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(54) **LOFT STAIRS WITH COPLANAR INFILL**

(57) Loft stairs comprising a frame 1 which comprisies a four frame members joined together to form a rectangular frame, at least two folding ladder or scissor segments that move relative to each other, and a closing flap 2, where the frame 1 is located deeper in the ceiling than the closing flap 2, and in the area of that difference in depth of their seating there is an coplanar infill in the form of a covering strip that comes flush with the outer surface of the ceiling 4, the covering strip having an embedding section 3' and an attachment arm 3", and when installed, the attachment arm 3" lies beneath the plasterboard layer and is mounted to the ceiling wall by means of a screw 7, the frame 1 abuts on the inner surface 3.1' of the embedding section 3', and the outer surface 3.2' of the embedding section 3' lies beneath the surface covering the ceiling 4, e.g. under plaster.

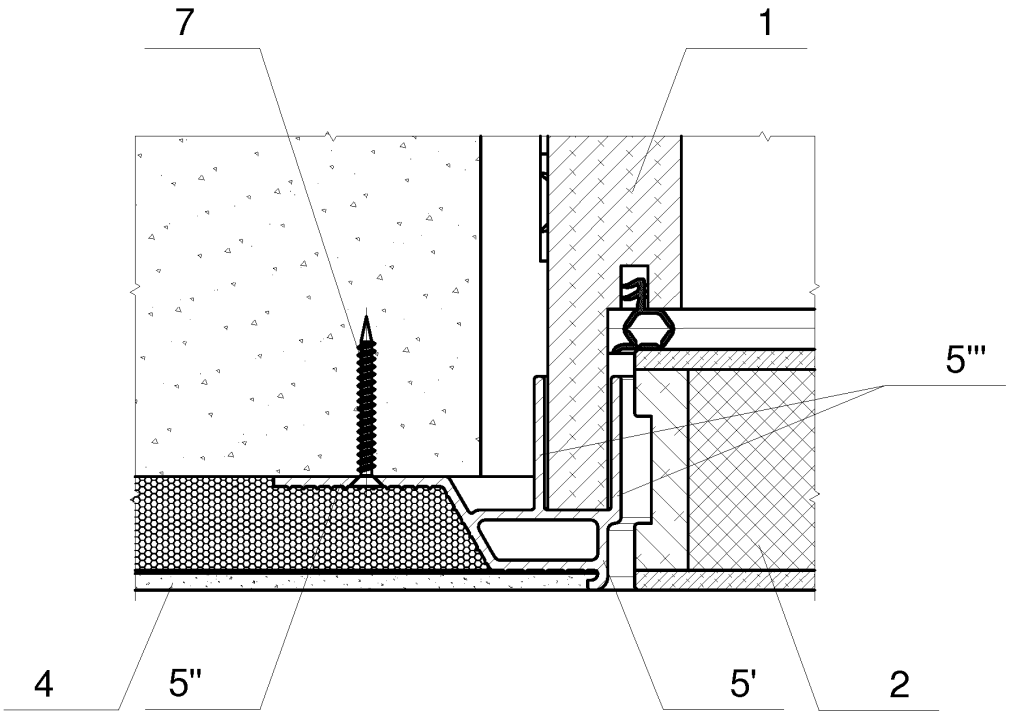


Fig. 6

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Description

[0001] Solution refers to a loft stairs comprising a coplanar infill that makes the loft stairs frame being in one plane with the surface of the loft stairs flap, the infill being a finishing element for installation of the stairs in the ceiling, covering the space between the loft stairs frame and the ceiling wall.

Background of the invention

[0002] There is known solution from WO2007091171 A1 application which refers to doors, windows or lightings, where the sash features profiles that form a frame around the door, window or lighting frame. Profiles have one arm with its surface on the same plane as the surface of the wall in which the door or window is mounted.

[0003] There is also known solution from polish patent application P.402367 which refers to integrated door frame for internal or external doors, whose middle section forming the door frame is made of wood, plywood, wood-based panels, metal or plastic. The outer side of the door frame, parallel to the plane of the door's opening in the wall, has at least one profile element on the door leaf side and/or a profile element on the opposite side of the door leaf, this being made of metal or plastic and additionally connecting the door frame to the wall surrounding the door opening, on one or both sides in the plane of the wall.

[0004] There is known another solution from US3855746 B1 patent, presenting a profile that covers the junction of two structural elements mounted perpendicular to each other. This covering profile has two pockets in which the ends of the two elements are attached, and the outer wall of the profile covers the place where they are joined.

[0005] **The field of the invention** is a loft stairs comprising a standard frame, an extendable ladder or a scissor ladder mounted in it, a flap closing the frame, and a coplanar infill that makes the frame being in one plane with the surface of the ceiling.

[0006] The loft stairs are installed in a ceiling opening, where said opening dimensions coresponds to dimensions of the loft stairs frame, while maintaining free play clearances for convenient installation of said stairs. The loft stairs frame comprises four members, which are joined together in preferably rectangular frame which is closed from the inside of the building by means of a flap. The loft stairs copmprises also at least two extendable ladder segments which are embedded on the closing flap of the stairs, and which are movable relative to other segments or extendable ladder is a scissor ladder. The ladder segments and the scissor ladder are connected to the frame by means of a hinges.

[0007] The flap may be attached directly to the frame member by hinge connection, which allow for pivotal movement of the flap in respect to said frame member or the flap may be attached only to the first ladder segment, where the latter is directly attached to the frame member by mentioned above hinges. In the loft stairs installed state, its frame is embeded deeper in the ceiling than the closing flap, such that in the area of that difference in the depth of their embeding, a coplanar infill is located. Said coplanar infill makes that the frame is placed in one plane with the surface of the ceiling, where said ceiling may be made of a plaster and plasterboard, covering the aforementioned free play clearances.

[0008] The coplanar infills are a covering strips, made particularly of aluminium, but possibly also of any other material. During assembly of the stairs, the coplanar infill is mounted around frame of the stairs or the coplanar infill forms an integral element with the loft stairs frame when the stairs are delivered to the customer.

[0009] Said covering strips comprises an embedding section whose extension is an attachment arm basically parallel to the surface of the ceiling. In the assembled state, the embedding section is located in the area constituting the difference in the depth of the loft stairs frame and the closing flap in the ceiling. An inner surface of the embedding section is directed towards the frame while its outer surface lies under the plaster layer or another layer covering the ceiling.

[0010] The attachement arm of the covering strip is an extension of the outer surface of the embedding section and serves as an element attaching the covering strip in the ceiling, while additionally the attachment arm is fixed to the ceiling by means of a screw. The arm is located under the outer surface of the ceiling covering, e.g. plaster, or is embedded under the thermal insulation layer of the ceiling, e.g. the plasterboard layer. The covering strips are attached around the four frame members of the frame to form a closed frame around the stairs.

[0011] The covering strip, being an integral part of the loft stairs frame, comprises an embedding section with an adhering arm, through which the strips are attached to the frame members already in a delivered to the customer loft stairs state. An alternative to the adhering arm are two adhering arms that form a pocket for the frame members. The width of the covering strips pocket is defined as the distance between the inner walls of the two adhering arms of the pocket and is equal at least to the width of the end section of each frame member that fits into that pocket. The embedding section has an outer surface lying under the plaster layer of the ceiling or another layer covering the ceiling. The extension of the inner surface is an attachment arm basically parallel to the surface of the ceiling, which is also attached under the plaster layer of the ceiling or another layer covering the ceiling.

[0012] Each of the aforementioned covering strips comprising any dimensions and shape that match the stairs that it is to be used with.

[0013] The advantage of this solution is new loft stairs provided with an coplanar infill in the form of the covering strips for the gap between the depth of the frame and the closing flap, covering the junction of the frame with the

edge of the ceiling, lending the stairs an aesthetic appearance as seen from the room in which they are installed.

[0014] The solution is disclosed also in the following drawings:

Fig. 1 view of the closed loft stairs as seen from the room
Fig. 2 section of the covering strip according to the first embodiment
Fig. 3 cross section of loft stairs fitted with the covering strips according to the first embodiment
Fig. 4 cross section of stairs fitted with the covering strips according to the first embodiment
Figure 5 cross section of stairs fitted with the covering strips according to the second embodiment
Fig. 6 cross section of stairs fitted with the covering strips according to the third embodiment

First embodiment

[0015] Loft stairs comprising a frame 1 closed from the outside by a flap 2, a coplanar infill that comes flush with the surface of a ceiling 4 and covers the space between the the frame 1 and the ceiling wall. The stairs also have folding ladder segments or scissor ladder not shown in the drawings. The infill is in the form of covering strips 3 featuring an embedding section 3' and an attachment arm 3". In the installed state, as shown in Fig. 3 and Fig. 4, the attachment arm 3" is located under the plaster board layer and is attached to the ceiling wall by means of a screw 7. Preferably, the frame 1 abuts on the inner surface 3.1' of the embedding section 3'. However, the embedding section may be at a distance from the base of the frame as shown in Fig. 4. The outer surface 3.2' of the embedding section 3' is located under the surface of the ceiling 4, e.g. under plaster. The covering strips forms a closed frame surrounding the stairs.

Second embodiment

[0016] Loft stairs comprising a frame 1 closed from the outside by the flap 2, a coplanar infill that comes flush with the surface of the ceiling 4. The stairs also have folding ladder segments or a scissor ladder, not shown in the drawings. The infill is in the form of a covering strips 5 integral with the frame 1, the former featuring an embedding section 5' and an attachment arm 5". In the installed state, as shown in Fig. 5, the attachment arm 5" is located under the plaster board layer and is attached to the ceiling wall by means of a screw 7. Preferably, the frame 1 abuts on the embedding section 5'; however, also possible is an option wherein the door frame box is at a distance from the embedding section. The integral covering strip 5 comprises an arm 5'" adjacent to the frame member of the frame 1 in addition to being connected to the frame by means of fasteners preferably in the form of screws 6. From the outside, the embedding section is covered with a plaster layer.

[0017] The integral covering strips also forms a closed frame surrounding the stairs mounted in the ceiling.

Third embodiment

[0018] The third embodiment disclose the stairs together with the integral covering strips as in the second embodiment, whereas the covering strips comprises a double adhering arm 5"', forming a pocket for the frame members.

Claims

1. A loft stairs comprising

- a frame (1) which comprises a four members arranged to be joined together to form a rectangular frame,
- a closing flap (2), movable in relation to the frame (1),
- at least two folding ladders or scissor segments arranged to be mounted in the frame (1) and embedded on the closing flap (2),

characterized in that the frame (1) being embedde deeper in the ceiling than the closing flap (2), and in the area of that difference in depth of their seating being a gap between the depth of the frame and the closing flap a coplanar infill is located such that the frame comes flush with the outer surface of the ceiling (4).

2. Loft stairs according to claim 1, **characterized in that** the coplanar infill (3) are covering strips comprising an embedding section (3') with extension which is an attachment arm (3") that in the loft stairs installed state is located under the surface of the ceiling, particularly under the plaster board.

3. Loft stairs according to claim 2, **characterized in that** the embedding section (3') is located in the area between the base of the frame (1) of the stairs and the outer surface of the ceiling (4).

4. Loft stairs according to claim 1, **characterized in that** the embedding section (3') has an inner surface (3.1') from the base of the frame (1) side and an outer surface (3.2') located under the ceiling covering surface (4), e.g. under plaster.

5. Loft stairs according to claim 1, **characterized in that** the coplanar infill are a covering strips (5) integral with the frame (1), comprising an embedding section (5') and an attachment arm (5") constituting a product ready for installation when the stairs are delivered.

6. Loft stairs according to claim 5, **characterized in that** the integral covering strip one adhering arm (5"') adjacent to the outer wall of the frame member of the frame is connected to it by fasteners preferably in the form of screws (6).

7. Loft stairs according to claim 5, **characterized in that** the integral covering strip (5) comprises two adhering arms (5"') forming a pocket for the frame members.

8. Loft stairs according to claim 7, **characterized in that** the width of the pocket, corresponding to the distance of the inner walls of the two adhering arms (5"') of the pocket, is at least equal to the width of the final section of the frame members of the frame (1).

9. Loft stairs according to claim 5 , **characterized in that** the attachment arm (5") when installed, lies beneath the surface of the ceiling (4).

10. Loft stairs according to claim 9, **characterized in that** the attachment arm (5"), when installed, lies beneath the outer layer of the ceiling (4), particularly under the plaster layer.

11. Loft stairs according to claim 9 or 10, **characterized in that** the attachment arm (5") is fixed to the ceiling wall by means of a screw (7).

12. Loft stairs according to claim 1, or 2, or 3, or 4, or 5, or 6, or 7, or 8, or 9, or 10, or 11, **characterized in that** the covering strips (3, 5) form a closed frame installed in the ceiling.

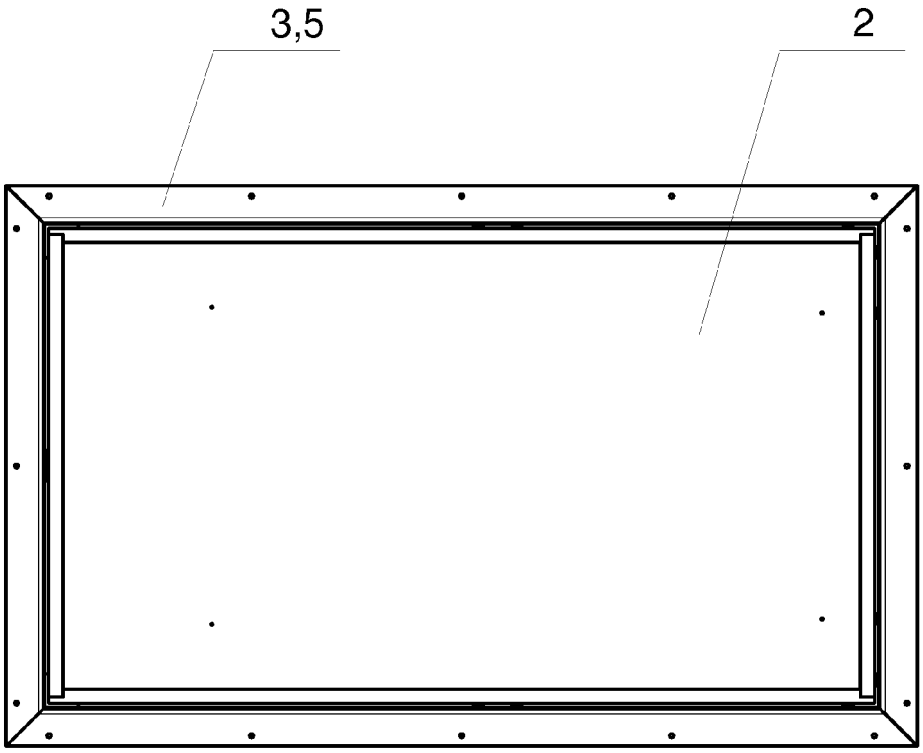


Fig. 1

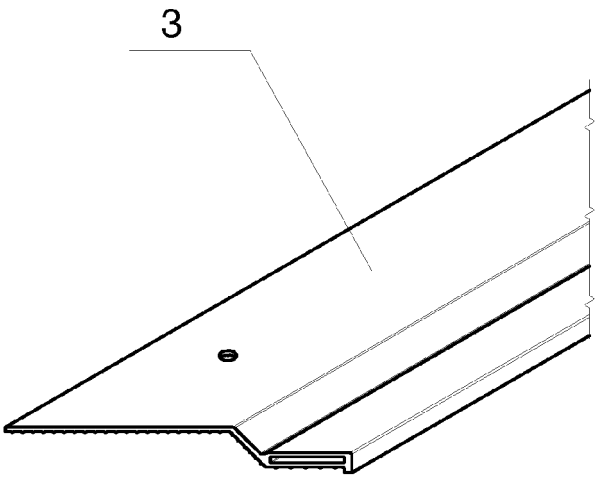


Fig. 2

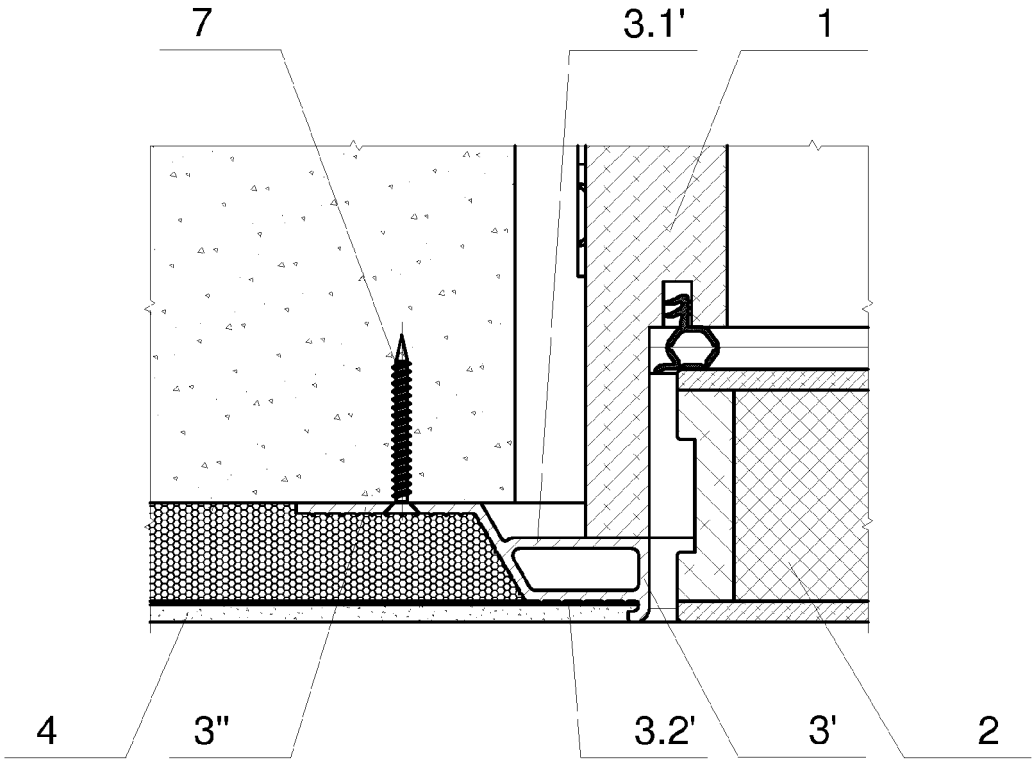


Fig. 3

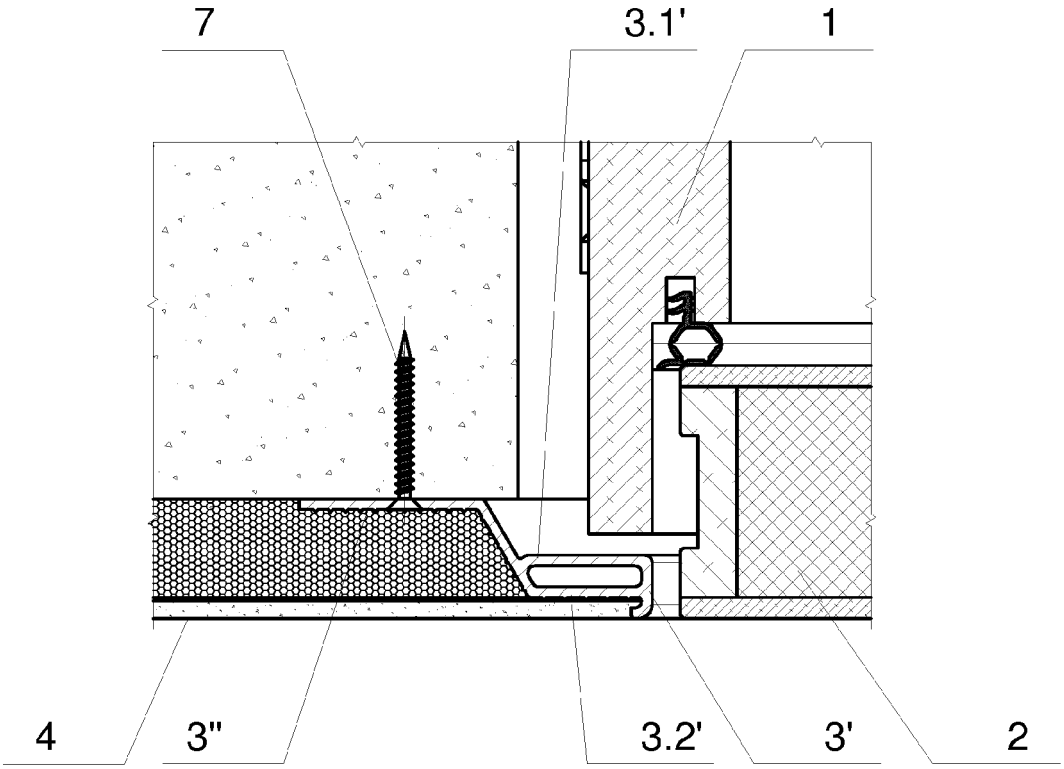


Fig. 4

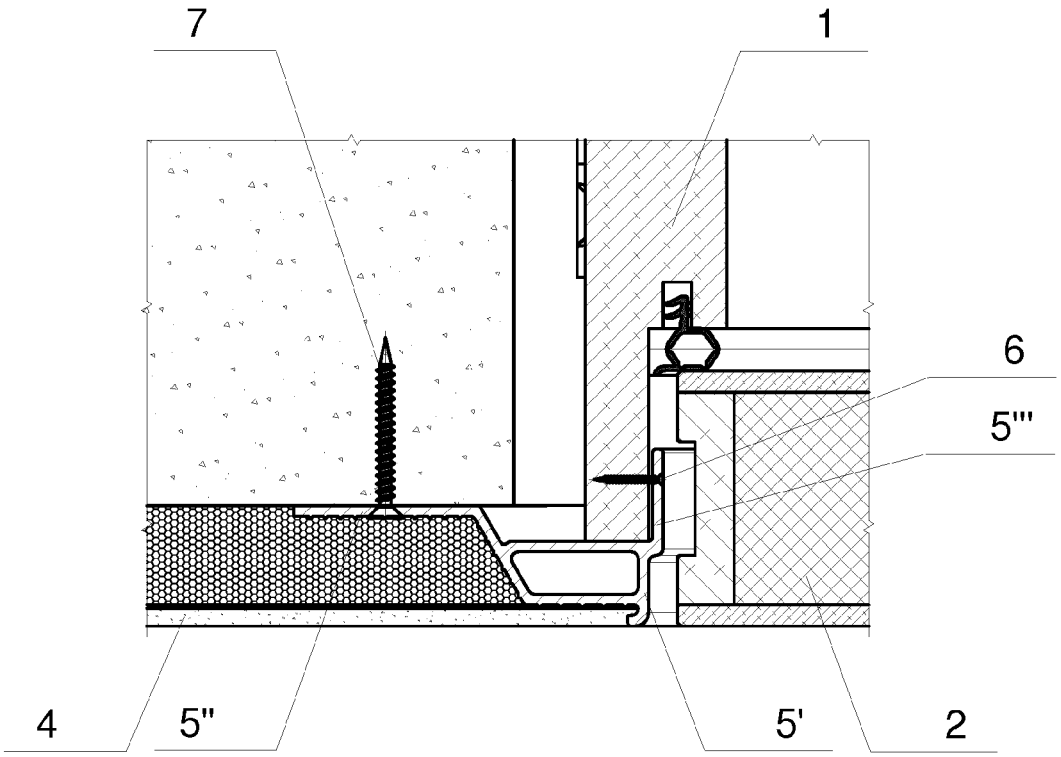


Fig. 5

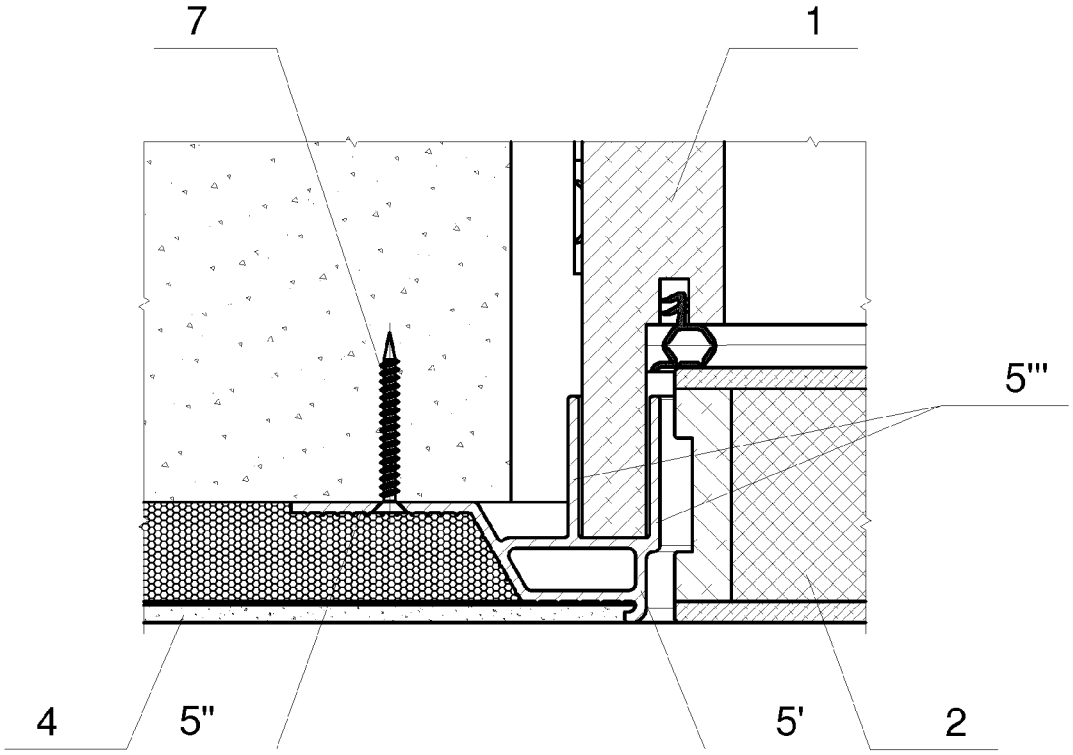


Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 17 18 0629

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	AT 505 683 A1 (MINKA HOLZ UND METALLVERARBEIT [AT]) 15 March 2009 (2009-03-15)	1-6,9-12	INV. E04F11/04 E04F19/02
A	* page 1, line 1 * * page 2, line 23 * * page 2, line 33 - page 4, line 5 * * figures 1,2 *	7,8	E06B1/62 E06B5/01
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TECHNICAL FIELDS SEARCHED (IPC)

E04F
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 November 2017	Arsac England, Sally

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 18 0629

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REFERENCES CITED IN THE DESCRIPTION

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