

GROUP FOR WALL-MOUNTING ELECTRIC MODULES

Description

The present invention relates to a group for wall-mounting electric modules of the type comprising a support frame which can be fixed to a wall and a
5 covering plate which is configured so as to cover a peripheral structure of the frame. The invention further relates to a covering plate and a support frame which can be used in such a group for installation.

In the technical sector relating to civil and industrial electric plants, there are
10 commonly used supports which can be fixed to walls and electric modules, such as, for example, control apparatus (circuit breakers, push-buttons, switches, etcetera) or sockets which can be connected in a stable manner to the support by means of suitable engagement systems.

15 Typically, there is further associated with the support which can be fixed to a wall a plate which covers the installation zone so as to hide the support from view and to leave a uniform surface with appreciable aesthetic characteristics in view.

20 In order to prevent accidental damage to the plates during the installation of the plants and to afford access to the electric modules for the purposes of maintenance, they are provided with an engagement system which allows the support plate to be fixed and subsequently removed. An example of an engagement system is described in WO2013/182819.

25 However, it may be observed that the known technical solutions may be subjected to a number of limitations, such as, for example, a relative difficulty in fixing or removing the plate, a limited capacity for compensating for any irregularities in the wall, difficulty in fixing the electric module to the support
30 or in removing it therefrom.

An object of the present invention is to provide a group for wall-mounting electric modules which is structurally and functionally configured to at least partially overcome one or more of the limitations of the above-cited prior art.

In the context of this problem, an object of the present invention is to provide a group for wall-mounting comprising a support frame and a covering plate, wherein the fixing of the covering plate to the support frame and the potential
5 subsequent removal can be carried out simply without particular difficulties.

Another object is to provide a group for wall-mounting comprising a support frame and a covering plate, wherein it is possible to at least partially compensate for any irregularities in the surface of the wall on which the group
10 is installed.

An object of the present invention is also to provide a group for wall-mounting which ensures that the plate remains in contact with the wall even in case of variations in the distance between the support and surface of the wall, as a
15 result, for example, of repainting or the presence of wallpaper on the wall.

This problem is solved and these objects are at least partially achieved by the invention by means of a group for wall-mounting electric modules, comprising a support frame, a covering plate and an engagement device which is
20 configured so as to fix the covering plate to the support frame in a removable manner.

Each of the extensions and the abutment elements comprises a respective main inclined surface which has an inclined extent with respect to the engagement direction of the covering plate with the support frame.
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Each of the extensions and/or the abutment elements comprise an auxiliary inclined surface which has an inclined extent with respect to the engagement direction and which is inclined in the opposite direction to the main inclined
30 surface.

The main inclined surface of the extensions is configured so as to abut the main inclined surface of the abutment elements when the covering plate is fixed to or removed from the support frame.

The auxiliary inclined surface of the extensions or the abutment elements is configured so as to abut the abutment elements or the extensions following the removal of the covering plate from the support frame or the fixing thereof.

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It will be appreciated that, according to an aspect of the invention, the main inclined surfaces are subjected to mutual abutment when the covering plate is fixed to the support frame and the auxiliary inclined surfaces are subjected to the abutment when the covering plate is removed from the support frame, or vice versa.

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15 Preferably, the extensions are resiliently deformable and are configured so as to become resiliently deformed following the abutment of the main inclined surfaces and/or the auxiliary inclined surfaces.

Therefore, the presence of the inclined surfaces allows both the fixing step and the removal step of the covering plate to be promoted.

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Furthermore, it allows appropriate guiding of the covering plate during the fixing operation.

25 In addition, the mutual abutment effect provided by the inclined surfaces allows the covering plate to be urged towards the wall once it has been engaged with the support frame. It is thereby possible to obtain correct installation even if the thickness of the wall is modified, for example, by successive coats of paint being applied or by wallpaper being applied.

30 Furthermore, the state of tension which is generated can urge the covering plate towards the wall, thereby promoting the adhesion between the plate and surface of the wall.

The solution is further found to be particularly versatile, being readily able to be used for support frames which are intended to receive a different number of modules. In other words, the solution is suitable, for example, for being used in installation groups which are intended for 3, 4, 5, 6, 7 electric modules.

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It will be appreciated that, in the context of the present invention, the term "electric module" is intended to be understood to be any module, also referred to as a subassembly, which can be used in a domestic, commercial or industrial electric plant. These modules may comprise, by way of non-limiting example, sockets, switches of various types, sensors, ringers, but also blank buttons with a covering function.

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In some embodiments, the support frame comprises a peripheral structure which is configured so as to abut the wall, the peripheral structure having a substantially rectangular shape so as to define short sides and long sides.

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In preferred embodiments, the covering plate has a substantially planar extent and is configured so as to cover the peripheral structure when it overlaps the support frame with respect to an engagement direction which is preferably perpendicular to the wall, the covering plate comprising an operating surface which is intended to be visible when the group is mounted on a wall.

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The engagement device preferably includes a plurality of fixing openings which are configured so as to allow the passage of respective extensions.

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The fixing openings preferably define a corresponding abutment element, on which a respective extension engages when the covering plate is fixed to the support frame.

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In this manner, the same structure of the support frame and the covering plate may allow the fixing device to be constructed, simplifying the construction of the installation group according to the present invention.

The fixing openings are preferably present in numbers greater than or equal to four.

5 Preferably, the fixing openings are through-openings so as to simplify the construction of the support frame.

In some embodiments, the fixing openings are defined in the support frame at the short sides or at an intersection zone between the short sides and the long sides.

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These features contribute to bringing about stable fixing of the plate even if the support frame has a particularly elongate form.

15 Preferably, the extensions are formed on the covering plate and extend away from a development plane of the covering plate in a direction opposite to the operating surface.

20 As a result of this feature, the fixing can be brought about by simply screwing the plate to the frame, pressing it in a direction perpendicular to the wall and to the visible surface of the plate.

In some embodiments, the main inclined surface of the extensions comprises a plurality of indentations which advantageously allow a plurality of stable positions of the engagement device to be defined.

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30 Preferably, the extensions are constructed in pairs and comprise a first extension and a second extension which face each other. In some embodiments, the first extension and the second extension face each other and are configured so as to abut a common abutment element. The support frame preferably comprises respective openings which are configured to receive the first extension and the second extension which are separated from each other by the abutment element, respectively. In some embodiments, a fixing seat is defined between the first and the second extension of each pair and is configured so as to receive the abutment element.

In this manner, the pair of extensions can operate on a common abutment element, enclosing it and at the same time ensuring connection stability and robustness.

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Furthermore, the abutment element can be directly formed as a separation element between two contiguous openings.

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Preferably, the covering plate comprises a through-opening, through which access is granted to the electric module(s). The through-opening is preferably defined by an edge, the extensions preferably being spaced apart from the edge.

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In this manner, the presence of the electric modules does not interfere with the correct positioning of the plate on the frame, promoting the simplicity and the installation speed of the electric plant.

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In some embodiments, the through-opening of the support frame is defined by an edge, preferably the fixing openings of the engagement device are provided in a position spaced apart from the edge. Preferably, the edge forms a closed perimeter.

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In this manner, the seat in which the extensions are received can be very robust and can promote stable fixing of the plate.

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Preferably, the main inclined surfaces of the extensions are configured so as to abut the main inclined surfaces of the abutment elements so as to urge the first extension and the second extension away from each other following a movement of the covering plate in a fixing direction with respect to the support frame.

The main surfaces are thereby able to deform the extensions in a suitable manner and particularly in a progressive manner when the plate is fixed.

Consequently, the fixing of the plate is facilitated and the risk of breakage is reduced.

5 Preferably, the auxiliary inclined surfaces of the extensions are configured so as to abut the auxiliary inclined surfaces of the abutment elements so as to urge the first extension and the second extension away from each other following a movement of the covering plate in a removal direction from the support frame.

10 Therefore, the other inclined surfaces which are present can operate during the removal step of the plate in an equivalent manner to what has been described in relation to the fixing step.

15 In some embodiments, the extensions comprise a thickened portion which is formed at a distal end thereof with respect to the covering plate.

It is thereby possible to use an auxiliary inclined surface with greater dimensions and to make the extension portion which abuts the abutment element when the plate is fixed to the frame very strong. At the same time,
20 the remaining portion of the extension can be thinner and can allow the necessary resilience.

Preferably, the main inclined surface of the first extension faces the corresponding main inclined surface of the second extension and/or the
25 auxiliary inclined surface of the first extension faces the corresponding main inclined surface of the second extension.

In this manner, the inclined surfaces of the first and second extensions can cooperate during the steps of fixing and/or removing the plate.

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Preferably, the covering plate comprises peripheral guide elements which are configured so as to surround an external edge of the support frame.

According to another aspect, the covering plate comprises internal guide elements which extend away on the covering plate in a direction opposite to the visible surface of the covering plate.

- 5 Both of these features contribute to further improving the stability of the structure.

According to another aspect, the invention also relates to a covering plate which is intended to be used in a group for wall-mounting electric modules,
10 having one or more of the above-mentioned features.

Preferably, the covering plate has a substantially planar extent and is configured so as to cover the peripheral structure of the support frame when it is superimposed, with respect to an engagement direction perpendicular to the
15 wall.

In some embodiments, the covering plate comprises an operating surface which is intended to be in view during use, and a plurality of extensions which extend away from a development plane of the covering plate in a direction
20 opposite to the operating surface.

According to an aspect of the invention, the extensions of the plate are included in an engagement device of a group for wall-mounting electric modules constructed according to one or more of the features set out above.
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Therefore, the plate constructed in this manner comprises a portion of the device which allows the fixing between the plate and the support frame and may be suitable for being used in the group for installing modules according to the present invention.
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According to yet another aspect, the invention also relates to a support frame for a group for wall-mounting electric modules, having one or more of the features mentioned above.

Preferably the frame comprises a peripheral structure which is configured so as to abut a wall and which delimits a through-opening which is suitable for receiving at least one electric module.

- 5 In some embodiments, the peripheral structure has a substantially rectangular form so as to define short sides and long sides.

Preferably, the support frame includes a plurality of fixing openings and preferably at least four fixing openings which are defined in the support frame
10 at the short sides or at an intersection zone between the short sides and the long sides and corresponding abutment elements.

According to an aspect of the invention, the openings and the abutment elements are included in an engagement device of a group for wall-mounting
15 electric modules constructed according to one or more of the features set out above.

Therefore, the support frame constructed in this manner comprises a portion of the device which allows the fixing between the plate and the support frame
20 and may be suitable for being used in the group for installing modules according to the present invention.

Additional preferred aspects are also defined in the appended claims.

25 The features and additional advantages of the invention will be better appreciated from the following detailed description of a preferred though non-limiting embodiment which is illustrated by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view of a group for wall-mounting, comprising
30 respective electric modules according to the present invention during use on a wall;
- Figure 1A is a perspective, exploded view of the group for wall-mounting comprising respective electric modules of Figure 1;

- Figure 2 is a perspective rear view of the group for wall-mounting according to the present invention;
- Figure 2A is a perspective, exploded rear view of the group for wall-mounting according to the present invention;
- 5 - Figures 3 and 3A are a perspective rear view and a cross-section of an engagement device, showing a detail of the group for wall-mounting of Figure 2, respectively;
- Figure 4 is a perspective cross-section of extensions included in the engagement device of Figure 3;
- 10 - Figure 5 and Figure 6 are a front view and a cross-section of fixing openings and an abutment element which are included in the engagement device of Figure 3, respectively;
- Figure 7 is a perspective front view which illustrates extensions which are included in an engagement device constructed according to an alternative
- 15 embodiment of the present invention; and
- Figure 8 is a perspective cross-section which illustrates the engagement device constructed according to the embodiment of Figure 7.

Initially with reference to Figures 1, 1A, 2 and 2A, a group for mounting
20 electric modules 200 on a wall P is generally designated 100.

As may be observed in particular in Figures 2 and 2A, the group 100 comprises a support frame 1 which is provided to be fixed to the wall P and a covering plate 2 which can be superimposed on the support frame 1 in
25 accordance with methods which are better described below.

The support frame 1 is preferably of the type intended to be combined with a recessed box which is not illustrated in the Figures, that is to say, with a box-shaped element which is intended to be fixed in an opening which is
30 constructed in a wall or in the gaps of lightweight walls.

For example, the frame 1 can be fixed to the recessed box by means of suitable screws 4 which can be engaged in relevant seats which are formed in the box. In any case, it will be appreciated that the support frame 1 and the

group of the present invention in general may also be intended for installation without any recessed box, for example, on a panel, on an external box or on another type of support.

5 The support frame 1 is further provided for installing one or more electric modules 200. For example, Figures 1 and 1A illustrate three modules, of which two are formed by an electric socket and by a switch and a third is formed by a module 201 of the filler type which can close off a space present between the socket and the switch, respectively.

10

The modules 200 can be fixed to the frame at a through-opening 10 which is illustrated, for example, in Figure 1 and fixed thereto by way of suitable connection means which are not illustrated in greater detail in the context of the present invention.

15

According to another aspect of the invention, the support frame 1 comprises a peripheral structure 11 which is configured so as to abut the wall P. Advantageously, the peripheral structure 11 delimits the through-opening 10 mentioned above. The peripheral structure 11 defines a face 11a which can be
20 seen in Figure 2 and which is directed towards the wall P and which is configured so as to be supported on the wall P during use, and a face 11B which is directed in an opposite direction and which is intended to be covered by the plate 2 during use. The face 11A can be urged towards the wall during installation by the screws 4 being tightened.

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On the basis of another aspect, the support frame 1 may comprise an outlet 16 which is constructed in the surface 11A, preferably in the form of an internally concentric indentation in the external edge 14 of the support frame 1, as illustrated in Figure 2. In other words, the peripheral portion of the face
30 11A forms a thickened portion which is intended to come into contact with the wall while the outlet 16 can ensure the correct installation in different operating situations, for example, with the use of an installation box for solid walls or for lightweight walls or other different mounting solutions.

In preferred embodiments, the peripheral structure 11 has a substantially rectangular shape defining short sides 12 and long sides 13.

However, the covering plate 2 can better be seen in an exemplary
5 embodiment thereof in Figures 1A and 2A.

According to some aspects of the invention, the covering plate 2 has a substantially planar extent and is configured so as to cover the peripheral structure 11. As illustrated in Figure 2A, when the plate 2 is moved towards
10 the frame 1 in an engagement direction N which is preferably perpendicular to the wall P, the plate is engaged with the frame by means of a suitable engagement device 3, which can better be seen in Figure 2 and which is illustrated in greater detail below.

15 It is thereby possible to obtain the configuration which is illustrated, for example, in Figure 1 and in which the plate covers the frame 1 and maintains in view an operating surface 21. In preferred embodiments, the engagement direction N is normal with respect to the operating surface 21 or, more generally, to an abutment surface which is intended to abut the wall and/or
20 the face 11B of the support frame 1.

Advantageously, the covering plate 2 is frame-like and defines a respective through-hole 20, through which access is granted to the modules 200, for example, in order to insert a plug into the socket or to act on a switch.

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The group of the present invention further comprises an engagement device 3 which is configured so as to fix the covering plate 2 to the support frame 1, as illustrated, for example, in Figure 1A.

30 The fixing which is brought about by the engagement device 3 is preferably carried out in a removable manner, that is to say, the covering plate 2 can be fixed to the support frame 1 and subsequently removed. The operation for fixing and removing can further advantageously be repeated for an indefinite number of times.

There are further defined a fixing direction F for the plate 2 to the frame 1 and a removal direction R which is counter to the first direction, as schematically shown, for example, in Figure 1A.

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Now also with reference to Figure 5, in some embodiments the engagement device 3 includes fixing openings 31 which are preferably present in numbers of at least four.

10 According to another aspect, the fixing openings 31 are defined in the support frame 1, preferably at the short sides 12 or at an intersection zone between the short sides 12 and the long sides 13.

The engagement device 3 further comprises corresponding extensions 32
15 which are configured so as to abut respective abutment elements which are defined by the openings 31.

Preferably, the extensions 32 are formed on the covering plate 2 and extend away from a development plane of the covering plate 2 in a direction opposite
20 to the operating surface 21. However, the openings 31 are formed on the support frame 1.

The abutment element 33 is illustrated in an exemplary embodiment thereof in Figures 5 and 6.

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As may be observed, in some embodiments the abutment element 33 separates two contiguous fixing openings 31. In an exemplary embodiment, therefore, there may be present a total of eight openings 31 and four corresponding abutment elements 33.

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As may be observed in Figure 3A, the fixing openings 31 are preferably through-openings and are configured so as to allow the passage of the respective extensions 32.

In this manner, the extensions 32 can abut the abutment elements 33 when the plate 2 is fixed to the frame 1.

Advantageously, the plate is fixed using the deformability of the extensions. In fact, following the abutment, the extensions 32 are resiliently deformed and, when the plate 2 is fixed to the frame 1, the extensions 32 are urged by the resilient return force against the abutment elements 31.

So that this force acts so as to keep the plate 2 fixed to the frame 1, the abutment elements 31 comprise suitably configured inclined surfaces, as will be described in greater detail below.

With reference to Figures 3 and 3A, the extensions 32 and the abutment elements 33 comprise a respective main inclined surface 32A, 33A which has an inclined extent with respect to the engagement direction N.

In the context of the present invention, the term "inclined surface" is intended to define a surface with such a main extent that the straight line which defines the engagement direction N is not located inside the plane which is defined by the surface. A person skilled in the art will be able to identify the main extent of the surface even in the case of imperfect planarity or irregularity in the surface.

Preferably, as may be observed from the example in Figure 3A, the main inclined surface 32A of the extension 32 is inclined so as to move towards the abutment element 33 in the fixing direction F.

According to another aspect, the main inclined surface 33A of the extension 33 is inclined so as to move towards the extension 32 in the removal direction R.

The extensions 32 and the abutment elements 33 further comprise a respective auxiliary inclined surface 32B, 33B which also has an inclined extent with respect to the engagement direction N. In some embodiments, only the

extensions or only the abutment elements are provided with auxiliary inclined surfaces.

As may still be observed in the example of Figure 3A, the extent of the
5 auxiliary inclined surfaces has a direction opposite to the main inclined surface 32A, 33A.

Preferably, the auxiliary inclined surface 32B of the extension 32 is inclined so
as to move away from the abutment element 33 in the fixing direction F.

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According to another aspect, the auxiliary inclined surface 33B of the
extension 33 is inclined so as to move away from the extension 32 in the
removal direction R.

15 Therefore, it will be appreciated that the main inclined surface 32A of the
extensions 32 is configured so as to abut the main inclined surface 33A of the
abutment elements 33 when the plate 2 is fixed to the frame, that is to say, it
is moved towards it in the fixing direction F.

20 In fact, the surface 32A moves into contact with the surface 33A when the
plate 2 is moved towards the frame 1 in the fixing direction F.

It will also be appreciated that, according to another aspect of the invention,
the main inclined surface 32A of the extension 32 is arranged in a position
25 following the auxiliary surface 32B in the fixing direction F.

Therefore, the extensions are configured in such a manner that, when the
plate 2 is fixed to the frame 1 by moving it in the fixing direction F, first the
main surface 32A abuts the abutment element 33 and subsequently the
30 auxiliary surface 32B abuts the abutment element 33.

Furthermore, when the plate 2 is fixed to the frame 1, the main inclined
surface 32A has overcome the abutment element 33 and the auxiliary inclined
surface 32B is in contact therewith.

Preferably, in this position the auxiliary inclined surface 32B of the extension 32 is in contact with the auxiliary inclined surface 33B of the abutment element 33, as may be observed in the embodiment illustrated in Figure 3A.

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According to another aspect of the invention, the extensions 32 are resiliently deformable and are configured so as to become resiliently deformed following the abutment of the main inclined surfaces 32A, 33A and/or the auxiliary inclined surfaces 32B, 33B.

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In light of the configuration of the inclined surfaces described above, therefore, during the movement for fixing and removing the plate, the extensions become deformed, moving away from the abutment element 33.

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It will be appreciated that, in alternative embodiments, the position of the main and auxiliary inclined surfaces may be transposed, that is to say, the auxiliary surfaces abut during the fixing step and the main surfaces abut during the removal step.

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In general, if the main inclined surfaces of an extension and abutment element abut during the fixing movement, the auxiliary inclined surfaces abut during the removal movement, or vice versa.

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As may be observed in the embodiments of Figures 2A and 4, the extensions 32 can be constructed in pairs and may comprise a first extension 321 and a second extension 322 which face each other. It will be appreciated that the pairs of extensions are not necessarily formed at the same side of the plate but may also be formed at opposite sides, therefore spaced apart from each other. In the embodiment illustrated in the Figures, consequently, if there are eight extensions present, there may be envisaged embodiments in which there are used four extensions which form two spaced-apart pairs. In any case, it is evident that these are preferred embodiments and the present invention is also used if they are present as different numbers of extensions.

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Preferably, the first extension 321 and the second extension 322 face each other.

5 In some embodiments, there is defined between the first extension 321 and the second extension 322 of each pair a fixing seat 37 which is configured so as to receive the abutment element 33 when the plate 2 is fixed to the frame 1.

10 The first extension 321 and the second extension 322 are further configured so as to abut a common abutment element 33 which is substantially gripped by the two extensions.

As illustrated in Figure 5, it will be appreciated that there are formed on the support frame 1 respective openings 31 which are separated by an abutment
15 element 33 and which are configured to receive the first extension 321 and the second extension 322, respectively.

The first extension and the second extension of each pair are advantageously configured so as to cooperate with each other in order to promote the fixing of
20 the plate 2 and easy positioning thereof on the frame 1.

To this end, the main inclined surface 32A of the first extension 321 preferably faces the corresponding main inclined surface of the second extension 322 and the auxiliary inclined surface 32B of the first extension 321 faces the
25 corresponding main inclined surface of the second extension 322.

Therefore, the main inclined surfaces 32A of the first extension and the second extension are configured so as to abut the main inclined surfaces 33A of the common abutment element 33 so as to urge the first extension 321 and the
30 second extension 322 away from each other following the movement of the covering plate 2 in the fixing direction F.

Similarly, the auxiliary inclined surfaces 32B of the first extension and second extension 32 are configured so as to abut the auxiliary inclined surfaces 33B of

the common abutment element 33 so as to urge the first extension 321 and the second extension 322 away from each other following a movement of the covering plate 2 in the removal direction R.

- 5 According to other aspects of the invention, the auxiliary inclined surface 32B of the extensions 32 comprises a plurality of indentations 34, as, for example, illustrated in Figure 3A.

10 These indentations 34 can abut a stepped surface 39 which is defined on the abutment element 33 in a transition zone between the main inclined surface 33A and the auxiliary inclined surface 32B.

15 It is thereby possible to define a plurality of fixing positions, thereby also promoting the stability of the plate 2 in the event of irregularities of the wall P or errors during the installation of the recessed box. Therefore, this feature is also advantageous in the case of successive coats of paint being applied to the wall or in the case of wallpaper being applied.

20 Another embodiment of the extensions 32, which is where applicable able to be combined with the embodiments set out above, is illustrated in Figures 7 and 8.

25 In these embodiments, the extensions 32 comprise a thickened portion 38 which is formed at a distal end thereof with respect to the covering plate 2. Preferably, the main inclined surfaces 32A and auxiliary inclined surfaces 32B are formed at the thickened portion 38.

30 In some embodiments, the extensions 32 comprise an additional surface 33C which extends from a base of the extension towards the thickened portion 38. This additional surface 33C may have a smaller inclination with respect to the auxiliary inclined surface 33B.

Now with reference to both Figure 3 and Figure 7, the extensions 32 may comprise shoulders 35 which extend perpendicularly to the inclined surfaces

32A and 32B. A recess 36 is defined between the two shoulders 35. In this manner, a suitable flexibility for the extensions 32 can be produced.

Now with reference to Figures 2 and 2A, according to another aspect, the
5 covering plate 2 comprises peripheral guide elements 22 which are configured so as to surround the external edge 14 of the support frame 1.

In some embodiments, the covering plate 2 may further comprise internal
10 guide elements 23 which extend on the covering plate 2 away in a direction opposite to the visible surface 21. Preferably, the internal guide elements 23 are configured so as to be connected to respective recesses 15 which are formed on the support frame 1 which are formed at the perimeter of the through-opening 10. In some embodiments, the recesses 15 also allow
15 respective protuberances 15A which are formed in the support frame 1 to be received, as can be seen, for example, in Figure 2. Advantageously, the connection between recesses 15 and protuberances 15A allows two support frames 1 to be stacked, with the protuberances 15A of the first one inserted in the recesses 15 of the second one, thereby facilitating the possible stacking of the support frames in order to store or transport them. The invention thereby
20 solves the problem proposed, at the same time affording a plurality of advantages. In particular, the group for wall-mounting electric modules according to the present invention allows easy fixing and easy removal of the plate to/from the support frame, while ensuring a high level of stability of installation and possible compensation for any irregularities of the wall.

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Claims

1. A group (100) for wall-mounting electric modules (200) comprising:

- 5 • a support frame (1) which is configured so as to be able to be fixed to a wall (P) and which comprises a peripheral structure (11) which is configured so as to abut the wall (P) and which delimits a through-opening (10) which is suitable for receiving at least one electric module (200), the peripheral structure (11) having a substantially rectangular form so as to define short sides (12) and long sides (13);
- 10 • a covering plate (2) which has a substantially planar extent and which is configured so as to cover the peripheral structure (11) when it is superimposed, with respect to an engagement direction (N) perpendicular to the wall (P), on the support frame (1), the covering plate (2) comprising an operating surface (21) which is intended to be
- 15 in view when the group (100) is wall-mounted;
- an engagement device (3) which is configured so as to fix in a removable manner the covering plate (2) to the support frame (1), the engagement device (3) including a plurality of fixing openings (31) and corresponding extensions (32), the fixing openings (31) being
- 20 configured so as to allow the passage of the corresponding extensions (32) and defining a corresponding abutment element (33), on which a respective extension (32) engages when the covering plate (2) is fixed to the support frame (1);
- wherein each of the extensions (32) and the abutment elements (33)
- 25 comprises a respective main inclined surface (32A, 33A) which has an inclined extent with respect to the engagement direction (N), and wherein each of the extensions (32) and/or the abutment elements (33) comprise an auxiliary inclined surface (32B, 33B) which has an inclined extent with respect to the engagement direction (N) and in the opposite
- 30 direction to the main inclined surface (32A, 33A), the main inclined surface (32A) of the extensions (32) being configured so as to abut the main inclined surface (33A) of the abutment elements (33) following a movement of the covering plate (2) in a fixing direction or removal direction to/from the support frame (1) and the auxiliary inclined

5 surface (32B, 33B) of the extensions (32)/abutment elements (33) being configured so as to abut the abutment elements (33)/extensions (32) following a movement of the covering plate (2) in a fixing direction or removal direction to/from the support frame (1), and wherein the extensions (32) are resiliently deformable and are configured so as to become resiliently deformed following the abutment of the main inclined surfaces (32A, 33A) and/or the auxiliary inclined surfaces (32B, 33B).

10 2. A group (100) for wall-mounting electric modules (200) according to claim 1, wherein the extensions are formed on the covering plate (2) and extend away from a development plane of the covering plate (2) in a direction opposite to the operating surface (21).

15 3. A group (100) for wall-mounting electric modules (200) according to claim 2, wherein the covering plate (2) comprises a through-opening (20), through which access is granted to the electric modules (200), the through-opening (20) being defined by an edge (20A), the extensions being spaced apart from the edge (20A).

20 4. A group (100) for wall-mounting electric modules (200) according to claim 3, wherein the through-opening (10) of the support plate (1) is defined by an edge (10A), the fixing openings (31) being provided in a position spaced apart from the edge (10A).

25 5. A group (100) for wall-mounting electric modules (200) according to any one of the preceding claims, wherein the auxiliary inclined surface (32B) of the extensions (32) comprises an engagement tooth and preferably a plurality of indentations (34).

30 6. A group (100) for wall-mounting electric modules (200) according to any one of the preceding claims, wherein the extensions (32) are constructed in pairs and comprise a first extension (321) and a second extension (322) which face each other.

7. A group (100) for wall-mounting electric modules (200) according to claim 6, wherein the first extension (321) and the second extension (322) face each other and are configured so as to abut a common abutment element (33), the support frame (1) comprising respective openings (31) which are configured to receive the first extension (321) and the second extension (322) which are separated from each other by the abutment element (33), respectively.

8. A group (100) for wall-mounting electric modules (200) according to claim 5, wherein the main inclined surfaces (32A) of the extensions (32) are configured so as to abut the main inclined surfaces (33A) of the common abutment element (33) so as to urge the first extension (321) and the second extension (322) away from each other following a movement of the covering plate (2) in a fixing direction (F) with respect to the support frame (1).

9. A group (100) for wall-mounting electric modules (200) according to claim 7 or 8, wherein the auxiliary inclined surfaces (32B) of the extensions (32) are configured so as to abut the auxiliary inclined surfaces (33B) of the common abutment element (33) so as to urge the first extension (321) and the second extension (322) away from each other following a movement of the covering plate (2) in a removal direction (F) from the support frame (1).

10. A group (100) for wall-mounting electric modules (200) according to any one of claims 6 to 9, wherein the main inclined surface (32A) of the first extension (321) faces the corresponding main inclined surface of the second extension (322) and/or the auxiliary inclined surface (32B) of the first extension (321) faces the corresponding auxiliary inclined surface of the second extension (322).

11. A group (100) for wall-mounting electric modules (200) according to any one of the preceding claims, wherein the covering plate (2) comprises peripheral guide elements (22) which are configured so as to surround an external edge (14) of the support frame (1).

12. A group (100) for wall-mounting electric modules (200) according to any one of the preceding claims, comprising internal guide elements (23) which extend away on the covering plate (2) in a direction opposite to the visible surface (21).

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13. A group (100) for wall-mounting electric modules (200) according to claim 11, wherein the internal guide elements (23) are configured so as to be connected to respective recesses (15) which are formed on the support frame (1) and which are formed at the perimeter of the through-opening (10).

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14. A group (100) for wall-mounting electric modules (200) according to any one of the preceding claims, wherein the fixing openings (31) are through-openings.

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15. A covering plate (2) for a group (100) for wall-mounting electric modules (200), having a substantially planar extent and being configured so as to cover the peripheral structure (11) when it is superimposed, with respect to an engagement direction (N) perpendicular to the wall (P), on the support frame (1), the covering plate (2) comprising an operating surface (21) which is intended to be in view during use, and a plurality of extensions (32) which extend away from a development plane of the covering plate (2) in a direction opposite to the operating surface (21), the extensions (32) being included in the engagement device (3) of a group (100) for wall-mounting electric modules (200) according to any one of claims 1 to 14.

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16. A support frame (1) for a group (100) for wall-mounting electric modules (200), comprising a peripheral structure (11) which is configured so as to abut a wall (P) and which delimits a through-opening (10) which is suitable for receiving at least one electric module (200), the peripheral structure (11) having a substantially rectangular form so as to define short sides (12) and long sides (13), wherein the support frame (1) includes at least four fixing openings (31) which are defined in the support frame (1) at the short sides (12) or at an intersection zone between the short sides (12) and the long sides (13), and at least four corresponding abutment elements (33), the openings

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(31) and the abutment elements (33) being included in the engagement device (3) of a group (100) for wall-mounting electric modules (200) according to any one of claims 1 to 14.