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

(11) **EP 2 568 093 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
10.09.2014 Bulletin 2014/37

(51) Int Cl.:
E04D 3/362 *(2006.01)* ***B25B 23/00*** *(2006.01)*
E04D 15/04 *(2006.01)*

(21) Application number: **12179622.1**

(22) Date of filing: **08.08.2012**

(54) **Bracket for fixing sheet metal parts to beams of roofs and the like**

Klammer zur Befestigung von Blechmetallteilen an Dachbalken und dergleichen

Support pour fixer des pièces de tôle sur des poutres de toiture et similaires

(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: **08.09.2011 IT MI20111620**

(43) Date of publication of application:
13.03.2013 Bulletin 2013/11

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Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a bracket for fixing sheet metal parts to beams of roofs and the like.

[0002] It is known in the technical sector of roofs for buildings to construct roofs using metal sheets which are arranged on top of the wooden roof beams to which they are fixed by means of positioning brackets and then longitudinally fastened together so as to form the fastening joint in the transverse direction from the roof ridge to the free edge or eaves thereof.

[0003] Also known are special L-shaped brackets designed to allow fixing, by means of nailing, of the metal sheets both to a corresponding support beam (rafters arranged along the slope of the pitch of the roof) and to a reference batten which is joined to the rafters and where fixing of the metal sheet is performed; once the sheets have been fixed in position they are then definitively fastened together.

[0004] Although performing their function, the fixing brackets of the known type have a number of drawbacks due to the fact that securing thereof to the beams and the battens is performed by means of nailing guns, operation of which is such that it is not possible to maintain correct positioning of the bracket which is fixed not perfectly at right angles and in alignment with the beams and/or the battens, resulting in the roofs making a bothersome noise when changes in temperatures during the summer and winter cause expansion/retraction of the metal sheet.

[0005] In addition to this, fixing by means of nails is increasingly less suited for the high tensile loads which stress the metal sheet and tend to raise it, resulting in the need for costly maintenance operations.

[0006] A bracket according to the preamble of Claim 1 is known from EP 2 333 452 A2. AU 2008 233 436 A1 and DE 10 2005 43957 B3 disclose similar brackets.

[0007] KR 2010 11655 discloses a bracket having a reinforcing rib adjacent to a base side edge, while DE 20 2011 4793 A discloses a bracket having a base side edge formed by a reinforcing rib. None of the above mentioned publications suggests a combination of ribs according to claim 1 that allows for centering of a tool with respect to the through-holes.

[0008] The technical problem which is posed therefore is that of providing a bracket for fixing sheet metal parts of roofs, able to ensure better centering, relative alignment and right-angled arrangement with the support beams during laying and fixing of the bracket itself, so as to eliminate the noise produced by the roof as a result of movements of the metal sheet.

[0009] In connection with this problem another requirement is that the bracket should allow fixing with screws at the same speed as nailing and should be inexpensive to produce and assembly.

[0010] These results are achieved according to the present invention by means of a bracket for fixing sheet metal parts to beams of roofs and the like according to the characteristic features of Claim 1.

[0011] The present invention relates furthermore to a guide tool which matches said bracket according to the characteristic features of Claim **7** and a bracket/tool assembly according to the characteristic features of Claim **9.**

[0012] Further details may be obtained from the following description of a non-limiting example of embodiment of the subject of the present invention provided with reference to the accompanying drawings, in which:

Figure **1** shows:	a perspective view of a **first** embodiment of a fixing bracket according to the present invention;
Figure **2** shows:	a schematic cross-section along the plane indicated by V-V in Fig. **1;**
Figure **3** shows:	a schematic cross-section along the plane indicated by VI-VI in Fig. **1;**
Figure **4** shows:	a schematic cross-section along the plane indicated by VII-VII in Fig. **1;**
Figs. **4**a,**4**b show:	respectively, a perspective view and a cross-section of the bracket according to Fig. **1** with an auxiliary sliding piece;
Figure **5** shows:	a perspective view from above of a tool matching the bracket for fixing said bracket by means of screws;
Figure **6** shows:	a perspective view from below of the tool according to Fig.**5;**
Figure **7** shows:	a schematic cross-section along the plane indicated by X-X in Fig. **5;**
Figure **8** shows:	a schematic cross-section along the plane indicated by XI-XI in Fig. **6;**
Figure **9** shows:	a schematic cross-section along the plane indicated by XII-XII in Fig. **7;**
Figs. **10-12** show:	perspective views of the different relative positions of the tool/bracket; and
Figs. **13-15** show:	partially sectioned views of the sequence for fitting and fixing the bracket according to the invention.

[0013] As shown and assuming solely for the sake of convenience of description and without a limiting meaning a set of three reference axes with directions defined, irrespective of the orientation of the figures, as longitudinal X-X, **corresponding to the width of the bracket,** transverse Y-Y **corresponding to the length of the bracket,** and vertical Z-Z perpendicular to the other two directions, an L-shaped bracket according to the invention comprises essentially:

- a first base sidle 110 on which through-holes 111 for the insertion of screws 1 are formed; said holes 111 are arranged in the vicinity of the longitudinal edges 110a,110b of the base side 110; a first raised rib 12 extending on the base side 110 between two through-holes 11; and a second raised rib 113 extending in the transverse direction

Y-Y is provided on the base side 110;

- a second side 120, extending parallel to the vertical direction Z-Z and at right angles to the first side **1**10; in **an** example **not** shown in the figures, the free end of the vertical side **1**20 has, preferably, a first fold substantially parallel to the longitudinal direction X-X and a second fold substantially parallel to the vertical direction Z-Z, the functions of which will become clear further below.

[0014] Fig. **1** shows a **first** embodiment of a fixing bracket according to the present invention in the form of an L which is longer in the transverse direction Y-Y **of length of the base side;** in this embodiment the bracket has a second vertical side 120 provided with a through-slit 121 extending in the transverse direction Y-Y along a suitable length and a base side 110 extending in the transverse direction Y-Y corresponding to the length of the vertical side 120.

[0015] The base side 110 has first through-holes 111 arranged in the vicinity of the opposite longitudinal side edges 110a,110b of the base side 110.

[0016] Between the two first through-holes 111 and aligned therewith the base side 110 has a first raised rib 112 extending in the **transverse** direction **Y-Y**.

[0017] **According to the invention,** between each end hole 111 and the associated side edge 110a,110b, the base 110 also has a respective raised rib 114 extending in the longitudinal direction X-X. According to the invention it is also envisaged that **the second** raised rib 113a, 113b extending in the transverse direction Y-Y is formed between the longitudinal end ribs 114 and a substantially central point of the base 110; preferably, but not necessarily, the **longitudinal** ribs 114 are connected to the respective **transverse** rib 11**3**. According to a preferred embodiment, the base 110 has a third hole 111a formed in said substantially centered position adjacent to the free transverse edge 110c of the said base side of the fixing bracket.

[0018] As shown in Figs. **4**a,**4**b the flange may be associated with a sliding piece 150 made in the form of a Z and inserted in the **transverse** slit 121 of the second vertical side 120 and the sliding piece is fixed to the battens while the bracket is fixed to the boarding and the beams, relative sliding of the two parts thus being allowed, this being useful during fixing of the various sheet metal parts to the beams and the battens, but also so as to allow the relative movements due to the expansion caused by the variations in temperature.

[0019] Figs. **5** to **9** show a tool 200 with a shape matching that of the fixing bracket according to the present invention, which tool has in turn a L shape with its base side 210 extending in the longitudinal direction X-X and vertical side 220 parallel to the vertical direction Z-Z.

[0020] The base side 210 has a central seat 211 extending inwards and open along the free transverse edge 200c so as to form two longitudinal feet 212 with their free end folded in the vertical direction so as to form a respective lug 212a.

[0021] The surface 230 of the base side 210 opposite to that of the vertical side 220 has, formed therein:

- a first recess 231 extending in the transverse direction Y-Y along the entire length in the said transverse direction of the base 210;
- two recesses 232 extending in the longitudinal direction X-X and arranged on opposite sides of and adjacent to the longitudinal central seat 211 and between the first transverse recess 231 and the free edge 200c of the base side 210 of the L.

[0022] With this configuration of the tool and as shown in Figs. 1**0-12**, the tool is designed to be arranged with its base 210 resting on the base 110 of the fixing bracket and with the central seat 211 centered with respect to the holes 111, 111a of the base 110 of the L; correspondingly the transverse recess 231 and longitudinal recess 232 engage with the respective longitudinal rib 11**4** and transverse rib 113,11**2** in the corresponding opposite end positions and/or the transverse recess 231 engages with the respective transverse rib 113,11**2** in the central position, bringing in all cases the lugs 212a of the feet 212 up against the vertical side 120 of the bracket which is thus forced to maintain its right-angled position with respect to the base 110.

[0023] Conveniently and as shown in Fig. 1**4**, the tool forms part of a screwing device 400 with a screwing head 401 so that during laying and fixing of the metal sheets 2 to the cross-beams and/or battens 3 of the roof it is possible to centre the hole 111, 111a in the base 110 of the bracket and screw precisely the screw 1 to the cross-beam, while keeping the fixing bracket squarely arranged and properly positioned.

[0024] It is therefore clear how, as a result of the fixing bracket with guiding raised ribs and the tool according to the invention, the fixing brackets may be mounted and the metal sheets forming the roofing may be fixed to them at a laying speed which is comparable to that of nailing, but with greater precision and using screws which have a resistance to tensile stress much greater than that of nails.

[0025] The bracket, which is more squarely arranged after fixing, also ensures that a sheet metal roof is more silent since the movements due to variations in temperature occur in parallel directions which do not produce squeaking.

[0026] Although described in connection with a number of preferred embodiments and examples of the invention it is understood that the scope of protection of the present patent is defined only by the claims which follow.

Claims

1. Bracket for fixing sheet metal parts (2) to roof beams (3), comprising

   - a first base side (110) **extending in a transverse direction (Y-Y) corresponding to the length of the base side (110) and in a longitudinal direction (X-X) corresponding to the width of the base side (110),**
   - a second side (120) at right angles to the base side (110),
   - at least two through-holes (111) formed **on said base side (110),**
   - at least one first raised rib (112) extending on **the base side (110)** between two **through**-holes (111), **and**
   - **at least one second raised rib (113) extending in the transverse direction (Y-Y) on the base side (110), characterized in that**
   - said base side (110) comprises a respective raised rib (114) extending in the longitudinal direction (X-X) between each end-hole (111) and the associated longitudinal side edge (110a,110b), **wherein each end-hole is the one of said through-holes (111) arranged in the vicinity of a respective one of the opposite longitudinal side edges (110a, 110b) on the base side (110),**
   and in that said at least one first raised rib (112) is situated between and aligned with two trough-holes (111) and extends in the transverse direction.

2. Fixing bracket according to Claim **1, characterized in that said second** raised rib (113a,113b) extend**s** in the transverse direction (Y-Y) **on said base side (110), in the vicinity of its front edge (110c),** between the longitudinal end ribs (114) and a substantially central point of the base side in the transverse direction (Y-Y).

3. Fixing bracket according to Claim **2, characterized in that** the base side (110) has a third hole (111a) at said substantially central point.

4. Fixing bracket according to Claim 1, **characterized in that** the free end (21) of the vertical side (**1**20) has a first fold substantially parallel to the longitudinal direction (X-X) and a second fold substantially parallel to the vertical direction (Z-Z).

5. Fixing bracket according to Claim 1, **characterized in that** the vertical side (120) has a through-slit (121) extending in the transverse direction (Y-Y) over a suitable length.

6. Fixing bracket according to Claim **5, characterized in that** it has a Z-shaped sliding piece (150) inserted in the transverse slit (121) and displaceable inside it.

7. Tool with a L-shape matching the shape of the fixing bracket according to Claim 1, having a base side (210) extending in the longitudinal direction (X-X) and vertical side (220) parallel to the vertical direction (Z-Z) and at right angles to the base side (210), **characterized in that** the base side (210) has a central seat (211) extending inwards **in the longitudinal direction (X-X)** and open along the **free** transverse edge (200c) wherein said transverse edge extending in the transverse direction (Y-Y) and **in that** the surface (230) of the base side (210) opposite to that where the vertical side (220) is situated has formed therein:

   - a first recess (231) extending in the transverse direction (Y-Y) along the entire length in the said transverse direction of the base (210);
   - two recesses (232) extending in the longitudinal direction (X-X) and arranged on the opposite sides of and adjacent to the longitudinal central seat (211) and between the first transverse recess (231) and the free **transverse** edge (200c) of the base side (210) of the L;

   said recesses being suitable for mating with corresponding ribs (10;110,12;112,113a,113b,114) of the fixing bracket according to Claim 1.

8. Tool according to Claim **7, characterized in that** it has two longitudinal feet (212) with their free end folded in the vertical direction so as to form a respective lug (212a) arranged on opposite sides of the central seat (211).

9. Assembly composed of a fixing bracket according to Claim 1 and a tool according to Claim **7** for positioning and fixing metal sheets (2) to roof beams (3).

10. Assembly according to Claim **9, characterized in that** the tool is joined to a screwing device.

11. Assembly according to Claim **10, characterized in that** fixing of the bracket is performed by means of screws (1).

Patentansprüche

1. Halterung zum Befestigen von Blechteilen (2) an Dachbalken (3), umfassend

- eine erste Grundseite (110), die sich in einer der Länge der Grundseite (110) entsprechenden Querrichtung (Y-Y) und einer der Breite der Grundseite (110) entsprechenden Längsrichtung (X-X) erstreckt,
- eine zweite Seite (120) rechtwinklig zur Grundseite (110),
- zumindest zwei in der Grundseite (110) gebildete Durchgangslöcher (111),
- zumindest eine erste erhabene Rippe (112), die sich auf der Grundseite (110) zwischen zwei Durchgangslöchern (111) erstreckt, und
- zumindest eine zweite erhabene Rippe (113), die sich in Querrichtung (Y-Y) auf der Grundseite (110) erstreckt,

dadurch gekennzeichnet, dass die Grundseite (110) jeweils eine sich in Längsrichtung (X-X) zwischen einem jeweiligen Endloch (111) und der zugeordneten Längsseitenkante (110a, 110b) erstreckende erhabene Rippe (114) umfasst, wobei ein jeweiliges Endloch dasjenige der Durchgangslöcher (111) ist, das in der Nähe einer jeweiligen der gegenüberliegenden Längsseitenkanten (110a, 110b) auf der Grundseite (110) angeordnet ist, und dadurch, dass die zumindest eine erste erhabene Rippe (112) zwischen zwei Durchgangslöchern (111) liegt und nach diesen ausgerichtet ist und sich in Querrichtung erstreckt.

2. Befestigungshalterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die zweite erhabene Rippe (113a, 113b) sich in Querrichtung (Y-Y) auf der Grundseite (110) erstreckt, in der Nähe von deren Frontkante (110c), zwischen den Längsendrippen (114) und einem im Wesentlichen in Querrichtung (Y-Y) zentralen Punkt der Grundseite.

3. Befestigungshalterung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Grundseite (110) ein drittes Loch (111a) an dem im Wesentlichen zentralen Punkt aufweist.

4. Befestigungshalterung nach Anspruch 1, **dadurch gekennzeichnet, dass** das freie Ende (21) der vertikalen Seite (120) eine erste, im Wesentlichen zur Längsrichtung (X-X) parallele Falte und eine zweite, im Wesentlichen zur Vertikalrichtung (Z-Z) parallele Falte aufweist.

5. Befestigungshalterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Vertikalseite (120) einen Durchgangsschlitz (121) aufweist, der sich über eine geeignete Länge in Querrichtung (Y-Y) erstreckt.

6. Befestigungshalterung nach Anspruch 5, **dadurch gekennzeichnet, dass** sie ein in dem Querschlitz (121) eingesetztes und darin verlagerbares Z-förmiges Gleitstück (150) aufweist.

7. Werkzeug mit einer zur Form der Befestigungshalterung nach Anspruch 1 passenden L-Form, aufweisend eine sich in Längsrichtung (X-X) erstreckende Grundseite (210) und eine zur Vertikalrichtung (Z-Z) parallele und zur Grundseite (210) rechtwinkligen Vertikalseite (220), **dadurch gekennzeichnet, dass** die Grundseite (210) eine zentrale Aufnahme (211) aufweist, die sich nach innen in Längsrichtung (X-X) und entlang der freien Querkante (200c) offen erstreckt, wobei die Querkante sich in Querrichtung (Y-Y) erstreckt, und dadurch, dass in der der Vertikalseite (220) gegenüberliegenden Oberfläche (230) der Grundseite (210) gebildet sind:

- eine erste sich in Querrichtung (Y-Y) über die gesamte Länge in der Querrichtung der Grundseite (210) erstreckende Aussparung (231);
- zwei Aussparungen (232), die sich in Längsrichtung (X-X) erstrecken und an den gegenüberliegenden Seiten von sowie benachbart zu der zentralen Längsauf nahme (211) und zwischen der ersten Queraussparung (231) und der freien Querkante (200c) der Grundseite (210) des L angeordnet sind;

wobei die Aussparungen zur Paarung mit entsprechenden Rippen (10; 110, 12; 112, 113a, 113b, 114) der Befestigungshalterung nach Anspruch 1 geeignet sind.

8. Werkzeug nach Anspruch 7, **dadurch gekennzeichnet, dass** es zwei Längsfüße (212) aufweist, deren freie Enden in Vertikalrichtung gefaltet sind, um an gegenüberliegenden Seiten der zentralen Aufnahme (211) angeordnet jeweils eine Nase (212a) zu bilden.

9. Anordnung umfassend eine Befestigungshalterung nach Anspruch 1 und ein Werkzeug nach Anspruch 7 zum

Positionieren und Befestigen von Blechen (2) am Dachbalken (3).

10. Anordnung nach Anspruch 9, **dadurch gekennzeichnet, dass** das Werkzeug mit einer Schraubvorrichtung verbunden ist.

11. Anordnung nach Anspruch 10, **dadurch gekennzeichnet, dass** die Befestigung der Halterung mittels Schrauben (1) vollzogen ist.

Revendications

1. Équerre de fixation de pièces de tôle (2) à des poutres de toiture (3), comprenant

- un premier côté base (110) s'étendant dans une direction transversale (Y-Y) correspondant à la longueur du côté base (110) et dans une direction longitudinale (X-X) correspondant à la largeur du côté base (110),
- un second côté (120) formant un angle droit avec le côté base (110),
- au moins deux trous traversants (111) formés sur ledit côté base (110),
- au moins une première nervure dressée (112) s'étendant sur le côté base (110) entre deux trous traversants (111), et
- au moins une seconde nervure dressée (113) s'étendant dans la direction transversale (Y-Y) sur le côté base (110),

caractérisé en ce que

- ledit côté base (110) comprenant une nervure dressée respective (114) s'étendant dans la direction longitudinale (X-X) entre chaque trou d'extrémité (111) et le bord latéral longitudinal associé (110a, 110b), dans laquelle chaque trou d'extrémité étant l'un desdits au moins deux trous traversants (111) réalisé, à proximité de l'un, respectif, des bords latéraux longitudinaux opposés (110a, 110b), sur le côté base (110),

et **en ce que** ladite au moins une première nervure dressée (112) est située entre deux trous traversants (111) et alignée avec ces derniers et s'étend dans la direction transversale.

2. Équerre de fixation selon la revendication 1, **caractérisée en ce que** ladite seconde nervure dressée (113a, 113b) s'étend dans la direction transversale (Y-Y) sur ledit côté base (110), à proximité de son bord avant (110c), entre les nervures d'extrémité longitudinale (114) et un point sensiblement central du côté base dans la direction transversale (Y-Y).

3. Équerre de fixation selon la revendication 2, **caractérisée en ce que** le côté base (110) comporte un troisième trou (111a) réalisé au niveau dudit point sensiblement central.

4. Équerre de fixation selon la revendication 1, **caractérisée en ce que** l'extrémité libre (21) du côté vertical (120) comporte un premier pli sensiblement parallèle à la direction longitudinale (X-X) et un second pli sensiblement parallèle à la direction verticale (2-2).

5. Équerre de fixation selon la revendication 1, **caractérisée en ce que** le côté vertical (120) comporte une fente traversante (121) s'étendant dans la direction transversale (Y-Y) sur une longueur appropriée.

6. Équerre de fixation selon la revendication 5, **caractérisée en ce qu'**elle comporte une pièce coulissante en forme de Z (150) introduite dans la fente transversale (121) et pouvant se déplacer à l'intérieur de cette dernière.

7. Outil en forme de L correspondant à la forme de l'équerre de fixation selon la revendication 1, comportant un côté base (210) s'étendant dans la direction longitudinale (X-X) et un côté vertical (220) parallèle à la direction verticale (Z-Z) et formant un angle droit avec le côté base (210), **caractérisé en ce que** le côté base (210) comporte un logement central (211) s'étendant vers l'intérieur dans la direction longitudinale (X-X) et ouvert le long du bord transversal libre (200c), dans lequel ledit bord transversal s'étend dans la direction transversale (Y-Y) et **en ce que** la surface (230) du côté base (210) opposée à celle où le côté vertical (220) est situé comporte, formés dans cette derrière :

- un premier évidement (231) s'étendant dans la direction transversale (Y-Y), sur toute la longueur de ladite direction transversale, de la base (210) ;
- deux évidements (232) s'étendant dans la direction longitudinale (X-X) et réalisés sur les côtés opposés du

logement central longitudinal (211), et adjacents à ce dernier, et entre le premier évidement transversal (231) et le bord transversal libre (200c) du côté base (210) de la forme de L ;
lesdits évidements étant appropriés pour accouplement avec des nervures correspondantes (10 ; 110, 12 ; 112, 113a, 113b, 114) de l'équerre de fixation selon la revendication 1.

8. Outil selon la revendication 7, **caractérisé en ce qu'**il comporte deux pieds longitudinaux (212) dont les extrémités libres sont pliées dans la direction verticale de façon à former une patte respective (212a) disposée sur les côtés opposés du logement central (211).

9. Ensemble composé d'une équerre de fixation selon la revendication 1 et d'un outil selon la revendication 7, destiné à positionner et à fixer des tôles (2) à des poutres de toiture (3).

10. Ensemble selon la revendication 9, **caractérisé en ce que** l'outil est lié à un dispositif de vissage.

11. Ensemble selon la revendication 10, **caractérisé en ce que** la fixation de l'équerre se fait au moyen de vis (1) .

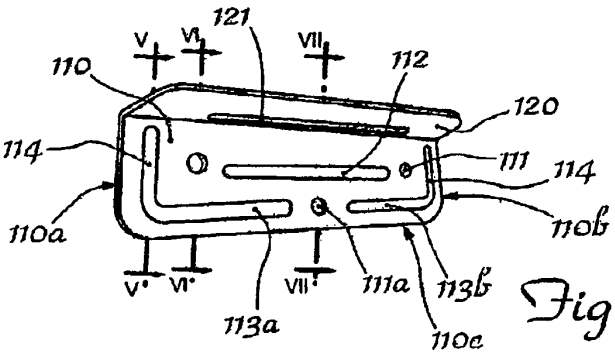
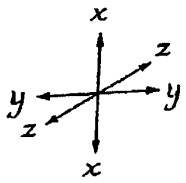


Fig.1



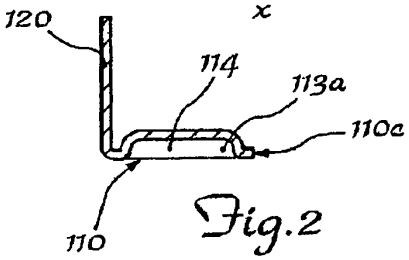


Fig.2

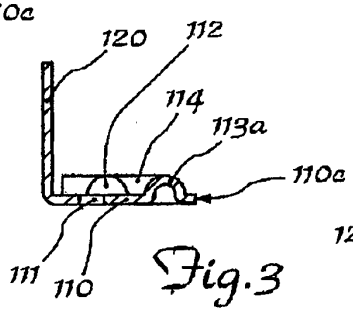


Fig.3

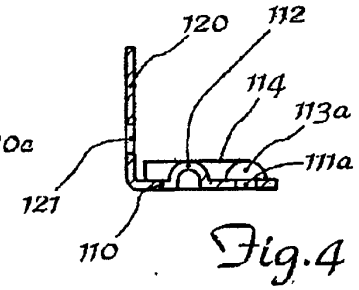


Fig.4

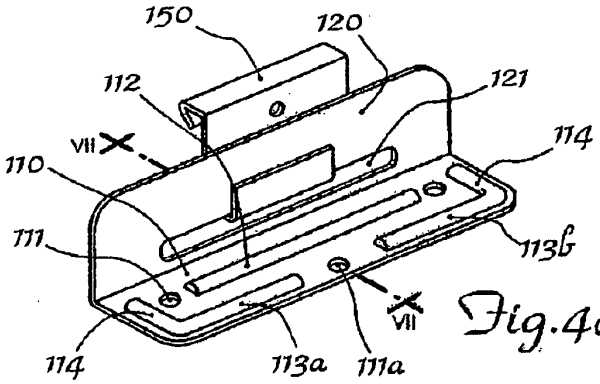


Fig.4a

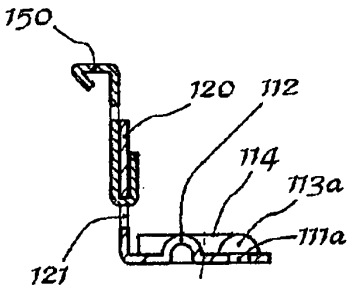


Fig.4b

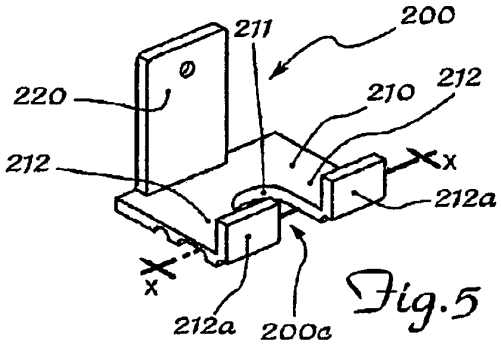


Fig.5

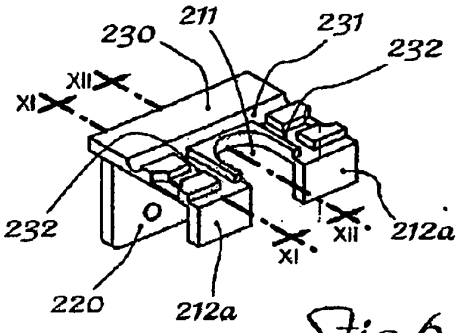


Fig.6

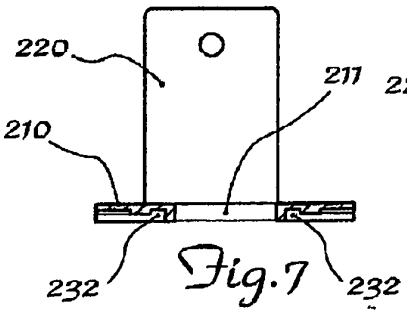


Fig.7

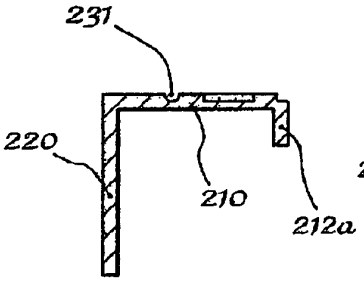


Fig.8

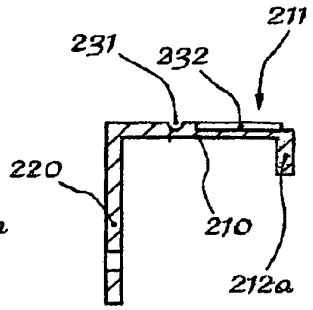


Fig.9

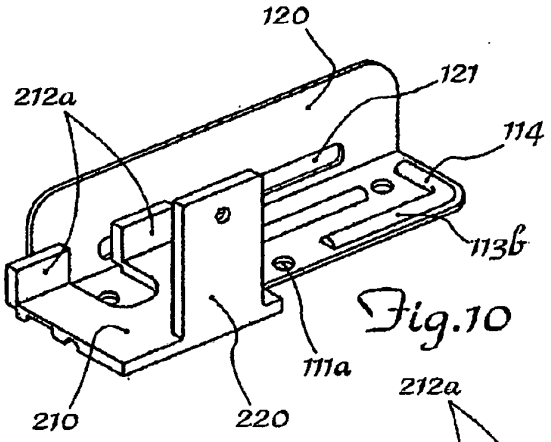


Fig.10

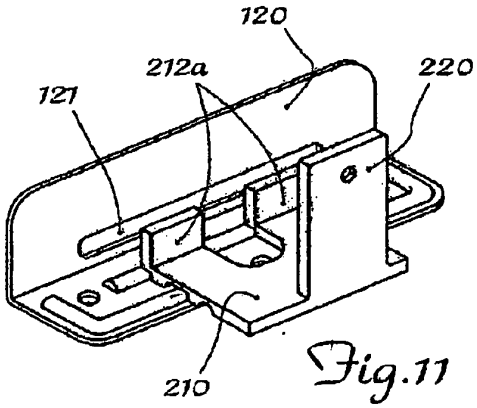


Fig.11

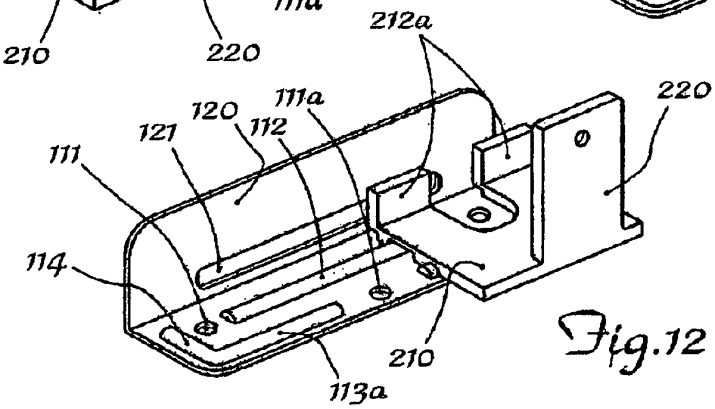


Fig.12

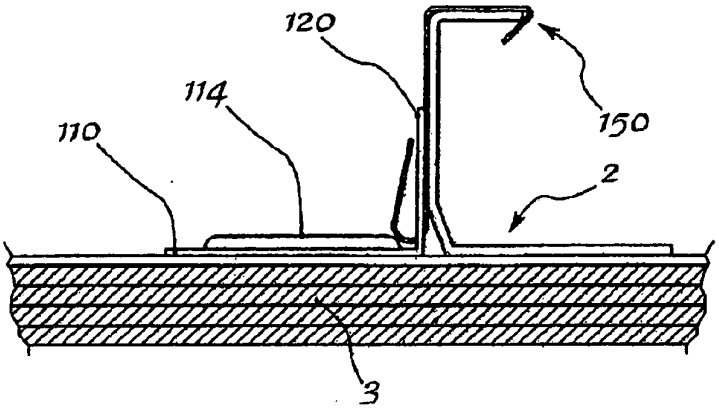


Fig.13

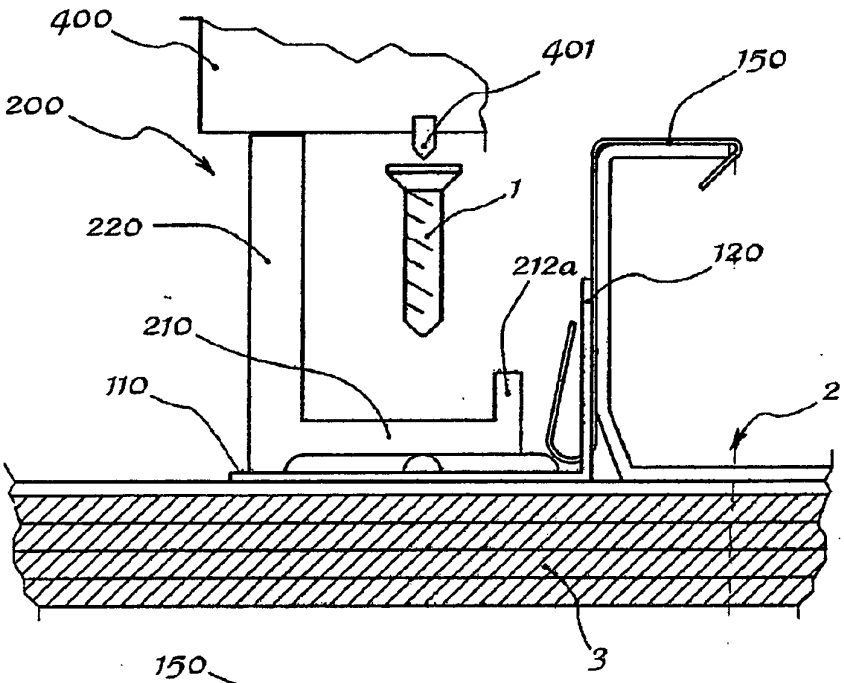


Fig.14

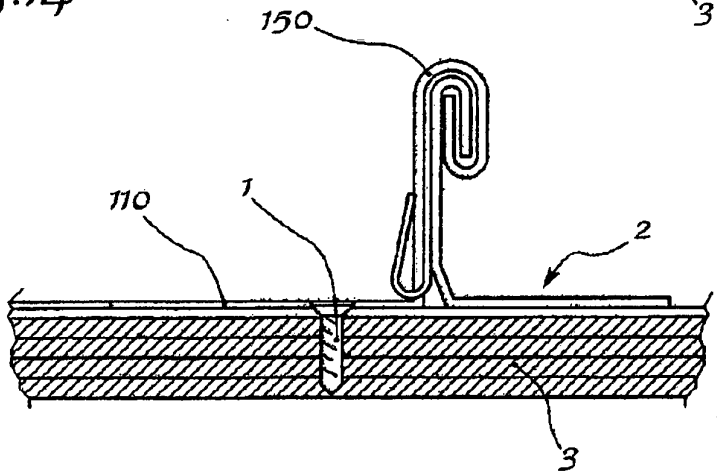


Fig.15

REFERENCES CITED IN THE DESCRIPTION

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