

(19)



(11)

EP 2 574 709 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
04.05.2016 Bulletin 2016/18

(51) Int Cl.:
E04G 5/04 (2006.01) **E04D 13/12 (2006.01)**
E04G 3/26 (2006.01)

(21) Application number: **12446506.3**

(22) Date of filing: **20.09.2012**

(54) **Roof step unit**

Dachtritteinheit

Unité de marche de toit

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **27.09.2011 SE 1100712**

(43) Date of publication of application:
03.04.2013 Bulletin 2013/14

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(56) References cited:
**DE-U1- 29 808 327 NO-B- 167 878
SE-B- 468 098 SE-C2- 524 177
SE-C2- 530 554 US-A- 298 463**

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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, wherein an elongated engagement unit is being fastened or fastenable onto each one of said end portions, each engagement unit 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 packaging in an acceptable way.

[0004] As technical background can also be mentioned SE 530 554 and the applicant's own SE 524 177, which discloses all the features of the preamble of claim 1, 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. DE 29808327 describes a support for a roof bridge having support elements that are to be fastened to a roof over foot plates.

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] In particular, 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.

[0009] It is further preferred that the engagement units are swingable also relative to the respective end portion around respective axes being perpendicular to their respective longitudinal extensions.

[0010] Hereby 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

[0011] 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.

[0012] 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.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] 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

[0017]

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 present invention in the transport position.

DETAILED DESCRIPTION OF EMBODIMENT

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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 .

[0026] 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 shown 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 it is not excluded that this can be done, and in that case the snap-engagement means 14 are lifted away for example by means of a simple tool such as a pliers before swinging them to the transport position.

[0027] 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.

[0028] 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), being a one step portion, with a stepping surface (3) and two sideward end portions (4,5), wherein the roof step unit comprises two elongated engagement units (6,7) each one fastened or fastenable onto one of said end portions, each engagement unit (6,7) being provided with means (8,9) for engagement with tile-carrying 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), and

- **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.

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), which are extending at a right angle to respective length extensions (r_1, r_2) of the engagement units.
3. Roof step unit according to claim 1 or 2, **characterized in that** the roof step unit exhibits snap-engagement means (14,14'), that allow movement of the engagement units from the transport position to the mounting position but prevents movement of the engagement units in the opposite direction.
4. Roof step unit according to claim 3, **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.
5. Roof step unit according to any one of claims 1 - 4, **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.
6. Roof step unit according to any one of claims 1 - 5, **characterized in that** the engagement units (6,7) in the transport position lie against each other.
7. Roof step unit according to any one of claims 1 - 6, **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).
8. Roof step unit according to claim 7, **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).
9. Roof step unit according to any one of claims 1 - 8, **characterized in that** the step portion is produced from a metal plate material with section of inverted U-shape and with diverging shanks.
10. Roof step unit according to any one of claims 1 - 9, **characterized in that** the engagement units are made from band-shaped steel or iron.

Patentansprüche

1. Dachtritteinheit (1) für das Anbringen eines schindelbedeckten Dachs eines Gebäudes, wobei die Dachtritteinheit einen Trittabschnitt (2) aufweist, der ein Abschnitt für einen Tritt ist, mit einer Auftrittoberfläche (3) und zwei seitwärtigen Endabschnitten (4, 5), wobei die Dachtritteinheit zwei längliche Eingriffseinheiten (6, 7) umfasst, die jeweils an einem der Endabschnitte befestigt sind oder befestigt werden können, wobei jede Eingriffseinheit (6, 7) mit Mitteln (8, 9) zum Eingreifen in schindeltragende Stützplatten bereitgestellt ist, **dadurch gekennzeichnet**,

- **dass** die Eingriffseinheiten (6, 7) schwenkbar in Bezug auf die zugehörigen Endabschnitte sind von:

i) einer Transportposition, in der die Eingriffseinheiten (6, 7) benachbart zueinander angeordnet sind und sich im Wesentlichen entlang einer Längenausdehnung des Trittabschnitts (2) erstrecken, zu:

ii) einer Montageposition, in der sich die Eingriffseinheiten (6, 7) im Wesentlichen senkrecht zu der Längenausdehnung des Trittabschnitts (2) erstrecken, und dadurch,

- **dass** die Eingriffseinheiten (6, 7) schwenkbar in Bezug auf den zugehörigen Endabschnitt um zugehörige Achsen (A_1 , A_2), die sich in einem rechten Winkel zu der Längenausdehnung (R) des Trittabschnitts erstrecken, sind.

2. Dachtritteinheit nach Anspruch 1, **dadurch gekennzeichnet, dass** die Eingriffseinheiten (6, 7) schwenkbar in Bezug auf den zugehörigen Endabschnitt um zugehörige Achsen (A_1 , A_2), die sich in einem rechten Winkel zu den zugehörigen Längenausdehnungen (r_1 , r_2) der Eingriffseinheiten erstrecken, sind.
3. Dachtritteinheit nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Dachtritteinheit Schnappeingriffsmittel (14, 14') aufweist, welche eine Bewegung der Eingriffseinheiten von der Transportposition zur Montageposition ermöglichen, aber die Bewegung der Eingriffseinheiten in die entgegengesetzte Richtung verhindern.
4. Dachtritteinheit nach Anspruch 3, **dadurch gekennzeichnet, dass** die Schnappeingriffsmittel (14, 14') aus nach innen gebogenen Blechelement-Randabschnitten am Trittabschnitt (2) bestehen, die Seitenränder aufweisen, die mit den Rändern an benachbarten Teilen (20) der zugehö-

rigen Eingriffseinheit zusammenwirken.

5. Dachtritteinheit nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** der Trittabschnitt (2) alternative Befestigungspositionen für die jeweilige Eingriffseinheit aufweist, um die Befestigung der Eingriffseinheiten (6, 7) an einem gewählten Abstand voneinander zu ermöglichen.
6. Dachtritteinheit nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Eingriffseinheiten (6, 7) in der Transportposition aneinander anliegen.
7. Dachtritteinheit nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** jede Eingriffseinheit in dem Bereich, in dem diese an dem Trittabschnitt befestigt ist oder befestigt werden kann, eine Rahmenkonstruktion (16) aufweist, die sich in Richtung des Trittabschnitts (2) verjüngt.
8. Dachtritteinheit nach Anspruch 7, **dadurch gekennzeichnet, dass** sich die Rahmenkonstruktion (16) in Richtung eines Befestigungsabschnitts (17) verjüngt, der ein Loch für ein Befestigungsmittel (10, 11) zum Durchgang eines Lochs in dem Trittabschnitt (2) aufweist.
9. Dachtritteinheit nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** der Trittabschnitt aus einem Blechmaterial in Form eines umgekehrten U und mit auseinanderlaufenden Schenkeln hergestellt wird.
10. Dachtritteinheit nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** die Eingriffseinheiten aus bandförmigem Stahl oder Eisen hergestellt sind.

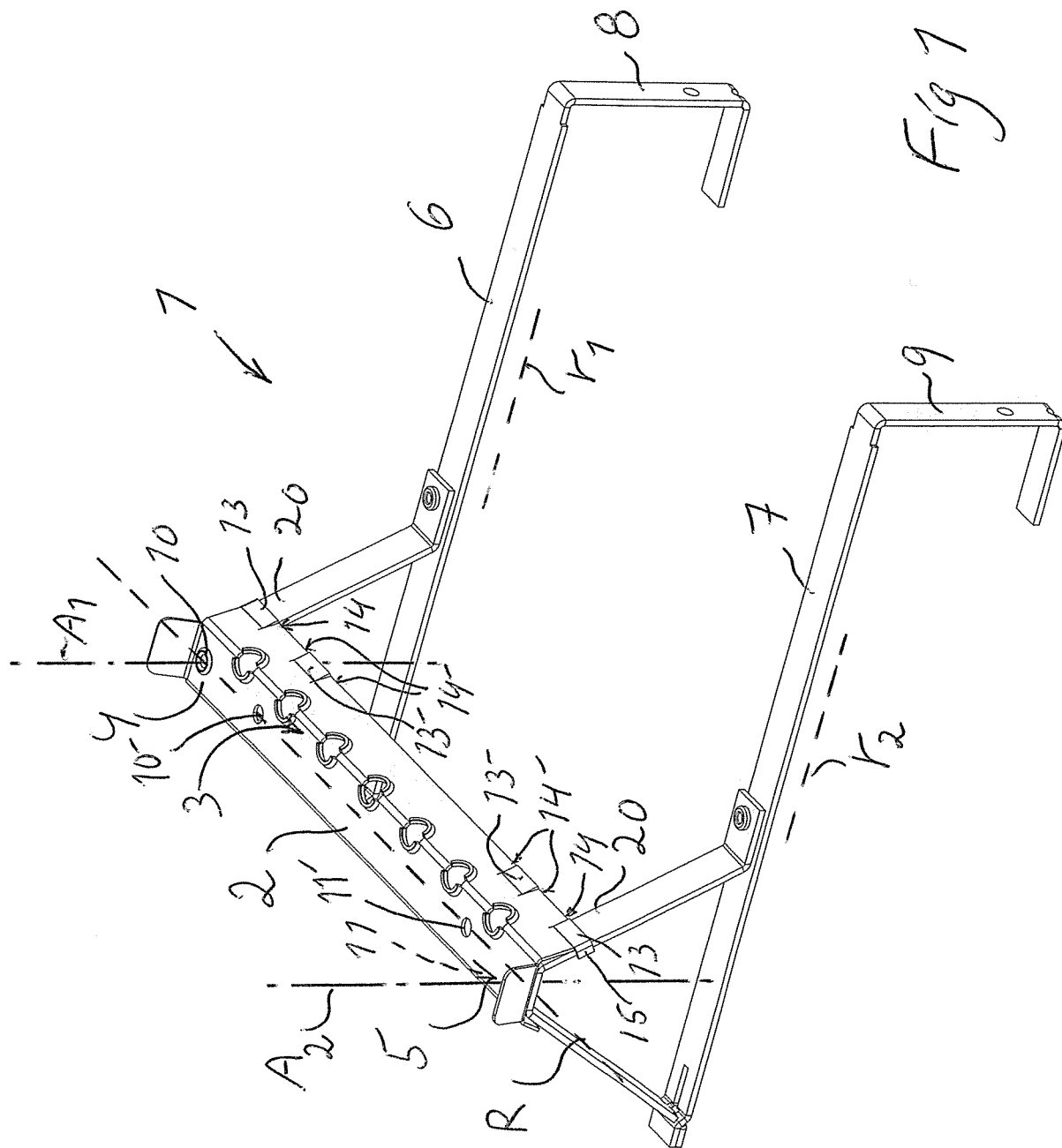
Revendications

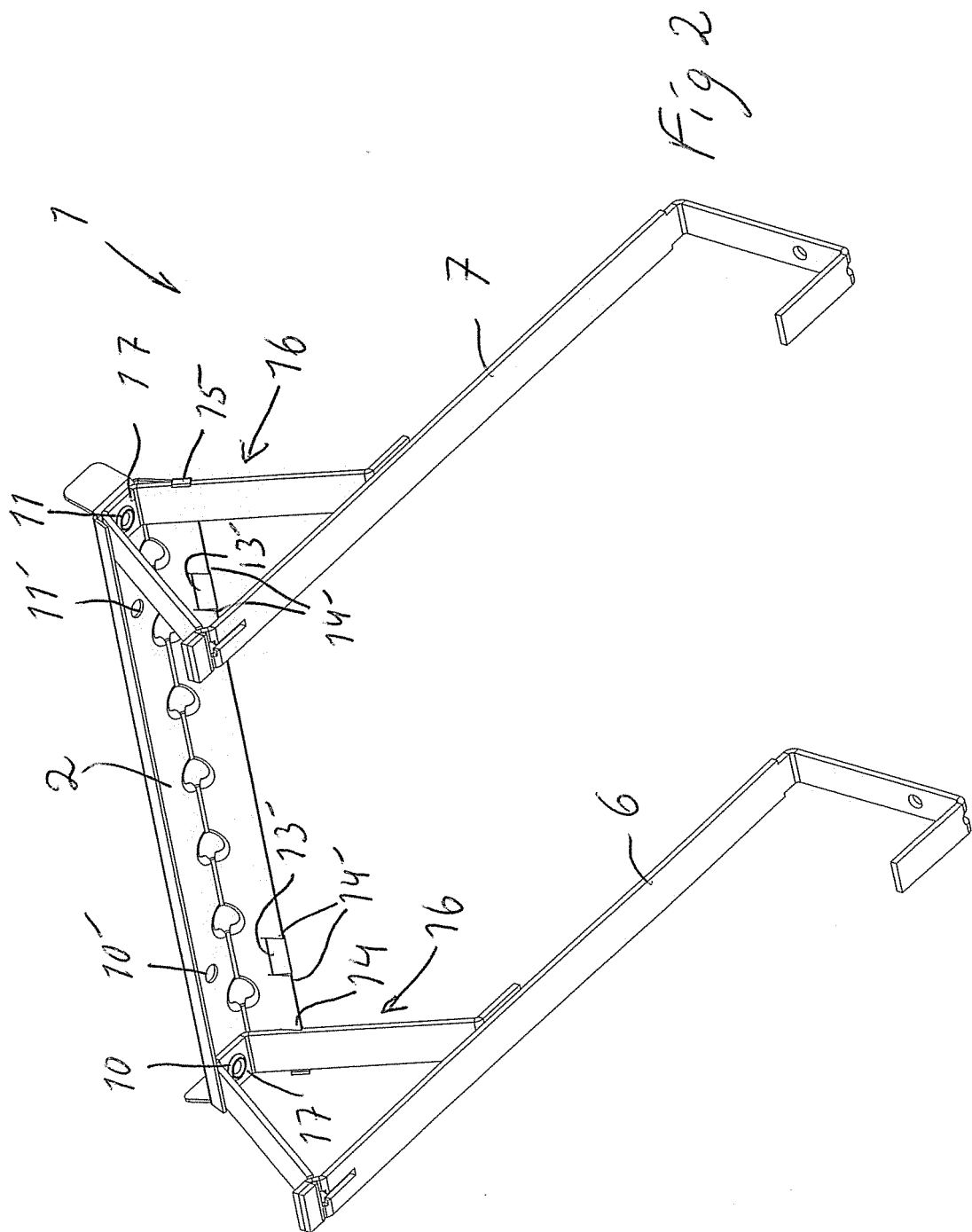
1. Unité de marche de toit (1) destinée à être installée sur un toit recouvert de tuiles d'un bâtiment, l'unité de marche de toit comprenant une partie marche (2), constituant une partie de marche unique, comportant une surface de frottement (3) et deux parties d'extrémité latérales (4, 5), l'unité de marche de toit comprenant deux unités d'accouplement allongées (6, 7) chacune fixées ou pouvant être fixées sur l'une desdites parties d'extrémité, chaque unité d'accouplement (6, 7) étant munie de moyens (8, 9) servant à l'accouplement avec des liteaux de support de tuiles,
- caractérisée en ce que**

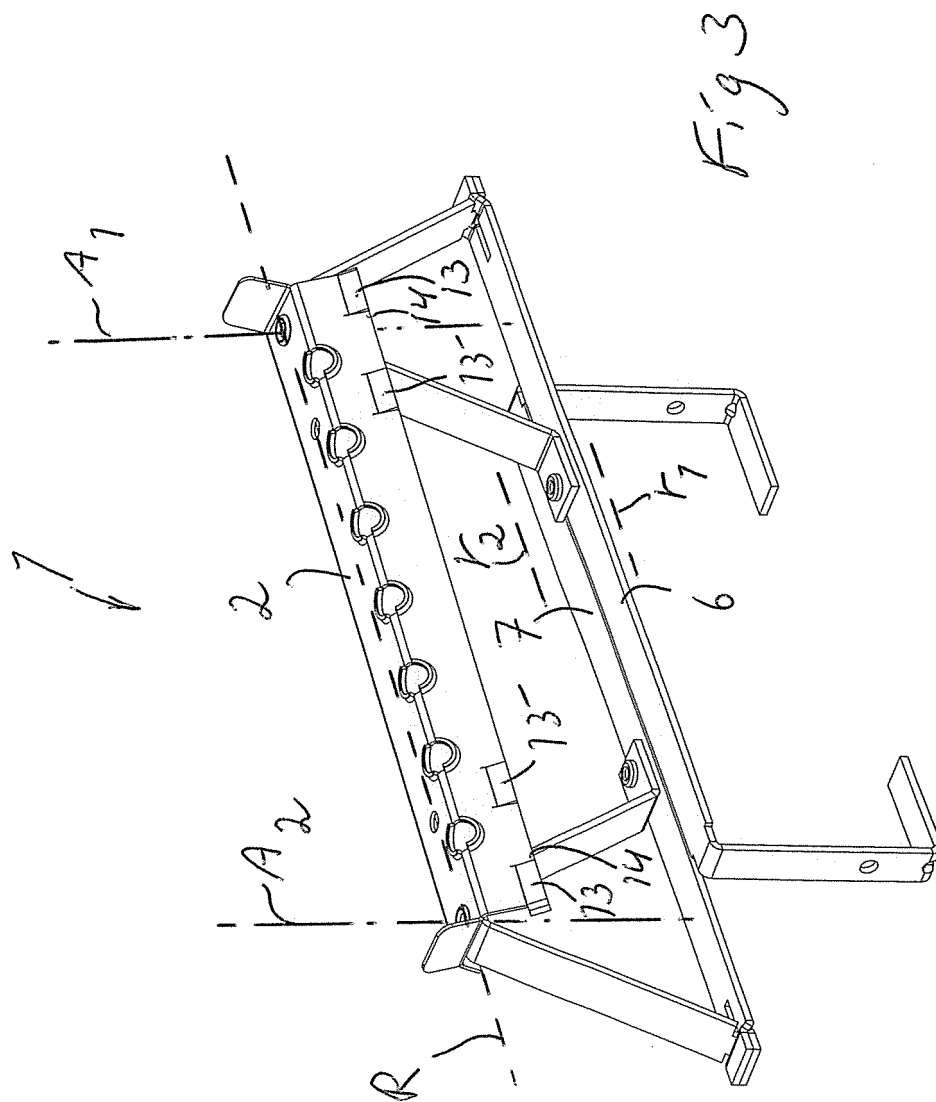
- les unités d'accouplement (6, 7) sont pivotantes par rapport aux parties d'extrémité

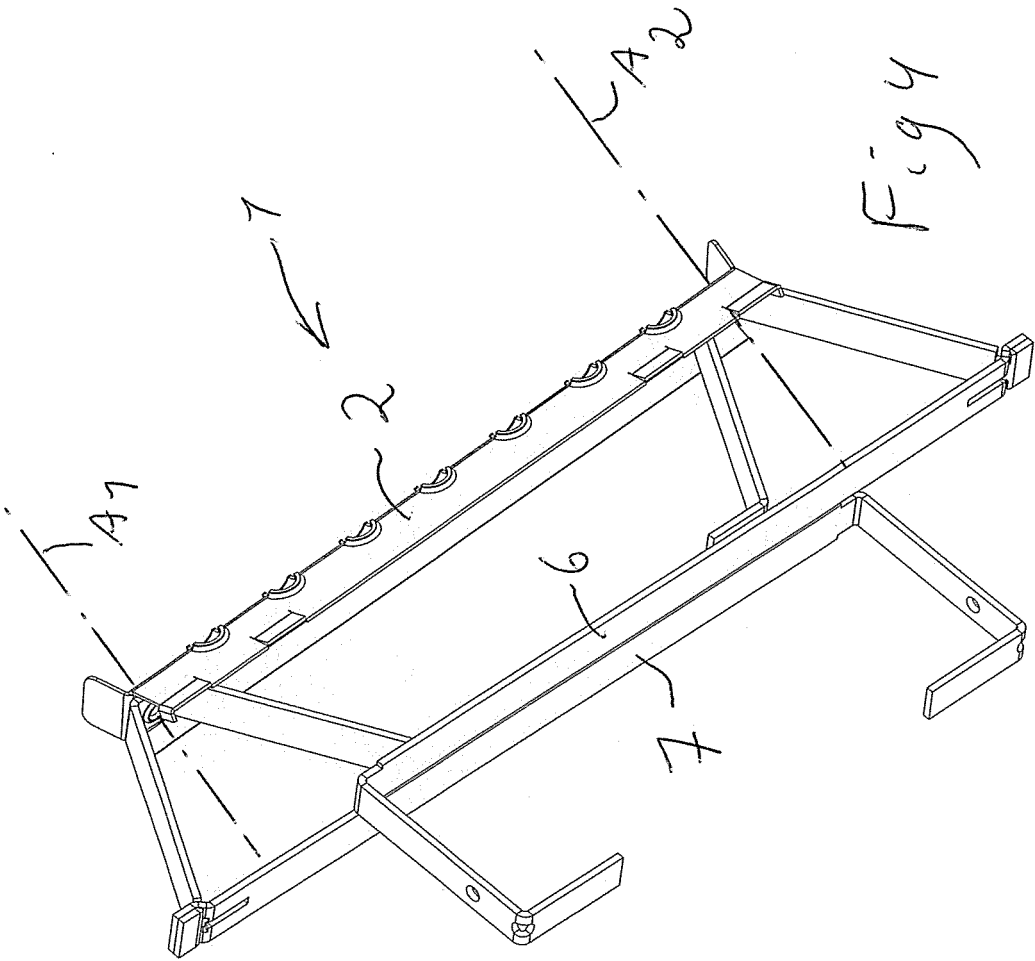
respectives :

- 1) d'une position de transport, dans laquelle les unités d'accouplement (6, 7) sont en position adjacente l'une vis-à-vis de l'autre et s'étendent essentiellement le long d'une étendue en longueur de la partie marche (2),
2) à une position d'installation, dans laquelle les unités d'accouplement (6, 7) s'étendent de manière essentiellement perpendiculaire à ladite étendue en longueur de la partie marche (2), et
- les unités d'accouplement (6, 7) sont pivotantes par rapport à la partie d'extrémité respective autour d'axes respectifs (A_1 , A_2), qui s'étendent à angle droit vis-à-vis de l'étendue en longueur (R) de la partie marche.
2. Unité de marche de toit selon la revendication 1, **caractérisée en ce que** les unités d'accouplement (6, 7) sont pivotantes par rapport à la partie d'extrémité respective autour d'axes respectifs (A_1 , A_2), qui s'étendent à angle droit vis-à-vis d'étendues en longueur respectives (r_1 , r_2) des unités d'accouplement.
3. Unité de marche de toit selon la revendication 1 ou 2, **caractérisée en ce que** l'unité de marche de toit comporte des moyens d'emboîtement élastique (14, 14'), qui permettent un mouvement des unités d'accouplement de la position de transport à la position d'installation mais empêchent un mouvement des unités d'accouplement dans la direction opposée.
4. Unité de marche de toit selon la revendication 3, **caractérisée en ce que** les moyens d'emboîtement élastique (14, 14') sont constitués de parties de bord métalliques sous forme de plaque inclinée vers l'intérieur sur la partie marche (2) comportant des bords latéraux coopérant avec des bords sur des parties adjacentes (20) de l'unité d'accouplement respective.
5. Unité de marche de toit selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** la partie marche (2) comporte plusieurs positions de fixation possibles pour l'unité d'accouplement respective, afin de permettre la fixation des unités d'accouplement (6, 7) à une distance choisie l'une de l'autre.
6. Unité de marche de toit selon l'une quelconque des revendications 1 à 5, **caractérisée en ce que** les unités d'accouplement (6, 7) se trouvent l'une contre l'autre dans la position de transport.
7. Unité de marche de toit selon l'une quelconque des revendications 1 à 6, **caractérisée en ce que** chaque unité d'accouplement, dans la zone au niveau de laquelle elle est fixée ou peut être fixée à la partie marche, comporte une structure (16) qui présente une section décroissante en direction de la partie marche (2).
8. Unité de marche de toit selon la revendication 7, **caractérisée en ce que** ladite structure (16) présente une section décroissante en direction d'une partie de fixation (17), qui comporte un trou pour un moyen de fixation (10, 11) destiné à passer dans un trou dans la partie marche (2).
9. Unité de marche de toit selon l'une quelconque des revendications 1 à 8, **caractérisée en ce que** la partie marche est produite à partir d'un matériau sous forme de plaque métallique présentant une section en U inversé et des flancs divergents.
10. Unité de marche de toit selon l'une quelconque des revendications 1 à 9, **caractérisée en ce que** les unités d'accouplement sont constituées d'acier ou de fer sous forme de bande.









REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- SE 530554 [0004]
- SE 524177 [0004]
- DE 29808327 [0004]