parts 20 pass the respective snap-engagement means 14, these snap-engagement means will snap passed the outer side of the parts 20 and with its respective edge prevent swinging back of the respective engagement units 6 and 7. The engagement units will instead be positioned under the respective seat tab 13. Furthermore, the engagement units are prevented from swinging further outwardly sidewardly by means of a respective locking tab 15, which is a back folded metal plate portion covering an outside portion of the step portion 2.

[0020] In Fig. 2, the roof step unit 1 is shown in another perspective view from below, whereof more clearly is shown that in the same mounting position, the part 20 is prevented from movement inwardly in the direction of a centre of the step portion 2 by means of the side edge of the snap-engagement means 14 acting against the part 20.

[0021] From Fig. 2 is shown even more clearly that the step portion is provided with alternative fastening positions for the respective engagement unit, whereby, for allowing adaption to for example tile size, the engagement units 6 and 7 are fastenable to the step portion 2 also through further holes 10' and 11', respectively, wherein are also shown associated seat tabs 13' and snap-engagement means 14' belonging to these alternative fastening positions.

[0022] From Fig. 2 is also shown more clearly the shaping of the engagement units 6 and 7 with a frame construction 16, which is tapering in the direction towards a fastening portion 17, through which a hole is bored for the reception of a fastening means 11 for swingable fastening of the step portion together with the two engagement units 6 and 7.

[0023] In Fig. 3 the roof step unit 1 is shown in the transport position, whereby the engagement units 6 and 7 are swung to positions where they extend essentially in parallel with a longitudinal extension R of the step portion or along a longitudinally extension R of the step portion 2. The length extensions of the engagement units are indicated with r_1, r_2.

[0024] As is mentioned above, the position shown in Fig. 3 and 4 is a transport position, which is intended for transport from the supplier but also for a transport up to the position on the roof where the roof step unit is to be mounted. From the position show in Figs. 3 and 4 the engagement units can now be easily swung out to the position shown in Figs. 1 and 2 where they are locked by the snap-engagement means as is described above. It is normally not of interest to reposition the engagement units from the positions shown in Figs. 1 and 2 to the positions shown in Figs. 3 and 4, but is it not excluded that this can be done, and in that case the snap-engage-

ment means 14 are lifted away for example by means of a simple tool such as a pliers before swinging them to the transport position.

[0025] The invention can be modified within the scope of the following claims. The construction of the engagement units as well as of the step portion can be otherwise and within the range of the invention is also to shape the lock arrangement in the mounting position in any other way and even to exclude it, which, however, is not preferred because of the stability issue. It is preferred that the material used is iron or steel. Metal plate and plate band material or iron bands are hereby of interest. The fastening means are suitably screws with locking nuts but also other equivalent fastening means can be of interest.

[0026] The frame construction for the engagement units is in the shown example shown with the bent frame part inserted into and locked through a key hole connection with the straight part and a screw connection through a threaded fastener. Other solutions that can be used are for example welding or soldering.

Claims

1. Roof step unit (1) for mounting on a tile-covered roof of a building, wherein the roof step unit includes a step portion (2) with a stepping surface (3) and two sideward end portions (4,5), and one longitudinal engagement unit (6,7), being fastened or fastenable onto each one of said end portions, and being provided with means (8,9) for engagement with support battens, **characterized in**

   - **that** the engagement units (6,7) are swingable relative the respective end portions from:

     i) a transport position where the engagement units (6,7) are positioned adjacent to each other and extend essentially along a length extension of the step portion (2), to:
     ii) a mounting position where the engagement units (6,7) extend essentially perpendicular to said length extension of the step portion (2).

2. Roof step unit according to claim 1, **characterized in that** the engagement units (6,7) are swingable relative to the respective end portion around respective axes (A_1,A_2), that are extending at a right angle to the length extension (R) of the step portion.

3. Roof step unit according to claim 1 or 2, **characterized in that** the engagement units (6,7) are swingable relative to the respective end portion around respective axes (A_1,A_2), which are extending at a right angle to respective length extensions (r_1,r_2) of the engagement units.

4. Roof step unit according to any one of the claims 1 - 3, **characterized in that** it exhibits snap-engagement means (14,14'), that allow the movement of the engagement units from the transport position to the mounting position but prevents movement of the engagement units in the opposite direction.

5. Roof step unit according to claim 4, **characterized in that** the snap-engagement means (14,14') are comprised of inwardly bent plate metal edge portions on the step portion (2) having side edges cooperating with edges on adjacent parts (20) of the respective engagement unit.

6. Roof step unit according to any one of the claims 1 - 5, **characterized in that** the step portion (2) exhibits alternative fastening positions for the respective engagement unit for allowing fastening of the engagement units (6,7) at a chosen distance from each other.

7. Roof step unit according to any one of the claims 1 - 6, **characterized in that** the engagement units (6,7) in the transport position lie against each other.

8. Roof step unit according to any one of the claims 1 - 7 , **characterized in that** each engagement unit, in the area where it is fastened or fastenable to the step portion, exhibits a frame construction (16), that is tapering in the direction of the step portion (2).

9. Roof step unit according to claim 8, **characterized in that** said frame construction (16) is tapering in the direction of a fastening portion (17), that exhibits a hole for a fastening means (10,11) for passage of a hole in the step portion (2).

10. Roof step unit according to any one of the claims 1 - 9, **characterized in that** the step portion is produced from a metal plate material with section of inverted U-shape and with diverging shanks.

11. Roof step unit according to any one of the claims 1 - 10. **characterized in that** the engagement units are made from band-shaped steel or iron.

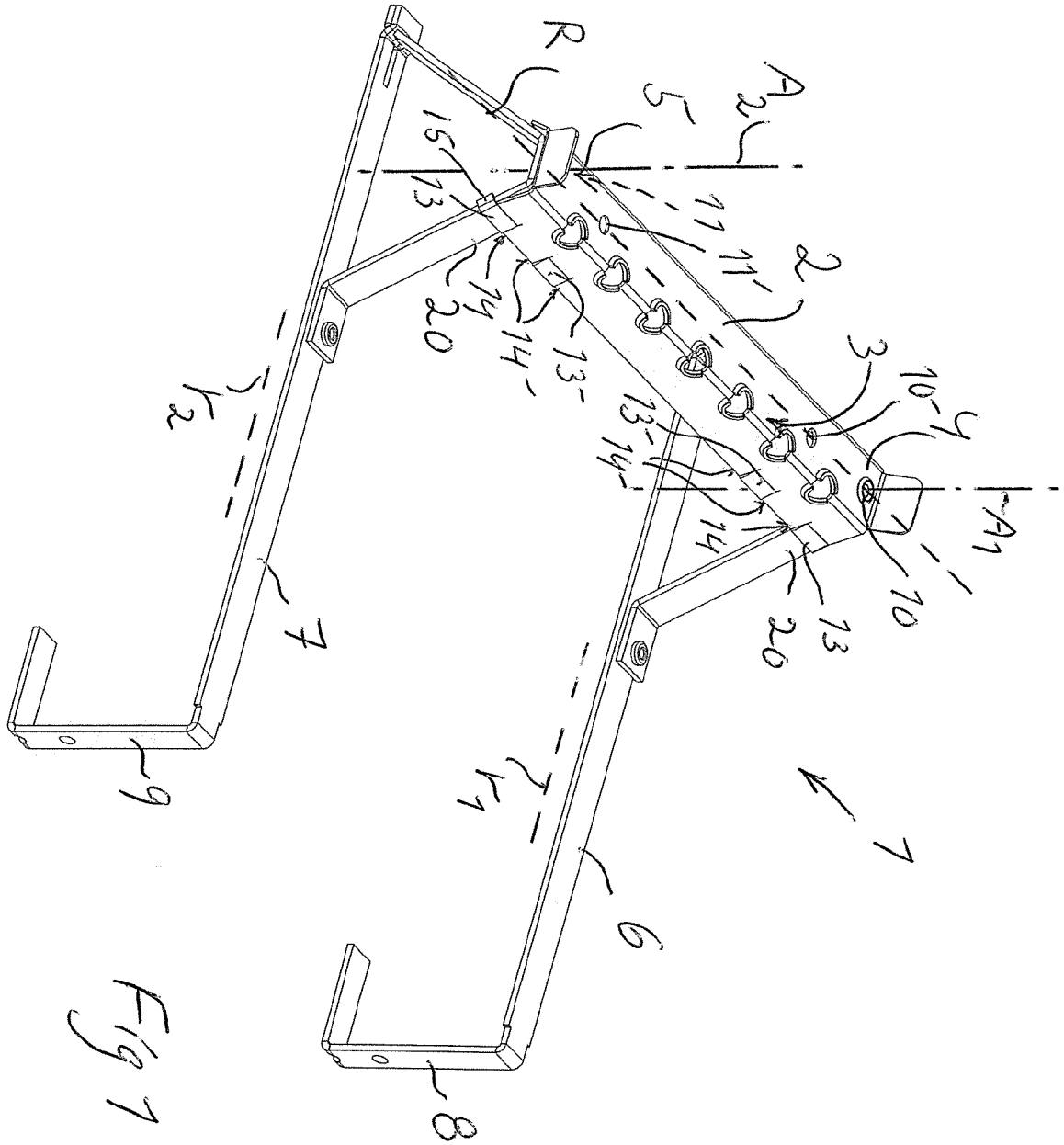

Fig 1

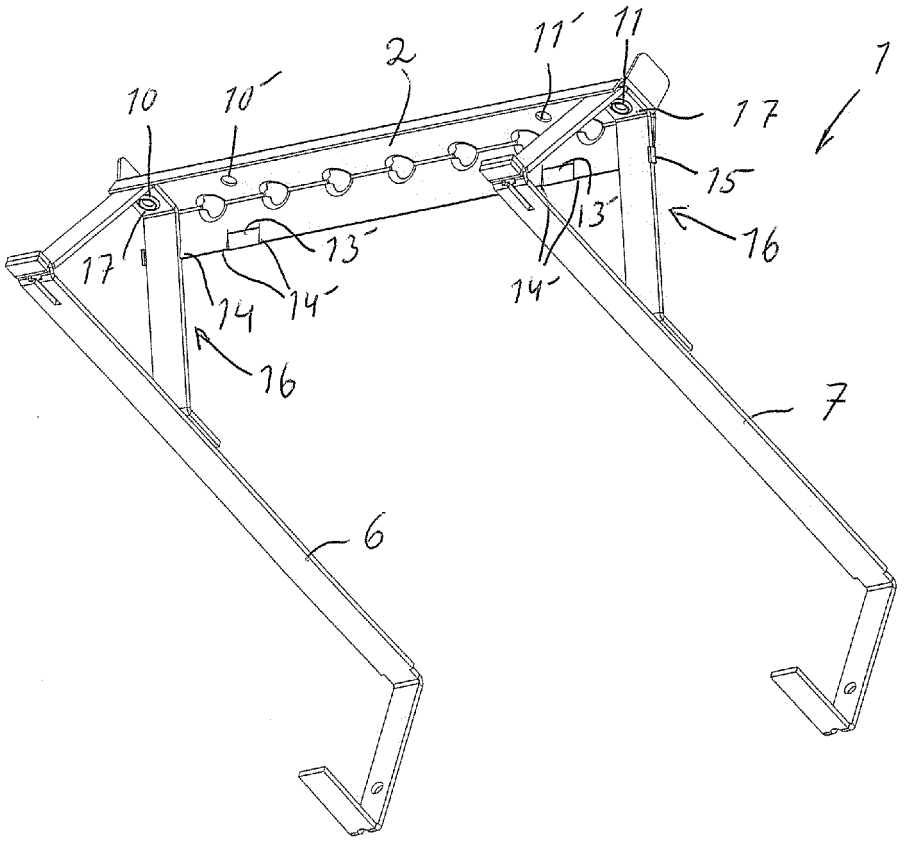

Fig 2

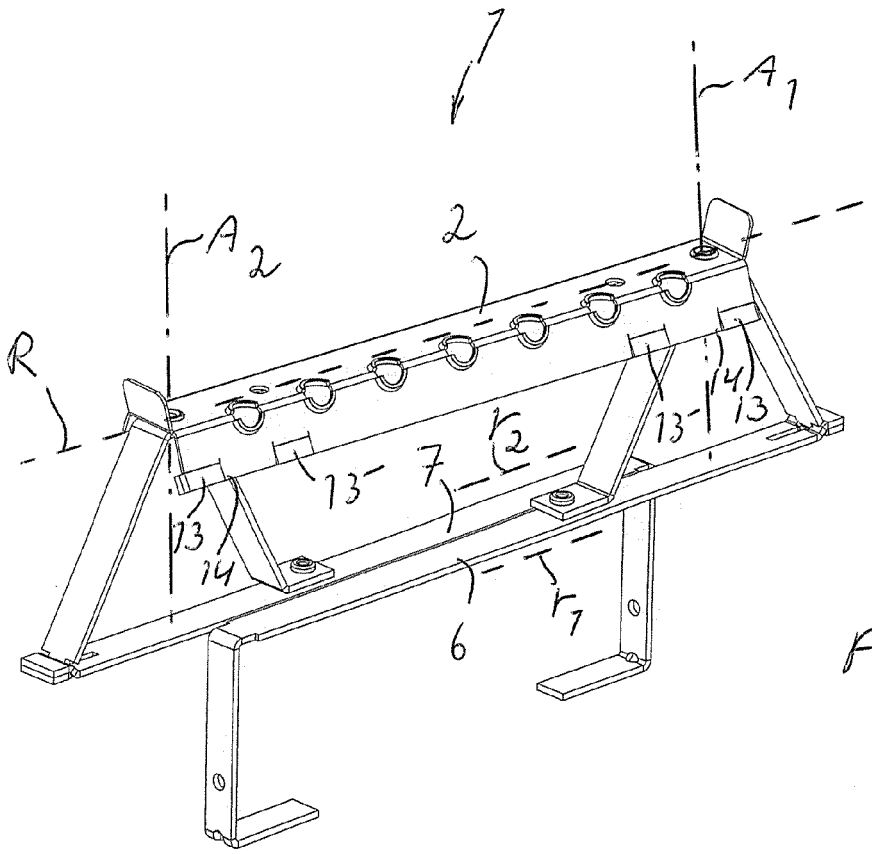

Fig 3

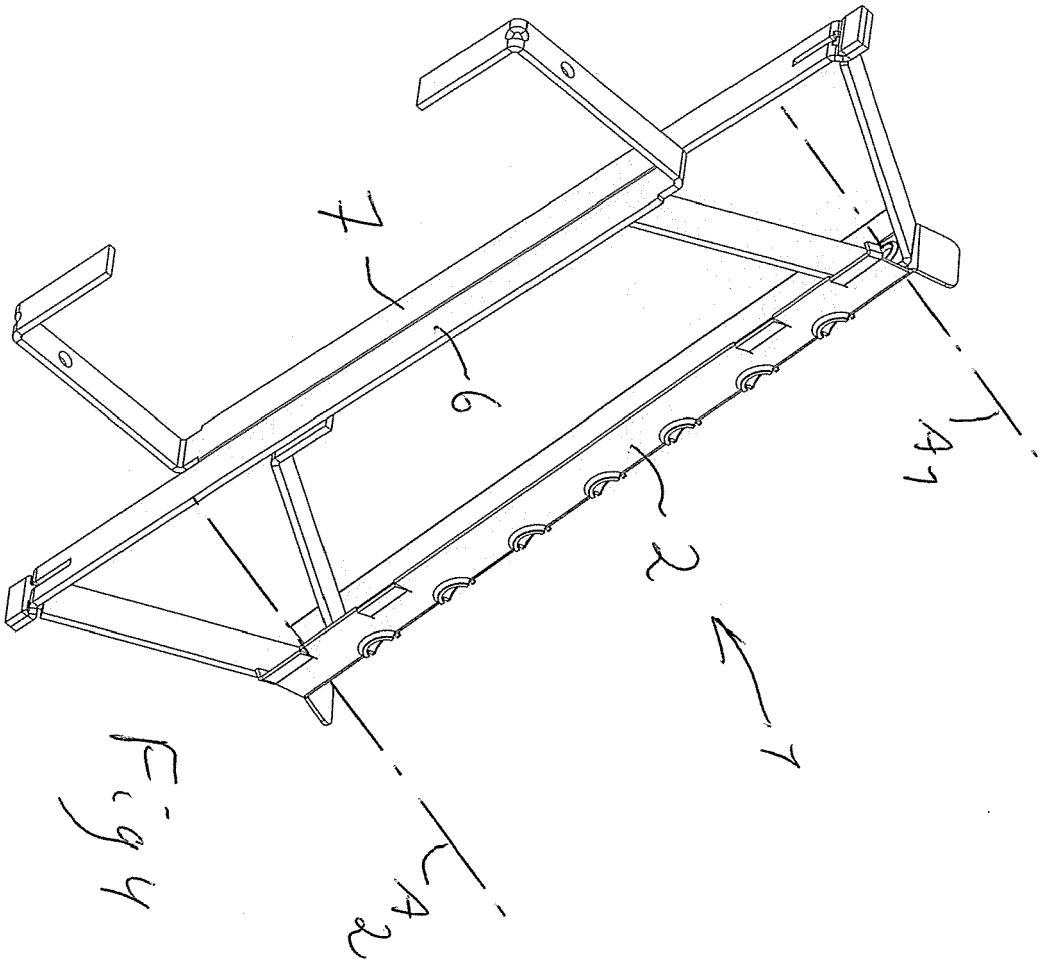

Fig. 4