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(11) **EP 1 621 697 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.02.2006 Bulletin 2006/05

(51) Int Cl.:
E04F 13/08 (2006.01)

(21) Application number: **05105784.2**

(22) Date of filing: **29.06.2005**

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

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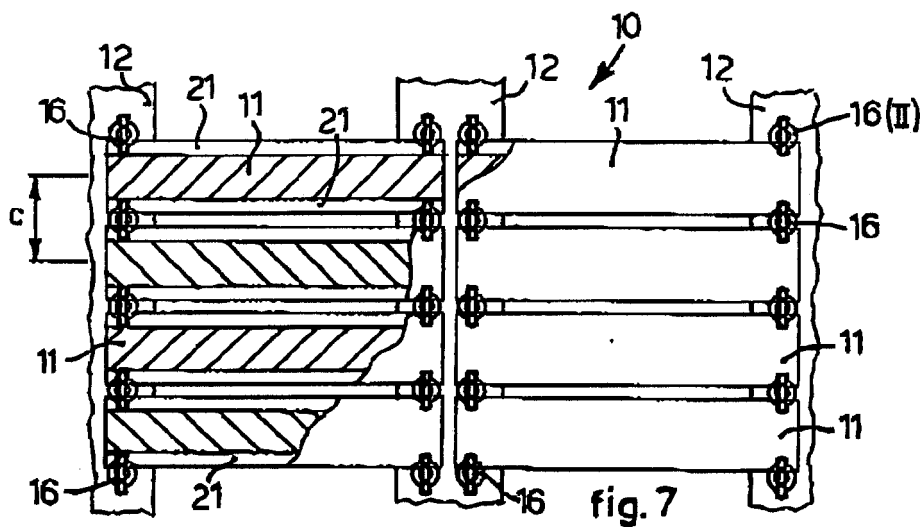
(30) Priority: **27.07.2004 IT UD20040153**

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(54) **Supporting frame for covering elements**

(57) Supporting frame (10) for covering elements (11), such as bricks, panels, plates, tiles or suchlike, comprising at least a first warp profile (12) provided with rapid

clamping elements (16) that cooperate with mating grooves (21, 22), provided on the covering elements (11) in order to clamp the covering elements (11) by interference onto the first warp profile (12).



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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a supporting frame for covering elements of the modular type, such as bricks, panels, plates, tiles or suchlike, used in the building trade in order to cover surfaces of structures such as for example walls, pillars or columns.

[0002] The invention is particularly indicated for making ventilated walls made of bricks and for this reason, in the following description, we shall refer specifically to this application, although this is not to be considered limitative.

BACKGROUND OF THE INVENTION

[0003] It is known to construct covering structures made of bricks, for example ventilated walls, in which the bricks are associated with each other by mortar.

[0004] Such structures take a long time to build, they are expensive and also require the use of specialized manpower able to dispose the bricks aligned with each other and with a constant interaxis.

[0005] In certain applications, proposals have been made for "dry" assembly systems which allow to install the bricks by constraining them to a frame fixed to a bearing structure, without using mortar or binder elements of other types.

[0006] These systems, however, have been proposed specifically for the application for which they were intended, and have therefore proved to be inadequate for a more extensive use; moreover, they make it necessary to use bricks of a particular production, the cost of which is therefore considerably higher than that of conventional bricks.

[0007] One purpose of the present invention is to achieve a supporting frame for covering elements, advantageously but not exclusively for bricks, which is simple and practical to use, and which allows to create covering structures quickly and with limited costs.

[0008] Another purpose of the invention is to achieve a supporting frame for covering elements that is extremely versatile and therefore usable for various applications.

[0009] 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

[0010] The present invention is set forth and characterized in the main claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0011] The supporting frame for covering elements according to the invention comprises at least a first warp profile, advantageously an upright, provided with rapid

clamping elements able to cooperate with mating grooves provided on the covering elements, in order to clamp the covering elements through interference, advantageously at least partly elastic, onto the first warp profile.

[0012] The rapid clamping elements are aligned along the first warp profile with an interaxis substantially equivalent to one of the two positioning interaxes, for example the vertical interaxis, of the covering elements.

[0013] In a preferential embodiment of the invention, a plurality of first warp profiles are present, each one provided with relative rapid clamping elements, disposed with respect to each other with an interaxis substantially equivalent to the other positioning interaxis, for example the horizontal interaxis, of the covering elements.

[0014] According to a variant, the first warp profiles area also associated with second warp profiles, orthogonal thereto, attached to a bearing structure, for example a wall.

[0015] According to a characteristic feature of the present invention, the rapid clamping elements are disposed at the front of the first warp profiles and comprise fin means, advantageously at least partly elastic, having at least a part able to be inserted with interference into the grooves of the covering elements in order to clamp the latter.

[0016] In a first form of embodiment, the rapid clamping elements are able to be selectively associated with the first warp profiles, and each of them comprises two fin means, opposite each other, able to cooperate with mating grooves of respective covering elements.

[0017] According to a variant, each rapid clamping element comprises four fin means, disposed radially at 90° from each other, each of which is able to cooperate with a mating corner groove of a relative covering element.

[0018] In a preferential solution, each rapid clamping element is able to selectively assume at least a first position, wherein the relative fin means are disposed outside the grooves of the covering elements, and a second position, rotated by 90° with respect to the first, wherein at least a part of the fin means is inserted into the relative grooves.

[0019] Moreover, each rapid clamping element comprises in a single piece at least a central part, connected with the fin means, and a retaining arm, advantageously at least partly elastic, able to be inserted into a mating aperture of the first warp profile, in order to move behind or inside the latter and, in cooperation with the central part, to be constrained thereon when the rapid clamping element is moved from the first to the second position.

[0020] According to a variant, the rapid clamping elements are made integrally on the first warp profiles and each of them comprises at least a pair of fin means, opposite each other, able to cooperate with relative grooves of the same covering element.

[0021] In a preferential form of embodiment, the fin means are L-shaped and at least some of them have V-shaped or hook-shaped ends.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] These and other characteristics of the present invention will become apparent from the following description of some preferential forms of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a front view of a supporting frame for covering elements according to the invention;
- fig. 2 is a partly sectioned lateral view of fig. 1;
- figs. 3 and 4 show front views of a clamping element of the frame in fig. 1 in two different positions;
- figs. 5 and 6 show a view from above of the clamping element in figs. 3 and 4;
- fig. 7 shows an example of an application of the supporting frame in fig. 1;
- fig. 8 is a part and front view of a variant of the supporting frame in fig. 1;
- figs. 9 and 10 show a front view of a clamping element of the frame in fig. 8 in three different positions;
- figs. 12, 13 and 14 show a view from above of the clamping element in figs. 9, 10 and 11;
- fig. 15 shows an example of an application of the supporting frame in fig. 8;
- fig. 16 is a three-dimensional view of another variant of the supporting frame for covering elements according to the invention;
- fig. 17 is a partly sectioned view of a variant of the supporting frame in fig. 16 used to make a ventilated wall;
- figs. 18, 19 and 20 show details of variants of the supporting frame in fig. 17;
- fig. 21 shows a partly sectioned lateral view of another variant of the supporting frame in fig. 16;
- fig. 22 is a partly three-dimensional view of the supporting frame in fig. 21;
- fig. 23 shows a variant of fig. 1;
- fig. 24 shows a variant of fig. 2;
- figs. 25 and 26 show a variant of figs. 3 and 4;
- figs. 27 and 28 show a variant of figs. 5 and 6;
- fig. 29 is a partly three-dimensional view of the supporting frame in fig. 23.

DETAILED DESCRIPTION OF SOME PREFERENTIAL FORMS OF EMBODIMENT

[0023] With reference to the attached drawings, the number 10 denotes generally a supporting frame according to the invention used to make structures with covering elements, in this case consisting of bricks 11.

[0024] The frame 10 is advantageously made of metal and comprises a plurality of uprights, or vertical warp profiles, 12, each of which is attached between two cross-pieces, or horizontal warp profiles 13, able to be associated, in contact or at a distance, with a bearing structure 14, for example a wall.

[0025] In the embodiment shown in fig. 17, the

cross-piece 13 is for example attached to a bracket 27 able to keep it at a distance from the bearing structure 14 on which the bracket 27 itself is anchored; this solution is particularly indicated for making ventilated walls.

[0026] The uprights 12 are disposed with an interaxis "i" substantially equivalent to the horizontal positioning interaxis "a" of the bricks 11 (fig. 15).

[0027] In the case of figs. 1, 2 and 17, the uprights 12, at the upper end, have a shaping 12a by means of which they are able to be constrained due to their coupling shape inside a hollow 13a made on the cross-pieces 13. Each upright 12 is also able to be attached, at least at the lower part, to the relative cross-piece 13 by means of rivets, nails, bolts or other attachment elements.

[0028] In the embodiment shown in figs. 1 ÷ 7, each upright 12 has at the front a plurality of horizontal eyelets 15, aligned in twos and disposed on two parallel and symmetrical rows with respect to the longitudinal axis of the upright 12. The eyelets 15 are disposed in a position corresponding to the grooves between the bricks 11, and their vertical interaxis "b" is substantially equivalent to the interaxis of vertical positioning "c" between the bricks 11.

[0029] Each eyelet 15, at the center, has two little semicircular recesses 15a (fig. 1) on the lower and upper edge.

[0030] With every eyelet 15 a clamping element 16 is associated, able to be rotated from a first position "I" in which it does not interfere with the bricks 11, to a second position "II" in which it interferes with two relative bricks 11, to determine the clamping thereof.

[0031] In this case, each clamping element 16, in a single piece, has a central disk 17 associated at the rear with a retaining arm 18, of a length substantially equivalent to the length of the eyelet 15, and at the front with two L-shaped fins 20, opposite each other (figs. 3 and 5).

[0032] The fins 20 are partly elastic and their end 20a is able to be inserted with interference into a mating groove 21 made longitudinally on the upper and lower end of the bricks 11.

[0033] The retaining arm 18 is partly elastic too, and between it and the central disk 17 there are two little ridges 19, opposite each other, of a shape mating with the semicircular recesses 15a of the eyelet 15.

[0034] In the first position "I", the clamping element 16 has the retaining arm 18 substantially aligned with the eyelet 15, and the ridges 19 and the fins 20 aligned horizontally.

[0035] The bricks 11 are laid simply by positioning each brick 11 between two uprights 12, so that the brick 11 is disposed between four clamping elements 16, and then by rotating the latter by 90° to take them from the first position "I" to the second position "II".

[0036] The rotation of each clamping element 16 determines, on the one hand, the disposition of the retaining arm 18 orthogonal to the eyelet 15 and the insertion of the ridges 19 into the semicircular recesses 15a, with the clamping element 16 consequently being constrained on

the upright 12; and on the other hand, the vertical positioning of the fins 20 and the insertion with interference of the relative ends 20a into the grooves 21 of the bricks 11, with the consequent clamping of the latter with respect to the uprights 12 (figs. 4 and 6).

[0037] In a preferential form of embodiment, the rotation of the clamping element 16 occurs by means of a tool able to be inserted into a mating impression made, for example, on the central disk 17.

[0038] According to a variant of the invention, the uprights 12 can be disposed with a halved interaxis "I", to allow the bricks 11 to be laid in staggered courses.

[0039] In the constructional variant shown in figs. 8÷15, the uprights 12 have a single row of eyelets 15 with which clamping elements 16 are associated, provided with four fins 20 disposed radially at 90° from each other and rotated by 45° with respect to the retaining arm 18.

[0040] In this embodiment, it is provided to use bricks 11 provided with four grooves 22 with a circular sector disposed in the corner position (figs. 11 and 15).

[0041] In this case too the bricks 11 are laid by disposing them between two uprights 12 and making the clamping elements 16 rotate from the first position "I" to the second position "II", so that each fin 20 is inserted in a groove 22 of a different brick 11; in this case however, in order to allow the positioning of the bricks 11, the clamping elements 16 are taken to an intermediate position "X", rotated by 45° with respect to the first position "I", so that the fins 20 are disposed two vertical and two horizontal (figs. 10 and 13), so as not to interfere with the bricks 11.

[0042] In the constructional embodiment shown in figs. 23÷29, the uprights 12 have a substantially C-shaped section and, as in the embodiment shown in figs. 1÷7, have the eyelets 15 aligned in twos and disposed on two parallel and symmetrical rows with respect to the longitudinal axis of the uprights 12.

[0043] In this case, however, the eyelets 15 have semicircular recesses 15a with a bigger radius, so as to allow screws 28 to be inserted, by means of which the uprights 12 are attached to the cross-pieces 13.

[0044] In correspondence with each eyelet 15, on the inner surface of the upright 12, there are also four little protrusions 33 disposed in twos, parallel and opposite with respect to the longitudinal axis of the eyelet 15 itself, the function of which will be explained hereafter.

[0045] In this embodiment, the clamping elements 16 comprise in a single piece a rod 29, cylindrical in shape, from one end of which two opposite fins 30 branch off; the clamping elements 16 also comprise, in a single piece, a central plate 31 and a retaining arm 32, having substantially the same shape as that of the eyelet 15.

[0046] The fins 30, which are substantially orthogonal to the rod 29, are separated from each other by a slit 34 and each of them has at the end a thin appendix 30a, advantageously some tens of a millimeter thick.

[0047] As in the embodiment shown in figs. 1÷7, the

fins 30 are able to be inserted with interference into grooves 21 made longitudinally on the upper side and on the lower side of the bricks 11.

[0048] The retaining arm 32 is able to be inserted into the eyelet 15, to move inside the upright 12, while the central plate 31, on the contrary, is of such a size that it cannot pass through the eyelet 15.

[0049] In this case too, for laying the bricks 11, each of them is disposed between two uprights 12, so as to be between four clamping elements 16 disposed in the first position "I", with the retaining arm 32 inserted into the eyelet 15 and the fins 30 aligned horizontally.

[0050] Subsequently, for example by inserting the end of a screwdriver inside the slit 34, each clamping element 16 is rotated by 90° so as to assume the second position "II", so that the retaining arm 32 is disposed orthogonal to the eyelet 15, with its ends first surmounting a respective protrusion 33 and then being disposed between the two pairs of protrusions 33, remaining constrained there (fig. 29).

[0051] Simultaneously, the fins 30 are disposed in vertical alignment, that is, substantially orthogonal to the respective eyelets 15, inserting themselves with interference into the grooves 21, so as to determine the clamping of the bricks 11 on the uprights 12 (figs. 26 and 28).

[0052] During this step the appendixes 30a are able to deform, on the one hand in order to increase the interference that determines the clamping of the bricks 11, and on the other hand in order to compensate possible differences in height between the grooves 21, or other imperfections of the bricks 11.

[0053] In the constructional variants shown in figs. 16÷20, the clamping elements 16 consist of pairs of partly elastic fins, respectively upper 23 and lower 24, made integrally on the upright 12.

[0054] The fins 23 and 24 are aligned in twos and are disposed on two parallel and symmetrical rows with respect to the longitudinal axis of the upright 12. The fins 23 and 24 are also disposed in correspondence with the grooves between the bricks 11 and the distance between the upper fin 23 and the lower fin 24 of the same clamping element 16 is slightly more than the height of a brick 11.

[0055] The upper fin 23 and the lower fin 24 of the same clamping element 16 are disposed facing each other and have the relative ends 23a and 24a facing respectively downwards and upwards; the ends 23a and 24a are able to be inserted with interference into mating grooves 21, longitudinal and through, made respectively on the upper and lower sides of the bricks 11.

[0056] In the embodiment shown in fig. 16, the fins 23 and 24 are both L-shaped with the relative ends 23a and 24a substantially vertical.

[0057] In the solution shown in fig. 17, the upper fin 23 on the contrary has a V-shaped end 23a, while in the embodiment in fig. 18, the same end 23a is shaped like a hook and is bent back towards the upright 12.

[0058] In the solutions shown in figs. 19 and 20, the fins 23 and 24 both have the ends 23a and 24a shaped

like a hook, in one case (fig. 19), and V-shaped in the other case (fig. 20).

[0059] According to another variant shown in figs. 21 and 22, the fins 23 and 24 both have the ends 23a and 24a wedge-shaped, with a vertical segment and an inclined segment; the ends 23a and 24a are able to be inserted into grooves 21 with a mating section made on the bricks 11.

[0060] In this embodiment, moreover, the fins 23 and 24 are not made in a single piece with the upright 12, but are added thereon; to be more exact, a plurality of holes 25 are made on the upright 12, with a constant interaxis, in correspondence with each of which a shaped profile 26 is able to be attached, defining the upper fin 23 of a clamping element 16 and the lower fin 24 of the clamping element 16 immediately above.

[0061] In all these embodiments the bricks 11 are laid simply by disposing them between two uprights 12 and then thrusting them against the fins 23 and 24, so that the elastic deformation of the latter allows the relative ends 23a and 24a to be inserted with interference into the grooves 21.

[0062] According to a variant, the bricks 11 are laid by means of lateral insertion.

[0063] It is clear, however, that modifications and/or additions of parts may be made to the supporting frame 10 as described heretofore, without departing from the field and scope of the present invention.

[0064] Moreover, although the invention has been described with reference to specific examples, a person of skill in the art shall be able to achieve other equivalent forms of supporting frame, having the characteristics as set forth in the claims and therefore all coming within the field of protection defined thereby.

Claims

1. Supporting frame for covering elements (11), such as bricks, panels, plates, tiles or suchlike, **characterized in that** it comprises at least a first warp profile (12) provided with rapid clamping elements (16) able to cooperate with mating grooves (21, 22), provided on said covering elements (11), in order to clamp said covering elements (11) by interference onto said first warp profile (12).
2. Supporting frame as in claim 1, **characterized in that** said interference is at least partly elastic.
3. Supporting frame as in claim 1 or 2, **characterized in that** it comprises a plurality of first warp profiles (12), provided with relative rapid clamping elements (16), disposed with respect to each other with an interaxis ("i") substantially equivalent to a first positioning interaxis ("a") of said covering elements (11).
4. Supporting frame as in any claim hereinbefore, **char-**

acterized in that said rapid clamping elements (16) are aligned along said first warp profiles (12) with an interaxis ("b") substantially equivalent to a second positioning interaxis ("c") of said covering elements (11).

5. Supporting frame as in any claim hereinbefore, **characterized in that** said rapid clamping elements (16) are disposed on two rows along said first warp profiles (12).
6. Supporting frame as in any claim hereinbefore, **characterized in that** said first warp profiles (12) are associated with second warp profiles (13) orthogonal thereto.
7. Supporting frame as in claim 6, **characterized in that** said first warp profiles (12) have at least a shaped end (12a) able to be constrained due to coupling of form inside a hollow (13a) of said second warp profiles (13).
8. Supporting frame as in any claim hereinbefore, **characterized in that** said rapid clamping elements (16) are disposed on the front of said warp profiles (12) and comprise fin means (20, 23, 24, 30) able to be at least partly inserted with interference into said grooves (21, 22) in order to clamp said covering elements (11).
9. Supporting frame as in claim 8, **characterized in that** said fin means (20, 23, 24, 30) include relative ends (20a, 23a, 24a) or appendixes (30a) able to at least partly deform in order to be inserted into said grooves (21, 22).
10. Supporting frame as in claim 8 or 9, **characterized in that** said fin means (20, 23, 24, 30) are at least partly elastic.
11. Supporting frame as in any claim hereinbefore, **characterized in that** said rapid clamping elements (16) are able to be selectively associated with said warp profiles (12) in correspondence with relative apertures (15, 25).
12. Supporting frame as in claim 11, **characterized in that** each of said rapid clamping elements (16) is able to selectively assume at least a first position ("I"), wherein said fin means (20, 30) are disposed outside said grooves (21, 22), and a second position ("II") wherein at least a part of said fin means (20, 30) is inserted into said grooves (21, 22).
13. Supporting frame as in claim 12, **characterized in that**, in said second position ("II"), said rapid clamping elements (16) are rotated by 90° with respect to said first position ("I").

14. Supporting frame as in claim 12 or 13, **characterized in that** each of said rapid clamping elements (16) comprises two fin means (20, 30), opposite each other, each of which is able to cooperate with a mating groove (21) of a relative covering element (11).
15. Supporting frame as in claim 12 or 13, **characterized in that** each of said rapid clamping elements (16) comprises four fin means (20), disposed radially at 90° one from the other, each of which is able to cooperate with a mating corner groove (22) of a relative covering element (11).
16. Supporting frame as in claims 13 and 15, **characterized in that** said rapid clamping elements (16) are able to assume an intermediate position ("X") wherein they are rotated by 45° with respect to said first position ("I") in order to allow the positioning of said covering elements (11).
17. Supporting frame as in any claim from 12 to 16, **characterized in that** each of said rapid clamping elements (16) comprises in a single piece at least a central part (17, 31), connected with said fin means (20), and a retaining arm (18, 32), at least partly elastic, able to be inserted into an aperture (15) of a relative first warp profile (12), in order to move behind or inside the latter, said retaining arm (18, 32) being able to be constrained to said first warp profile (12) in cooperation with said central part (17, 31), in the passage from said first position ("I") to said second position ("II").
18. Supporting frame as in claim 17, **characterized in that** said first warp profile (12) includes recess means (15a) or protrusion means (33) able to cooperate through interference with mating parts (19, 32) of said rapid clamping element (16) in order to prevent the accidental return of said rapid clamping element (16) from said second position ("II") to said first position ("I").
19. Supporting frame as in claim 11, **characterized in that** said rapid clamping elements (16) are defined by shaped profiles (26) provided with at least two fin means (23, 24) able to cooperate with the grooves (21) of respective covering elements (11).
20. Supporting frame as in any claim from 1 to 10, **characterized in that** said rapid clamping elements (16) are made integrally on said first warp profiles (12).
21. Supporting frame as in claim 20, **characterized in that** each of said rapid clamping elements (16) comprises at least a pair of fin means (23, 24), opposite each other, able to cooperate with relative grooves (21) of the same covering element (11).
22. Supporting frame as in any claim hereinbefore, **characterized in that** said fin means (20, 23, 24) are L-shaped.
23. Supporting frame as in any claim hereinbefore, **characterized in that** at least some of said fin means (23, 24) have the ends (23a, 24a) V-shaped or hook-shaped.

