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

(11) **EP 1 939 371 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.07.2008 Bulletin 2008/27

(51) Int Cl.:
E04B 5/12 *(2006.01)* ***E04F 15/04*** *(2006.01)*

(21) Application number: **06125684.8**

(22) Date of filing: **08.12.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(71) Applicant: **Nørskov, Niels Erik**
7870 Råslev (DK)

(72) Inventor: **Nørskov, Niels Erik**
7870 Råslev (DK)

(74) Representative: **Holme Patent A/S**
Vesterbrogade 20
1620 Copenhagen V (DK)

(54) **A plank structure and method of installation**

(57) A structure is comprising at least one plank (2) attached with a side to an edge of at least one joist (3) by means of at least one mount (4). The at least one mount is with at least two first openings (7,7') at either side of the edge of the at least one joist and at least one other opening (8) above said edge. The structure is quick and easy to assemble. The assembling is strong and durable and do not involve any safety risk for the users. It also has a pleasant aesthetic appearance and can be made of hard wood.

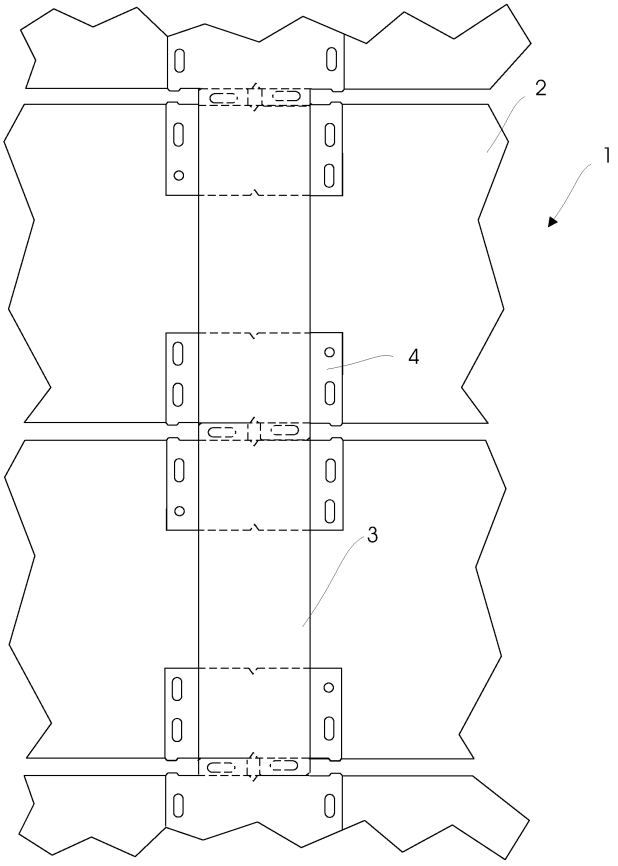

Fig. 2

EP 1 939 371 A1

Description

[0001] The invention relates to a structure comprising at least one plank with a side attached generally transversely to an edge of at least one joist by means of at least one mainly plate-formed mount and also to a method for producing the structure.

[0002] Structures of this kind are widely used for example for floors in terraces, hoardings and pallets.

[0003] The joist forms a bearing part of the structure. It has a relatively large height for being able to obtain the necessary moment of resistance against being bent. The thickness of the joist may be smaller than the width of the planks. The planks are normally attached to the joists with a little distance in between.

[0004] Such structures have traditionally been assembled by means of nails or screws, which however can work up above the surface of the plank and cause a safety risk. The screws or nails can moreover be seen and detract from the aesthetic appearance of the structure and sometimes they also can discolour the area of the structure surrounding the nails or screws.

[0005] In order to avoid these problems angular brackets have been used for assembling the structures. The assembling operation by means of such brackets is however difficult and time-consuming.

[0006] Mounts in form of plates with serrated edges are well known and can be used by being hammered into planks and joists to be assembled. The obtained connections are however relatively week and the operations difficult to carry out. These known mounts cannot be used when the structure is made of hard wood.

[0007] The above-mentioned disadvantages of the prior art are according to the present invention remedied by,
in a first aspect of the invention providing a structure of the kind mentioned in the opening paragraph which is quick and easy to assemble,
in a second aspect of the invention providing a structure of the kind mentioned in the opening paragraph which is assembled in a strong and durable way,
in a third aspect of the invention providing a structure of the kind mentioned in the opening paragraph in which the assembling involves no safety risk for the users,
in a fourth aspect of the invention providing a structure of the kind mentioned in the opening paragraph which has an aesthetic appearance,
in a fifth aspect of the invention providing a structure of the kind mentioned in the opening paragraph which consists of hard wood,
in a sixth aspect of the invention providing a method for producing a structure consisting of planks attached to joists.

[0008] The novel and unique features of the invention whereby these features are achieved consist in the fact that the structure further comprises two first openings preferably formed in the mount at either side of the middle line of the edge of the at least one joist, a fastener for via each of the first openings attaching the mount to said side of the at least one plank, at least one second opening formed in the mount, and a second fastener for via the at least second opening attaching the mount to said edge of the at least one joist.

[0009] The assembling of the construction according to the invention is easy and quick to carry out and a strong and durable construction is obtained.

[0010] The mounts of the construction moreover do not involve any risk for the users and since the mounts in the main are hidden, a pleasant aesthetic appearance is simultaneously obtained.

[0011] The fasteners can, according to the invention, be screws so that the structure advantageously can be made of hard wood.

[0012] The two first openings can be formed in the mount above the edge of the at least one joist in the mount. Countersunk screw heads should in this case be used.

[0013] In a preferred embodiment of the invention, the two first openings can be formed in the mount at either side of the edge of the at least one joist so that countersunk screw heads are not required.

[0014] The mount can, according to the invention, moreover be placed between the associated planks and joists so that a space between said wood parts is formed. Opposite surfaces of the wood parts therefore are exposed to air preventing the wood against rotting.

[0015] The mount can, according to the invention, furthermore have a mainly rectangular base, whereby the first openings are formed in the base and at least one tongue with the at least second opening is protruding from the base.

[0016] Each plank can, according to the invention, be attached to each joist by means of two opposite mounts which are turned 180° in relation to each other. Neighbouring planks are attached to the same joist in the same way and with a little space in between. The tongue of each mount is protruding into that space.

[0017] Both tongues can, side by side, be in the same space between neighbouring planks when the tongue, in the mounted position of the mount, is placed above an area of the edge of the joist extending outwards in the lateral direction from the middle of the edge of the joist.

[0018] The mounts are easy to attach to the planks when they have two perpendicularly extending hooks which, by attaching the mount to the plank, are abutting an edge of this. The hooks may be bent of parts of the plate-formed mounts.

[0019] The joists of the structure according to the invention will preferably be placed with a predetermined distance between their middle lines. Markings corresponding to the positions of said middle lines can according to the invention preliminary be marked out on the planks to be attached to the joists. The mounts are then attached to the planks with their base symmetrically arranged in relation to said markings.

[0020] The mounts can easily and quickly be placed in the correct positions upon the planks when the middle

of the base of each mount is indicated in advance. Such indication may, according to the invention, be in form of two opposite angular incisions in the edges of the base of the mounts.

[0021] The object, features and advantages of the invention will be explained in more details in the following with reference to the drawing in which,

Fig. 1 is a perspective view of a first embodiment of a mount for assembling the structure according to the invention,

Fig. 2 shows a fragment seen from below of the structure,

Fig. 3 shows a fragment seen from above of the structure,

Fig. 4 is a perspective view of a second embodiment of a mount for assembling the structure according to the invention, and

Fig. 5 is a perspective view of a third embodiment of a mount for assembling the structure according to the invention,

[0022] The structure 1 shown in fragment in figs. 2 and 3 consists of planks 2 attached to joists 3 by means of plate-formed mounts 4. The mounts are partly shown in full-drawn line, partly in dotted line.

[0023] The structure of the invention can be made of materials like for example wood, chipboard, hardboard and plasterboard. In the following is supposed that the material is wood.

[0024] The planks may e.g. have a width of between 100 and 150 mm and a thickness of between 15 and 30 mm. The joist may have a thickness of between 40 and 50 mm and a height of between 90 and 150 mm. The width of the planks thus is larger than the thickness of the joists.

[0025] The dimensions of the mount depend on the dimensions of the woods parts. The mount may be a plate of stainless steel having a thickness of about 1½ mm.

[0026] A first embodiment of the mount 4 according to the invention is shown on a larger scale in fig. 1.

[0027] The mount has a mainly rectangular base 5 with a protruding tongue 6. Opposite pairs of first openings 7 are formed in the base and a second opening 8 is formed in the tongue.

[0028] The middle of the base is indicated in form of angular incisions 9 in opposite edges of the base. The tongue is arranged at one side of the line between the incisions while there is no tongue on the base of the mount on the opposite side.

[0029] Opposite parts of the mount are bent an angle of e.g. 90° to form two hooks 10.

[0030] The openings 7 and 8 are oblongs except, in this case, the opening 7', which is, round. Some or all openings may within the scope of the invention be oblong or round.

[0031] The joists of the structure are placed with a predetermined distance between their middle lines, and markings corresponding to the positions of said middle lines are marked out on an upwardly facing side of the planks to be attached to the joists.

[0032] Two opposite mounts are placed on each plank at each of the markings with their angular incisions coincident with the markings.

[0033] Therefore, the base of the mounts, in the assembled state of the structure, will automatically be symmetrically arranged in relation to the middle of the joists.

[0034] Each mount is placed on the respective plank with their hooks abutting an edge of the plank and the tongue protruding from said edge.

[0035] A screw (not seen) is then screwed into the plank through the round first opening 7'.

[0036] Three points then fix the position of the mount in relation to the plank. It then is easy to secure the position of the mount by means of screws (not seen) screwed into the plank through the oblong openings 7.

[0037] The plank with the attached mounts is then turned and placed upon the associated joists in such a way that the angular incisions of the mounts are coincident with the middle lines of the joists.

[0038] Each mount on the plank is then attached to the joist by means of a screw (not seen) screwed into the edge of the joist through the second opening formed in the tongues.

[0039] Since the tongue of each mount is offset in one direction from the line between the two angular incisions of the mount and the mounts on neighbouring planks are turned 180° in relation to each other, both tongues can find place side by side in the same space between the two planks.

[0040] Neighbouring planks are placed on the joists with a space in between corresponding to the extension of the protruding tongue that in this way functions as distance piece.

[0041] Fig. 4 shows a second embodiment of the mount according to the invention. This mount corresponds in the main to the mount shown in fig. 1. Identical parts therefore are denoted by the same reference numerals.

[0042] This mount is formed with only two first openings 7, which as shown are oblong. One ore both of the openings also may be round.

[0043] The mount of the second embodiment is especially simple and inexpensive.

[0044] Fig. 5 shows a third embodiment of the mount according to the invention. This mount corresponds in the main also to the mount shown in fig. 1. Identical parts therefore are denoted by the same reference numerals.

[0045] The mount has like the mount shown in fig. 1 a mainly rectangular base 5 with a protruding tongue 6. Opposite pairs of first openings 7 are formed in the base

and a second opening 8 is formed in the tongue.

[0046] The middle of the base is indicated in form of angular incisions 9 in opposite edges of the base. The tongue is arranged at one side of the line between the incisions while there is no tongue on the base of the mount on the opposite side of the line between the incisions.

[0047] Opposite parts of the mount are bent an angle of e.g. 90° to form a pair of hooks 10.

[0048] In this case there is on the opposite edge of the base formed a second protruding tongue 6' arranged at the opposite side of the line between the incisions 9 as the first protruding tongue 6.

[0049] On the same edge as the second protruding tongue 6' is also formed a second pair of hooks 10'. The mount of the third embodiment is used for planks having the same width as the distance between the first and second pair of hooks.

[0050] For each assembling between a plank and a joist then is advantageously used only one mount.

Claims

1. A structure comprising at least one plank (2) with a side attached generally transversely to an edge of at least one joist (3) by means of at least one mainly plate-formed mount, **characterized in** further comprising,

   - two first openings (7,7') preferably formed in the mount (4) at either side of the middle line of the edge of the at least one joist,
   - a fastener for via each of the first openings attaching the mount to said side of the at least one plank,
   - at least one second opening (8) formed in the mount, and
   - a second fastener for via the at least second opening attaching the mount to said edge of the at least one joist.

2. A structure according to claim 1, **characterized in that** the mount (4) is placed between said side of the at least one plank (2) and said edge of the at least one joist (3) .

3. A structure according to claim 1 or 2, **characterized in that** the at least one second opening (8) is formed in the mount (4) above an area of the edge of the joist (3) extending outwards in the lateral direction from the middle of the edge.

4. A structure according to claim 1, 2 or 3, **characterized in**

   - **that** the mount (4) has a mainly rectangular base (5),
   - **that** the at least two first openings (7,7') are formed in the base,
   - **that** at least one tongue (6) which is protruding from the base is placed above an area of the edge of the joist (3) extending outwards in the lateral direction from the middle line of the edge, and
   - **that** the at least one second opening (8) is formed in said at least one tongue.

5. A structure according to any of the claims 1- 4, **characterized in that** the at least one plank (2) is attached to the at least one joist (3) by means of two mounts (4).

6. A structure according to any of the claims 1 - 5, **characterized in that** the at least two first openings (7,7') comprise a pair of two first openings (7,7') at either side of the edge of the joist (3).

7. A structure according to claim 4, 5 or 6, **characterized in that** the base (5) is formed with two generally perpendicularly extending hooks (10) placed at the same side as the tongue (6).

8. A structure according to claim 7, **characterized in that** each hook (10) is bent of parts of the plate-formed mount (4).

9. A structure according to any of the claims 4 - 8, **characterized in that** the middle between the at least two first openings (7,7') is indicated by means of at least one angular incision (9) formed in the edge of the base (5) of the mount (4).

10. A method for producing the structure according to claims 1 - 9, **characterized in** comprising the following steps,

    - placing the at least one plank (2) with a side facing upwards,
    - marking the position on said side where the middle line of the edge of the at least one joist (3) to be assembled with the plank is expected to be,
    - placing two mounts (4) opposite each other with their at least one angular incisions (9) coincident with said marking and their hooks (10) abutting each their edge of the plank (2),
    - attaching the mounts (4) to the at least one plank (2) by means of fasteners through the first openings (7,7') of the mounts (4),
    - turning the plank,
    - placing the plank (2) on the edge of the joist (3) so that the line between the angular incisions (9) of the mount (2) is coincident with the middle line of the edge, and
    - attaching the mounts (4) to the joist (3) by

means of fasteners through the second openings (8) of the mounts (4).

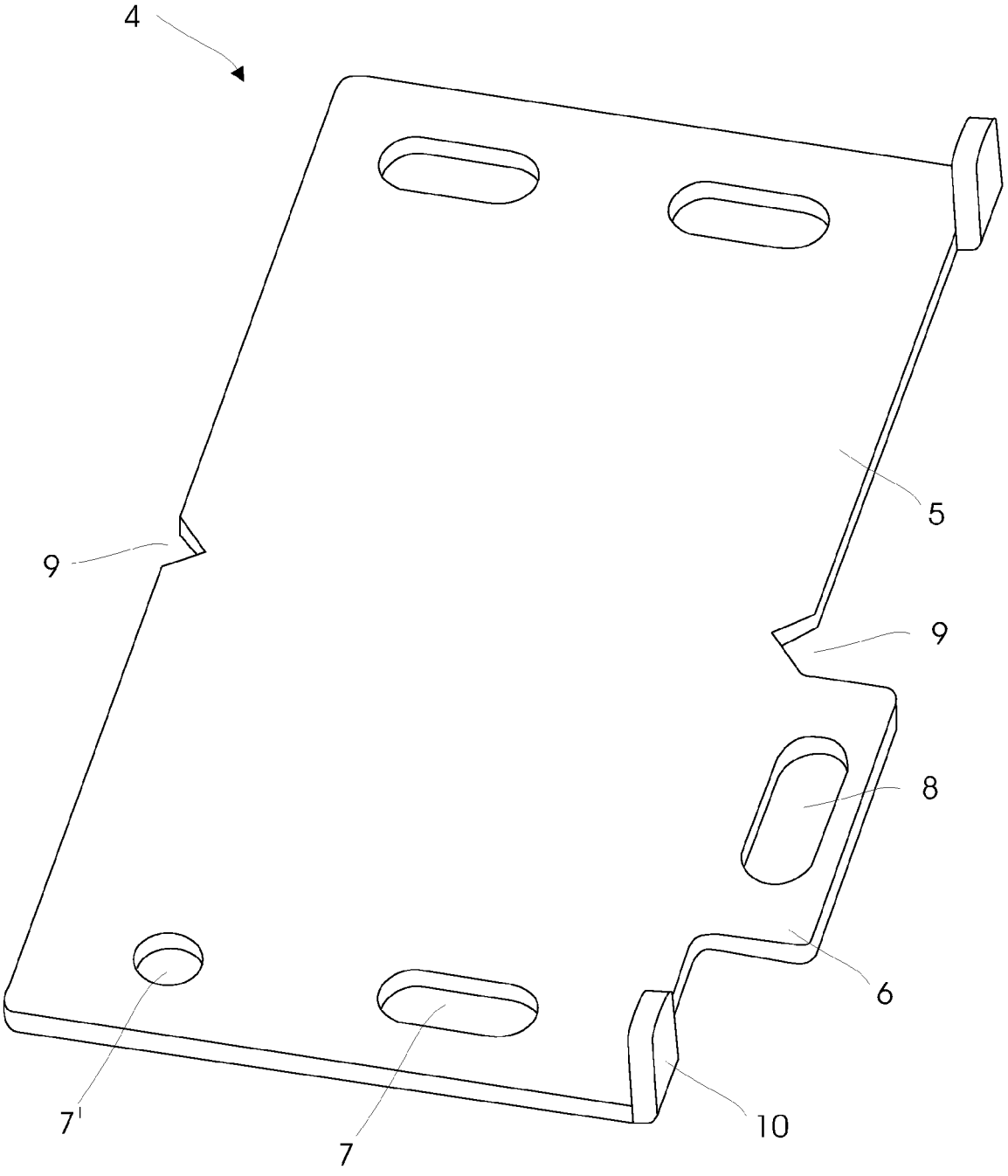

Fig. 1

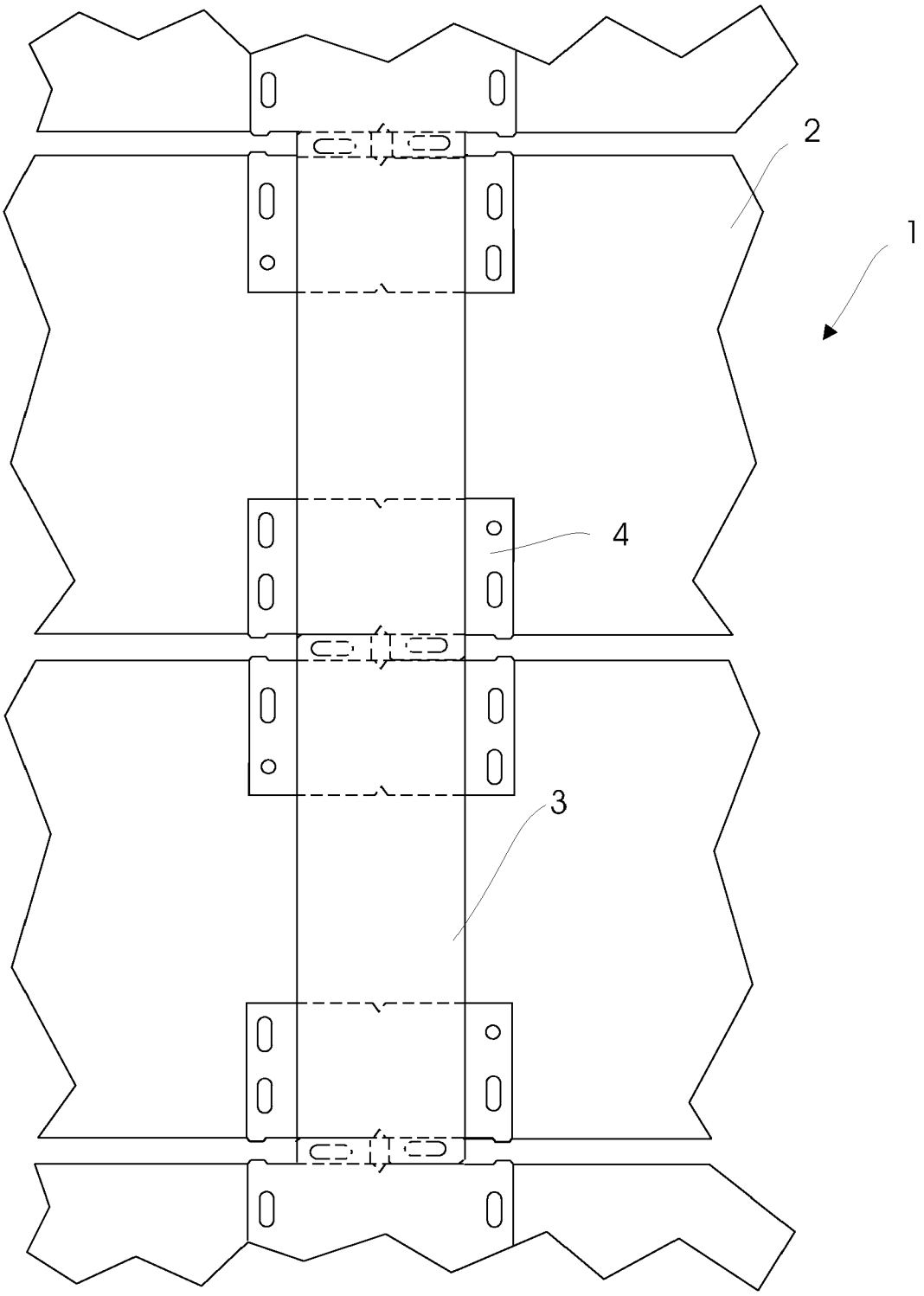

Fig. 2

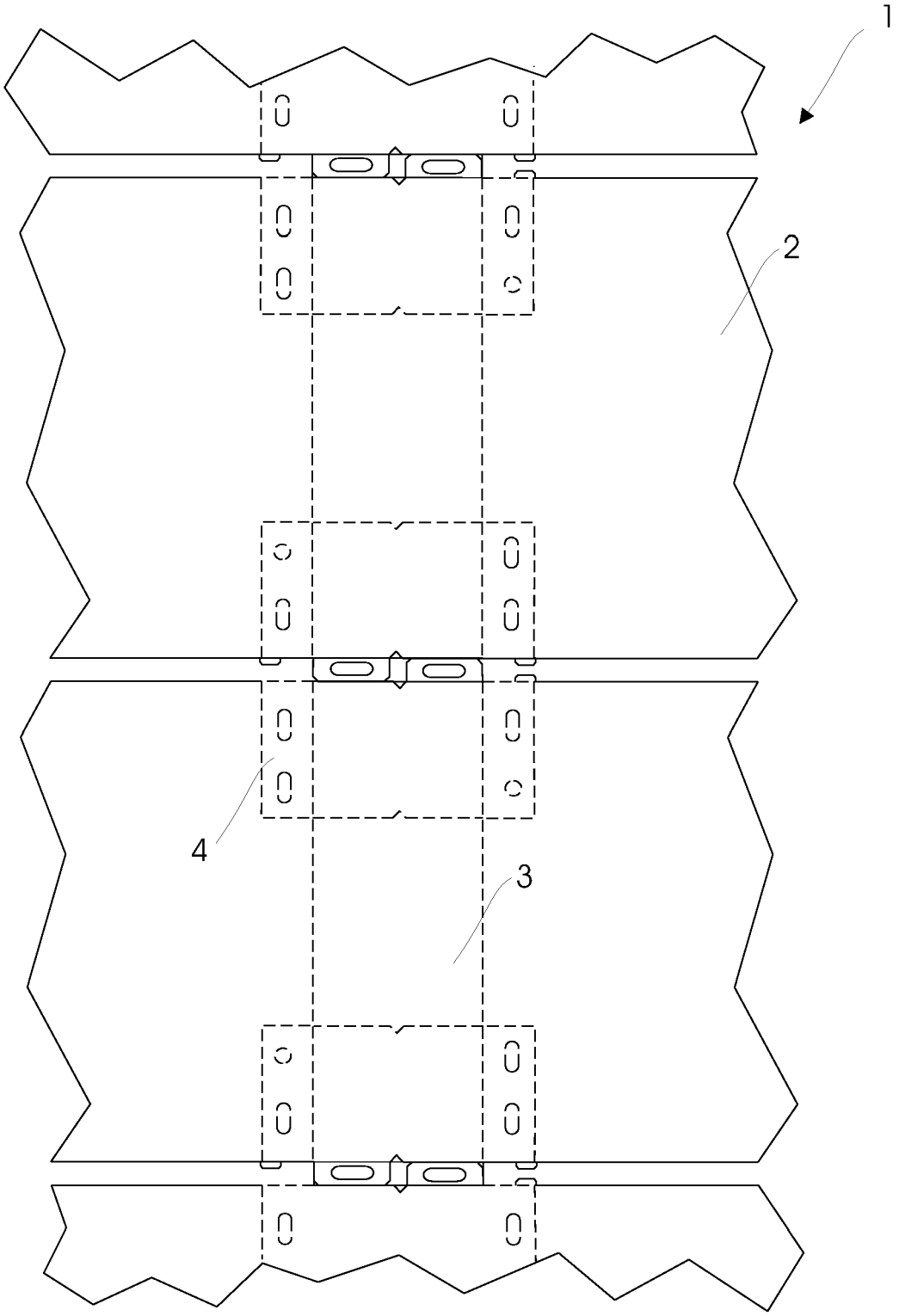

Fig. 3

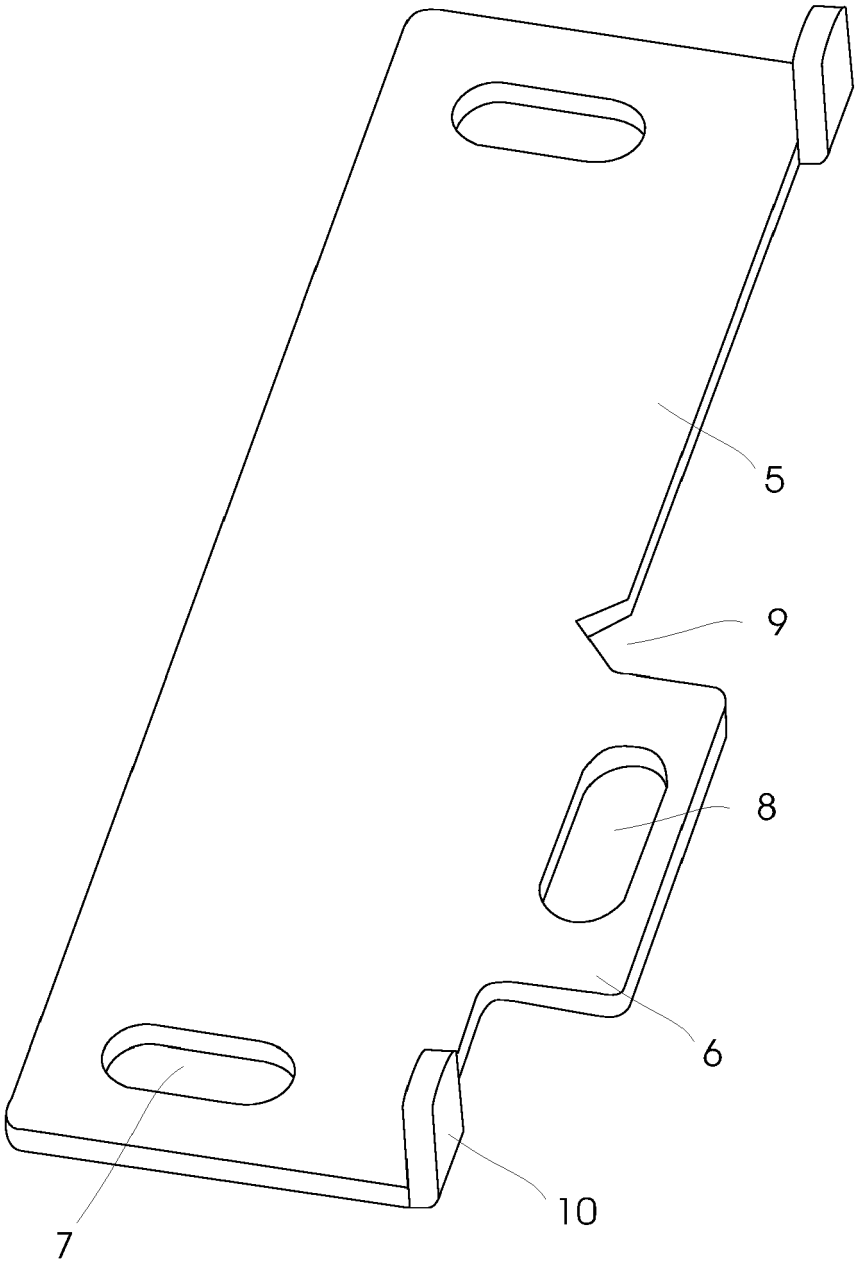

Fig. 4

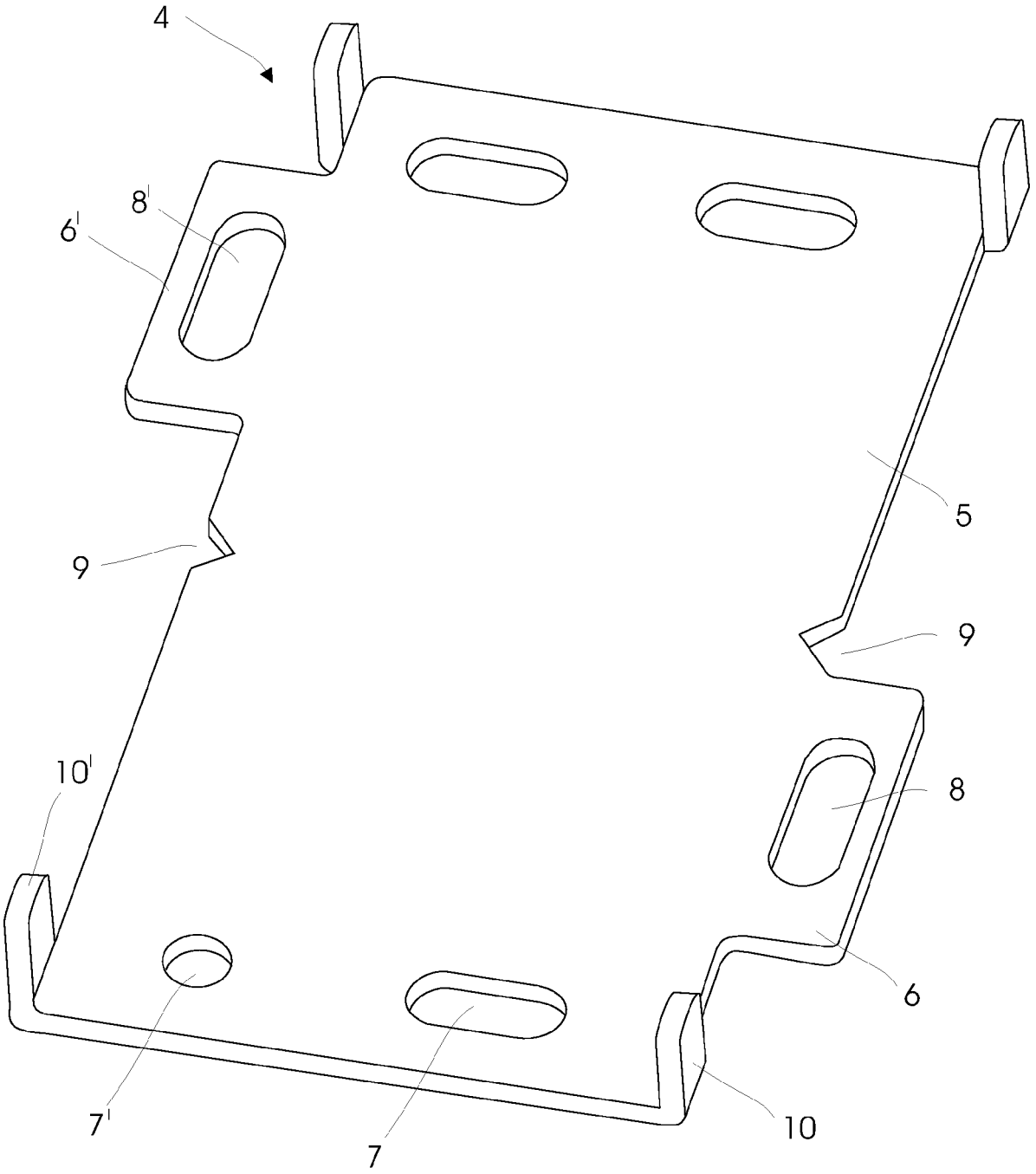

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 5684

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 844 651 A (PARTRIDGE JUERGEN W [CA]) 4 July 1989 (1989-07-04) * claims 1,2,4; figures 1-4 * -----	1-3,5-8	INV. E04B5/12 E04F15/04
X	CA 2 154 035 A1 (ORCHARD BRIAN KEITH [CA]) 18 January 1997 (1997-01-18) * figures 1,2,4 * -----	1-3,5,6, 10	
A	US 4 466 225 A (HOVIND JOHN K [US]) 21 August 1984 (1984-08-21) * figure 2 * -----	7	

TECHNICAL FIELDS SEARCHED (IPC)

E04B
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 May 2007	Rosborough, John

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

2

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 12 5684

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-05-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4844651 A	04-07-1989	NONE	
CA 2154035 A1	18-01-1997	US 5775048 A	07-07-1998
US 4466225 A	21-08-1984	CA 1181219 A1	22-01-1985

EPO FORM P0459

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