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3,381,344

LATCHING FASTENERS

Filed April 5, 1965

FIG. 1

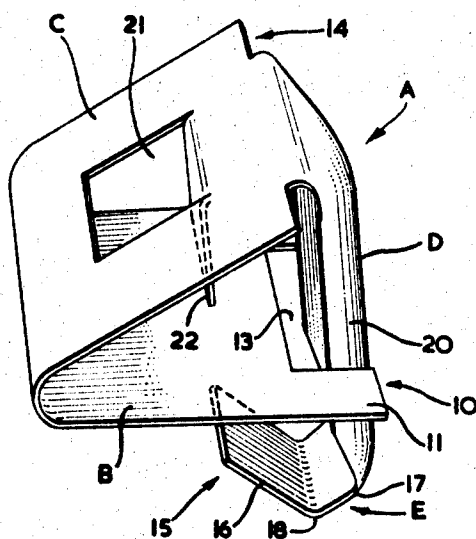


FIG. 2

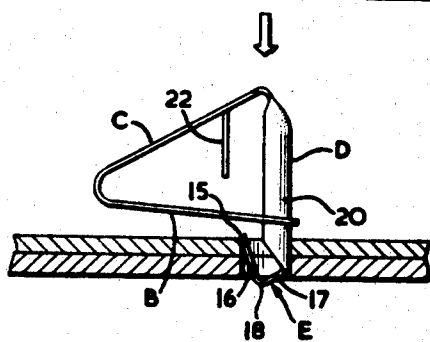
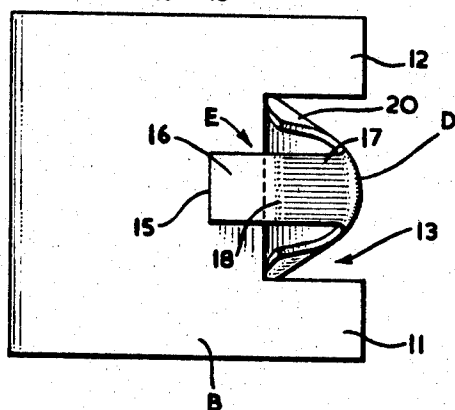


FIG. 3

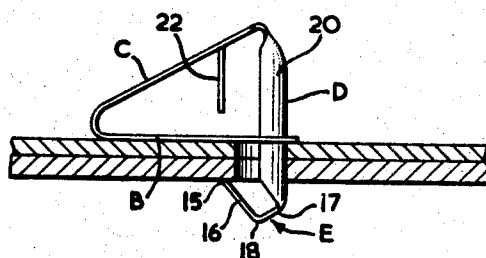


FIG. 4

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LATCHING FASTENERS

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ABSTRACT OF THE DISCLOSURE

A latching fastener for securing panels, such as those carrying printed circuits, to a carrying support, in which the fastener is made from a single sheet of resilient and ultimately hardened metal bent upon itself in generally triangular form in side elevation to form a base for surface engagement with a panel, and a latch element for engagement with the panel carrying support to secure the panel and support together.

This invention relates to latching fasteners.

This fastener has particular adaptation in the communications industry for securing panels carrying printed circuits and other accessories, in respect to which it will be conveniently described but is, of course, not limited to such use.

In the communications industry, it has long been a problem to fasten panels to their carrying support as to maintain necessary zero or constant electrical contact under all conditions including those of vibratory load. Generally, fastening by screws has been the mode employed, as fasteners such as cam-shouldered fasteners and the like have been found wanting. However, securement by screws often results in costly loss since the force of the power tool sometimes tightens the screws too much and in result, the panel board cracks and must be discarded together with its printed circuit and accessories attached thereto.

The fastener of the present invention avoids the difficulties of the past and provides a fastener quickly applicable and which will securely fasten such panels firmly as to maintain the necessary zero or constant under all conditions including those of vibratory load. In fact, under extreme vibration test it has been found that the accessories and some panel parts will dislodge and break but the securement achieved by this fastener remains unchanged. Obviously its qualities for securement can be of advantage in other fields.

The invention generally embodies a fastener made from a single sheet of resilient and ultimately hardened metal bent upon itself and formed to provide a flat base plate having a free terminal end, a resilient body plate inclining to and rising from the opposite end of the base plate as to overlie it and terminating in a free end, said base plate being recessed substantially adjacent to its free end, intermediate its side edges, to form a passage, said body plate having a tongue projecting beyond its free edge and intermediate its side edges, said tongue being bent to extend angularly to said body plate and substantially normal to said base plate and being of a length to intersect said base plate recess and terminate beyond it in a free end, said free end of said tongue being bent upon itself to form a hook-like latch element, said body plate being depressible to move said latching element beyond said base plate to a greater degree and releasable to cause said latch element to engage and grip a surface of a mounting structure upon which said base plate is disposed.

The fastener of the present invention will be clearly understood by reference to the following detailed specification taken in conjunction with the accompanying drawings.

In the drawings:

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FIGURE 1 is an enlarged perspective illustration of the preferred fastener of the present invention;

FIGURE 2 is a bottom plan view of the fastener; and

FIGURES 3 and 4 are side elevations of the fastener showing it, respectively, about to be applied to and secured to a mounting structure, the latter being illustrated fragmentarily in section.

Referring to the drawings, A indicates the fastener as a whole formed from a single strip of sheet metal bent upon itself to form a generally triangular structure in side elevation including a base plate B, a body plate C overlying and rising therefrom at an incline thereto and a tongue D disposed at an angle to body plate C and substantially normal to base plate B.

The base plate B, opposite to its juncture with body plate C, terminates in a free end 10 and it is recessed adjacent thereto preferably by cutting in end 10 intermediate its side edges and forming at each side the arms 11 and 12. This also forms the central passage 13 adapted to be intersected by the tongue D.

The body plate C, opposite its juncture with base plate B, terminates in the free end 14 and intermediate its side edges carries a narrower tongue projecting therefrom and bent from its plane to extend angularly thereto and substantially normal to base plate B. The tongue is of a length to intersect or pass through the recess in the base plate and to terminate beyond the plane of the latter in a free end 15. Tongue D is bent adjacent to its free end 15 to form the hook-like latch element E being preferably sloped in opposed relation as at 16 and 17 from its apex 18 as to form a guide for the tongue through an aperture or passage when the fastener is being secured on a mounting structure.

The tongue D is preferably formed wider between its ends and is bent transversely of its side edges to form the substantially rigid shank 20 resistant to flexing due to thrust of the fastening operation when being mounted. Also, preferably the body plate C is recessed as at 21 by striking a tang 22 therefrom and caused to project towards the base plate B substantially normal thereto. Tang 22 forms a stop member designed to prevent stressing of said fastener beyond its elastic limit by over-bending as to de-energize its spring thrust when mounting it under pressure, by its contact with the base plate B under these conditions.

In forming the hook-like latch element E, the portion 16 is preferably bent to underlie the base plate B to apply maximum compression force of the fastener, and it will be realized that the compression of this close coupler triangular design provides for great perpendicular tension or pull on the tongue and effectively directed for maximum gripping action underlying the free edge of the base plate B. It could, of course, operate with reasonable effect in some uses if the hook-like terminal was directed oppositely.

It will be obvious, therefore, from the foregoing that I provide a particularly simple fastener which will achieve great gripping power, which is economical of manufacture, subject of simple pressure application effected when the passage 13 registers with an aperture or the like in a mounting structure engaged by base plate B and with tongue D also in such registry. The recess or aperture 21 in body plate C may conveniently form means for receiving a portion of a mounting tool if desired, but the fastener does not necessarily require a mounting tool and may be applied by simple pressure as desired.

I claim:

1. A latching fastener comprising a single sheet of metal bent upon itself and formed to provide a flat base plate having a free terminal end, a resilient body plate inclining to and rising from the opposite end of the base

plate so as to overlie it and terminating in a free end having spaced apart edge portions, said base plate being recessed substantially adjacent to its free end, intermediate its side edges, to form a passage, said body plate having a tongue projecting beyond its free end edge portions and intermediate its side edges, said tongue being bent to extend angularly to said inclining body plate and substantially normal to said base plate and being of a length to intersect said base plate recess and to terminate beyond it in a free end, said free end of said tongue being bent upon itself prior to passage of the tongue within said recess to form a hook-like latch element, said body plate being depressible to move said latch element beyond said base plate to a greater degree and releasable to cause said latch element to engage and grip a surface of a mounting structure upon which said base plate is disposed.

2. A latching fastener as claimed in claim 1 in which said body plate has a tang struck therefrom projecting towards said base plate and adapted to contact said base plate when said body plate is depressed as to prevent stressing said fastener beyond its elastic limit.

3. A latching fastener as claimed in claim 1 in which the terminal portion of said free end of said tongue is bent acutely inwardly and in a direction towards said base plate

to cause said terminal portion of said hook-like latch element to underlap said base plate.

4. A latching fastener as claimed in claim 1 in which said tongue is formed with a wider portion intermediate its ends, side edges of said wider portion being bent inwardly towards one another to form a channeled shank whereby to substantially span and fill said base recess and to have bearing engagement of the tongue with a wall of an opening in a mounting structure to insure stability of the fastener mounted in said mounting structure.

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