

"Fixing clip for wall mounting of an electric apparatus"

DESCRIPTION

The present invention relates to the technical field of home and office electric systems, and more particularly, relates to a fixing clip for wall mounting of an electric apparatus.

For the present description purposes, electric apparatus means, in general, any means or electric device generally part of electric equipment in civil building and the like and usually destined for mounting, for instance embedded, onto such building walls.

Therefore such definition comprises, in a non limitative way, circuit breakers, electric network plugs, data network plugs, TV plugs, phone plugs, buttons, circuit breaker, switches, general electric control devices, connectors, thermostats, timers, fuse boxes, alarms/buzzers, emergency lamps for instance removable ones, signaling lamps for instance step signaling ones, displays, for instance LCD's and the like.

As it is known, most above mentioned electric apparatuses are usually wall installed using composite mounting structures, or part sets,

generally comprising:

- a box destined to be embedded in the wall
- an apparatus carrying mounting frame (or support frame) fixable to the box and comprising a frame body that develops around an opening defining a mounting seat adapted to receive and hold one or more electric apparatuses; and
- a cover plate removably fixable to the frame and provided with an opening that allows a user to access, visually or manually to the electric apparatuses installed on the support frame.

Some specific electric apparatus types are also known, named single-blocks, wherein a plate and the electric apparatus itself are substantially integrated in a single piece and are fixed directly to the wall embedded box without requesting a suitable support frame.

From the state of the art various systems are known to fix removably a mounting frame, or a single-block electric apparatus, to a wall embedded box. For instance, it is known fixing a support frame or a single-block electric apparatus onto a wall box employing screws adapted to engage appropriate seats, threaded or not, provided in the wall box. This type of fixing shows a shortcoming due to the fact that it

requires a perfect alignment of the box with respect to the wall wherein this one is embedded. Further the provision within the box of threaded seats reduces the available space therein.

Another fixing system belonging to the known art foresees the use of through screws, in corresponding holes provided onto the support frame or the single-block apparatus, active on respective straddling members (usually named fixing clips) realized with sheared and bent iron sheet. In practice, such screws tightening determines such fixing clips progressive diversion, that subsequently engage with the box inner walls with the aim of securing the support frame or the electric apparatus to the box.

It has been noticed that known art fixing clips, even though widely used, are not able to secure a support frame or an apparatus to the wall embedded box with a sufficient hold,

The present invention aim is to make available a fixing clip that allows overcoming above described shortcoming of the known art.

Such aim is achieved by a fixing clip as defined in the attached claim one in its more general form and in the dependent claims in some particular embodiments.

Also a mounting frame and an electric apparatus as defined in attached claims 9 and 10 respectively are part of the present invention.

The invention will be better understood from the following detailed description in its particularly preferred embodiment made by way of example and, thus, in no way limitative, referring to the attached drawings, wherein:

- figure 1 is a perspective view and with detached parts of a set of parts for an electric apparatus wall mounting;

- figure 2 depicts a side view of a support frame comprised in figure 1 parts set; and

- figure 3 depicts a fixing clip according to a particularly preferred embodiment of the present invention.

In the figures, similar or identical members will be indicated by the same reference numerals.

In figure 1a a frame-box part set perspective view is depicted, generally indicated as 1. The frame-box part set 1 comprises a support frame 2 and a wall embeddable box 3. Box 3, that only by way of example has been depicted in a cylindrical shape, is in practice a container provided with an inner receiving space and comprising an inner container wall 30

bounding such inner space. Said container is commonly realized in anti-impact resin and has standard dimensions.

Support frame 2 comprises a frame shaped body 4, having approximately a shape of a substantially plate-shaped frame, for instance, non limiting, of a quadrangular layout with rounded corners. Only by way of example, the support frame 2 frame body 4 was depicted of a substantially square shape.

The support frame 2 frame body 4, develops itself around a mounting window 5, defining a mounting seat adapted to receiving or holding one or more electric apparatuses, not shown in figures. On mounting window 5 there are two support frame 2 facing opposed walls 6, each comprising a plurality of latching members 7 that project from walls 6 towards mounting window 5. Such latching members 7 are such to cooperate with corresponding latching members provided of opposite sides of electric apparatuses to be latched to support frame 2. Preferably, such latching members 7 allow to connect electric apparatus to support frame 2 with a notching and snap joint.

Support frame 2 comprises, further, fixing means 10, 11 for removably fixing the support frame 2 to the wall embeddable box 3.

In particular, such fixing means comprise, advantageously, fixing clips 11, or straddling members 11, and comprise adjustment screws 10 cooperating with such fixing clips 11 to vary progressively a slope angle α (visible in figure 2) defined between such clips 11 and support frame 2. In practice, adjustment screws 10 are such to go through respective holes 13 provided in support frame 1 to insert in a suitable threaded cavity 22 provided in a respective fixing clip 11.

As shown in figure 1, in a particularly preferred embodiment, support frame 2 includes a pair of fixing clips 11 associated with respective adjustment screws 10 and located on respective opposite sides of support frame 3 frame body 4.

Referring to figure 2, wherein a side view of support frame 2 depicted in figure 1 is shown, it must be observed that the fixing clips 11 have a structural arrangement such that tightening adjustment screws 10 one may vary an slope angle α defined between fixing clips 11 and support frame 2 frame body 4, until reaching a latching configuration wherein fixing clips 11 engage the box inner walls to secure support frame 2 to wall embeddable box 3.

A fixing clip 11 particularly preferred embodiment

according to the present invention is shown in greater detail in figure 3. Advantageously, such fixing clip 11 is realized in a dye cast metal. In practice, such fixing clip 11 is realized by a dye forming technique wherein dye filling is achieved exerting a high pressure on molten metal. In general, dye forming techniques by dye casting are known to the man skilled in the art and therefore will not be described in more detail.

More preferably, clip 11 is realized in zama, that is in practice a metal alloy with a high zinc content comprising small amounts of copper, aluminum and magnesium.

In a particularly preferred embodiment, fixing clip 11 shows a minimum thickness approximately greater than 1,5 mm, preferably equal to approximately 2 mm. Such clip includes a base portion 20 having a seat surface 21 adapted to interfere with a corresponding surface portion defined onto support frame 2 body 4. The base portion 20, that is preferably conformed as a small bar, further includes a substantially cylindrical and inner threaded channel 22 having an opening defined on seat surface 21. Such channel 22 crosses base portion 20 as well as the channel opening defined on seat surface 21 allows channel 22

to be able to receive within itself adjustment screw 10 cooperating with fixing clip 11.

In a particularly advantageous embodiment, seat surface 21 is a substantially planar surface laying on a plane substantially perpendicular to channel 22 extension direction z, that in practice is adjustment screw 10 screwing direction z. In this way, tightening adjustment screw within channel 22, seat surface 22 slopes progressively with respect to support frame 2 frame body 4 moving to reach a position wherein such seat surface 21 is facing and parallel to a corresponding surface defined upon support frame e frame body 2.

Mounting clip 11, further includes at least a claw 24, or a jawed portion, formed by a small bar 25 having a first end radiused to base portion 20 and a second opposite end provided with a projecting tooth 26 adapted to penetrate at least partially inside inner wall 30 of the embedded box 3. Preferably such projecting tooth 26 is substantially conformed as a square base pyramid, or a rectangular base, or a tapered base one.

In the particularly advantageous embodiment depicted in figure 3, mounting clip 11 includes, in particular, two clawed portions 24 that depart from

base portion 20 and are spaced between themselves. Preferably, a reinforcement cross bar 27, different from base portion 20, is provided in fixing clip 11, between two clawed portions 24. Preferably, such reinforcement bar 27 is near the clawed end portions 24 distal from base portion 20. This way, between, cross bar 27, base portion 20 and both clawed portions 24, a fixing clip 11 open portion 28 is bounded, adapted to receive part of screw 10 that possibly goes over threaded channel 22 defined in base portion 20.

On the basis of what described above, one can understand therefore why a fixing clip 11 according to present invention is able to guarantee a considerable hold in fixing wall box 3 support frame 2, overcoming in this manner known art fixing systems shortcomings. In particular, it was found that a fixing clip 11 according to the present invention guarantees a 20% higher hold as compared to known art clips made of punched iron sheet.

It must be observed that, notwithstanding that in present description the particular example was referred to wherein fixing clips 11 are used to fix a support frame 2 to the wall box 3 such clips 11 may also be used advantageously to fix an electric

apparatus, for instance a single-block type, directly to wall embedded box 3, that is, without using support frame 2.

Obviously, someone skilled in the art will be able to make various modifications and variations to the above described fixing clip, even though all contained within the scope of the invention, as defined by the following claims.

CLAIMS

1. Fixing clip (11) for mounting an electric apparatus or a support frame (2) of said electric apparatus, onto a wall embeddable box (3), said fixing clip (11) being such that to cooperate with an adjustment screw (10) to engage an inner wall (30) of said box (3) so as to secure said electric apparatus or said frame (2) to said box (3), characterized in that

the fixing clip (11) is made with die-cast metal.

2. Fixing clip (11) according to claim 1, wherein said metal is zama.

3. Fixing clip (11) according to claim 1, wherein said fixing clip (11) has a minimum thickness greater than 1.5 mm.

4. Fixing clip (11) according to claim 3, wherein said minimum thickness is approximately 2 millimeters.

5. Fixing clip (11) according to any of the preceding claims, comprising a base portion (20) comprising a base surface (21) adapted to interfere abuttingly with a corresponding surface portion defined on said electric apparatus or support frame (2), said base portion (20) comprising a channel (22) threaded inside adapted to receive said adjustment

screw (10).

6. Fixing clip (11) according to claim 5, wherein said base surface (21) lies on a plane substantially perpendicular to an extension direction (z) of said channel (22).

7. Fixing clip (11) according to claim 5, further comprising at least a clawed member (24) conformed substantially as a small bar (25) and having a first end radiused with said base portion (20) and a second opposite end provided with a small projecting tooth (26) adapted to penetrate at least partially in said box (3) inner wall (30).

8. Fixing clip (11) according to claim 7, wherein said at least one clawed member (24) comprises a first and second clawed members (24) radiused with said base portion (20) and connected one to another by a reinforcement cross-bar (27) different from said base portion (20).

9. Single-block electric apparatus fixable to a wall embeddable box (3), characterized in that it comprises a fixing clips (11) pair according to any of the preceding claims, adapted to fix said electric apparatus to said box (3).

10. Support frame (2) for wall mounting of at least one electric apparatus, said frame (2) being fixable

to a wall embeddable box (3), characterized in that it comprises a fixing clips (11) pair according to any of claims 1 to 8, adapted to fix said support frame (2) to said box (3).