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

(11) **EP 3 048 233 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.07.2016 Bulletin 2016/30

(51) Int Cl.:
E06B 3/30 *(2006.01)*

(21) Application number: **16152844.3**

(22) Date of filing: **26.01.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **26.01.2015 IT UD20150007**

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(54) WINDOW FRAME ELEMENT WITH AN INTERNAL PROFILE, AN EXTERNAL PROFILE AND AN INTERMEDIATE CONNECTION PROFILE

(57) Frame element for door and window fixtures comprising an external profile (12), an internal profile (14), disposed in an opposite position to the external profile (12), an intermediate connection profile (16) disposed between the external profile (12) and the internal profile (14), an external releasable connection unit (11) configured to releasably couple the intermediate profile (16) to the external profile (12), and an internal releasable connection unit (15) configured to releasably couple the intermediate profile (16) to the internal profile (14) or to another intermediate profile (62) in its turn connected to the internal profile (14).

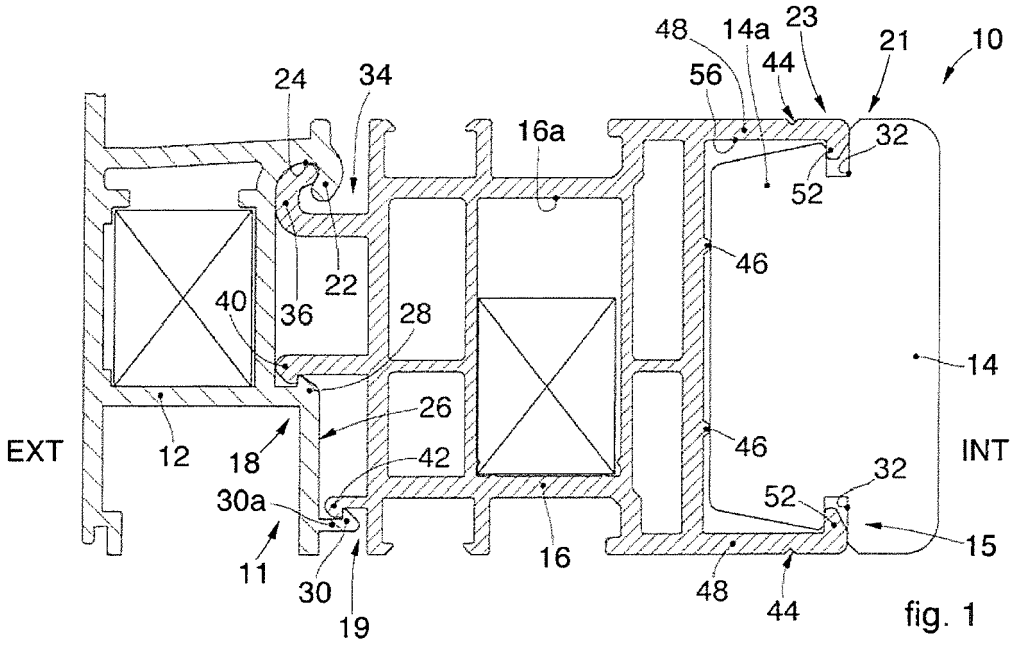

fig. 1

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Description

FIELD OF THE INVENTION

[0001] Embodiments described here concern a frame element for fixtures, such as doors, windows, panels and suchlike, in particular a frame element with an internal profile, an external profile and an intermediate connection profile.

BACKGROUND OF THE INVENTION

[0002] Fixtures are known, such as windows, but also doors, panels or suchlike, and it is known that such fixtures comprise at least a frame generally formed by frame elements connected to each other, for example two uprights and two cross-pieces. The fixture can also possibly comprise two frames, one fixed and one mobile. The frame elements are coupled with each other to define the frame for fixtures, which can be, as we said, a mobile frame, typically hinged, or a fixed frame. For example, the frame for fixtures can be the fixed or mobile frame of a window with a sheet of transparent material, such as glass or a suitable optical polymer.

[0003] It is known that the frame elements for fixtures in question can be formed by several profiles or layers, to satisfy thermal break requirements, esthetic requirements, ease of construction and/or assembly, limiting costs and/or reducing weight.

[0004] The frame elements generally comprise a profile or layer of external covering, mostly made of aluminum or its alloys, or other material suitable to be used in an external space, a profile or layer of internal covering, made of wood or similar materials, for esthetic embellishment purposes, and an intermediate connection profile or layer.

[0005] The intermediate connection profile is generally made of plastic material, for example polyamide, nylon, PVC or suchlike and is interposed between the two layers not only with a connection function, but also due to its heat insulation characteristics, to function as a thermal break.

[0006] One disadvantage of such known frame elements is that the coupling of the external and intermediate profile is typically a same-shape coupling of the irreversible type, made for example by rolling, i.e. it consists of a solid and non-removable connection.

[0007] Consequently, when the frame and the frame elements of which it is made have to be removed and dis-assembled in order to replace and/or dispose of it, for example in order to recover the intermediate connection profile and/or send it to a differentiated refuse collection site, the intermediate connection profile itself has to be broken up, breaking the irreversible connection with the internal profile and the external profile. However, the fact that the dis-assembly of the profiles is destructive constitutes a disadvantage in terms of re-using the intermediate connection profile, which is damaged, and also in terms of disposing in the garbage of the material that makes up the intermediate connection profile, part of which, after breakage, remains constrained to the internal profile and the external profile.

[0008] Therefore, these known frame elements do not allow to have a complete recovery and recycling of the materials used to make them.

[0009] There is therefore a need to perfect a frame element for fixtures that can overcome at least one of the disadvantages of the state of the art.

[0010] In particular, one purpose of the present invention is to obtain a frame element for fixtures that allows to dis-assemble in a non-destructive way and to completely recover the profiles of which it is made, without damaging them, and also the materials that make up the individual profiles, so as to be able to recycle them correctly and/or re-use them.

[0011] Another purpose is to obtain a frame element for fixtures that has thermal break characteristics and therefore obtains a heat insulation between the inside and outside.

[0012] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0013] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0014] In accordance with some embodiments, a frame element for door and window fixtures is provided. According to one embodiment, the frame element for door and window fixtures comprises:

- an external profile;
- an internal profile, disposed in an opposite position to the external profile;
- an intermediate connection profile disposed between the external profile and the internal profile.

[0015] According to one aspect of the present description, the frame element also comprises:

- an external releasable connection unit configured to releasably couple the intermediate profile to the external profile;
- an internal releasable connection unit configured to releasably couple the intermediate profile to the internal profile or to another intermediate profile in its turn connected to the internal profile.

[0016] According to one embodiment, the external releasable connection unit is configured to obtain a releasable attachment of the snap-in type between external profile and intermediate profile and wherein the internal

releasable connection unit is configured to obtain a releasable attachment of the snap-in type between intermediate profile and internal profile or other intermediate profile.

[0017] According to one embodiment, the external releasable connection unit comprises one or more external releasable coupling members that are part of the external profile and one or more mating external releasable coupling counter-members that form part of the intermediate profile.

[0018] According to one embodiment, the external releasable coupling members comprise at least a curved or hooked element, configured to define an attachment seating and, in a coordinated manner, the external releasable coupling counter-members comprising a mating curved or hooked element configured to be inserted and coupled in the attachment seating defined by the curved element.

[0019] According to one embodiment, the external releasable coupling members also comprise at least a protruding attachment wall that is part of the external profile, and coupling elements of the intermediate profile configured to make a releasable snap-in connection with the protruding attachment wall.

[0020] According to one embodiment, the protruding attachment wall is provided with attachment teeth and the coupling elements comprise attachment teeth mating with the attachment teeth.

[0021] According to one embodiment, the internal releasable connection unit comprises one or more internal releasable coupling members that are part of the internal profile or of the other intermediate profile and one or more mating internal releasable coupling counter-members that are part of the intermediate profile.

[0022] According to one embodiment, the internal releasable coupling members comprise attachment grooves or coupling elements and, in a coordinated manner, the internal releasable coupling counter-members comprise attachment teeth, configured to cooperate with the attachment grooves or coupling elements.

[0023] According to one embodiment, the internal releasable coupling counter-members comprise attachment walls on which the attachment teeth are provided, the attachment walls protruding from the intermediate profile to define an attachment seating to receive an attachment portion of the internal profile on which the attachment grooves are provided, or a part of the other intermediate profile on which the coupling elements able to cooperate with the attachment teeth are provided.

[0024] According to one embodiment, the frame element also comprises one or more external covering elements, mounted at the front on the external profile.

[0025] According to one embodiment, one or more external covering elements are releasably mounted on the external profile.

[0026] According to other embodiments, a frame for door and window fixtures is provided. According to one embodiment, the frame for door and window fixtures comprises one or more frame elements according to the present description.

[0027] According to other embodiments, a door and window fixture is provided. According to one embodiment, the door and window fixture comprises a frame according to the present description.

[0028] According to other embodiments, a method is provided to make a frame element for door and window fixtures. According to one embodiment, the method comprises:

- providing an external profile;
- providing an internal profile, disposed in position opposite the external profile;
- providing an intermediate connection profile disposed between the external profile and the internal profile.

[0029] According to one aspect, the method also comprises:

- releasably coupling the intermediate profile to the external profile;
- releasably coupling the intermediate profile to the internal profile or to another intermediate profile in its turn connected to the internal profile.

[0030] According to some embodiments, a method is provided to disassemble a frame element of a door or window fixture comprising an external profile, an internal profile, disposed in a position opposite the external profile, and an intermediate connection profile disposed between the external profile and the internal profile. According to one embodiment, the method comprises:

- de-coupling the intermediate profile from the external profile in a non-destructive manner;
- de-coupling in a non-destructive manner the intermediate profile from the internal profile or from another intermediate profile in its turn connected to the internal profile.

[0031] These and other aspects, characteristics and advantages of the present disclosure will be better understood with reference to the following description, drawings and attached claims. The drawings, which are integrated and form part of the present description, show some embodiments of the present invention, and together with the description, are intended to describe the principles of the disclosure.

[0032] The various aspects and characteristics described in the present description can be applied individually where possible. These individual aspects, for example aspects and characteristics described in the attached dependent claims, can be the object of divisional applications.

[0033] It is understood that any aspect or characteristic that is discovered, during the patenting process, to be

already known, shall not be claimed and shall be the object of a disclaimer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a section view of a profile for door or window fixtures according to embodiments described here;
- fig. 2 shows how the intermediate profile is coupled with the external profile;
- figs. 3-7 are cross section views on the cross-piece of variants of embodiments of a profile for door or window fixtures;
- fig. 8 is a cross section view of the upright of a variant of embodiments of a profile for door or window fixtures;
- figs. 9 and 10 are schematic representations, respectively front and side, of a frame for door or window fixtures made using frame elements according to embodiments described here.

[0035] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0036] We shall now refer in detail to the various embodiments of the present invention, of which one or more examples are shown in the attached drawing. Each example is supplied by way of illustration of the invention and shall not be understood as a limitation thereof. For example, the characteristics shown or described insomuch as they are part of one embodiment can be adopted on, or in association with, other embodiments to produce another embodiment. It is understood that the present invention shall include all such modifications and variants.

[0037] Before describing these embodiments, we must also clarify that the present description is not limited in its application to details of the construction and disposition of the components as described in the following description using the attached drawings. The present description can provide other embodiments and can be obtained or executed in various other ways. We must also clarify that the phraseology and terminology used here is for the purposes of description only, and cannot be considered as limitative. The use of terms such as "including", "comprising", "having" and their variations is intended to include the elements listed after them and their equivalents, and also additional elements. Unless otherwise specified, terms such as "mounted", "connected", "supported" and "coupled" and their variations are used in the widest sense and include both direct and indirect assemblies, connections, supports and couplings. Furthermore, the terms "connected" and "coupled" cannot be limited to physical or mechanical connections or couplings.

[0038] The term "comprise" and variants of the term such as "comprises" and "comprising" are used here to indicate the inclusion of a clearly expressed whole or clearly expressed wholes, but not the exclusion of any other whole or wholes, unless in the context or use an exclusive interpretation of the term is required. In particular, in the present description the term "comprising" indicates the elements reported, or equivalent structural elements or functions, with the possible addition of one or more other elements not reported. The expressions "which has" and "which provides" must also be understood in a non-exhaustive sense, unless the context suggests otherwise.

[0039] Embodiments described here concern a frame element 10 for door or window fixtures formed by several profiles or layers, to obtain fixtures such as windows, but also doors, panels or suchlike. Several frame elements 10 as described here can be coupled together to define a frame 13 for a door or window fixture (see figs. 8 and 9), which can be a mobile frame or a fixed frame of the window or door fixture. For example, the frame 13 can be associated with a sheet of transparent material, such as glass or suitable optical polymer. The door or window fixture provided with the frame 13 can be used to separate and possibly heat insulate two spaces, for example two spaces in a building, whether domestic, industrial, commercial, public or private, in particular an internal space (INT) from an external space (EXT).

[0040] Fig. 1 is used to describe embodiments of a frame element 10 for door or window fixtures which comprises

- an external profile 12, able to be put in contact with the external space;
- an internal profile 14, disposed in an opposite position to the external profile 12 and able to be at least partly in contact with the internal space;
- an intermediate connection profile 16 disposed between the external profile 12 and the internal profile 14, coupled with both the external profile 12 and the internal profile 14;
- an external releasable connection unit 11 configured to releasably couple the intermediate profile 16 to the external profile 12;
- an internal releasable connection unit 15 configured to releasably couple the intermediate profile 16 to the internal profile 14.

[0041] According to some embodiments, which can be combined with all the embodiments described here, the

external profile 12 can typically be made of metal, for example aluminum or its alloys, so as to be suitable to be positioned in contact with an external space. For example, the external profile 12 is a section shape, in particular a metal section shape, for example aluminum or its alloys. By the term "section shape" we mean an oblong metal element, for example a beam or bar, which can be obtained with a rolling mill or an extruder, and which is characterized by the shape or profile of its cross section. According to some embodiments, which can be combined with all the embodiments described here, the internal profile 14 can be made of wood, wood substitutes or wood-based materials or similar materials, and can typically have an esthetic and enhancing function of the frame element 10.

[0042] According to some embodiments, which can be combined with all the embodiments described here, the intermediate profile 16 can typically be made of polyamide or other polymer material, in particular, plastic polymer such as nylon, PVC or suchlike. According to some embodiments, which can be combined with all the embodiments described here, the external releasable connection unit 11 and the internal releasable connection unit 15 can be configured to obtain a releasable coupling or attachment of the snap-in type.

[0043] According to some embodiments, which can be combined with all the embodiments described here, the external releasable connection unit 11 comprises one or more external releasable coupling members 18 that are part of the external profile 12 and one or more mating external releasable coupling counter-members 19 that form part of the intermediate profile 16. The external releasable coupling members 18 can be configured to cooperate with the external releasable coupling counter-members 19, so as to obtain a releasable coupling of the external profile 12 and the intermediate profile 16. According to some embodiments, which can be combined with all the embodiments described here, the external releasable coupling members 18 and the external releasable coupling counter-members 19 can be configured to obtain a releasable coupling or attachment of the snap-in type.

[0044] The external releasable coupling members 18 can be provided on the external profile 12 in the part facing toward the internal space, while the external releasable coupling counter-members 19 can be provided on the intermediate profile 16 in the part facing toward the external space. According to some embodiments, the external releasable coupling members 18 can include at least a curved or hooked element 22, configured to define an attachment seating 24, for example with a hook shaped cross section. The curved element 22 can be part of the external profile 12. In the embodiments described using fig. 1, the curved element 22 has the free end facing downward. The terms "upper", "lower", "upward" and "downward", "vertical", "horizontal" are used, here and hereafter, only as a reference, with regard to the profile for fixtures 10 shown in the attached drawings.

[0045] In a coordinated manner, the external releasable coupling counter-members 19 can include a mating curved or hooked element 36. In particular, the curved element 36 can be part of the intermediate profile 16. The curved element 36 can be configured to be inserted and coupled in the attachment seating 24 defined by the curved element 22. To this purpose, the curved element 36 can be protruding, for example, from the intermediate profile 16 and can possibly have a cross section with a hook shape. In the embodiments described using fig. 1, the curved element 36 has the free end facing upward.

[0046] According to some embodiments, the external releasable coupling members 18 can also include at least a protruding attachment wall 26 that is part of the external profile 12. The protruding attachment wall 26 can be provided to attach and stabilize the position of the intermediate profile 16 with respect to the external profile 12.

[0047] According to embodiments described using fig. 1, and which can be combined with all the embodiments described here, the external profile 12 can be provided with attachment teeth 28, 30, in particular a first attachment tooth 28 and a second attachment tooth 30. The attachment teeth 28, 30 of the external profile 12 can be part of the protruding attachment wall 26. In particular, the first attachment tooth 28 can have a length mating with the curved element 22, while the second attachment tooth 30 can be longer than the curved element 22, and extends more toward the inside, that is, toward the intermediate profile 16. Moreover, in particular, the second attachment tooth 30 can be provided on an attachment rib 30a protruding transversely from the protruding attachment wall 26.

[0048] According to embodiments described using fig. 1, and which can be combined with all the embodiments described here, the first attachment tooth 28 and the second attachment tooth 30 of the external profile 12 can be hook-shaped, and both can be positioned facing upward.

[0049] According to some embodiments, the external releasable coupling members 18 can also include coupling elements 34 of the intermediate profile 16, configured to cooperate with the protruding attachment wall 26. In particular, the coupling elements 34 can be configured to obtain a releasable snap-in connection. The coupling elements 34, together with the curved element 36 able to cooperate with the curved element 22, in particular being inserted into the attachment seating 24, can allow the reversible coupling of the external profile 12 and intermediate profile 16.

[0050] According to some embodiments, the coupling elements 34 can include attachment teeth 40, 42 of the intermediate profile 16 mating with the attachment teeth 28, 30 of the protruding attachment wall 26, in particular a first attachment tooth 40 and a second attachment tooth 42, configured to make a releasable snap-in coupling.

[0051] According to embodiments described using fig. 1, and which can be combined with all the embodiments described here, the first attachment tooth 40 and the second attachment tooth 42 of the intermediate profile 16

can be hook-shaped, and both can be positioned facing downward, so as to be able to cooperate with the first attachment tooth 28 and the second attachment tooth 30 facing upward.

[0052] According to some embodiments, which can be combined with all the embodiments described here, the internal releasable connection unit 15 includes one or more internal releasable coupling members 21 that are part of the internal profile 14 and one or more mating internal releasable coupling counter-members 23 that are part of the intermediate profile 16. The internal releasable coupling members 21 are configured to cooperate with the internal releasable coupling counter-members 23, so as to obtain a releasable coupling of the internal profile 14 and the intermediate profile 16. According to some embodiments, which can be combined with all the embodiments described here, the internal releasable coupling members 21 and the internal releasable coupling counter-members 23 can be configured to obtain a releasable snap-in coupling or attachment with each other.

[0053] The internal releasable coupling members 21 can be provided on the internal profile 14 in the part facing toward the external space, while, in coordination, the internal releasable coupling counter-members 23 can be provided on the intermediate profile 16 in the part facing toward the internal space.

[0054] According to some embodiments, which can be combined with all the embodiments described here, the internal releasable coupling members 21 can include attachment grooves 32 or similar female attachment elements, to obtain a reversible coupling, in particular a snap-in attachment, with the internal releasable coupling counter-members 23. For example, the attachment grooves 32 can be made with a longitudinal development on an attachment portion 14a of the internal profile 14, in particular by milling or similar removal of material, both along an upper part and a lower part of the attachment portion 14a of the internal profile 14.

[0055] In possible implementations, the internal releasable coupling counter-members 23 can include attachment teeth 52, or similar male attachment elements, configured to cooperate for example by snap-in attachment, with the attachment grooves 32.

[0056] In other variants, not shown in the drawings, the attachment grooves 32, or other female attachment elements, can be part of the internal releasable coupling counter-members 23 of the intermediate profile 16, while the attachment teeth 52, or other male attachment elements, can be part of the internal releasable coupling members 21 of the internal profile 14. According to some embodiments, the internal releasable coupling counter-members 23 comprise attachment walls 48. The attachment walls 48 can be part of the intermediate profile 16, made protruding toward the internal space. The attachment walls 48 can extend parallel one with respect to the other in a horizontal direction from the intermediate profile 16 toward the internal profile 14. The attachment teeth 52 can be provided protruding from the attachment walls 48, in particular one attachment tooth facing downward and one facing upward.

[0057] The attachment walls 48 of the intermediate profile 16 can therefore define an attachment seating 56, inside which the attachment portion 14a of the internal profile 14 is inserted, so as to couple the attachment teeth 52 to the attachment grooves 32 provided on the internal profile 14.

[0058] In this way, it is also possible to obtain a stable and reversible coupling of the intermediate profile 16 and the internal profile 14, so that the two profiles 14, 16 can be separated easily, quickly and non-destructively. In this way, the intermediate profile 16 and the material it is made of can be wholly recovered, for the purposes of reusing, recycling or differentiated disposal of refuse.

[0059] In possible implementations, the attachment walls 48 can have a length such as to define a desired depth of the attachment seating 56, able to accommodate the attachment portion 14a of the internal profile 14.

[0060] The attachment walls 48 can also have a length and thickness such that, together with the material of which they are made, they allow elastic flexibility to facilitate a slight spreading thereof, so that the attachment portion 14a can be inserted into the attachment seating 56 before the attachment teeth 52 are positioned in the attachment grooves 32 and to facilitate an elastic return in which they close, taking the attachment teeth 52 to a constrained and stable position in the attachment grooves 32. The same elastic mechanism can advantageously be exploited inversely, so as to dis-insert the attachment teeth 52 from the attachment grooves 32 in a non-destructive manner. Advantageously, the attachment walls 48 can be provided with lines of weakening 44, made longitudinally outside, for example such as furrows, incisions or millings, which are able to define a localized weakening so as to facilitate the flexibility described above.

[0061] In possible implementations, the intermediate profile 16 can be provided with one or more abutment ribs 46 that develop longitudinally and that can be provided to function as an abutment or end-of-travel for the internal profile 14 once the attachment portion 14a is inserted in the attachment seating 56 of the intermediate profile, coupling the attachment teeth 52 to the attachment grooves 32, so as to stabilize and consolidate the releasable constraint of the intermediate profile 16 and internal profile 14.

[0062] Fig. 2 is used to describe steps for the insertion and releasable coupling of the intermediate profile 16 with respect to the external profile 12. In particular, initially the curved element 36 can be inserted (see step a) in fig. 2) in the attachment seating 24 of the curved element 22, as indicated by arrow F, creating a joint between the intermediate profile 16 and the external profile 12 (see step b) in fig. 2).

[0063] Subsequently, the intermediate profile 16 can be made to rotate as indicated by arrow G, in this case

again clockwise, keeping the curved element 36 inside the seating 24 (see step b) in fig. 2).

[0064] Continuing the rotation indicated by arrow G (see step c) in fig. 2), the first attachment tooth 40 and the second attachment tooth 42 of the intermediate profile 16 couple respectively with the first attachment tooth 28 and the second attachment tooth 30 of the external profile 12, thus obtaining the snap-in releasable attachment of the intermediate profile 16 and the external profile 12.

[0065] This type of snap-in releasable attachment allows to join the external profile 12 and the intermediate profile 16, and to separate them when necessary, simply, quickly and non-destructively. Furthermore, it allows to wholly recover the two profiles 12, 16, allowing to replace one or both without having to break them to separate them.

[0066] Figs. 3-8 are used to describe embodiments of a frame element 10 to obtain a frame, fixed 58 and/or mobile 60, for a fixture 20 provided to separate an internal space (INT) from an external space (EXT).

[0067] With reference to the embodiments described using figs. 3-8, which can be combined with all the embodiments described here, the fixture 20 comprises a fixed frame 58, typically associable with at least a mobile frame 60. In possible implementations, one or more sheets of glass 70 can be mounted on the mobile frame 60. For example, an insulated glass unit can be provided, formed by two sheets of glass 70 opposite and distanced from each other to define an interspace (see figs. 3, 6, 7 and 8), or a double glass unit, formed by three sheets of glass 70 opposite and distanced from each other to define two interspaces (see figs. 4 and 5).

[0068] According to embodiments described using fig. 3, and which can be combined with all the embodiments described here, the frame element 10 can be used to make at least part of the fixed frame 58. In particular, several frame elements 10 can be used as uprights and cross-pieces to make the fixed frame 58.

[0069] According to embodiments described using figs. 4 and 5, and which can be combined with all the embodiments described here, the frame element 10 can be used to make at least part of the mobile frame 60. In particular, several frame elements 10 can be used as uprights and cross-pieces to make the mobile frame 60.

[0070] According to embodiments described using figs. 4 and 5, and which can be combined with all the embodiments described here, the frame element 10 can be used to make both the fixed frame 58 and the mobile frame 60.

[0071] In particular, according to embodiments described using fig. 4, the frame element 10 used to make at least part of the mobile frame 60 provides a direct coupling of the internal profile 14 and the intermediate profile 16, as described previously.

[0072] In this case, the intermediate profile 16 can be coupled with the internal profile 14 by rapid coupling elements 66. Examples of rapid coupling elements 66 are described in the European patent EP-B-1.703.145 in the name of the present Applicant.

[0073] According to embodiments described using fig. 5, and which can be combined with all the embodiments described here, the frame element 10 used to make at least part of the mobile frame 60 can comprise, in addition to the external profile 12, the intermediate profile 16 and the internal profile 14, another intermediate profile 62, disposed between the intermediate profile 16 and the internal profile 14.

[0074] The other intermediate profile 62, which is therefore more internal with respect to the intermediate profile 16, can be made for example of aluminum or its alloys, other metal material or other suitable material. If both the external profile 12 and the other intermediate profile 62 are made of metal, for example aluminum or its alloys, the intermediate profile 16 can also function as a thermal break, separating the two layers of aluminum of the external profile 12 and the other intermediate profile 62, improving the heat insulation between the external space (EXT) and the internal space (INT).

[0075] According to embodiments described using fig. 5, the other intermediate profile 62 can comprise coupling elements 64, for example cavities or grooves that extend longitudinally, which can function as internal releasable coupling counter-members, for releasable coupling with the coordinated internal releasable coupling members 21. In particular, the coupling elements 64 can be configured to cooperate with the attachment teeth 52 of the intermediate profile 16.

[0076] In its turn, the other intermediate profile 62 can be joined by releasable coupling to the internal profile 14, by means of rapid coupling elements 66. In this case too, therefore, the intermediate profile 16 can be completely separated, simply, quickly and non-destructively, from the external profile 12 and also from the other intermediate profile 62, without having to break the intermediate profile 16 itself.

[0077] According to other embodiments, which can be combined with all the embodiments described here, the frame element 10 can include external covering elements 84, 86, mounted at the front on the external profile 12, with an enhancement function. In particular, the external profile 12 has an external side 72 on which the external covering element 84, 86 can be applied.

[0078] In possible implementations, the external covering elements 84, 86 can also be advantageously applied by releasable coupling, in particular snap-in coupling, on the external profile 12.

[0079] The releasable coupling of the external covering elements 84, 86 and the external profile 12 therefore allows to modify the esthetics of a fixture 20, simply by adding or replacing the external covering elements 84, 86, to the external profiles 12 already existing.

[0080] This can be useful and advantageous especially in reconstructions, where in order to improve the esthetic embellishment of the buildings it is possible simply to replace the covering elements 84, 86, without having

to make more substantive modifications such as, for example, to remove and replace the external profile 12 or the fixture 20.

[0081] For example, an external covering element 84 can be provided applied to the external profile 12 of the mobile frame 60 and an external covering element 86 applied to the external profile 12 of the fixed frame 58.

[0082] According to some embodiments, the external side 72 of the external profile 12 can have different configurations, for example it can be conformed as a bent external side 72a or a straight external side 72b, in particular depending on whether the external profile 12 is used respectively as part of a frame element 10 of the mobile frame 60 or the fixed frame 58.

[0083] In possible implementations, the bent external side 72a comprises a first rectilinear segment 90, a segment 92 inclined toward the inside, for example with an inclination of about 40°-50°, for example about 45°, and finally a second rectilinear segment 94, which extends from the end of the inclined segment 92, transverse to the first rectilinear segment 90 (see for example figs. 2-8). For example, the inclined segment 92 can be rectilinear or also curved.

[0084] Attachment grooves 74 can be provided along the second rectilinear segment 94 of the bent external side 72a, and are configured to cooperate with a respective attachment rib or tooth 112 of the covering element 84 to obtain a stable but releasable coupling.

[0085] Furthermore, at the end, the first rectilinear segment 90 has a free attachment end 76, for coupling with the covering element 84.

[0086] In possible implementations, the straight external side 72b comprises a first rectilinear segment 96 and a second rectilinear segment 98, transverse to the first rectilinear segment 96 and shorter than it.

[0087] Attachment grooves 78 can be provided along the second rectilinear segment 98, and are configured to cooperate with a respective attachment tooth 124 of the covering element 86 to obtain a stable but releasable coupling therewith.

[0088] Furthermore, at the end, the first rectilinear segment 96 has a cavity 80, delimited by two retaining ribs 82. The external covering element 86 can be provided with a lower attachment rib 126, able to engage releasably in the cavity 80.

[0089] According to embodiments described using fig. 8, the straight external side 72b can comprise two second rectilinear segments 98 disposed in a symmetrical position at the opposite ends of the first rectilinear segment 96. These embodiments can provide an external covering element 86 with two attachment teeth 124 in opposite position, to couple with respective attachment grooves 78 of the straight external side 72b of the internal profile 12 of the fixed frame 58.

[0090] According to some embodiments, which can be combined with all the embodiments described here, one or both the external covering elements 84, 86 can be made of aluminum or its alloys, or similar metal material, or other suitable material, for example the same material as the external profile 12.

[0091] According to embodiments described using figs. 6, 7 and 8, which can be combined with all the embodiments described here, the external covering element 84 applicable to the mobile frame 60 can comprise at least a first rectilinear segment 100 in correspondence with the first rectilinear segment 90 of the bent external side 72a and a second rectilinear segment 102, transverse to the first rectilinear segment 100, in correspondence with the second rectilinear segment 94 of the bent external side 72a. The second rectilinear segment 102 can be provided at its end with the attachment tooth 112.

[0092] According to some embodiments, described using figs. 6, 7 and 8, the external covering element 84 applicable to the mobile frame 60 can also comprise an inclined connection segment 104, able to join the first rectilinear segment 100 to the second rectilinear segment 102.

[0093] The connection segment 104 can have various shapes, depending on needs. For example, it can be rectilinear, or curved, rounded with the convex part toward the outside, stepped, right-angled, rounded with the convex part toward the inside, inclined or it can have a combination of these shapes. For example, the inclined connection segment 104 can be parallel to the inclined segment 92 of the bent external side 72a of the external profile 12.

[0094] According to embodiments described using figs. 5, 6 and 7, the external covering element 84 applicable to the mobile frame 60 can comprise protruding walls 106, able to rest on the external profile 12 to keep a predetermined distance from the latter. According to embodiments described using figs. 6, 7 and 8, the external covering element 84 applicable to the mobile frame 60 comprises at one end a curved attachment element 108, which defines a seating 110 suitable to accommodate the free attachment end 76 of the external profile 12. In the position opposite the end provided with the curved attachment element 108, the attachment tooth 112 is provided, suitable to be inserted in the attachment groove 74 of the external profile 12.

[0095] According to some embodiments, described using figs. 6, 7 and 8, the external covering element 86 applicable to the fixed frame 58 comprises a first rectilinear segment 114 in correspondence with the first rectilinear segment 96 of the straight external side 72b of the external profile 12 associated with the fixed frame 58, and at least a second rectilinear segment 116, transverse to the first rectilinear segment 114 in correspondence with the second rectilinear segment 98 of the straight external side 72b.

[0096] According to some embodiments, described using figs. 6, 7 and 8, the external covering element 86 applicable to the fixed frame 58 can also comprise an inclined connection segment 120, able to join the first rectilinear segment 114 to the second rectilinear segment 116.

[0097] Like the inclined connection segment 104 of the external covering element 84 applicable to the mobile frame 60, the inclined connection segment 120 can also have various shapes, depending on needs or as desired. For example, it can be rectilinear, or curved, rounded with the convex part toward the outside, stepped, right-angled, rounded with the convex part toward the inside, inclined or it can have a combination of these shapes.

[0098] According to some embodiments, the external covering element 86 applicable to the fixed frame 58 can comprise spacer elements 122, able to rest on the external profile 12 to keep a predetermined distance from the latter.

[0099] The external covering element 86 applicable to the fixed frame 58 can have at its ends, as we said, the attachment tooth 124 and the lower attachment rib 126 (see figs. 6 and 7), or two attachment teeth 124 (see fig. 8).

[0100] It is clear that modifications and/or additions of parts may be made to the frame element 10 for door and window fixtures as described heretofore, without departing from the field and scope of the present invention.

[0101] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of frame element 10 for door and window fixtures, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

[0102] Although the above refers to embodiments of the invention, other embodiments can be provided without departing from the main field of protection, which is defined by the following claims.

Claims

1. Frame element for door and window fixtures comprising:

   - an external profile (12);
   - an internal profile (14), disposed in an opposite position to the external profile (12);
   - an intermediate connection profile (16) disposed between the external profile (12) and the internal profile (14);

   characterized in that said frame element also comprises:

   - an external releasable connection unit (11) configured to releasably couple the intermediate profile (16) to the external profile (12);
   - an internal releasable connection unit (15) configured to releasably couple the intermediate profile (16) to the internal profile (14) or to another intermediate profile (62) in its turn connected to the internal profile (14).

2. Frame element as in claim 1, wherein said external releasable connection unit (11) is configured to obtain a releasable attachment of the snap-in type between external profile (12) and intermediate profile (16) and wherein said internal releasable connection unit (15) is configured to obtain a releasable attachment of the snap-in type between intermediate profile (16) and internal profile (14) or other intermediate profile (62).

3. Frame element as in claim 1 or 2, wherein said external releasable connection unit (11) comprises one or more external releasable coupling members (18) that are part of the external profile (12) and one or more mating external releasable coupling counter-members (19) that form part of the intermediate profile (16).

4. Frame element as in claim 3, wherein the external releasable coupling members (18) comprise at least a curved or hooked element (22), configured to define an attachment seating (24) and, in a coordinated manner, the external releasable coupling counter-members (19) comprising a mating curved or hooked element (36) configured to be inserted and coupled in the attachment seating (24) defined by the curved element (22).

5. Frame element as in claim 3 or 4, wherein the external releasable coupling members (18) also comprise at least a protruding attachment wall (26) that is part of the external profile (12), and coupling elements (34) of the intermediate profile (16) configured to make a releasable snap-in connection with said protruding attachment wall (26).

6. Frame element as in claim 5, wherein the protruding attachment wall (26) is provided with attachment teeth (28, 30) and the coupling elements (34) comprise attachment teeth (40, 42) mating with said attachment teeth (28, 30).

7. Frame element as in any of the claims from 1 to 6, wherein the internal releasable connection unit (15) comprises one or more internal releasable coupling members (21) that are part of the internal profile (14) or of the other intermediate profile (62) and one or more mating internal releasable coupling counter-members (23) that are part of the intermediate profile (16).

8. Frame element as in claim 7, wherein the internal releasable coupling members (21) comprise attachment grooves (32) or coupling elements (64) and, in a coordinated manner, the internal releasable coupling counter-members (23) comprise attachment teeth (52), configured to cooperate with said attachment grooves (32) or coupling elements (64).

9. Frame element as in claim 8, wherein said internal releasable coupling counter-members (23) comprise attachment walls (48) on which said attachment teeth (52) are provided, the attachment walls (48) protruding from the intermediate profile (16) to define an attachment seating (56) to receive an attachment portion (14a) of the internal profile (14) on which said attachment grooves (32) are provided, or a part of the other intermediate profile (62) on which the coupling elements (64) able to cooperate with said attachment teeth (52) are provided.

10. Frame element as in any of the claims from 1 to 9, wherein said frame element also comprises one or more external covering elements (84, 86), mounted at the front on the external profile (12).

11. Frame element as in claim 10, wherein one or more external covering elements (84, 86) are releasably mounted on said external profile (12).

12. Frame for door and window fixtures comprising one or more frame elements (10) as in any of the claims from 1 to 11.

13. Door or window fixture comprising a frame as in claim 12.

14. Method to make a frame element for door and window fixtures, said method comprising:

- providing an external profile (12);
- providing an internal profile (14), disposed in position opposite the external profile (12);
- providing an intermediate connection profile (16) disposed between the external profile (12) and the internal profile (14);

characterized in that said method also comprises:

- releasably coupling the intermediate profile (16) to the external profile (12);
- releasably coupling the intermediate profile (16) to the internal profile (14) or to another intermediate profile (62) in its turn connected to the internal profile (14).

15. Method to disassemble a frame element of a door or window fixture comprising an external profile (12), an internal profile (14), disposed in a position opposite the external profile (12), and an intermediate connection profile (16) disposed between the external profile (12) and the internal profile (14), said method comprising:

- de-coupling the intermediate profile (16) from the external profile (12) in a non-destructive manner;
- de-coupling in a non-destructive manner the intermediate profile (16) from the internal profile (14) or from another intermediate profile (62) in its turn connected to the internal profile (14).

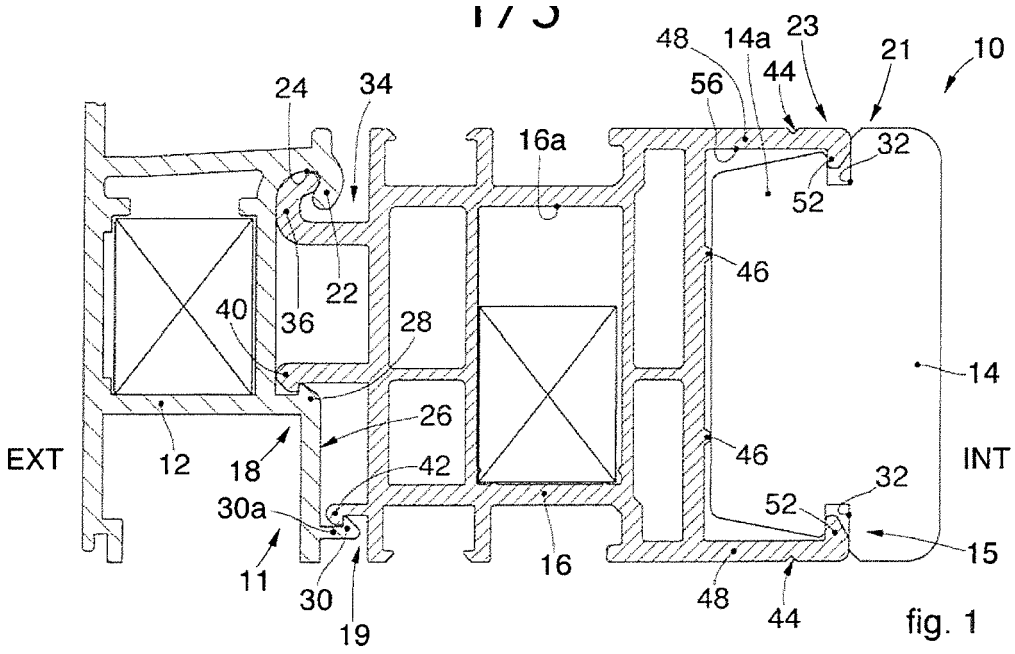
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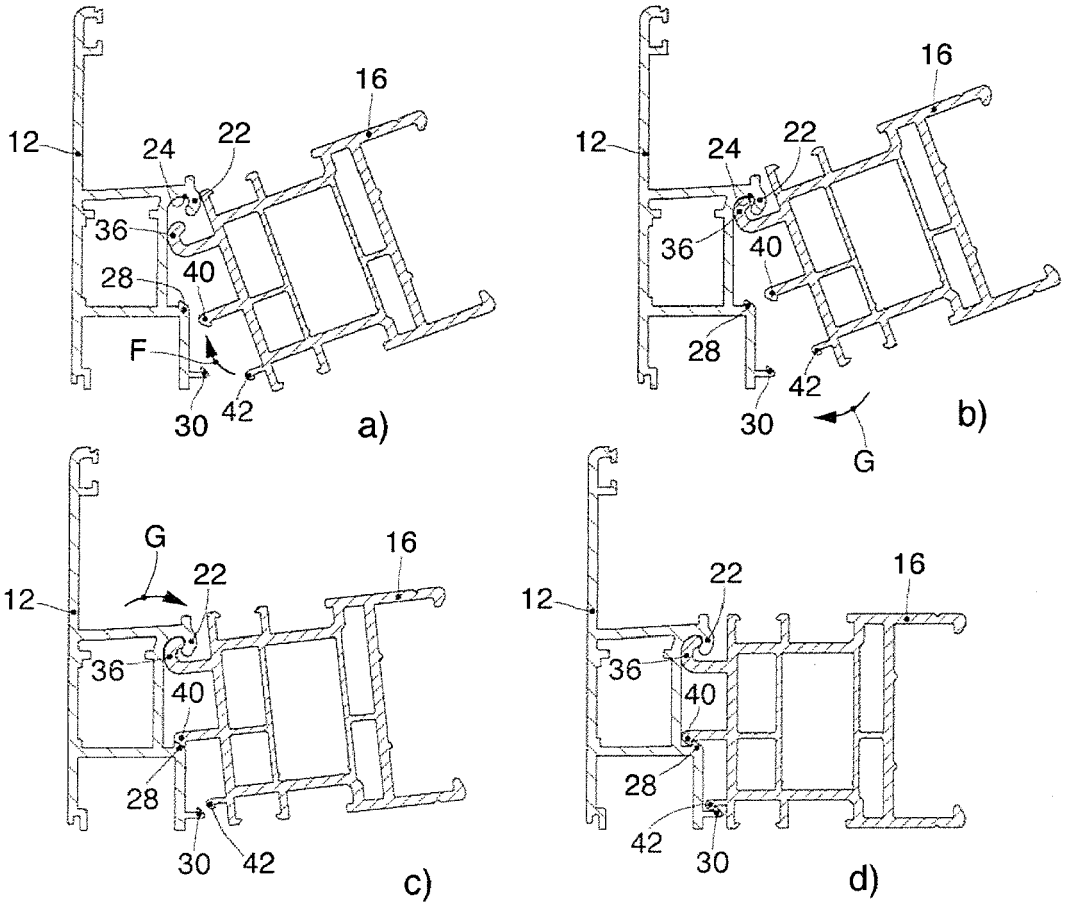
fig. 1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a)
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40
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30
G
b)
G
12
22
16
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40
28
30
42
c)
12
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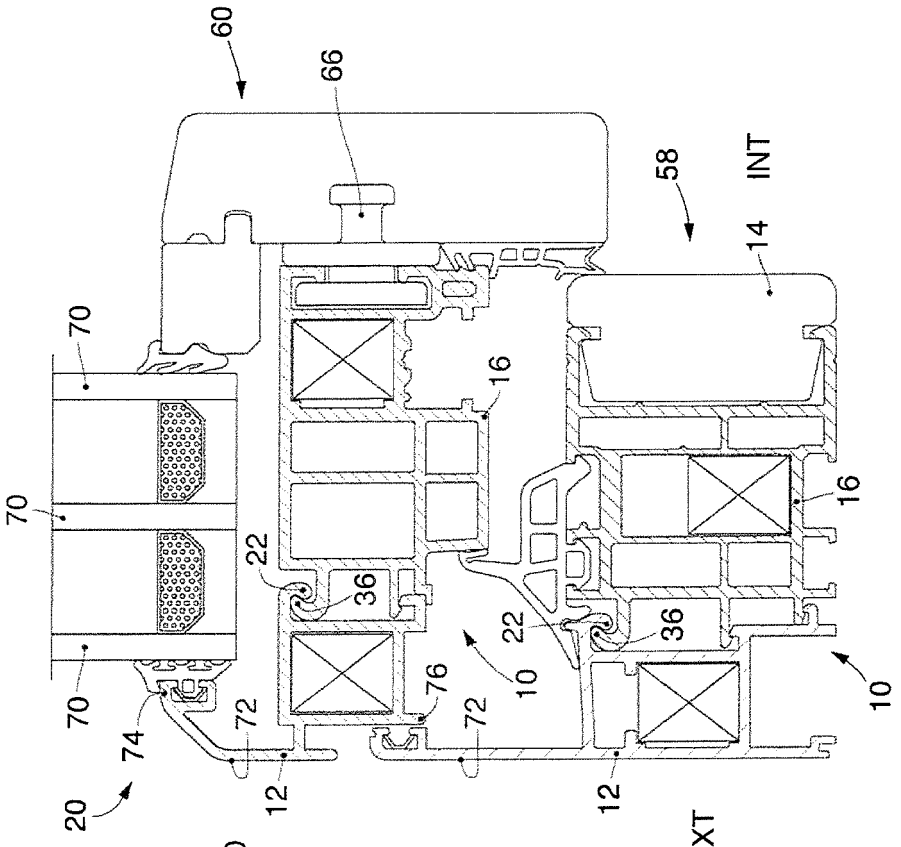
16
36
40
28
42
30
d)

fig. 2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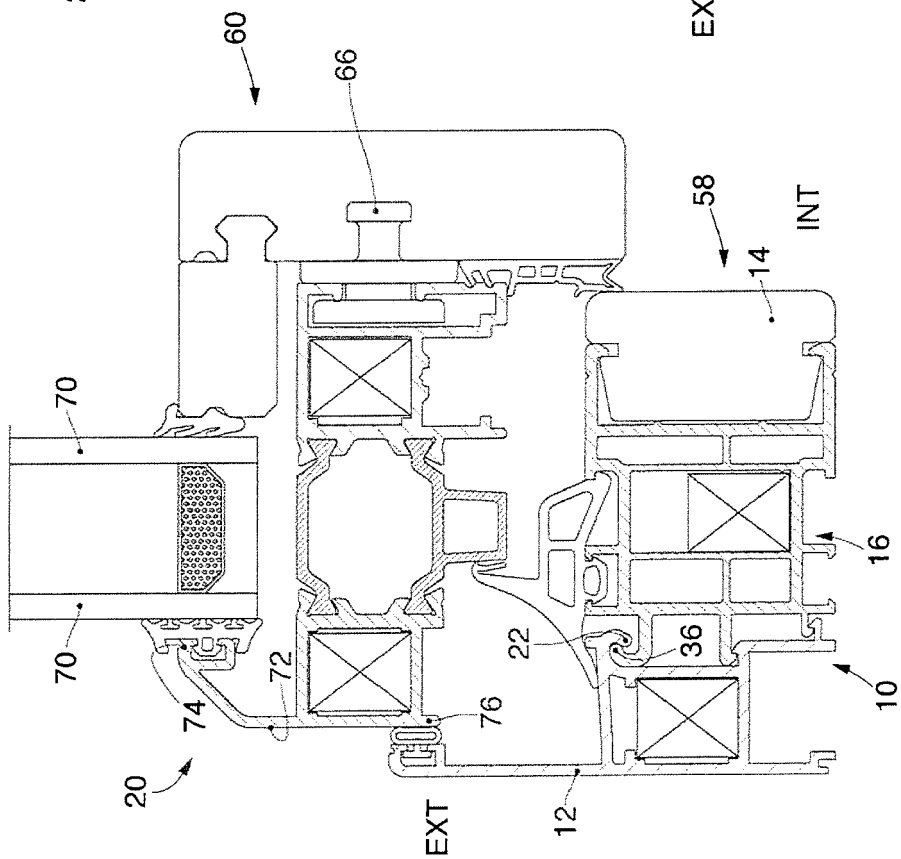
12
12
EXT

fig. 4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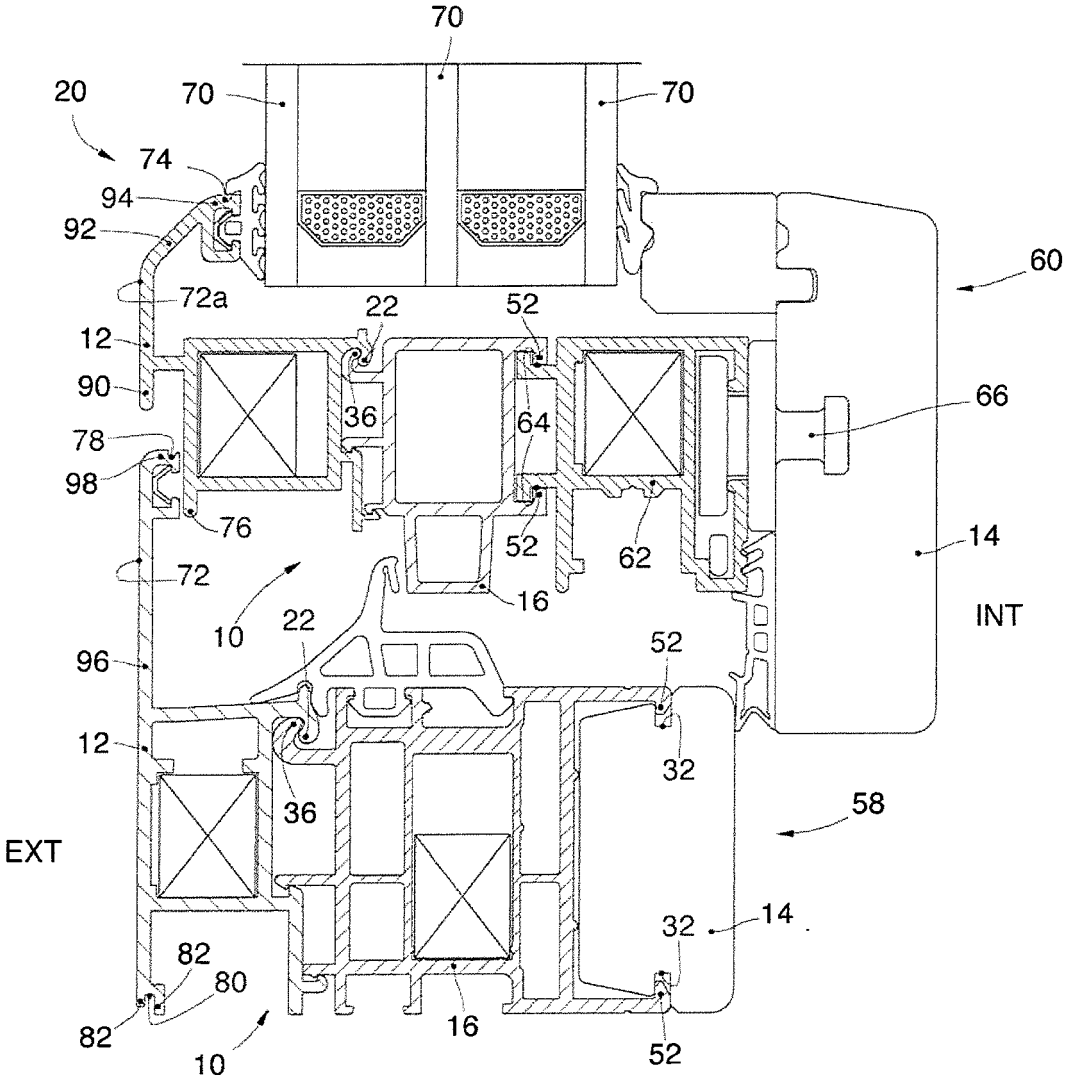
EXT

fig. 3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72
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96
12
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36
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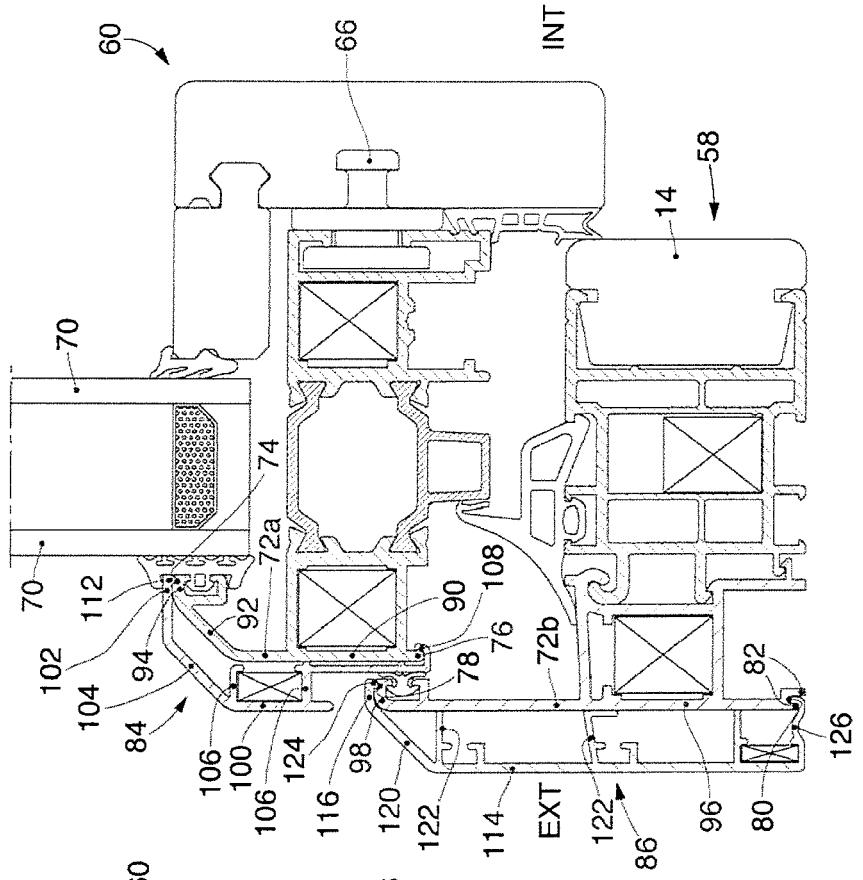
16
52
10

fig. 5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76
72b
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124
98
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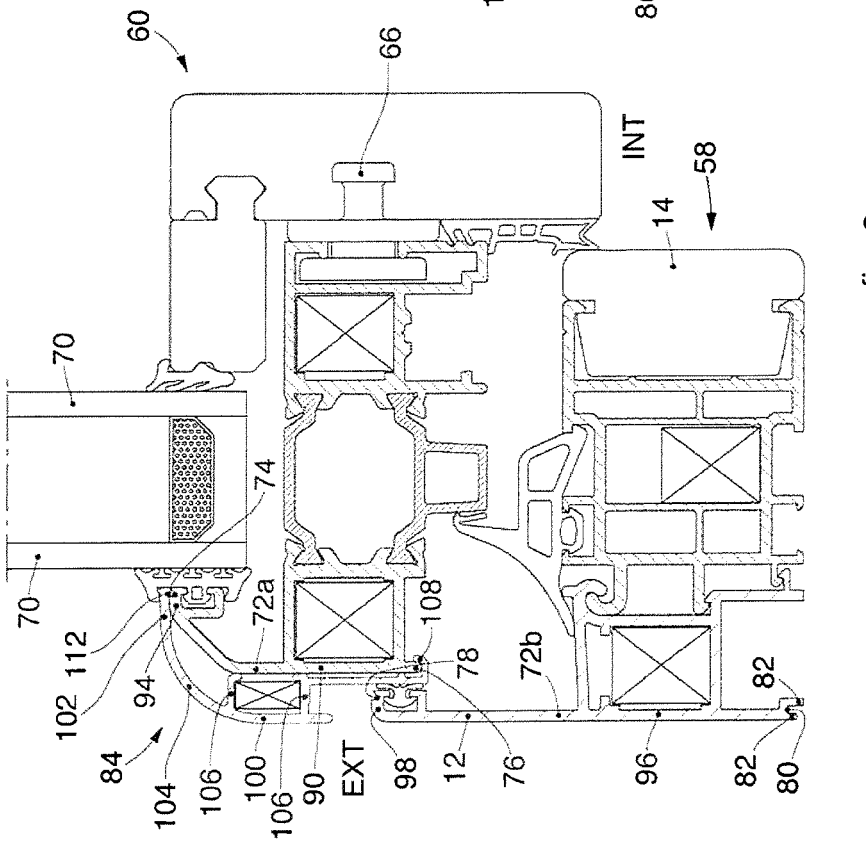
114
EXT
122
96
80
126
86

fig. 7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80

fig. 6

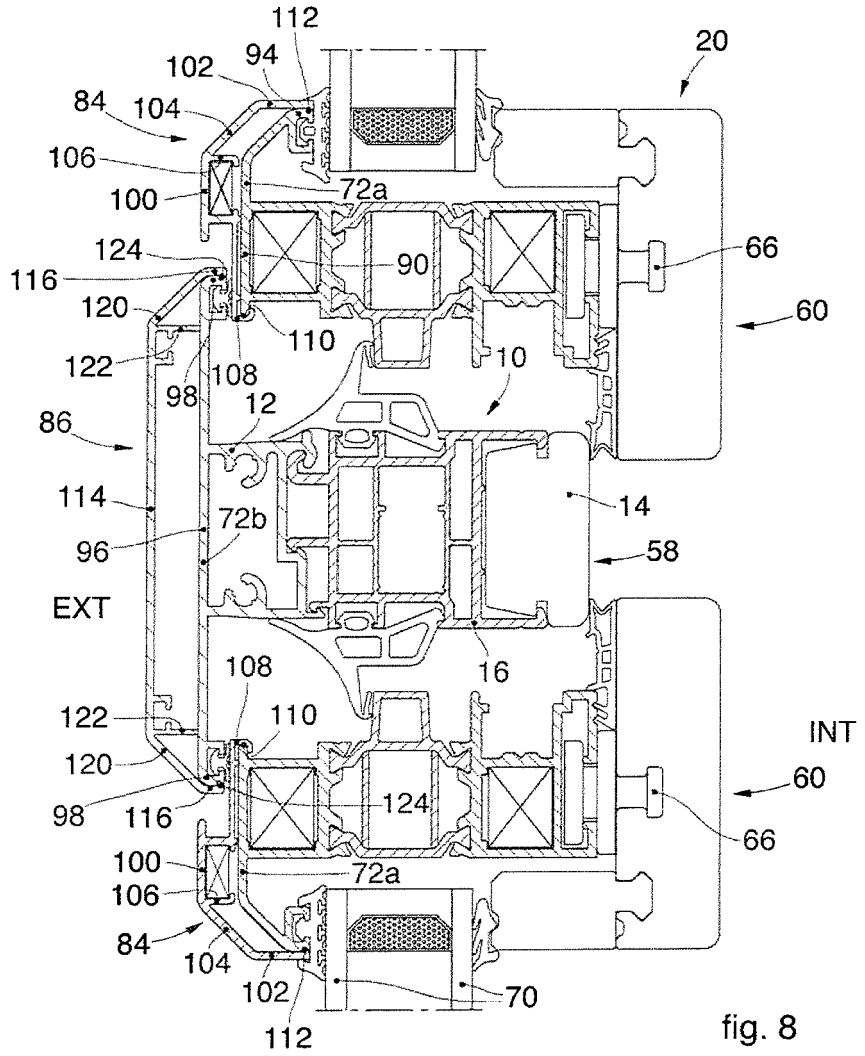

fig. 8

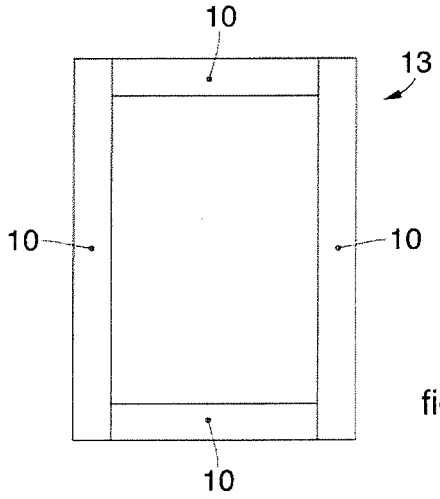

fig. 9

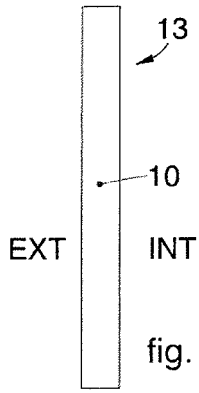

fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 16 15 2844

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	WO 2014/079556 A1 (SERRAMETAL S R L [IT]) 30 May 2014 (2014-05-30) * figure 3 * -----	1-15	INV. E06B3/30
X	WO 00/75472 A1 (MIXALL 2000 SRL [IT]) 14 December 2000 (2000-12-14) * figure 1A * -----	1-15	

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
The Hague	31 May 2016	Cobusneanu, D

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31-05-2016

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WO 2014079556 A1	30-05-2014	CN 104919124 A	16-09-2015
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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