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(54) **Clip for anchoring clamps to terminals.**

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## Description

The present invention pertains to a clip anchoring an eyelet terminal clamp to a terminal bar of an electric device or machine, being said clamp provided to receive and connect external supply conductors, allowing to said clip to fasten in simple and fast way the eyelet terminal to the terminal bar.

It is well known that the clamp of electric machines and devices must be provided with means to connect cables thereto. Should the currents through said terminals be high (from tens to hundreds of amperes) there is the need to use clamps surely connecting, with the lowest possible contact resistance, said cables to said terminals.

The clamps can be manufactured integral with the terminals themselves, what allows particularly safe clamping and connection, but implies a very high cost, only justifiable for high cost machines and devices.

Alternatively, the clamps can be manufactured separated from the terminals at a quite lower cost, but in such a case a particularly careful manufacture is needed to avoid possible poor connections and consequent overheatings.

One of the most common clamps is the so-called "eyelet" clamp comprised of a sleeve shaped metal member provided with threaded clamping means allowing to clamp inside said sleeve a cable to be connected thereto.

The problem connected with this eyelet clamps is their mobility with respect to the terminals, with the risk of a loss, occurring when said clamps are loosed.

A partial solution for this problem is to provide an insulating basis, bearing said terminals, with bracket protrusions on which can be supported said clamps when they are loosed. Said solution is only partial because can assure a gravity support of the clamps on said brackets which, for its shape is rather problematic.

It could be possible to remedy this fact by conforming said bracket protrusions with seats forcefully housing said clamps, but this implies higher expenses and larger size of the insulating basis, which not always are permitted.

DE-A-3413740 discloses a screw clamp consisting of a clamp body or sleeve, surrounding a terminal bar, provided with a screw crossing an upper side of the sleeve and resting on the terminal bar to move the sleeve in relation to the terminal bar itself, in order to grip a line conductor between the movable sleeve and the terminal bar, and with a U-shaped fastening clip enclosing between its legs the terminal bar and the upper side of the sleeve, wherein the upper leg does not contact the upper side of the sleeve but is engaged, by means of a slit, in a neck provided in the screw between the threaded shank and the head of the screw itself.

It is an object of the present invention to provide a resilient and conductive clip maintaining a clamp fastened to a terminal when is loose, but able to clear it through a specific intervention on a particular engaging means of said clip between said clamp and said terminal.

A clip according to the present invention for fastening to a terminal bar an eyelet clamp, thereon inserted, consisting of a sleeve formed from a folded metallic strip, comprises a stiff and resilient bent sheet structure characterized in that it is formed by two U-shaped bends folded in opposite directions and side by side arranged, of which one encloses the terminal bar and the other encloses a bottom portion of the sleeve, to keep permanently fastened said sleeve against said terminal bar, being a leg common to the two U-shaped bends provided with a tang punched therefrom and raised for engaging a through hole pierced through said bar and therefrom disengageable just on purpose by using a suitable tool; further said clip is made of resilient metallic materials, such as bronze or beryllium copper, and is punched for having the first leg put against the terminal bar, followed by at least a leg folded in a first direction to span said terminal bar and by another leg folded in opposite direction to span the bottom portion of said sleeve, being said first leg faced against the terminal bar provided with the above mentioned raised tang.

Preferably, said clip on a side is provided with two parallel legs spanning the terminal bar and on the other side is provided with another single leg spanning the bottom portion of the sleeve.

More preferably, the leg of the clip spanning the bottom portion of the sleeve has a protrusion engaging a seat of an insulating base of the terminal bar for providing an additional support to said leg in order to have a safer fastening action of the clamp to the terminal bar.

The features and the advantages of the present invention will be specified in the concluding part of this disclosure, while further features and advantages of an embodiment, herebelow given in a not limiting way, will be depicted in the following detailed description provided with the enclosed drawings, wherein:

- figure 1 is a front view of an eyelet clamp anchored to a terminal by means of a clip according to the present invention;
- figure 2 is a sectional view along a line 2-2 of the same clamp depicted in figure 1;
- figure 3 is a perspective detailed view of a clip according to the present invention.

Considering specifically the figures 1 and 2, an eyelet clamp 10 is seen as comprising a rectangular sleeve 12, obtained by folding a metal strip, which surrounds a terminal bar 14 coming out from an insulating basis 16. Said sleeve 12 has two superimposed sides 18 and 20 through which pass a screw 22 whose

threaded stem is engaged in a threaded hole 24 crossing the upper side 18 of the sleeve 12, while the lower side 20 has a not threaded larger hole 26 crossed, without be engaged, by the screw 22. Said screw ends with a fastening plate 28 having the task to fasten a possible cable against the terminal 14, assuring connection therewith.

The sleeve 12 has a lower side 30, opposed to the superimposed sides 18 and 20, passing around the terminal 14 and therewith anchored by means of a clip 40 according to the present invention.

Considering in addition the figure 3, the clip 40 according to the present invention is comprised of a punched metallic strip from which protrude a downwards bent leg 44, for engaging the side 30 of the sleeve 12, possibly ending with a restricted area 46 to be engaged in a support seat 48 into the insulating basis 16 (figures 1 and 2), and two legs 50 and 52 upwards bent, for engaging the terminal bar 14.

From the body 42 protrudes also an inclined tang 54 insetrable in a through hole 56 in the terminal bar 14, preventing unwanted extraction of the eyelet clamp 10 from the terminal bar 14, because it is impossible to extract the clip 40, being said tang able to be disengaged from said through hole 56 just by means of the operation of a tool, as a screwdriver, lowering said tang 54 making it to pass under the bar 14.

The tang 54 is provided to be possibly lowered just to clear the clip 40 from the bar 14 and allow the replacement of the clip 40 itself or the whole eyelet clamp 10, should it be damaged.

The operation of the present invention is the following one:

when it is intended to fasten an eyelet clamp 10 to a terminal bar 14, a clip 40 is grasped and inserted around the side 30 of the clamp sleeve 12 with the leg 44 thereof engaging said side. Then the assembly of the sleeve 12 and clip 40, inserted around the side 30, is taken and iserted around the terminal bar 14 in such a way that the two legs 50 and 52 engage said bar 14 and the tang 54 is flattened, passing under the bar 14, meeting the hole 56 through the bar, getting rid and getting the orientation depicted in figures 2 and 3, so that said tang 54 tends to engage the walls of the hole 56 at any attempt to extract the clip 40 from the terminal bar 14, making impossible to disconnect the eyelet clamp 10 from the bar 14, unless an intervention through a tool is made on the tang to lower it, permitting the extraction of the clip 40 from bar 14. Once extracted from the bar 14, the clip 40 is easilly extracted from the sleeve 12 of the clamp 10, allowing any clamp or clip substitution in case of damages thereto.

What has been hereabove disclosed is a not limiting embodiment of the present invention and it will be obvious to people skilled in the art to find equivalent means in manufacturing said clip, which must be considered as all here covered.

For example, according to a less preferred embodiment, the leg 44 could be upwards folded for engaging the bar 14 and the legs 50 and 52 downwards folded for engaging the side 30 of the sleeve 12, being in this case sufficient to add a hole in the leg 44, coincident with the hole 56 of the bar 14, for allowing the insertion of a tool for the disengagement of the tang 54.

## Claims

1. Clip for fastening to a terminal bar (14) an eyelet clamp (10), thereon inserted, consisting of a sleeve (12) formed from a folded metallic strip, said clip comprising (40) a stiff and resilient bent sheet structure characterized in that it is formed by two U-shaped bends folded in opposite directions and side by side arranged, of which one encloses the terminal bar (14) and the other encloses a bottom portion (30) of the sleeve (12), to keep permanently fastened said sleeve (12) against said terminal bar (14), being a leg (42) common to the two U-shaped bends provided with a tang (54) punched therefrom and raised for engaging a through hole (56) pierced through said bar (14) and therefrom disengageable just on purpose by using a suitable tool; further said clip is made of resilient metallic materials, such as bronze or beryllium copper, and is punched for having the first leg (42) put against the terminal bar (14), followed by at least a leg (50 or 52) folded in a first direction to span or enclose said terminal bar (14) and by another leg (44) folded in opposite direction to span the bottom portion (30) of said sleeve (12), being said first leg (42) faced against the terminal bar (14) provided with the above mentioned raised tang (54).
2. Clip for fastening an eyelet clamp (10) to a terminal bar (14), as in claim 1, characterized in that on a side is provided with two parallel legs (50, 52) spanning the terminal bar (14) and on the other side is provided with another single leg (44) spanning the bottom portion (30) of the sleeve (12).
3. Clip for fastening an eyelet clamp (10) to a terminal bar (14), as in claim 2, characterized in that the leg (44), spanning the bottom portion (30) of the sleeve (12) has a protrusion (46) engaging a seat (48) of an insulating base (16) of the terminal bar (14) for providing an additional support to said leg (44) in order to have a safer fastening action of the clamp (10) to the terminal bar (14).

## Patentansprüche

1. Clip zum Befestigen an einem Anschlußstab (14) einer darauf aufgesetzten Ösenklemme (10), die eine Hülse (12) enthält, die aus einem gefalteten Metallband gebildet ist, wobei der Clip (40) eine steife und elastische gebogene Blechstruktur aufweist, dadurch gekennzeichnet, daß er durch zwei U-förmige Biegungen gebildet ist, die in entgegengesetzten Richtungen gefaltet und Seitenan-Seite angeordnet sind und von denen die eine den Anschlußstab (14) umschließt und die andere einen Bodenabschnitt (30) der Hülse (12) umschließt, um die Hülse (12) dauerhaft an dem Anschlußstab (14) befestigt zu halten, wobei ein den zwei U-förmigen Biegungen gemeinsamer Schenkel (42) mit einem Dorn (54) versehen ist, der daraus ausgestanzt und erhöht ist für einen Eingriff in ein Durchgangsloch (56), das durch den Stab (14) gebohrt ist, und von diesem nach Wunsch lösbar ist unter Verwendung eines geeigneten Werkzeuges; wobei der Clip ferner aus elastischen metallischen Materialien hergestellt ist, wie beispielsweise Bronze oder Beryllium-Kupfer, und gestanzt ist, damit der erste Schenkel (42) gegen den Anschlußstab (14) anliegt, gefolgt von wenigstens einem Schenkel (50 oder 52), der in einer ersten Richtung gefaltet ist, um sich über den Anschlußstab (14) zu erstrecken oder diesen zu umschließen, und einem weiteren Schenkel (44), der in entgegengesetzter Richtung gefaltet ist, um den Bodenabschnitt (30) der Hülse (12) zu überspannen, wobei der erste Schenkel (42), der gegen den Anschlußstab (14) gerichtet ist, mit dem oben genannten erhöhten Dorn (54) versehen ist.
2. Clip zum Befestigen einer Ösenklemme (10) an einem Anschlußstab (14) nach Anspruch 1, dadurch gekennzeichnet, daß er auf einer Seite mit zwei parallelen Schenkeln (50, 52), die sich über den Anschlußstab (14) erstrecken, und auf der anderen Seite mit einem anderen einzigen Schenkel (44) versehen ist, der sich über den Bodenabschnitt (13) der Hülse (12) erstreckt.
3. Clip zum Befestigen einer Ösenklemme (10) an einem Anschlußstab (14) nach Anspruch 2, dadurch gekennzeichnet, daß der Schenkel (44), der sich über den Bodenabschnitt (30) der Hülse (12) erstreckt, einen Vorsprung (46) hat, der an einem Sitz (48) von einer isolierenden Basis (16) des Anschlußstabes (14) angreift, um für eine zusätzliche Halterung des Schenkels (44) zu sorgen, um eine sicherere Befestigung der Klemme (10) an dem Anschlußstab (14) zu haben.

## Revendications

1. Attache pour fixer à une barrette de borne (14) un bloc de serrage à oeillet (10) qui est inséré sur cette dernière et comprend un manchon (12) fait d'une bande de métal repliée, ladite attache (40) comprenant une structure de feuille repliée, élastique et rigide, caractérisée en ce qu'elle est formée de deux coudes en forme de U pliés en sens opposés et disposés côte-à-côte, dont l'un entoure la barrette de borne (14) et l'autre entoure une partie de base (30) du manchon (12), pour maintenir en permanence ledit manchon (12) fixé contre ladite barrette de borne (14), une branche (42) commune aux deux coudes en forme de U étant dotée d'une languette (54) découpée et soulevée pour s'engager dans un trou traversant (56) percé dans ladite barrette (14) et qui peut en être dégagée de façon voulue seulement grâce à un outil approprié; ladite attache est faite en outre d'un matériau métallique élastique tel que le bronze ou le cuivre-béryllium et est découpée pour avoir sa première branche (42) placée contre la barrette de borne (14), suivie d'au moins une branche (50 ou 52) repliée dans une première direction pour chevaucher ou entourer ladite barrette de borne (14) et par une autre branche (44) repliée en sens inverse pour chevaucher la partie de base (30) dudit manchon (12), ladite première branche (42) appuyée contre ladite barrette de borne (14) comportant ladite languette soulevée (54).
2. Attache pour fixer à une barrette de borne (14) un bloc de serrage à oeillet (10) selon la revendication 1, caractérisée en ce qu'elle comporte deux branches parallèles (50, 52) sur un côté, qui chevauchent la barrette de borne (14), et en ce qu'elle comporte sur l'autre côté une seule autre branche (44) qui chevauche la partie de base (30) du manchon (12).
3. Attache pour fixer à une barrette de borne (14) un bloc de serrage à oeillet (10) selon la revendication 2, caractérisée en ce que la branche (44) qui chevauche la partie de base (30) du manchon (12) comporte une saillie (46) portant contre un appui (48) de la base isolante (16) de la barrette de borne (14) pour fournir un support supplémentaire à ladite branche (44) afin d'avoir un effet de fixation plus sûr du bloc (10) à la barrette de borne (14).

Fig. 1

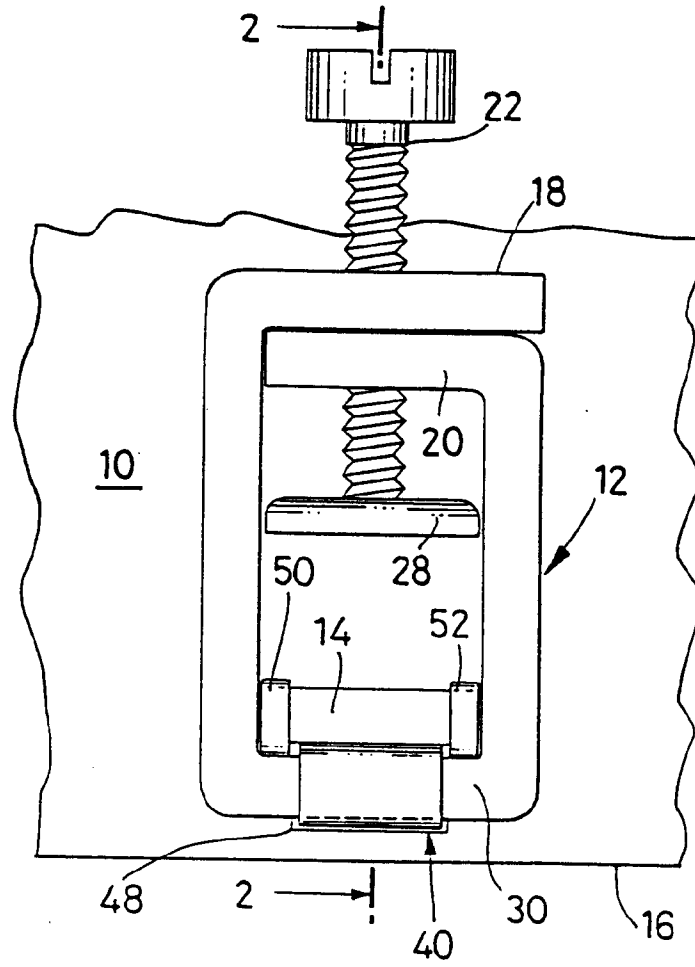
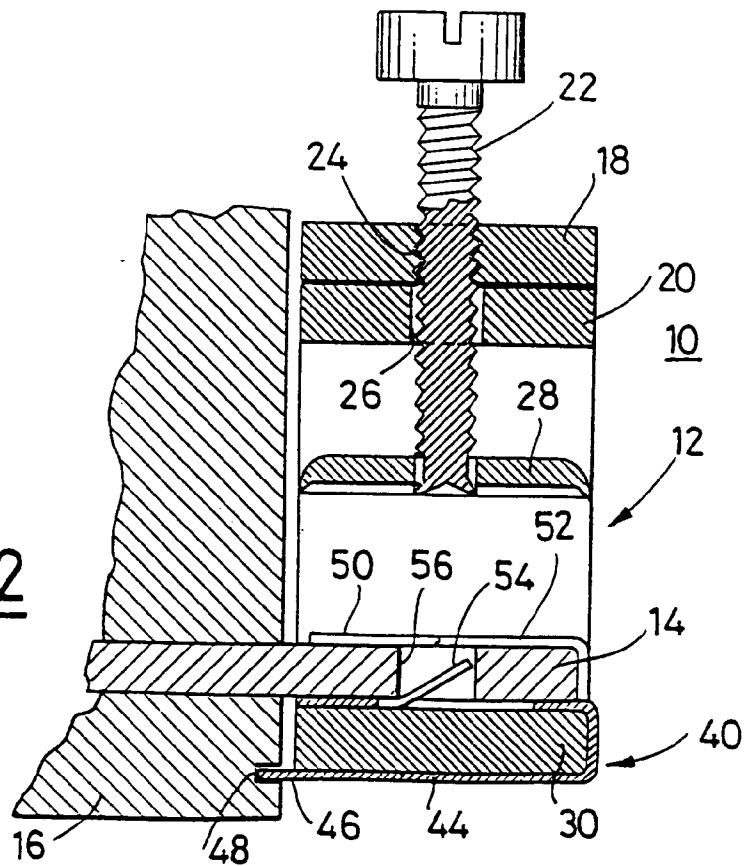


Fig. 2



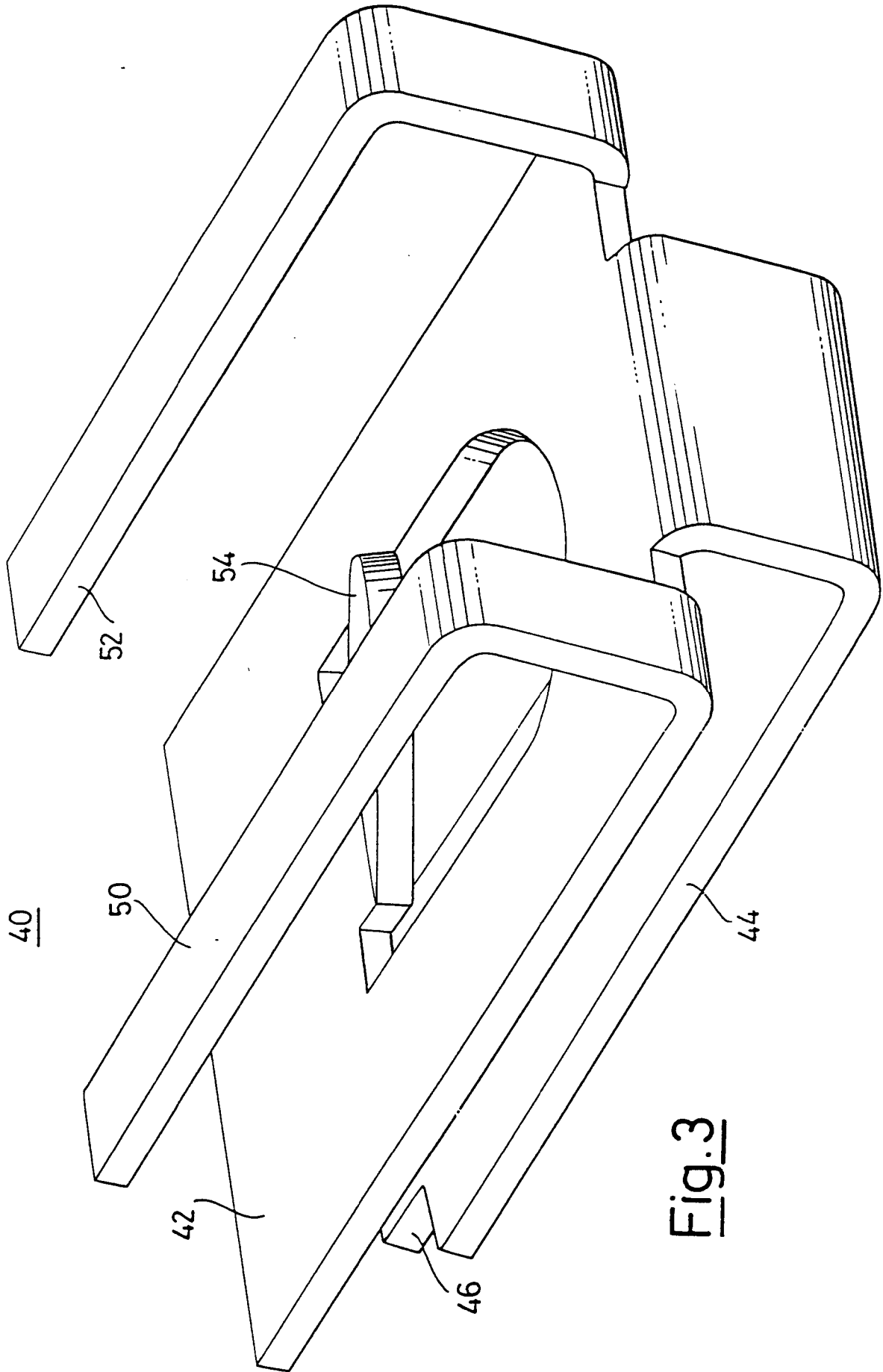


Fig. 3