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

(11) **EP 2 312 106 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.04.2011 Bulletin 2011/16

(51) Int Cl.:
E06B 1/08 *(2006.01)* ***E06B 1/32*** *(2006.01)*
E06B 1/02 *(2006.01)*

(21) Application number: **10183143.6**

(22) Date of filing: **30.09.2010**

(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 SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **30.09.2009 IT MI20091678**

(71) Applicant: **Setten Genesio S.p.A.**
31046 Oderzo (TV) (IT)

(72) Inventor: **Setten, Genesio**
31046 Oderzo (Treviso) (IT)

(74) Representative: **Faggioni, Marco et al**
Fumero Studio Consulenza Brevetti Snc
Pettenkoferstrasse 20-22
80336 München (DE)

(54) Wall-flush, prefabricated wooden door and mounting template

(57) A prefabricated door made of wood or plastic or metal materials, for internal partitions of buildings comprises an auxiliary frame to be embedded in the wall consisting of a pair of vertical and parallel first metal sections (1), each one apt to make up the full head of the wall portion wherein it is embedded. The door frame consists of two wooden posts (3) on the hidden face of which a second metal section (2) is securely fastened, said second section (2) having a shape matching that of the first metal section (1) of the auxiliary frame. The two sections are securely coupled by screw means (8,9) and/or engagement means and a leaf (B) is hinged to the door frame.

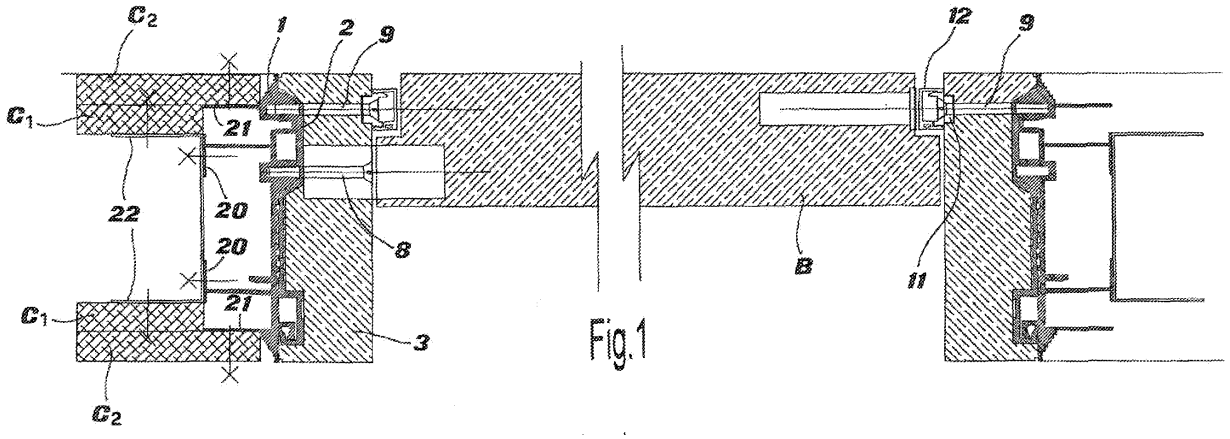


Fig.1

EP 2 312 106 A1

Description

FIELD OF THE INVENTION

[0001] The present invention refers to a prefabricated wooden door characterised by the absence of a frame and hence flush with the wall wherein it is mounted. In particular, the door of the invention has a high level of aesthetic finish and high stability from a mechanical point of view, despite allowing very quick mounting. A preferred field of application of this door is within plasterboard walls.

[0002] The invention also refers to a template for the fast and accurate mounting of the door.

STATE OF THE BACKGROUND ART

[0003] The construction and use of prefabricated wooden doors for use in offices or residential building or have already been known for some time, for optimising manufacturing costs and making mounting operations faster.

[0004] The prefabricated door of the present invention falls in this particular sector of the art to offer a product with improved features both from the point of view of mounting swiftness and efficiency, and from the point of view of the final aesthetic appearance of the mounted door.

PROBLEM AND SOLUTION

[0005] As is well-known to experts in the field, the mounting of prefabricated doors currently occurs in two distinct phases. In a first phase, which is carried out during the building of the internal partition walls, in correspondence of the position where the door will have to be arranged, a so-called "auxiliary frame" is embedded in and fastened to the wall, which determines the raw door opening, i.e. a space corresponding to the width and possibly to the height of the door, in addition to a predetermined mounting slack. The auxiliary frame is anchored to the wall in different ways depending on the nature of the wall, and represents the support to which the frame of the final door is fastened, normally by screws or the like.

[0006] Once the mounting has occurred, a certain air gap hence remains between the auxiliary frame and the door frame, corresponding to the above-said mounting slack, which is normally hidden by the application of a frame arranged across said space and hence partly on the wall and partly on the door frame, of course on both sides of the door.

[0007] From an aesthetic point of view, this frame forms a step with respect to the door and wall plane, which prevents building a door flush with the wall. From a structural point of view, the frame represents an element added to the door structure and it is hence easily subject to twisting, detachments and the like. From an economic point of view, the application of the frame, in addition to the raw cost of materials, entails a non-negligible application time and hence determines also an increase of mounting costs.

[0008] There is furthermore to be noted that the fastening of the door frame to the auxiliary frame necessarily leaves in sight the heads of the fastening screws. Although various systems (stucco, inlay, studs) for masking such screw heads exist, they require a certain time for the application thereof, as well as the presence of a qualified worker. Moreover, should it later be necessary to take the door off the auxiliary frame, to move, replace or maintain it in a special way, screw identification and removal occurs with some difficulty and often with a deterioration of the surface of the wooden posts.

[0009] Doors having an aluminium case serving as an auxiliary frame have also been introduced in the market; said case is laid in while building the wall and also serves as "true" door frame, since it is already designed to receive the door. However, this solution has the drawback of necessarily having to protect the contour of the aluminium case in sight during all the operations following the building of the wall. Moreover, the finish quality of this solution is rather low and it hence cannot be used for high-quality doors.

[0010] The main object of the present invention is hence to provide a new structure of a prefabricated door which can be easily manufactured on an industrial scale, which has a wide versatility of use and overcomes the mentioned drawbacks, in particular allowing to accomplish a very quick mounting of a wall-flush, wooden door with high-level aesthetic features and free from fastening elements in sight.

[0011] This object is achieved through a prefabricated wooden door having the features defined in claim 1. The dependent claims describe additional features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further features and advantages of the invention will in any case be more evident from the following detailed description of a preferred embodiment of the same, given purely by way of a non-limiting example and illustrated in the attached drawings, wherein:

- fig. 1 is a cross-section view, with part of the leaf removed, of an inward-opening door according to the present invention, complete with the relative wall-fastening system;
- fig. 2 is a cross-section view similar to fig. 1 of an outward-opening door;
- fig. 3 is an exploded cross-section view which shows the building elements of the hinge post of the door shown in fig. 1;
- fig. 4 is a schematic elevation front view showing a mounting template of the door according to the present invention;
- fig. 5 is a section view of a template post and of an element of the auxiliary frame fastened thereto.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0013] Before beginning the detailed description of the prefabricated door according to the present invention, it is useful to highlight the fact that it has been designed for a mounting of the auxiliary frame fully unlike the traditional one described above. As a matter of fact, while in the traditional mounting procedure the wall is first built and then the auxiliary frame is fastened thereto, said auxiliary frame normally consisting of a substantially U-shaped wooden frame (two posts and one crossmember), in the door according to the present invention this mounting concept of the auxiliary frame is completely reversed. As a matter of fact, as first operation, through the use of a suitable template, the auxiliary frame is put into position and only after this operation are the walls mounted thereon. This inversion of the mounting phase is a decisive element for obtaining a highly accurate positioning of the auxiliary frame, which is in turn an essential condition for being able to then remove the traditional gap-covering frame and for manufacturing the wall-flush door.

[0014] It is also useful to point out that in the traditional art the horizontal crossmember of the auxiliary frame is a fundamental element to guarantee the shape and size stability thereof, i.e. parallelism and preset distance between the two posts, and for this reason the auxiliary frame is often provided also with temporary stiffening elements, such as a second crossmember and knee rafters, to be removed only when the frame is securely fastened to the walls. On the contrary, the auxiliary frame according to the present invention consists exclusively of the two vertical posts, formed by suitable metal sections which - after having been accurately positioned through the above-said template - make up the opposite heads of the two walls which determine the door opening. To this auxiliary frame, which may extend without limitations even for the entire height of the room, wooden door posts are then secured by means of a joint coupling with a matching metal section integral with the inner side of the wooden post, locking the assembly by means of hidden screws, as better shown in the following.

[0015] Here and in the following exclusive reference will be made to "wooden" doors, wherein by this expression the noble material which makes up the part in sight of the door is intended, since wood is normally the material of greatest interest for quality doors. Notwithstanding of course the fact that the above-said in-sight door part can alternatively be made also of plastic or metal materials, when specific requirements of cost or of technical features demand it, without this implying any change in the structure of the door which will be described in the following. It must hence be clear that when, in the description and in the claims, reference is made to the material "wood", which is anyhow the preferred material, it is meant to include in this term also the other plastic or metal materials which are habitually used for this purpose in the art, the technical structure of the door described in the following of course remaining unchanged.

[0016] In the door according to the present invention the upper crossmember of the door hence merely has a padding and possibly an abutting function, but no longer carries out - unlike the traditional door - a door frame stiffening function, which frame hence consists exclusively of the above-said two posts. There derives that the leaf height and the crossmember shape are fully free, and said last one may also be fully lacking, for example when the upper part of the door opening is closed by crystal plates or by a wood panel having the same thickness as the leaf.

[0017] More precisely, and with reference in particular to fig. 3, the door according to the present invention comprises, for each post, a shaped metal section 1 of the auxiliary frame, a matching metal section 2 and a wooden post 3. Metal sections 1 and 2 are preferably made of aluminium; section 1 makes up the auxiliary frame which is embedded in the wall, while section 2 is securely fastened to the hidden side of wooden post 3 during prefabrication, for example by gluing or by other known systems. For this purpose - and as clearly shown in figs. 1 to 3 - the hidden side of wooden post 3 is machined so as to have an identical shape to the one of section 2 which hence adheres thereto perfectly, except in correspondence of a series of lightening grooves which also have the purpose of facilitating the adherence between the surfaces of elements 1 and 2. Said last ones, moreover, can be used when it is necessary to increase the thickness of the auxiliary frame for the mounting on walls having a thickness different from the standard one. As a matter of fact, in this case it is sufficient to cut section 1 in a longitudinal direction and across all its length, precisely in correspondence of said series of grooves; on the grooves remaining on the two parts of the section it is thus possible to embed a third metal element provided with matching grooves, through which the overall width of section 1 may be increased at will.

[0018] Once wooden post 3 has been coupled with section 2, the assembly of these two elements can be easily hooked up and securely fastened to auxiliary frame section 1, due to the presence of ribbings 4 and 5, formed on sections 1 and 2, respectively, and to grooves 6 e 7, with which screws 8 and 9 engage, respectively. As a matter of fact, for the mounting, first ribbing 5 is inserted into ribbing 4, while post 3 is kept in a slightly angled position towards the inside of the door compartment with respect to a vertical axis passing through the coupling of said ribbings. Once ribbings 4 and 5 have been coupled together, post 3 is rotated until sections 1 and 2 are in abutment, where a first hooking is provided by a knurl provided on at least one pair of inclined matching portions 10 provided both on section 1 and on section 2; afterwards, introducing and tightening screws 8 and 9, final locking occurs. As a matter of fact, during the tightening of said screws, the inclined matching portions 10 determine a perfect and stable positioning of section 2, and

hence of post 3 associated therewith, with respect to auxiliary-frame section 1.

[0019] As better shown in figs. 1 and 2, for the positioning and tightening of the posts sole screw 9 is sufficient (more precisely, a pair of screws 9, arranged in the proximity of the base and of the top of post 3, respectively). In order to hide from view screw 9, a door-stopping function is associated therewith; for this purpose a screw plug 11 is associated with the screw head, which screw anchor is partly embedded in post 3 and which is provided with a peripheral ribbing for the snap engagement with the same of a door-stop 12, made of a suitable plastic or metal material. The function of door stop 12 is hence twofold, on the one hand that of hiding from sight the head of screw 9 and, on the other, that of forming a suitable support point of the travel end for leaf 13.

[0020] Second screw 8 (more precisely, a pair of screws 8, arranged in the proximity of the base and of the top of post 3, respectively) is instead used for fastening to post 3 corresponding fold-away hinges (hinges which are shown in the drawings only by their housing recess, which extends naturally also into the inside of leaf B) of a type known per se. The mutual position of screws 8 and 9 is swapped depending on the type of opening (inward or outward) of the leaf, without this implying any change of sections 1 and 2, but only a different arrangement of the recesses housing plug 11 and hinges in post 3, as clearly shown in figs. 1 and 2.

[0021] As said above, the technique for mounting the door according to the present invention provides that first auxiliary-frame sections 1 are positioned, and only afterwards are built the walls which are intended to embed them. As a matter of fact, only thus is it possible to obtain a very precise positioning of said auxiliary frames, essential for the correct mounting of the door.

[0022] In order to make this operation easy and quick, according to the present invention it is provided the use of a template for the positioning of said sections 1 consisting of a strong, metal, rectangular frame 13 of the type shown in fig. 4. Frame 13 preferably consists of a metal, C-shaped section, preferably made of aluminium for lightness reasons, stiffened by suitable crossmembers T or internal angular knee rafters S and completed by a series of accessories to allow the quick positioning thereof and the temporary and secure fastening of sections 1. In particular, frame 13 provides:

- adjustable lower feet 14 to adjust the height of the frame over the finished floor plane, regardless of the fact that such floor has already been laid or not;
- upper push rods 15, screwed in in corresponding threaded sites formed in the upper crossmember of frame 13 and/or in an internal crossmember T and provided with spring ends 16 for the quick and secure positioning of the template against the ceiling surface;
- a possible top plate 17 hooked to said spring ends and apt to snug-fit in a preset guide on the ceiling for building the plasterboard wall;
- side angle bars 18a and 18b (shown in greater detail in fig. 5) fastened on both sides of the template posts by screws housed in threaded holes 19, to accomplish the engagement with the same of sections 1;
- three levels for checking for correct template positioning, namely: a first level 23 on the lower crosspiece of the template for checking for horizontality when performing the adjustment of feet 14, a second level 24 on an intermediate crossmember T of the template for checking for horizontality when push rods 15 are positioned, and a third level 25 on a template post, for checking for verticality of the same.

[0023] Hence, firstly the template is arranged in the final position which will have to be taken up by the door and then, acting first on feet 14 and then on push rods 15 and checking levels 23, 24 and 25, it is securely fastened between floor and ceiling, in a perfectly perpendicular way. Subsequently, on the two sides of the template, sections 1 are positioned, introducing their ribbing 4 into angle bars 18a, already previously mounted on template 13, and hence locking in position sections 1 by applying angle bars 18b, as clearly shown in fig. 5.

[0024] At this point, on inner wings 20 of auxiliary-frame sections 1, C-shaped metal posts 22 are screwed for the fastening of a first layer of plasterboards C_1, a second layer of plasterboards being instead fastened directly on the wings 21 of section 1. The building of the double-layer plasterboard wall then occurs in a fully traditional way, thereby embedding in the wall head auxiliary-frame section 1. As soon as such wall has sufficient stability, the template can be removed and reused for positioning another auxiliary frame.

[0025] Once the pair of auxiliary-frame sections 1 has been embedded into the plasterboard wall, the final mounting of the door, as described above, is extremely quick and requires no further finishing operation; it is hence preferably performed when the other building operations (for example putting in of systems and flooring) which require the intervention of workmen and machines have been completed. Any application of an upper crossmember, as much as that of an above-lying padding panel, occurs in a manner well-known per se to the person skilled in the field and is hence not further detailed here.

[0026] In the previous description exclusive reference has been made to the application of the door of the invention to plasterboard walls. As stated initially, as a matter of fact this is the preferred application field of such door, where it can unfold fully all its advantageous features. However, the door according to the present invention may be equally easily applied to traditional walls, suitably changing the shape of section 1, in particular as far as the internal wings are concerned, intended to accomplish the fastening to the brickwork and the connection with the plaster.

[0027] From the preceding description it can be easily

noticed how the present invention has fully achieved the desired objects of providing a wall-flush door characterised by an extremely fast and stable mounting, devoid of fastening elements in sight. Moreover, the door of the invention, due to its very simple structure and to the reduced number of elements it consists of, is apt to be manufactured successfully in large batches at industrial level, by which it is possible to obtain considerable reductions of pre-fabrication costs. Finally, due to the fact that the posts may be manufactured of any desired height and that there are no limits as far as shape and positioning of the upper crossmember are concerned, the door of the invention allows a wide design versatility of the finishing elements and hence gives designers ample freedom of execution of very different solutions, despite them all using the same basic structure.

[0028] However, it is understood that the invention must not be considered limited to the particular arrangement illustrated above, which represents only an exemplifying and schematic embodiment thereof, but that a number of variants are possible - in particular as far as the shape of sections 1 and 2 and that of posts 3 is concerned - all within the reach of a person skilled in the field, without departing from the scope of protection of the invention, as defined by the following claims.

Claims

1. Prefabricated wooden door for internal partitions of buildings, of the type comprising an auxiliary frame to be embedded in the wall, a door frame fastened thereto by screw means and a leaf (B) hinged on the door frame, **characterised in that** the auxiliary frame consists of a pair of vertical and parallel first metal sections (1), each section being apt to make up the complete head of the wall portion wherein it is embedded, and **in that** the door frame consists of two wooden posts (3) on the hidden face of which a second metal section (2) is securely fastened, said second metal section (2) having a shape matching that of the first metal section (1) of the auxiliary frame and being coupled with the same by said screw means and/or engagement means.

2. Prefabricated wooden door as claimed in claim 1), wherein said first and second metal sections (1, 2) are made of aluminium.

3. Prefabricated wooden door as claimed in claim 2), wherein said screw means consist of screws (8, 9) housed in through-holes formed in said wooden post (3) and screwed in grooves (6, 7) provided in said first section (1) of the auxiliary frame.

4. Prefabricated wooden door as claimed in claim 3), wherein said screws (8) make up also the fastening element of a fold-away hinge of the leaf (B), inside which they are housed.

5. Prefabricated wooden door as claimed in claim 3), wherein said screws (9) have a plug (11) in correspondence of the head thereof, said plug (11) being partly embedded in said wooden post (3) and comprising snap-connection means of a door-stop element (12).

6. Prefabricated wooden door as claimed in any one of the preceding claims, wherein said first metal sections (1) have internal wings (20, 21) for the fastening of plasterboards or for the anchoring to masonry.

7. Template for the fast initial positioning of a pair of first metal sections (1) of an auxiliary frame as claimed in claim 1), **characterised in that** it comprises a rectangular metal frame (13), means for temporarily fastening said frame to the floor (14) and to the ceiling (15, 16, 17), control means of the plumbing (23, 24, 25) and means for temporarily fastening (18, 19) said first metal sections (1).

8. Template as claimed in claim 7), wherein said means for the temporary fastening of the frame (13) consist of adjustable lower feet (14) and of at least one upper push rod (15).

9. Template as claimed in claim 7), wherein said means for temporarily fastening the first metal sections (1) consist of angle bars (18a, 18b), which can be fastened to the posts of the frame (13) by means of screws screwed in corresponding holes (19) formed on the same and on the frame (13) and apt to securely retain between the same said sections (1).

10. Template as claimed in claim 7), wherein said control means of the plumbing consist of levels for checking for horizontality and levels for checking for verticality, all fastened to posts or crossmembers of said template.

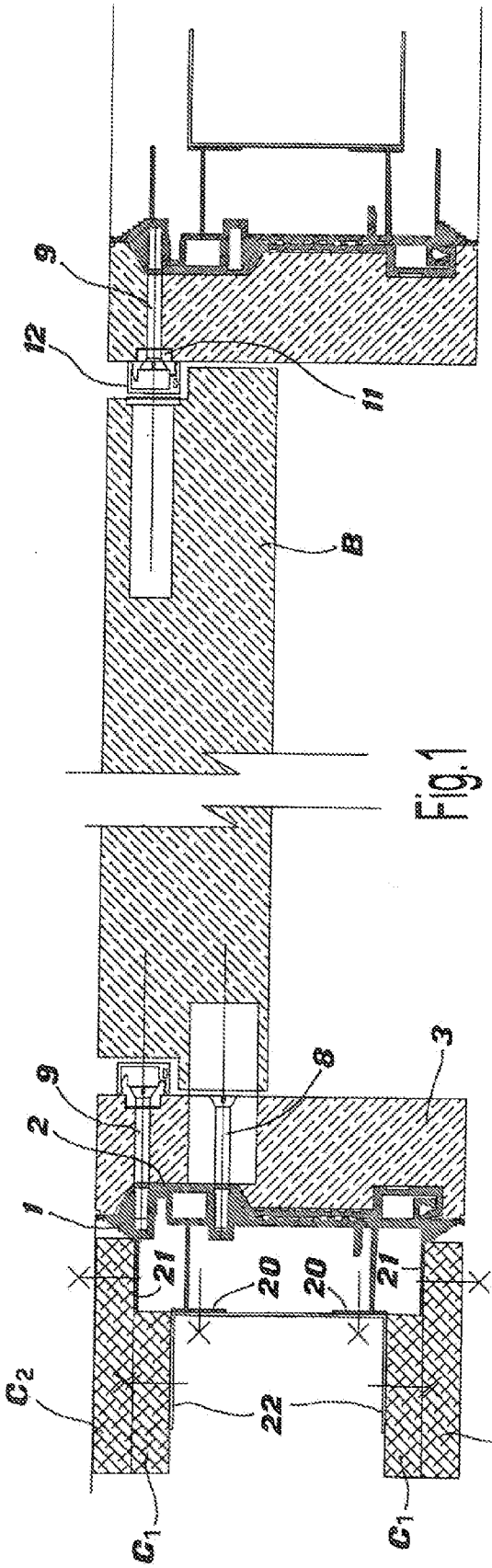


Fig.1

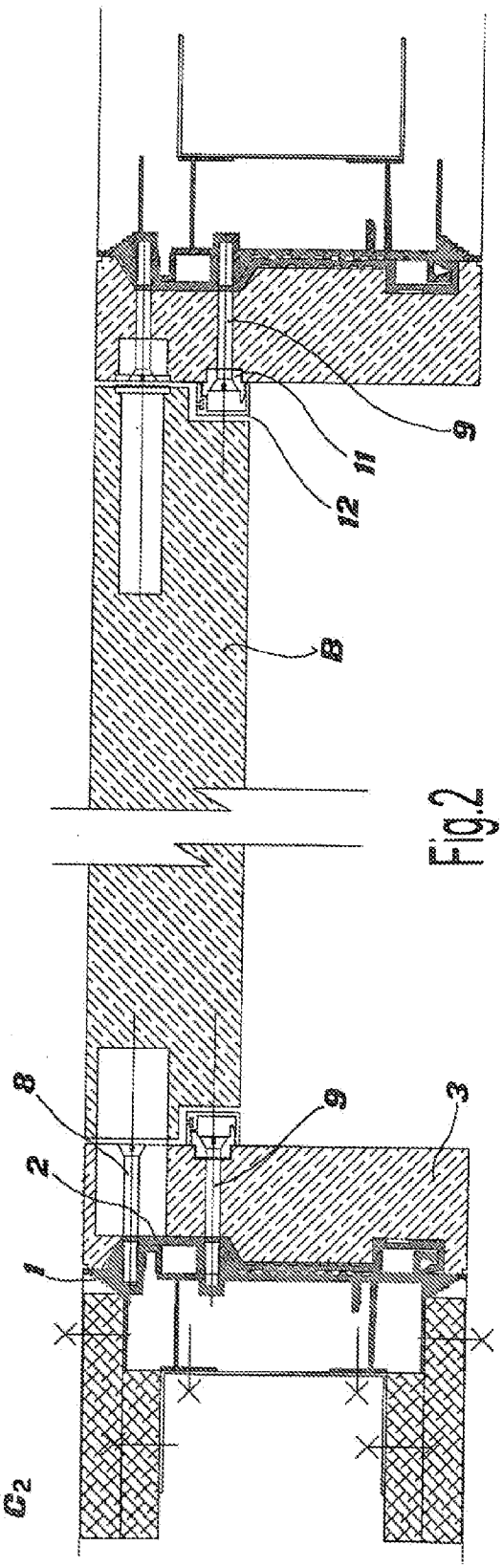


Fig.2

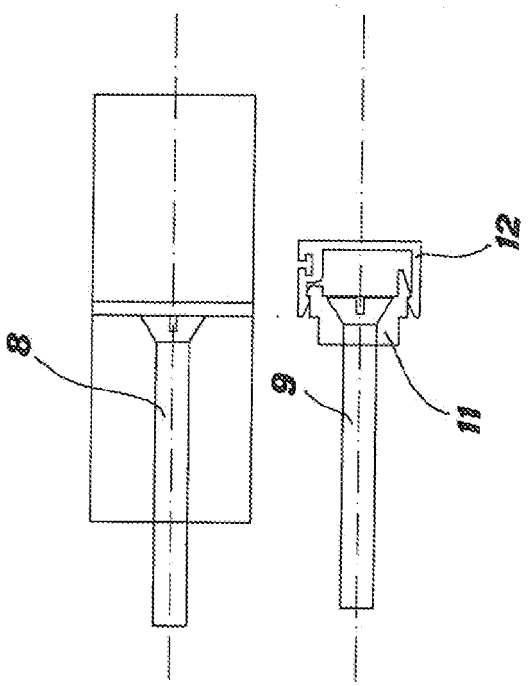
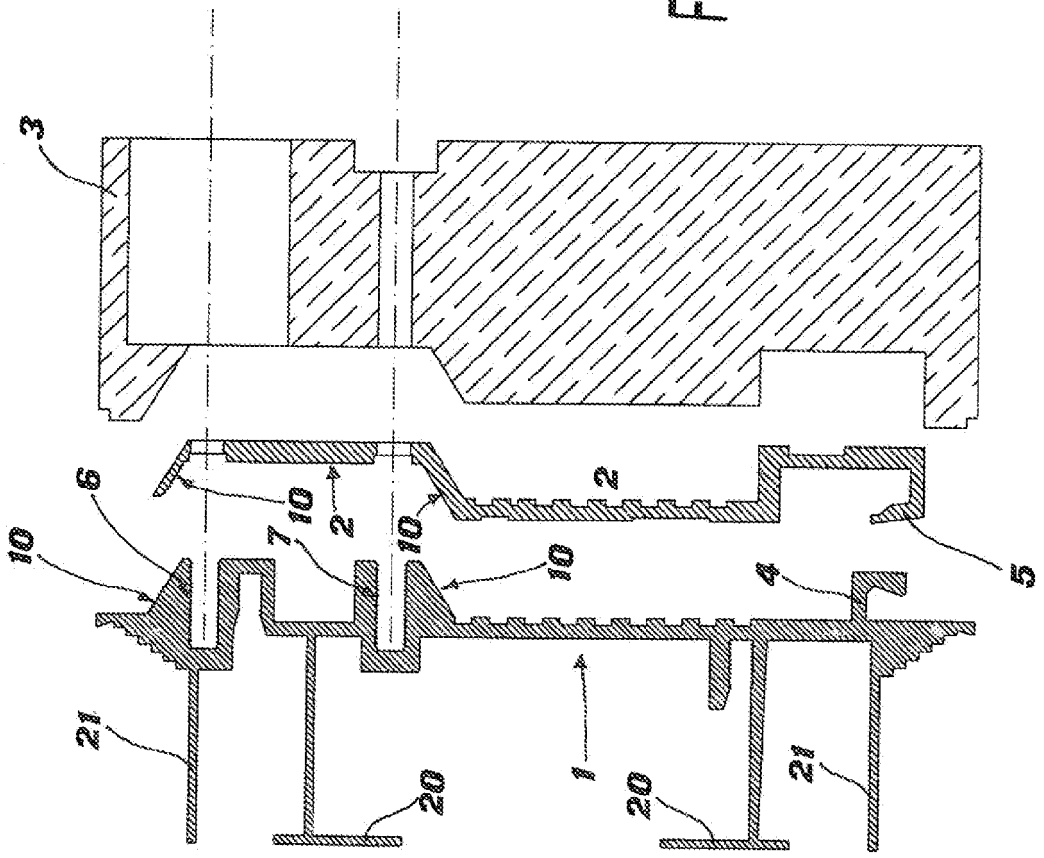


Fig.3



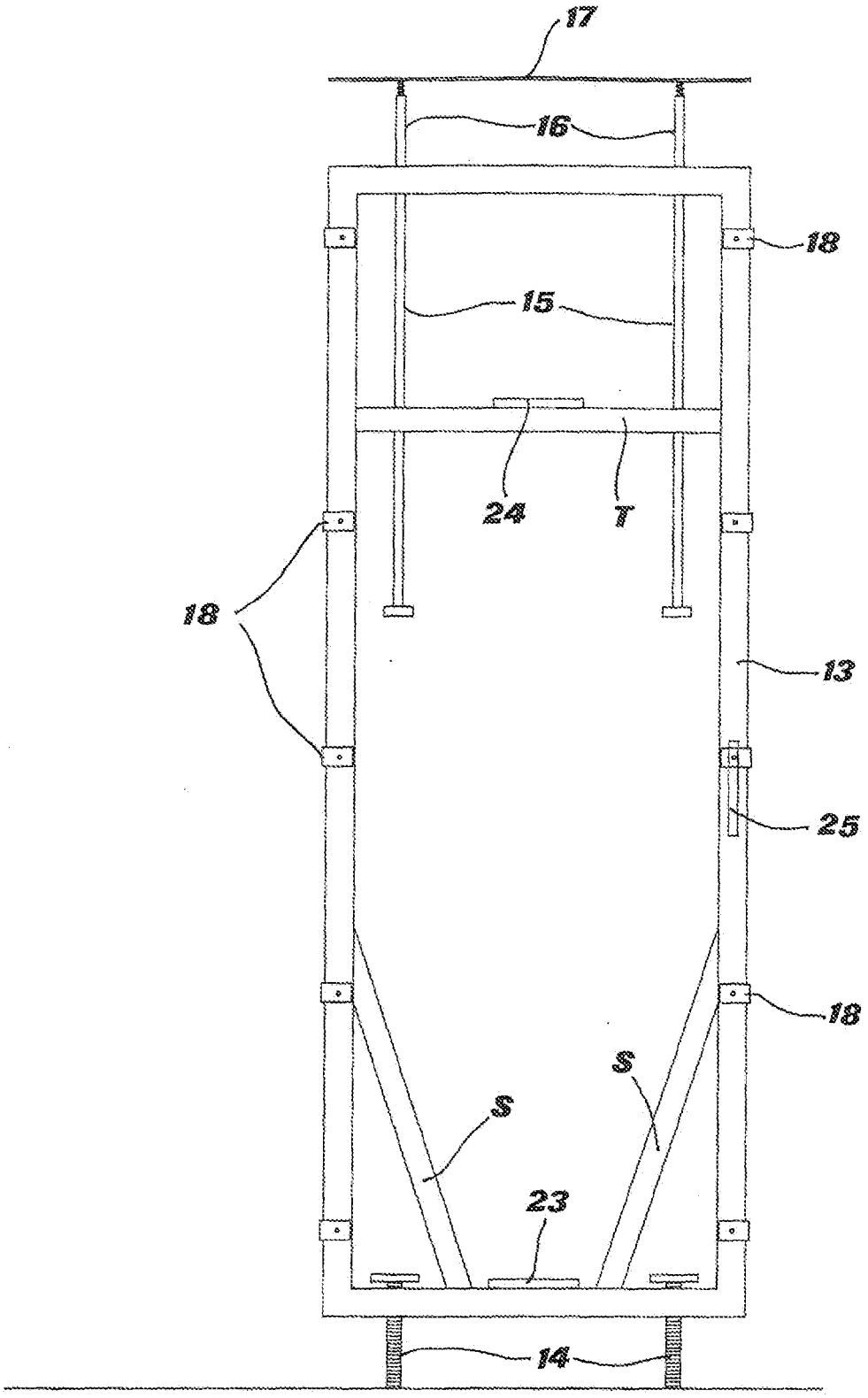


Fig.4

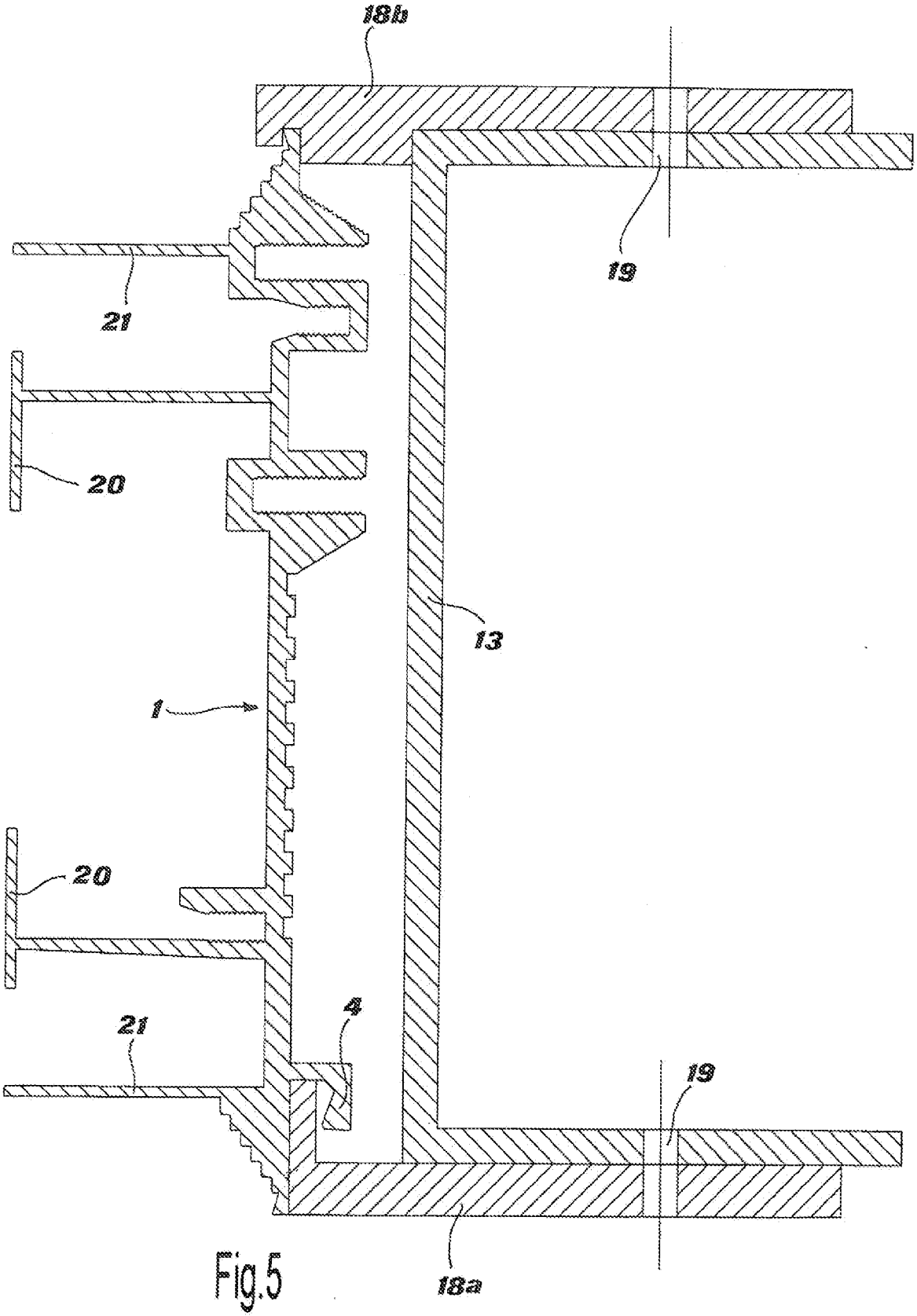


Fig.5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 18 3143

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 258 880 A (JOHN CARR [GB]) 24 February 1993 (1993-02-24) * abstract; figures 1,2 * * page 2, line 12 - line 24 * * page 4, line 28 - line 35; claims 1-9 * -----	1-10	INV. E06B1/08 E06B1/32 E06B1/02
A	DE 35 04 665 A1 (VONDER MEUBEL [NL]) 14 August 1985 (1985-08-14) * the whole document * -----	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 January 2011	Koulo, G

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

1

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 18 3143

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.

03-01-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2258880 A	24-02-1993	NONE	
DE 3504665 A1	14-08-1985	NL 8400456 A	02-09-1985

EPO FORM P0459

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