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(54) SYSTEM FOR ANCHORING AND FIXING COVERING MATERIALS TO AN EXTERNAL SURFACE OF BUILDINGS

SYSTEM ZUR VERANKERUNG UND ZUR BEFESTIGUNG BELAGSELEMENTE AUF EINE
AUSSENFLÄCHE VON GEBÄUDEN

SYSTÈME D'ACCROCHAGE ET DE FIXATION D'ÉLÉMENTS DE REVÊTEMENT SUR UNE
SURFACE EXTÉRIEURE DE BÂTIMENTS

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(56) References cited:
WO-A1-2010/052921 AU-B3- 714 529
JP-A- 2007 032 270 JP-A- 2009 046 924
US-A- 2 116 533 US-A- 3 807 112

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Description

[0001] The present invention relates to a system for anchoring and fixing cladding materials to an exterior surface of buildings.

[0002] The word "building" refers to any type of building construction for residential, industrial, commercial or service use.

[0003] In the field of claddings for buildings in general, there are various types of materials that can be used.

[0004] The types of cladding can in fact be extremely varied as, for example, metallic, ceramic, stone, fiber cement, concrete, HPL, fiberglass claddings and so forth, can be used.

[0005] All of these materials can be used with different dimensions and each one is distinguished by its own characteristics such as weight, thickness, processability, etc.

[0006] All of these variables currently involve the study of a fixing system that maintains its specific features of practicality and safety but that can be used and adapted to the different materials used for producing the cladding.

[0007] In this respect, it should first of all be observed that the strict dependence of the type of cladding with the specificity of the respective mechanical fixing system results in equally diverse costs.

[0008] Secondly, it follows that different types of fixing systems involve, for the various companies in the field, investments in specific solutions with consequent warehouse stocks and capital commitments.

[0009] Thirdly, there must be the availability of workers who are capable of using the various solutions and therefore having a certain experience and professionalism and who must be duly paid, thus increasing the final costs.

[0010] All of these issues are forcing building-cladding companies to seek solutions that can provide an answer to these problems.

[0011] US 3807112 relates to a panel and structure assembly for rapid assembly and disassembly.

[0012] JP 2007 032270 relates to a panel assembly structure on the surface of a building.

[0013] JP 2009 046924 relates to a panel assembly structure on the surface of a building that allows energy saving and agreeable decoration.

[0014] US 2116533 relates to a structure for the construction of a building.

[0015] The general objective of the present invention is to provide an anchoring and fixing system of cladding materials to the outer surface of a building capable of solving the drawbacks of the known art specified above in an extremely simple, economic and particularly functional manner.

[0016] A further objective of the present invention is to provide an anchoring and fixing system of cladding materials to the outer surface of buildings which is particularly simple and can facilitate operations for fixing the cladding material.

[0017] Another objective of the present invention is to

provide an anchoring and fixing system of cladding materials to the outer surface of buildings which can be used with respect to different types of claddings, without having to look for a single and specific solution for the single cladding to be used.

[0018] The structural and functional characteristics of the present invention and its advantages with respect to the known art will appear even more evident from the following description, referring to the attached schematic drawings, which show an embodiment example of the invention itself. In the drawings:

- figure 1 shows a perspective view of an exterior wall of a building partially provided with an anchoring and fixing system of cladding materials of the invention on which some cladding elements have been arranged;
- figures 2 to 7 show a perspective view of some of the main steps of an assembly sequence of an anchoring and fixing system of cladding materials according to the present invention;
- figure 8 is a perspective view from above of a portion of a fixing arrangement of an upright of the anchoring and fixing system according to the invention;
- figure 9 is a perspective view from above of a portion of the anchoring and fixing system according to the invention during its assembly phase;
- figure 10 is a side perspective view of a portion of the anchoring and fixing system according to the invention once it has been assembled on the wall for supporting a cladding element.

[0019] The system for anchoring and fixing cladding materials to an exterior surface of buildings according to the present invention mainly solves the problem of its use in various types of cladding material.

[0020] Some of these types with which there has been the possibility of using the system for anchoring and fixing cladding materials to the exterior surface of buildings according to the invention, are examined hereunder.

[0021] The types of cladding material used and illustrated hereunder can, for example, be expressed in at least three main types of cladding:

- metallic, such as aluminium, copper, steel, etc.;
- stone materials, concrete or any other material having significant thicknesses;
- HPL or fiber cement or ceramic, and all materials having a relatively low thickness and weight.

[0022] The examples of materials examined hereunder are obviously not intended as limiting the use of an anchoring and fixing system of the invention to these alone, as they are simply described as illustrative and non-limiting examples.

[0023] A system for anchoring and fixing cladding materials to an exterior surface of buildings, of any type as previously defined, in its more general formulation com-

prises at least one upright 11 positioned integrally with respect to an exterior surface 12 of a building.

[0024] This at least one upright 11 has, for example, a C-shaped profile so as to be able to house an engagement element 13. The engagement element 13 is, for example, a hollow metallic element containing expandable side parts 14 that exit sideways when moved in translation by means of a specific drive key 15 that can be inserted in an appropriate hole 23 provided in the engagement element 13.

[0025] In the example illustrated, the engagement element 13 is a hollow prismatic box-shaped element containing two expandable side parts 14 positioned on opposite sides. Said expandable side parts are in the form of two wings 14 telescopically housed in the body of the engagement element and commanded to exit from opposite sides of the engagement element itself 13.

[0026] A control mechanism (inside the engagement element 13 and not shown) can be actuated by means of the above drive key 15. The control mechanism causes the outgoing movement from the engagement element 13 of the two wings 14 on opposite side parts and their engagement inside the profile of the upright 11. This outgoing movement of the two wings 14 causes their engagement on opposite inner surfaces of the upright 11. In a preferred but non-limiting embodiment, the surface of the upright 11 and that of the surfaces of the wings 14 facing the same, are knurled or in any case not smooth so as to facilitate a stable engagement between the parts when the translation has been completed.

[0027] It should also be pointed out that a first fixing element 16 of a particular type is firmly constrained to a surface facing the outside of the engagement element 13.

[0028] This first fixing element generally consists of a base portion from which loops or hooks extend forming a female fixing element or a male fixing element.

[0029] The base portion, for example, can consist of a strip of hairy fabric, similar to an uncut velvet or to a sponge, with a rigid bottom from which the hair rings emerge. Alternatively, said base can consist of a strip of fabric with hooks, which emerge from the rigid bottom and are, for example, small flexible hooks made of a hard material.

[0030] Said fixing element 16 can be sewn, glued or otherwise mechanically constrained to the engagement element 13.

[0031] In an embodiment, the fixing element 16 can consist of at least a female portion facing outwards, but it can identically be at least a male portion facing outwards.

[0032] In any case, this arrangement is provided so as to be able to receive a supporting element 17 for a cladding element 18 of various shapes, material and thickness. In particular, the supporting element 17 provides, constrained to the same, on the surface facing the engagement element 13, a second fixing element 19 complementary to the first fixing element 16 positioned on the engagement element 13.

[0033] In an exemplification, the fixing element 19 can consequently consist of at least a female portion facing outwards, but it can identically be at least a male portion facing outwards as previously indicated for illustrative purposes.

[0034] These fixing elements 16 and 19 are positioned on two elements to be connected (in this case the engagement element 13 and the supporting element 17 respectively) so as to make them firmly integral. It can in fact be noted that in the two fixing elements 16 and 19, when put in contact with each other, the part with the hooks is firmly hooked to the hairy part making the connection stable and secure.

[0035] The supporting element 17 can generally consist of a shaped profile, for example C-shaped or double T-shaped or with another appropriate section, suitable for being engaged with an edge or different end portion of a cladding element 18 made of the cladding material selected.

Figure 1 schematically shows how, with the system according to the present invention, a cladding is provided, composed of a series of panels or cladding elements 18 on an exterior surface or wall 12 of a building provided with a series of uprights 11.

Figures 2 to 7 show a perspective view of some of the main steps of a possible assembly sequence of the anchoring and fixing system of cladding materials according to the present invention.

[0036] First of all, a series of uprights 11 are positioned on a wall or exterior surface 12 of a building, integral with the same. As shown in figure 8, for example, a perspective view from above illustrates how the constraint between the wall 12 and an upright 11 of the anchoring and fixing system according to the invention, is effected.

[0037] It can be seen, for example, how a constraining element 20 of the upright 11 to the wall 12 is created by means of a pair of L-shaped profiles, associated along the long vertical sides of the L forming a Z. In this way, the arrangement of uprights 11 is produced as shown in figure 1.

[0038] At this point, the assembly sequence of the anchoring and fixing system of cladding materials according to the present invention is created, which, as already indicated, is briefly illustrated in figures 2 to 7.

[0039] A series of engagement elements 13 to be inserted in the single upright(s) 11 is then prepared.

[0040] Figure 2 shows how, according to the arrow 21, an engagement element 13 is inserted in the C-shaped profile of the upright 11. Once the engagement element 13 has been inserted, it is brought to its preselected height or position in the upright, acting according to the directions of the arrows 22.

[0041] Figure 3 shows how, when the desired position for the specific application has been found, the drive key 15 is inserted into the hole 23 of the engagement element 13. The possibility of positioning the engagement ele-

ment 13 as desired makes the system particularly advantageous with respect to systems which provide fixed points and with a discreet number of possible positionings.

[0042] Figure 4 shows the subsequent step in which the drive key 15 positioned in the hole 23 of the engagement element 13, is rotated. This rotation is effected according to the arrows 24 so as to allow the expandable side parts 14 to exit, by means of the inner control mechanism, according to the arrows 27. This step and arrangement can be better seen in figures 5 and 9, where, in particular, in this second figure 9, the translation and expansion of the expandable side parts 14 can be seen, inside the profile of the upright 11 with engagement between the facing and juxtaposed surfaces of the side parts 14 and inside the profile of the upright 11.

[0043] Once the outgoing expansion of the wings or expandable side parts 14 has taken place, the drive key 15 is removed. The engagement element 13 is therefore stably fixed inside the upright 11 and the first fixing element 16, integral with the same, is facing the outside of the upright 11.

[0044] The application to the same of a supporting element 17 for a cladding element 18 is effected in this position. In particular, as already indicated, the supporting element 17 provides, constrained to the same, in the surface which is brought to face the engagement element 13, a second fixing element 19, facing inwardly and complementary to the first fixing element 16 of the engagement element 13.

[0045] This application is effected by joining the supporting element 17 with the engagement element 13 according to the arrow 25 of figure 6 and creating a stable union between the two male and female portions of the fixing elements 16 and 19 of the engagement element 13 and supporting element 17, arranged as desired on one or the other, indifferently, provided they are alternating.

[0046] A stable positioning between the parts is thus created as shown in figure 7. Said figure 7 also shows how the subsequent positioning of a cladding element 18 is effected on a supporting element 17 thus positioned. In this specific example, a notch 26 formed beneath the cladding element 18 is stably engaged on a portion of the double-T profile constituting the supporting element 17. In this way, the cladding element 18 is firmly fixed with respect to the exterior wall or surface 12 of a building.

[0047] Figure 10 shows this stable application of the above-mentioned cladding element 18 from a different angle in a perspective view.

[0048] By effecting a series of applications such as that described and illustrated above, a cladding of a building is obtained such as that shown in figure 1.

[0049] Both the engagement element 13 and the supporting element 17 are provided with a fixing element 16 (male or female as desired) and the other with a complementary fixing element 19 (female or male as desired) arranged integrally with the same in the workshop so as

to arrive already ready on site.

[0050] An anchoring and fixing system of cladding materials to an exterior surface of buildings according to the present invention substitutes traditional mechanical fixings through the use of a material based on plastic, metal or of another type which is engaged by means of a part called "female" and another part called "male" positioned indifferently on the engagement element 13 or on the supporting element 17.

[0051] The adhesives, seams or other mechanical and nonmechanical systems for a stable joining between the engagement element 13 and supporting element 17 and complementary fixing elements 16 and 19 are designed so as to be adapted and be such as to be able to carry different kinds of cladding element 18.

[0052] As already specified, in fact, three types of cladding material can be identified:

- 1) metallic materials
- 2) non-metallic materials having a considerable thickness and weight
- 3) non-metallic materials having a small thickness and weight

[0053] Each of these materials has adequate and specific characteristics for the type of structural and aesthetic cladding required.

[0054] Metallic materials have the advantage of having a modest weight with the possibility of working on large formats. They are also easy to process and can therefore be adapted to the fixing system of the present invention.

[0055] Non-metallic materials having a considerable weight and thickness can be stone materials, concrete, stone, etc.

[0056] The bracket or profile of the supporting element must be suitably sized in relation to the weight of the cladding. The cladding element can be easily processed so as to allow an easy and secure anchorage.

[0057] The third materials mentioned above have the advantage of being light, but have a small thickness.

[0058] Their reduced weight resizes the type of bracket or supporting element and relative profile to be used. This type can therefore relate to ceramic materials, HPL, Bakelite wood, etc.

[0059] As already indicated, it has been possible to analyze some applications on the cladding element where they are "glued", mechanically constrained or otherwise made integral with the fixing elements 19, on a bracket or metallic profile of the supporting element suitably processed and dimensioned. As already indicated, this operation can be effected in the workshop and on standard materials, before arriving on site with the advantage of having ready pieces, the speed and time necessary for the glues or adhesives used or other mechanical constraining elements or whatever to have a sufficient grip or to be stably fixed.

[0060] The upright 11 and supporting element 17 of the cladding element 18 is normally a metallic element

which is sized for supporting the cladding material and wind thrust.

[0061] The upright preferably has a shaped profile so as to be able to house the above-mentioned engagement element 13 suitably processed, having its fixing element 16, male or female, as preferred, previously described, already identically arranged on the outer face.

[0062] The engagement element 13 therefore has its fixing element 16 already glued or constrained in the workshop, ready to be used on site, and is inserted in the seat of the closed upright 11.

[0063] As already indicated, it can be regulated in height and once the position has been found, it is tightened by intervening in the front part of the block by means of the specifically designed drive "key".

[0064] This solution makes it possible to have a truly infinite series of positions adapting to requirements arising on site or on the place of application, eliminating any difficulties in the case of unpredictable positioning variations, unlike a fixing with a definite and discreet number of seats as obtained by the systems so far known.

[0065] This key opens the two wings that form a block with the upright 11.

[0066] The forms of the structure for producing a system according to the invention, as also the materials and assembly modes, can naturally differ from those shown for purely illustrative and non-limiting purposes in the drawings.

[0067] The objective mentioned in the preamble of the description has therefore been achieved.

[0068] The protection scope of the present invention is defined by the enclosed claims.

Claims

1. A system suitable for anchoring and fixing cladding materials to the exterior surface of buildings comprising at least one upright (11) positioned integrally with respect to an exterior surface (12) of buildings, said at least one upright (11) being shaped for receiving at least one engagement element (13) provided with a first fixing element (16), wherein said at least one engagement element (13) is suitable for receiving a coupled supporting element (17) containing a cladding element (18), wherein said supporting element (17) is provided with a second fixing element (19), said first and second fixing elements (16, 19) indifferently consisting of at least a base portion from which either loops or hooks extend to form a female fixing element or a male fixing element, respectively, **characterized in that** said at least one engagement element (13) provides a hollow element which contains expandable side parts (14) that exit sideways when moved in translation by a command (15).
2. The system according to claim 1, **characterized in that** said at least one engagement element (13) is a

hollow prismatic element containing two wings (14) telescopically housed therein and expandable from opposite parts of the engagement element (13).

3. The system according to claim 1 or 2, **characterized in that** said command is a mechanism inside the engagement element (13) which can be actuated by means of a drive key (15) insertable in a hole (23) of said engagement element (13).
4. The system according to one or more of the previous claims from 1 to 3, **characterized in that** facing surfaces of said upright (11) and said expandable side parts (14) of said hooking element (13) are knurled or in any case not smooth, so as to facilitate a stable engagement between the parts of said side parts (14) when their translation has been completed.
5. The system according to one or more of the previous claims from 1 to 4, **characterized in that** said supporting element (17) containing a cladding element (18) is a double T- or C-shaped section or other suitable section.
6. The system according to one or more of the previous claims from 1 to 5, **characterized in that** said at least one upright (11) is positioned integrally with said exterior surface (12) by means of a least one constraining element (20).
7. The system according to claim 6, **characterized in that** said at least one constraining element (20) comprises a pair of L-shaped sections, combined along their long vertical sides of the L, forming a Z.
8. The system according to one or more of the previous claims from 1 to 7, **characterized in that** said first fixing element (16) positioned integrally with respect to said engagement element (13) consists of at least one base portion from which loops extend and said second fixing element (19), integral with said supporting element (17), consists of at least one base portion from which hooks extend.
9. The system according to one or more of the previous claims from 1 to 7, **characterized in that** said first fixing element (16) positioned integrally with respect to said engagement element (13) consists of at least one base portion from which hooks extend and said second fixing element (19), integral with said supporting element (17), consists of at least one base portion from which loops extend.

Patentansprüche

1. System, das zum Verankern und Befestigen von Verkleidungsmaterialien an der Außenfläche von

- Gebäuden geeignet ist und das mindestens ein aufrecht stehendes Teil (11) umfasst, das integral mit Bezug auf eine Außenfläche (12) von Gebäuden positioniert ist, wobei das mindestens eine aufrecht stehende Teil (11) so geformt ist, dass es mindestens ein Eingriffnahmeelement (13) aufnehmen kann, das mit einem ersten Befestigungselement (16) versehen ist, wobei das mindestens eine Eingriffnahmeelement (13) dafür geeignet ist, ein gekoppeltes Stützelement (17) aufzunehmen, das ein Verkleidungselement (18) umfasst, wobei das Stützelement (17) mit einem zweiten Befestigungselement (19) versehen ist, wobei das erste und das zweite Befestigungselement (16, 19) unterschiedslos aus mindestens einem Basisabschnitt bestehen, von dem sich entweder Schlaufen oder Haken erstrecken, um ein Aufnahme-Befestigungselement bzw. ein Einschub-Befestigungselement zu bilden, **dadurch gekennzeichnet, dass** das mindestens eine Eingriffnahmeelement (13) ein hohles Element bereitstellt, das aufweitbare Seitenteile (14) umfasst, die seitwärts austreten, wenn sie durch einen Befehl (15) linear verschoben werden.
2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** das mindestens eine Eingriffnahmeelement (13) ein hohles prismatisches Element ist, das zwei Flügel (14) umfasst, die teleskopisch darin aufgenommen sind und von gegenüberliegenden Teilen der Eingriffnahmeelement (13) aufgeweitet werden können.
3. System nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Befehl ein Mechanismus im Inneren des Eingriffnahmeelements (13) ist, der mittels eines Antriebsschlüssels (15) betätigt werden kann, der in ein Loch (23) des Eingriffnahmeelements (13) eingeführt werden kann.
4. System nach einem oder mehreren der vorangehenden Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** einander zugewandte Flächen des aufrecht stehenden Teils (11) und der aufweitbaren Seitenteile (14) des Hakenelements (13) gerändert oder in jedem Fall nicht glatt sind, um eine stabile Eingriffnahme zwischen den Teilen der Seitenteile (14) zu ermöglichen, wenn ihre lineare Bewegung vollendet wurde.
5. System nach einem oder mehreren der vorangehenden Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das Stützelement (17), das ein Verkleidungselement (18) umfasst, ein Doppel-T- oder C-Profil oder ein anderes geeignetes Profil ist.
6. System nach einem oder mehreren der vorangehenden Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das mindestens eine aufrecht stehende Teil (11) integral mit der Außenfläche (12) mittels mindestens eines Klemmelements (20) positioniert ist.
7. System nach Anspruch 6, **dadurch gekennzeichnet, dass** das mindestens eine Klemmelement (20) ein Paar L-förmige Sektionen umfasst, die entlang ihrer vertikalen Längsseiten des L kombiniert werden und ein Z bilden.
8. System nach einem oder mehreren der vorangehenden Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** das erste Befestigungselement (16), das mit Bezug auf das Eingriffnahmeelement (13) integral positioniert ist, aus mindestens einem Basisabschnitt besteht, von dem aus sich Schlaufen erstrecken, und das zweite Befestigungselement (19), das mit dem Stützelement (17) integral ist, aus mindestens einem Basisabschnitt besteht, von dem aus sich Haken erstrecken.
9. System nach einem oder mehreren der vorangehenden Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** das erste Befestigungselement (16), das mit Bezug auf das Eingriffnahmeelement (13) integral positioniert ist, aus mindestens einem Basisabschnitt besteht, von dem aus sich Haken erstrecken, und das zweite Befestigungselement (19), das mit dem Stützelement (17) integral ist, aus mindestens einem Basisabschnitt besteht, von dem aus sich Schlaufen erstrecken.

Revendications

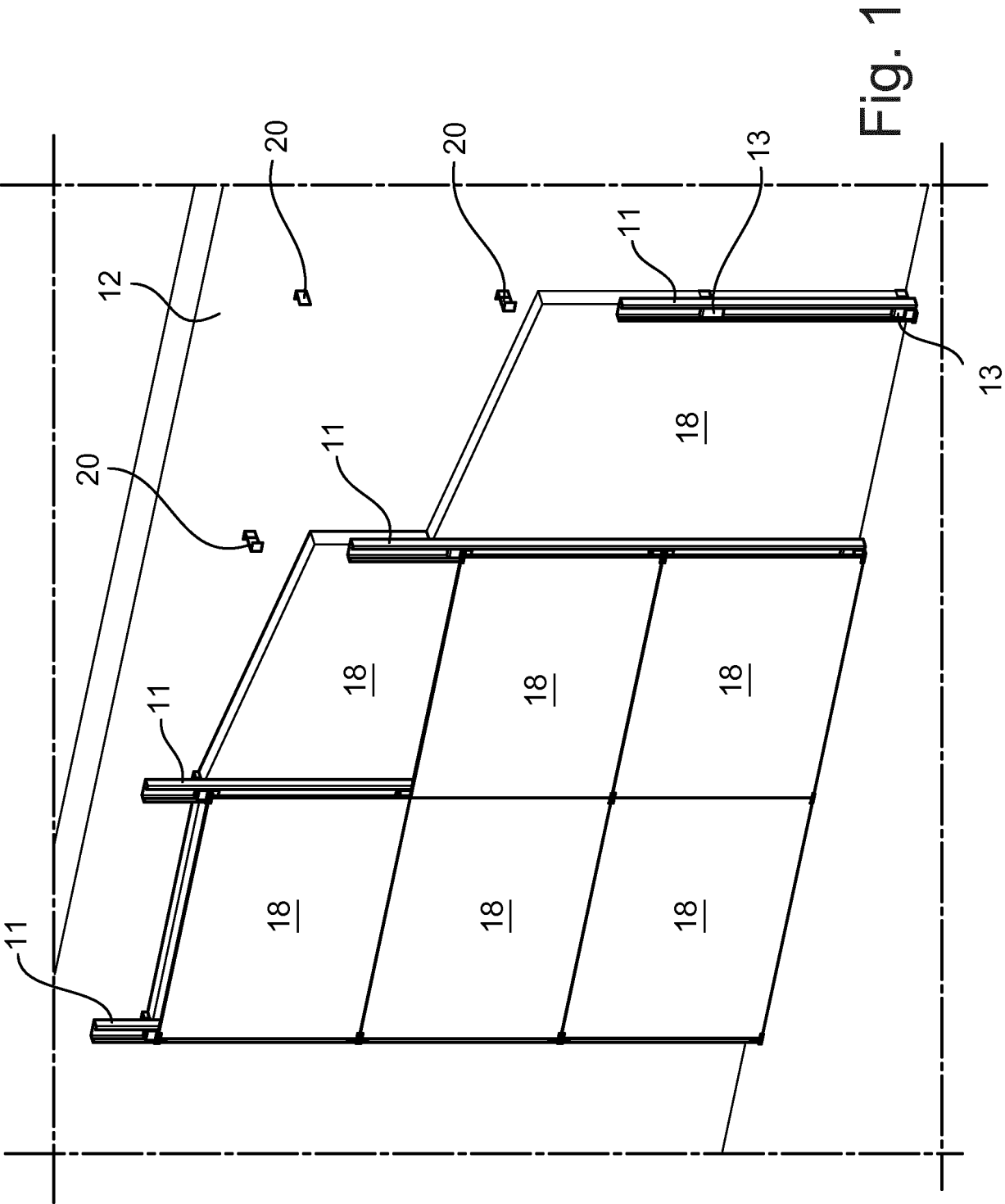
1. Système approprié pour ancrer et fixer des matériaux de revêtement à la surface extérieure de bâtiments, comprenant au moins un montant (11) positionné d'un seul tenant par rapport à une surface extérieure (12) de bâtiments, ledit au moins un montant (11) étant formé pour recevoir au moins un élément d'engagement (13) muni d'un premier élément de fixation (16), ledit au moins un élément d'engagement (13) étant approprié pour recevoir un élément de support couplé (17) contenant un élément de revêtement (18), ledit élément de support (17) étant muni d'un second élément de fixation (19), lesdits premier et second éléments de fixation (16, 19) consistant indifféremment en au moins une partie de base à partir de laquelle des boucles ou crochets s'étendent pour former respectivement un élément de fixation femelle ou un élément de fixation mâle, **caractérisé par le fait que** ledit au moins un élément d'engagement (13) fournit un élément creux qui contient des parties latérales extensibles (14) qui sortent latéralement lors d'un déplacement en translation par une commande (15).
2. Système selon la revendication 1, **caractérisé par**

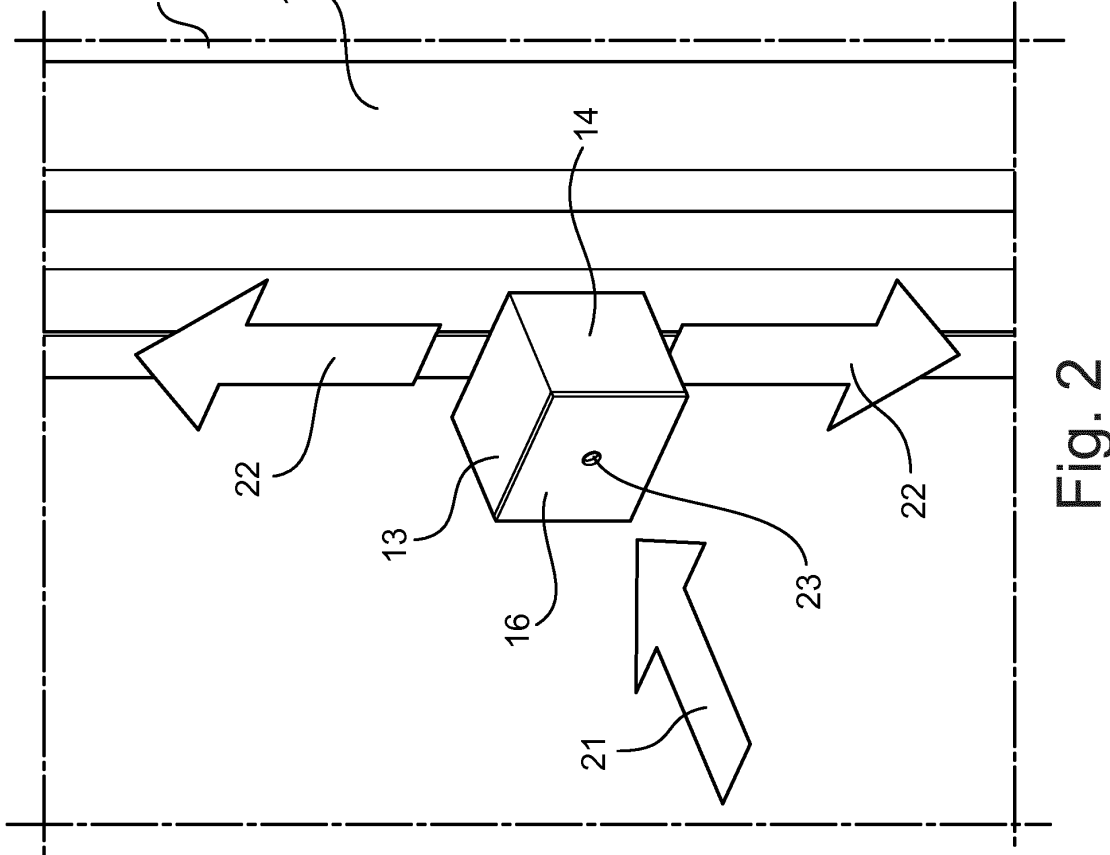
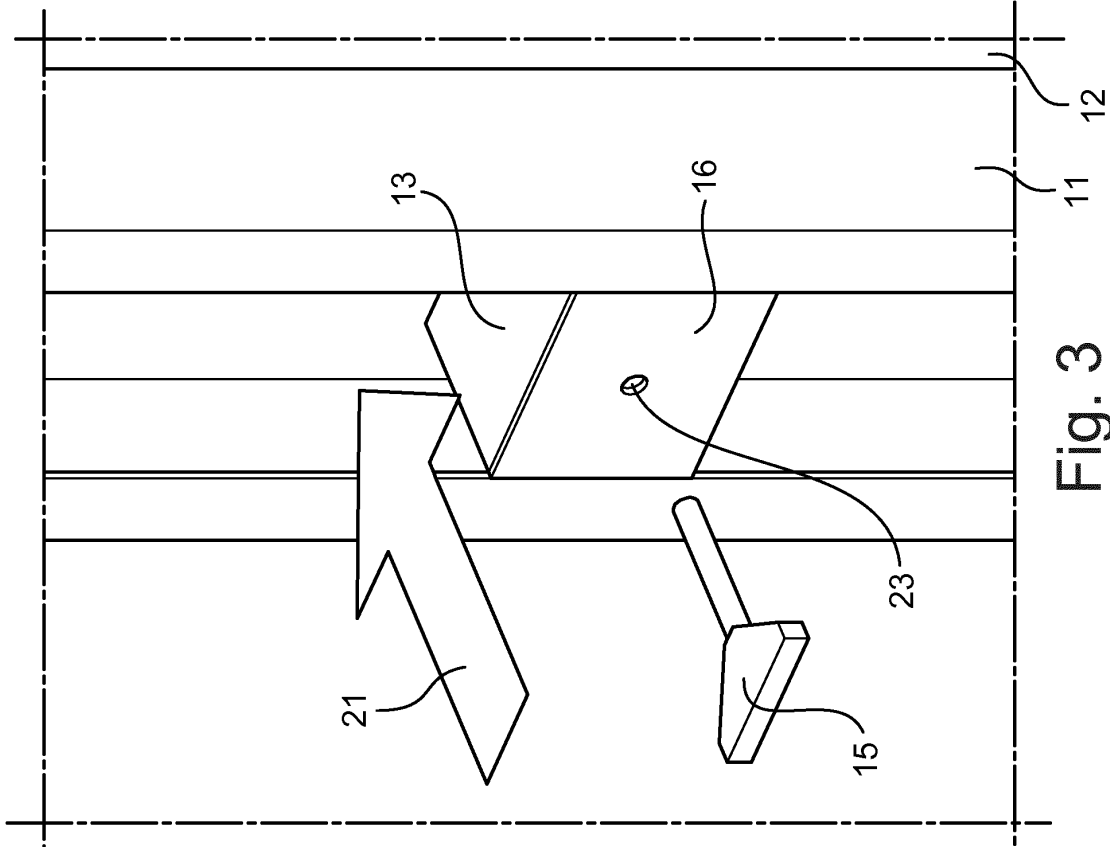
le fait que ledit au moins un élément d'engagement (13) est un élément prismatique creux contenant deux ailes (14) logées télescopiquement dans celui-ci et extensibles à partir de parties opposées de l'élément d'engagement (13).

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3. Système selon l'une des revendications 1 ou 2, **caractérisé par le fait que** ladite commande est un mécanisme à l'intérieur de l'élément d'engagement (13) qui peut être actionné au moyen d'une clé d'entraînement (15) apte à être introduite dans un trou (23) dudit élément d'engagement (13). 10
4. Système selon une ou plusieurs des revendications précédentes 1 à 3, **caractérisé par le fait que** des surfaces en regard dudit montant (11) et lesdites parties latérales extensibles (14) dudit élément d'accrochage (13) sont moletées ou, en tout cas, non lisses, de façon à faciliter un engagement stable entre les parties desdites parties latérales (14) lorsque leur translation a été achevée. 15
20
5. Système selon une ou plusieurs des revendications précédentes 1 à 4, **caractérisé par le fait que** ledit élément de support (17) contenant un élément de revêtement (18) est une section en forme de double T ou C ou autre section appropriée. 25
6. Système selon une ou plusieurs des revendications précédentes 1 à 5, **caractérisé par le fait que** ledit au moins un montant (11) est positionné d'un seul tenant avec ladite surface extérieure (12) au moyen d'au moins un élément de limitation (20). 30
7. Système selon la revendication 6, **caractérisé par le fait que** ledit au moins un élément de limitation (20) comprend une paire de sections en forme de L, combinées le long de leurs côtés verticaux longs du L, formant un Z. 35
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8. Système selon une ou plusieurs des revendications précédentes 1 à 7, **caractérisé par le fait que** ledit premier élément de fixation (16) positionné d'un seul tenant par rapport audit élément d'engagement (13) consiste en au moins une partie de base à partir de laquelle des boucles s'étendent, et ledit second élément de fixation (19), d'un seul tenant avec ledit élément de support (17), consiste en au moins une partie de base à partir de laquelle des crochets s'étendent. 45
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9. Système selon une ou plusieurs des revendications précédentes 1 à 7, **caractérisé par le fait que** ledit premier élément de fixation (16) positionné d'un seul tenant par rapport audit élément d'engagement (13) consiste en au moins une partie de base à partir de laquelle des crochets s'étendent, et ledit second élément de fixation (19), d'un seul tenant avec ledit élé-

ment de support (17), consiste en au moins une partie de base à partir de laquelle des boucles s'étendent.





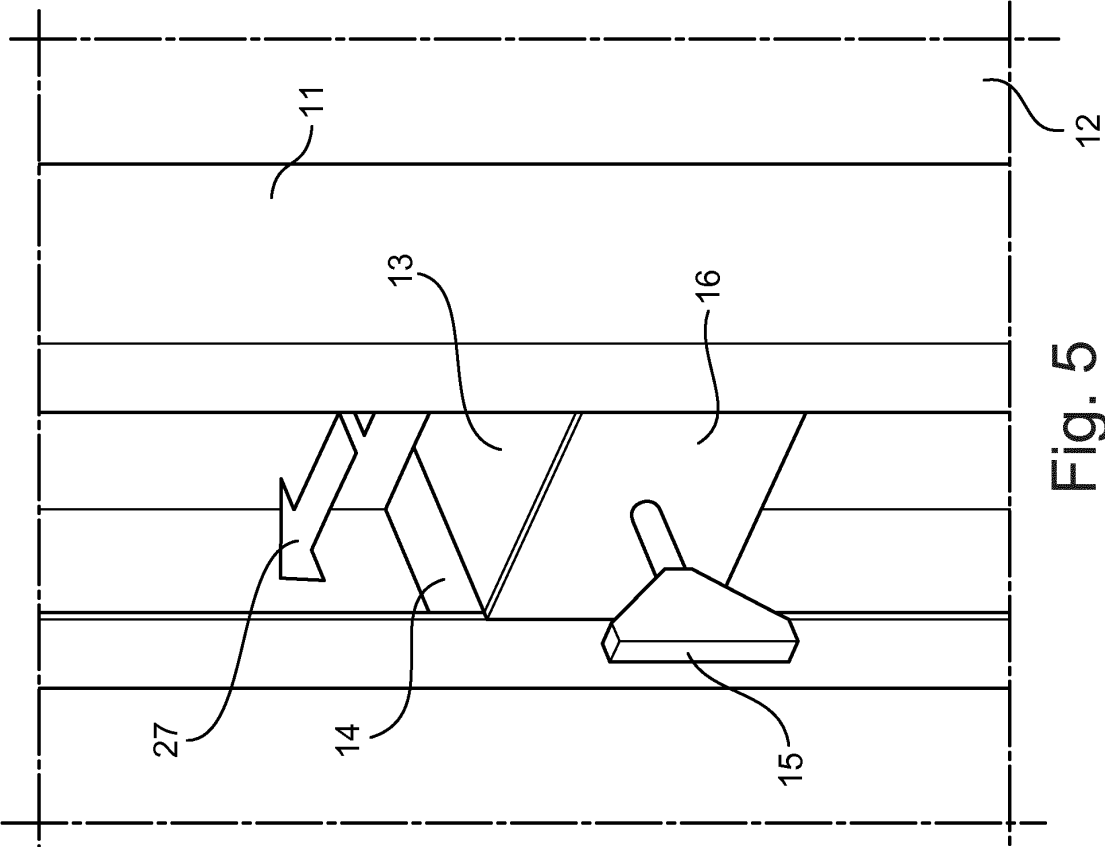


Fig. 5

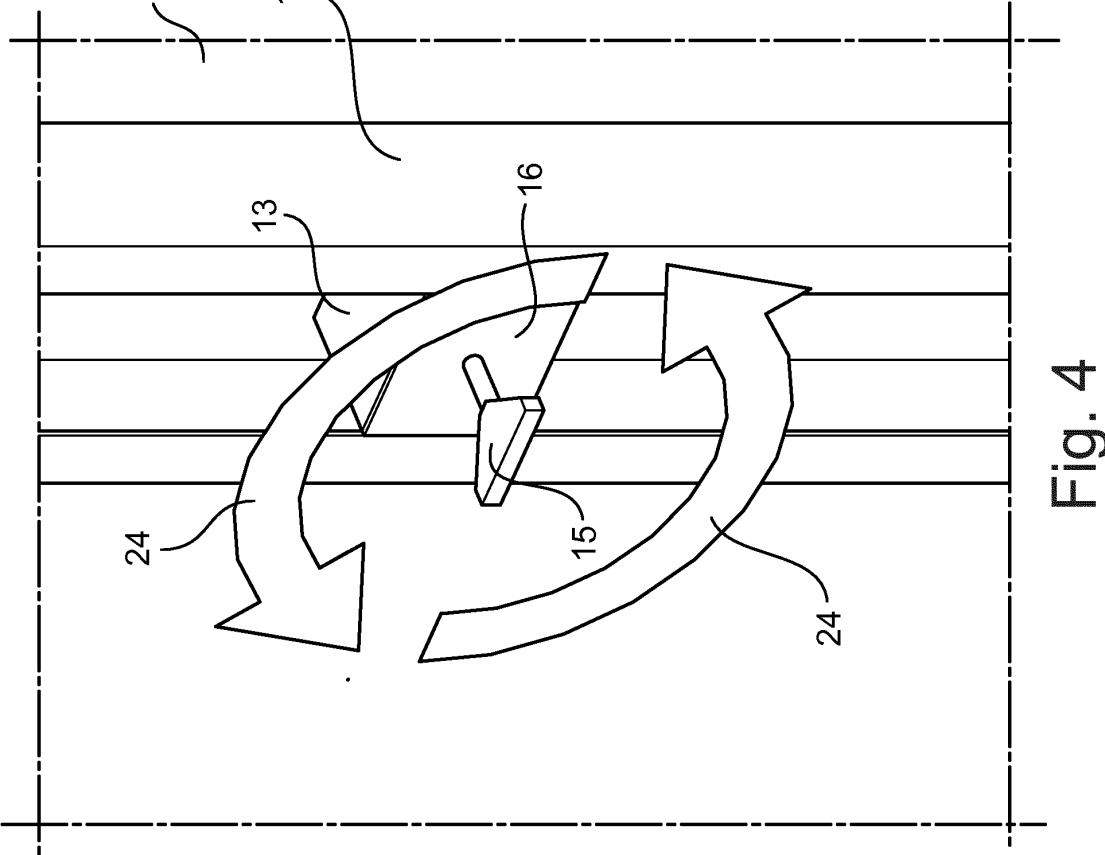
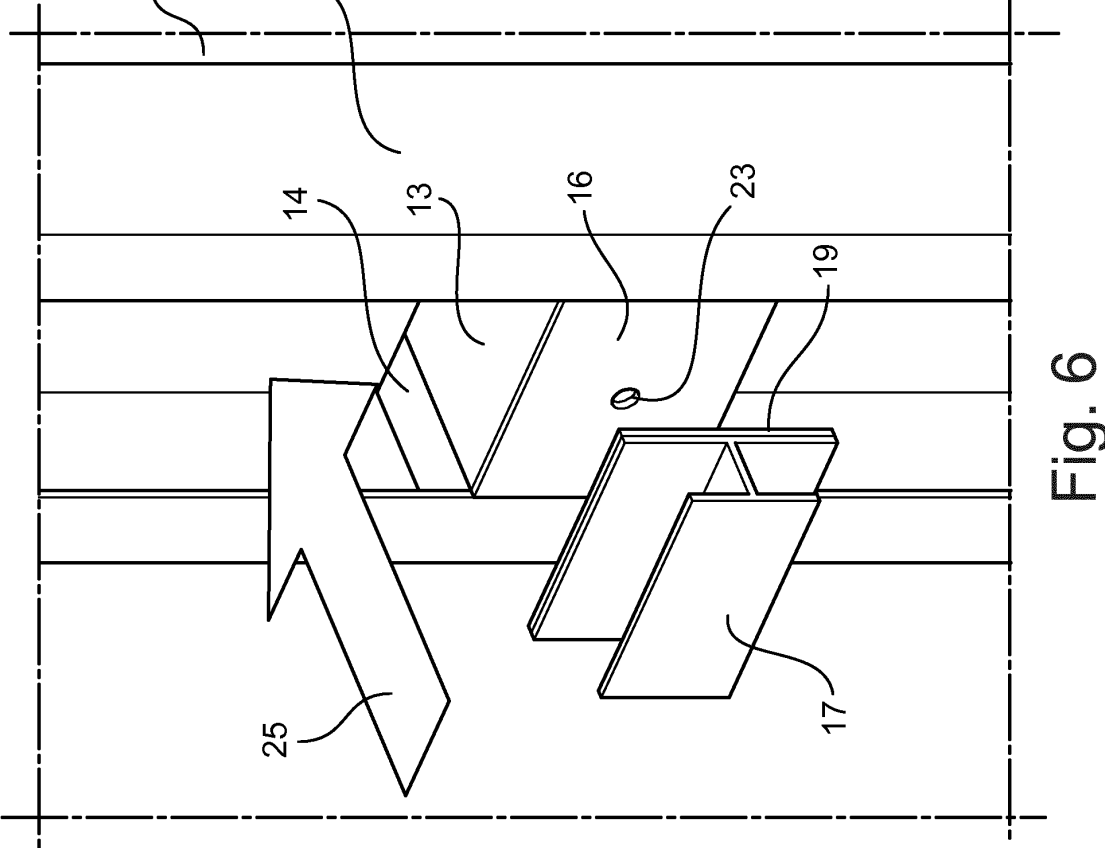
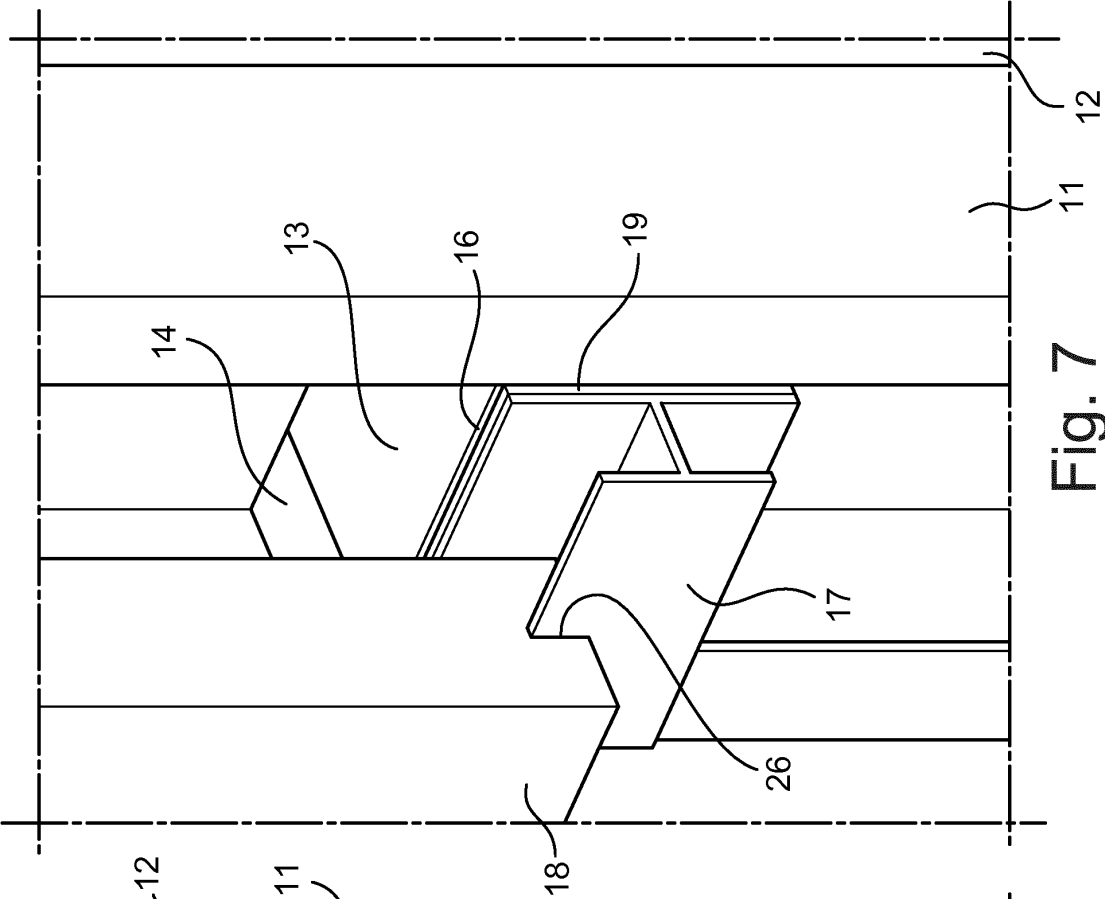


Fig. 4



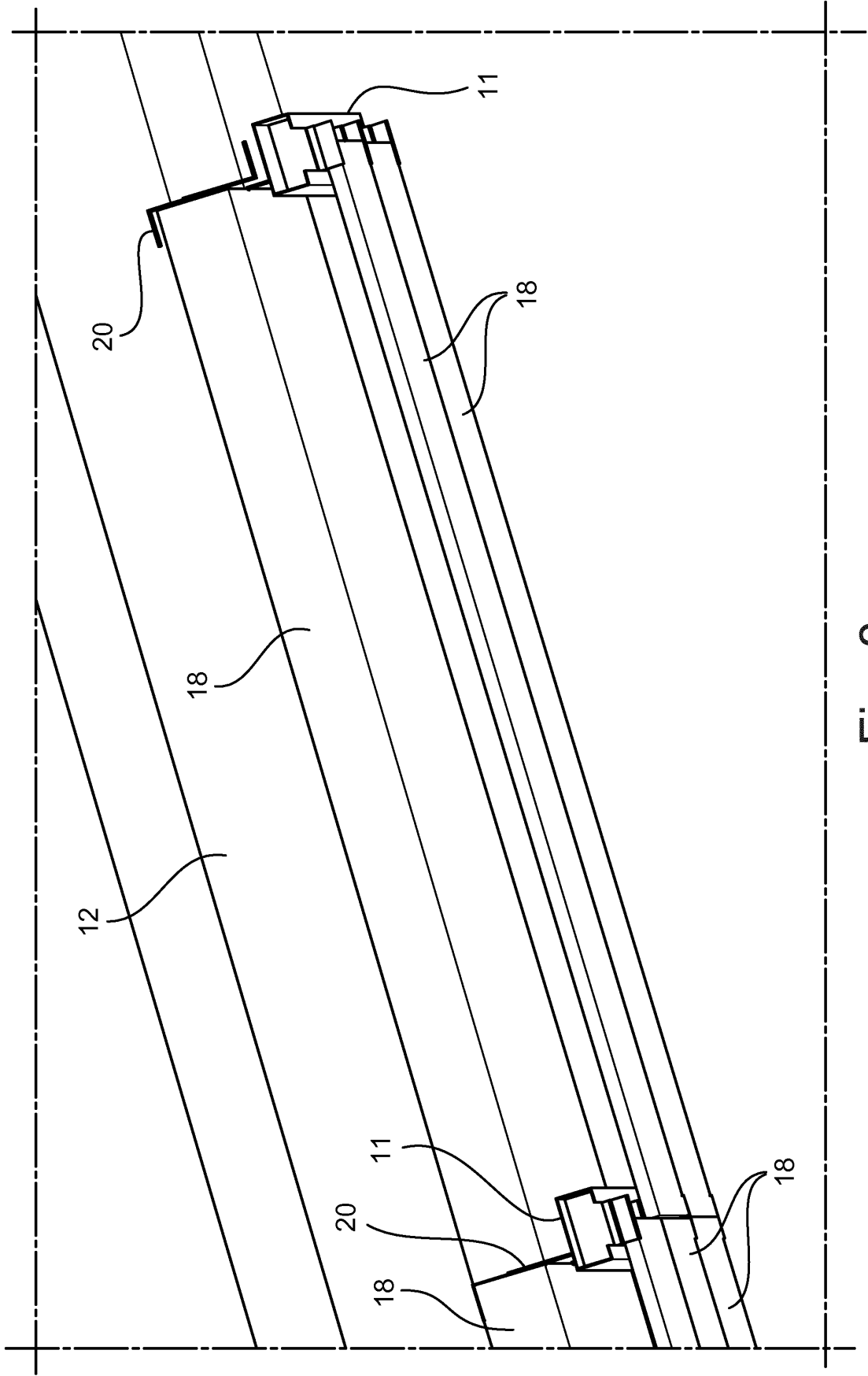
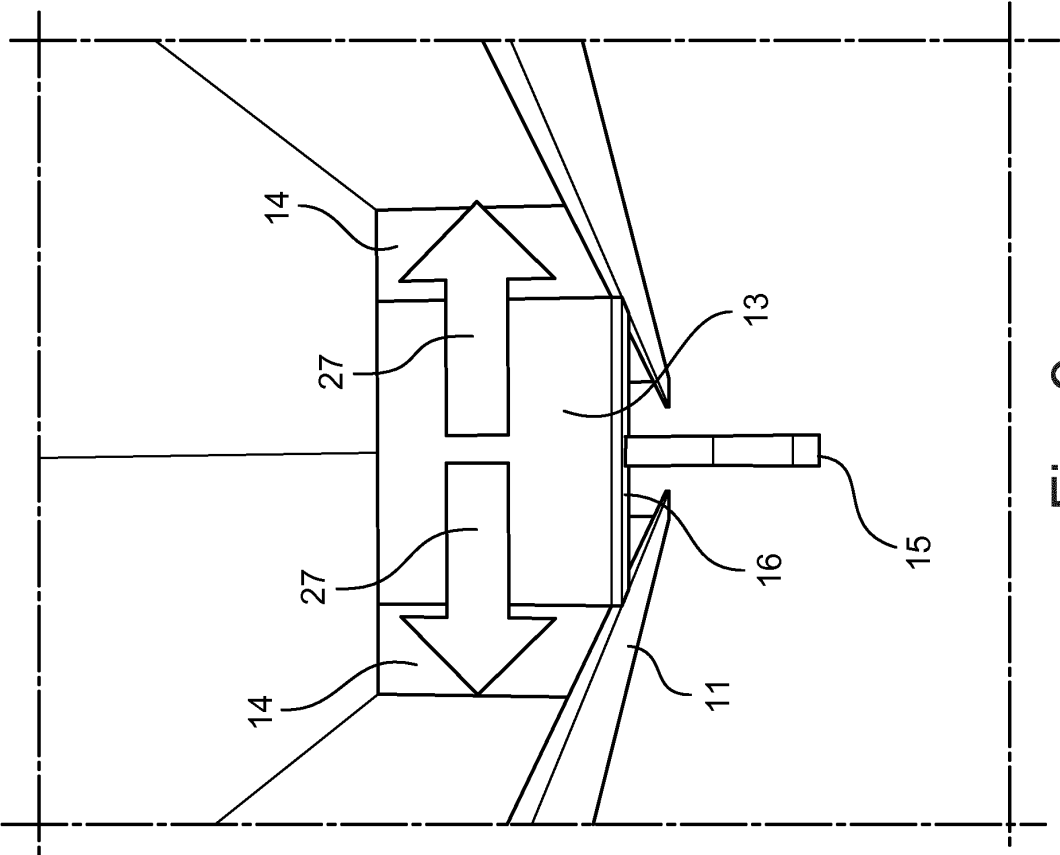
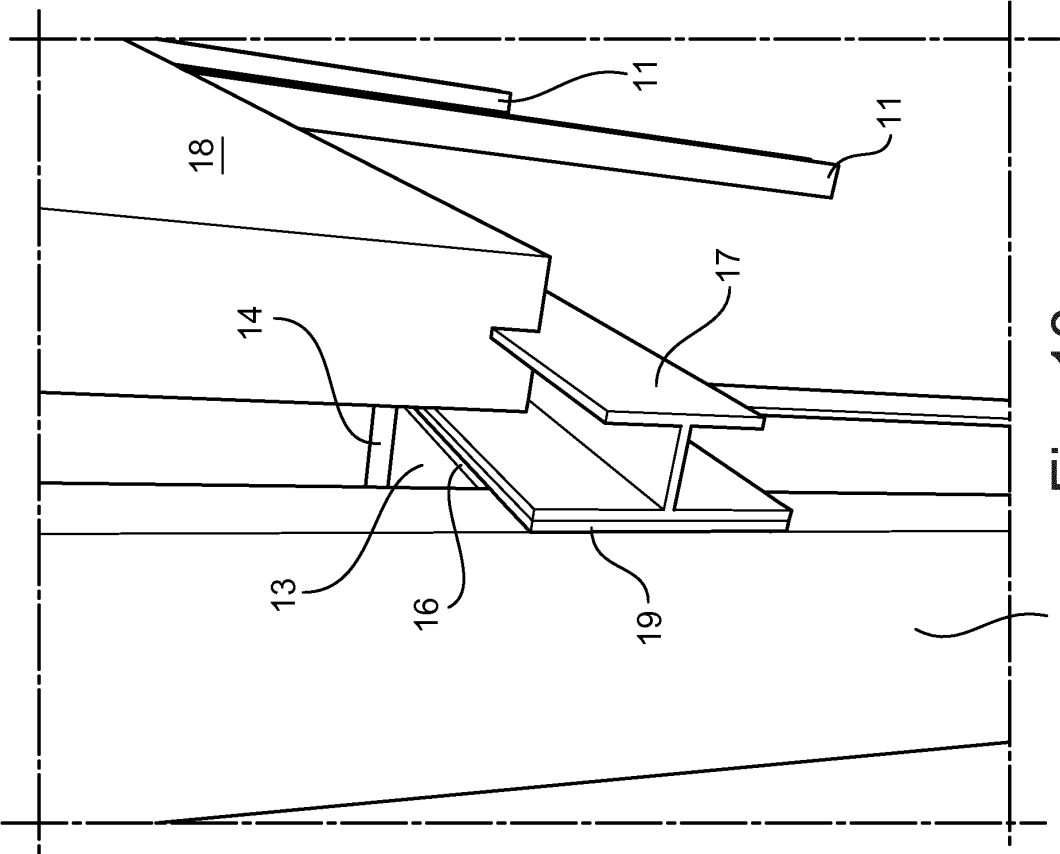


Fig. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 3807112 A [0011]
- JP 2007032270 A [0012]
- JP 2009046924 A [0013]
- US 2116533 A [0014]