

(19)



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(51) Publication number:

0 522 185 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **91111254.8**(51) Int. Cl.⁵: **H01R 25/14, F21V 21/34**(22) Date of filing: **06.07.91**

Amended claims in accordance with Rule 86 (2)
EPC.

(43) Date of publication of application:
13.01.93 Bulletin 93/02

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

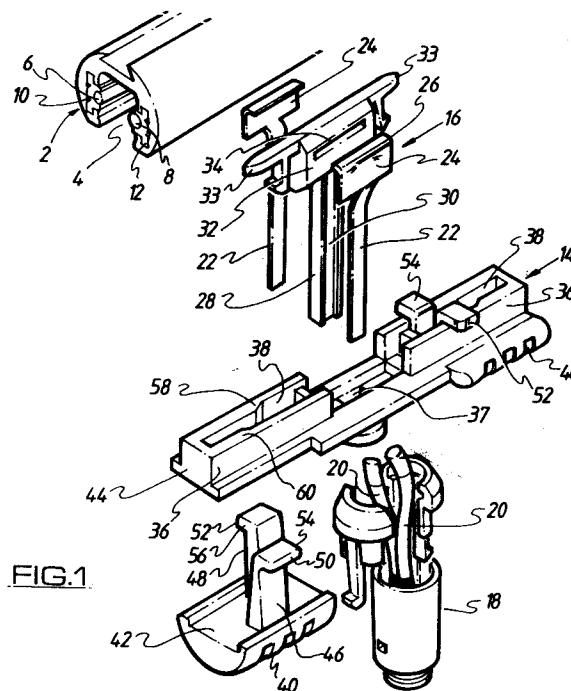
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(54) **Lighting track system.**

(57) The invention provides a lighting track system comprising a track (2) which carries electrical supply conductors (6, 8). Any one of a plurality of carriages (14) is adapted to be coupled to the track (2) mechanically and electrically. Each carriage (14) is provided with a lighting fitting such as a low voltage bulb and when the carriage is connected to the track mechanically, there is electrical connection between the supply conductors and the bulb. The mechanical connection is made by means of projections (46, 48) and a slidable cam (33, 38) so that to connect the carriage (14) it is fitted into the track (2) and the slidable cam (33, 38) is moved to cause projections to grip the track (2). The carriage (14) is released by the opposite movement of the cam (33, 38).

**FIG.1****EP 0 522 185 A1**

This invention relates to lighting track systems, and in particular to systems of the kind in which lights or other electrical devices are electrically connected to a track incorporating power supply means, by means of a mounting device which also retains the device in position, on the track. The invention relates particularly (although not exclusively) to lighting systems of the low voltage type.

According to the present invention, there is provided a lighting track system comprising a mounting device adapted for cooperation with a track incorporating electrical contact means, the mounting device comprising a carriage including contact means adapted to cooperate with the electrical contact means of the track, and retaining means, adapted to hold the carriage in a desired position on the track, and comprising displaceable locking means which can be moved between a first position in which the carriage can be engaged with the track, and a second position in which the locking means locks the carriage to the track. Preferably, the track has a longitudinally extending recess which incorporates the electrical contact means, and said locking means is adapted to be moved between a retracted position (the first position) in which the carriage can be inserted into or released from the track, and a protruding position (the second position) in which they engage with corresponding opposed internal faces of the recess.

Preferably, the locking means comprises at least one set of oppositely facing abutment members formed from a relatively resilient material, so as to be inherently biased either towards the engaged position or the released position; and at least one set of cooperating camming means, whereby relative movement of the locking means and the camming means results in displacement of the locking means between the locked and released position.

In a preferred embodiment of the invention, there are two sets of camming means for each set of abutment members, the abutment means being movable between the released position, in which they are held by one set of camming means, and the engaged position in which they are held by the other set of camming means.

Preferably, each set of abutment members comprises at least one pair of mutually opposed wings or claws which are resiliently biased towards one of the said positions, and the camming means comprises a tapered member which is slidably engageable with the said members, so as to urge them towards the other of the said positions.

In a preferred embodiment of the invention, the abutment members comprise at least one pair of mutually opposed wings or claws which are resiliently

biased apart, towards an outward locked position, and two sets of camming means one set comprising a tapered slot, the wings or claws being mounted on a sub-assembly of the carriage and being slidable in the said tapered slot; so as to be urged together by the taper of the slot at one extreme position, whilst the other set of camming means comprises a tapered member which projects between the wings at the other extreme position so as to hold them apart.

Some embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is an exploded view of the operative parts of a lighting track system in accordance with the invention;

Figure 1a is an enlarged view of part of Figure 1, to illustrate the electrical connections in more detail;

Figure 2a is an elevational view of a contact member for the electrical connections;

Figure 2b is a side elevation of the contact member of Figure 2a;

Figure 3a is a plan view of the locking means of the carriage in its engaged or locked position;

Figure 3b is a plan view of the carriage in the released position; and

Figure 4 is an exploded view of an alternative form of lighting track system in accordance with the invention.

Referring to Figure 1, a track 2 of generally conventional form comprises an elongate body which may for example be an aluminium extrusion, having a generally circular external profile, and a longitudinally extending recess 4. The opposite internal faces of the recess 4 carry conductor wires 6 and 8 which are mounted in respective electrically insulating housing strips 10 and 12, which are retained in correspondingly shaped re-entrant slots in either side of the recess.

A carriage 14 is adapted to be releasably located in the track, as explained in more detail below, and carries a contact assembly 16, adapted to make connections with the conductors 6 and 8 of the track, and a downwardly dependent mounting barrel (18) having a threaded lower end which carries a light fitting (not shown).

As shown more clearly in Figure 1a, the electrical connections between the fitting and the track are made via a pair of wires 20 whose upper ends are suitably connected to respective downwardly extending contact members 22 of the contact assembly 16. The upper ends of the contact members comprise enlarged plate-like portions 24 whose upper and lower edges are inwardly flanged at 26.

This is illustrated in more detail in Figures 2a and 2b from which it will be seen that the downwardly

dly extending portions of the contact members are shaped to fit the sides of the support member and are also provided with fixing holes 25 at their lower ends to facilitate the attachment of a connector.

A support member 28 for the contact assembly comprises a generally T-shaped body, having a downwardly dependent stem 30, each side of which is formed with a channel which receives the downwardly extending end of the corresponding contact member 22.

The head 32 of the contact support member 28 is somewhat enlarged in cross-section, and is formed with a slot 34 on each side which receives and locates the flange 26 of the corresponding contact member.

The top of the head 32 also carries endwise projecting tapered portions 33 described in more detail below, and has downwardly dependent lug positions 35 at each end which lock the contact member into a slot 37 in the centre of the carriage. Thus in the assembled condition of the contact assembly 16 and carriage 14 the contact members and the support member 28 are securely held in location with one another. As seen in Figure 1a, this assembled condition brings the contact plate members 24 into approximate alignment with the corresponding side faces of the carriage 36 which in use, extend into the recess 4 of the track 2, so that the contact members 24 are brought into contact with the conductors 6 and 8 in the track. Since the contacts 24 are stamped from a suitably resilient metal, and somewhat convex in cross-section so that they protrude outwardly from the head 32 of the contact support member 28, they are urged into intimate contact with the conductors of the track.

Referring to Figure 1 and Figures 3a and 3b the opposite ends of the carriage 14 are formed with an elongate tapered slot 38, in which is mounted a locking sub-assembly 40. The sub-assembly 40 comprises a main body forming a slider, whose upper surface is formed with a longitudinally extending recess 42 which is shaped to cooperate with the underside of the end portion 44 of the carriage, which, as can be seen from the drawing, is of generally "top hat" shaped cross-section. The upper surface of the slider carries a pair of upwardly extending, wing like locking members 46, 48, having oppositely facing flanged projections 50, 52 at their upper ends. The wing members are staggered longitudinally of the slider, so that the "leading edge" of one projection 50 is approximately level with the "trailing edge" 56 of the other projection 52.

Since the "wings" and the body 40 are moulded from resilient plastics material, the slider can be assembled onto the carriage 14 as illustrated at the righthand side of Figure 1, by squeezing the wings

together and inserting them through the base of the tapered slot 38, at the inner end of the slot which is wider. The natural resilience of the material then causes the wings to move outwardly so that the flanged portions 52 and 54 hold the slider in position on the carriage, again as illustrated on the righthand side of Figure 1.

As can be more clearly seen from Figures 3a and 3b the slot 38 has a relatively wide inner section and a relatively narrower outer end portions, there being a short tapered region 58, 60 on each side of the slot adjacent each end. The positions of the tapered regions 58 and 60 are staggered in the same relationship as the locking wings 46 and 48 of the slider, and thus it will be seen that when the slider is in its installed position, the action of moving the slider 40 in an axially outward direction urges the two wings 46 and 48 laterally inwards, so that the assembled carriage can then be offered up for insertion to the track. When the sliders 40 are subsequently moved to their axially innermost position, therefore, the wings 46 and 48 will be allowed to move laterally outwards, so as to engage against the opposed internal side walls of the track. As can be seen from the Figure, the arrangement of the conductors 6 and 8 and their corresponding mounting strips 10 and 12 is such that recesses are formed above them to receive the outer extremities of the wings 46 and 48 of the slider.

In order to securely lock the wings in this position, they also engage around the tapered end projections 33 of the head 32, in the inner position, Figure 3a, and again as will be seen more clearly from Figure 3b, the projections 33 are so shaped on each side that they match the offset of the wings.

Figure 4 shows an alternative form of the invention, which again includes a track 2 having internal contact members 6 and 8, a mounting member 18 for a light fitting, a carriage 14, and a pair of opposed contact members 24 on a contact support member 28. The general relationship of the parts is similar to that of Figure 1, but the arrangement for locking the carriage into the track is slightly different, as will be explained in more detail below.

In the case of the Figure 4 embodiment, each outer end 80 of the carriage 40 is bifurcated, to form a pair of parallel arms 82, and a slider 84 is formed with a vertically upstanding central flange 86 which fits between the arms 82.

A pair of locking wings 88 are integrally formed with the carriage 14, and have laterally outwardly extending flanges on their upper ends. A tapered formation 90, carried on the upper end of the flange 86 of the slider, is urged between the wings 88 as the slider is moved towards its axially inner-

most position, as shown at the righthand side of Figure 4. It will thus be appreciated that the carriage can be inserted onto the track, with its sliders in axially outward positions, and the sliders subsequently moved inwards to lock the wings into position against the opposed internal side walls of the track 2.

Modifications of the invention may be made without departing from the scope thereof. For example, the carriage and locking arrangement may be modified so that the locking means engages with and locks to the outside of the track in addition to or instead of the inside of the track.

Claims

1. A lighting track system comprising a mounting device for cooperation with a track incorporating electrical contact means, the mounting device comprising a carriage (14) including contact means (24,22) adapted to cooperate with the electrical contact means (6,8) of the track (2), and retaining means, comprising at least one pair of mutually opposed abutment members (46, 48) adapted to hold the carriage in a desired position on the track (2), and comprising displaceable locking means comprising camming means including a tapered member (33) which is slidably engageable with said retaining means so as to move same between a first position in which the carriage (14) can be engaged with the track (2) and a second position in which the locking means locks the carriage to the track (2).
2. A lighting track system according to Claim 1, wherein there are two sets of camming means (33, 38) for each set of abutment members (46,48), the abutment means being movable between the released position, in which they are held by one set of camming means (38), and the engaged position in which they are held by the other set of camming means (33).
3. A lighting track system according to Claim 2, wherein the abutment members (46, 48) comprise at least one pair of mutually opposed wings or claws which are resiliently biased apart, towards an outward locked position, and two sets of camming means (33, 38) one set comprising a tapered slot (38), the wings or claws being mounted on a sub-assembly (40) of the carriage (14) and being slidable in the said tapered slot (38); so as to be urged together by the taper of the slot at one extreme position, whilst the other set of camming means (33) comprises a tapered member

which projects between the wings at the other extreme position so as to hold them apart.

4. A lighting track system according to Claim 1, wherein each set of abutment members (46, 48) comprises resiliently deflectable members which are engageable by the camming means upon the camming means being slidably moved relative to the abutment members to spread the abutment members from the protracted position in which the abutment members are unstressed to the protruding position in which the abutment members are resiliently spread apart.
5. A lighting track system comprising a mounting device adapted for cooperation with a track incorporating electrical contact means, the mounting device comprising a carriage including contact means adapted to cooperate with the electrical contact means of the track, and retaining means, adapted to hold the carriage in a desired position on the track, and comprising displaceable locking means which can be moved between a first position in which the carriage can be engaged with the track, and a second position in which the locking means locks the carriage to the track.
6. A lighting track system according to Claim 1, wherein the track has a longitudinally extending recess which incorporates the electrical contact means, and said locking means is adapted to be moved between a retracted position (the first position) in which the carriage can be inserted into or released from the track, and a protruding position (the second position) in which they engage with corresponding opposed internal faces of the recess.

Amended claims in accordance with Rule 86-(2) EPC.

1. A lighting track system comprising a mounting device adapted for cooperation with a track incorporating electrical contact means, the mounting device comprising a carriage (14) including contact means (22,24) adapted to cooperate with the electrical contact means (6,8) of the track (2), and retaining means (46,48), adapted to hold the carriage in a desired position on the track (2), and comprising displaceable locking means which can be moved between a first position in which the carriage can be engaged with the track, and a second position in which the locking means locks the carriage to the track characterised in that said locking means includes two sets of

camming means (33,38) for said retaining means (46,48), the retaining means being moveable between the release position, in which they are held by one set of camming means (38), and the engaged position in which they are held by the other set of camming means (33). 5

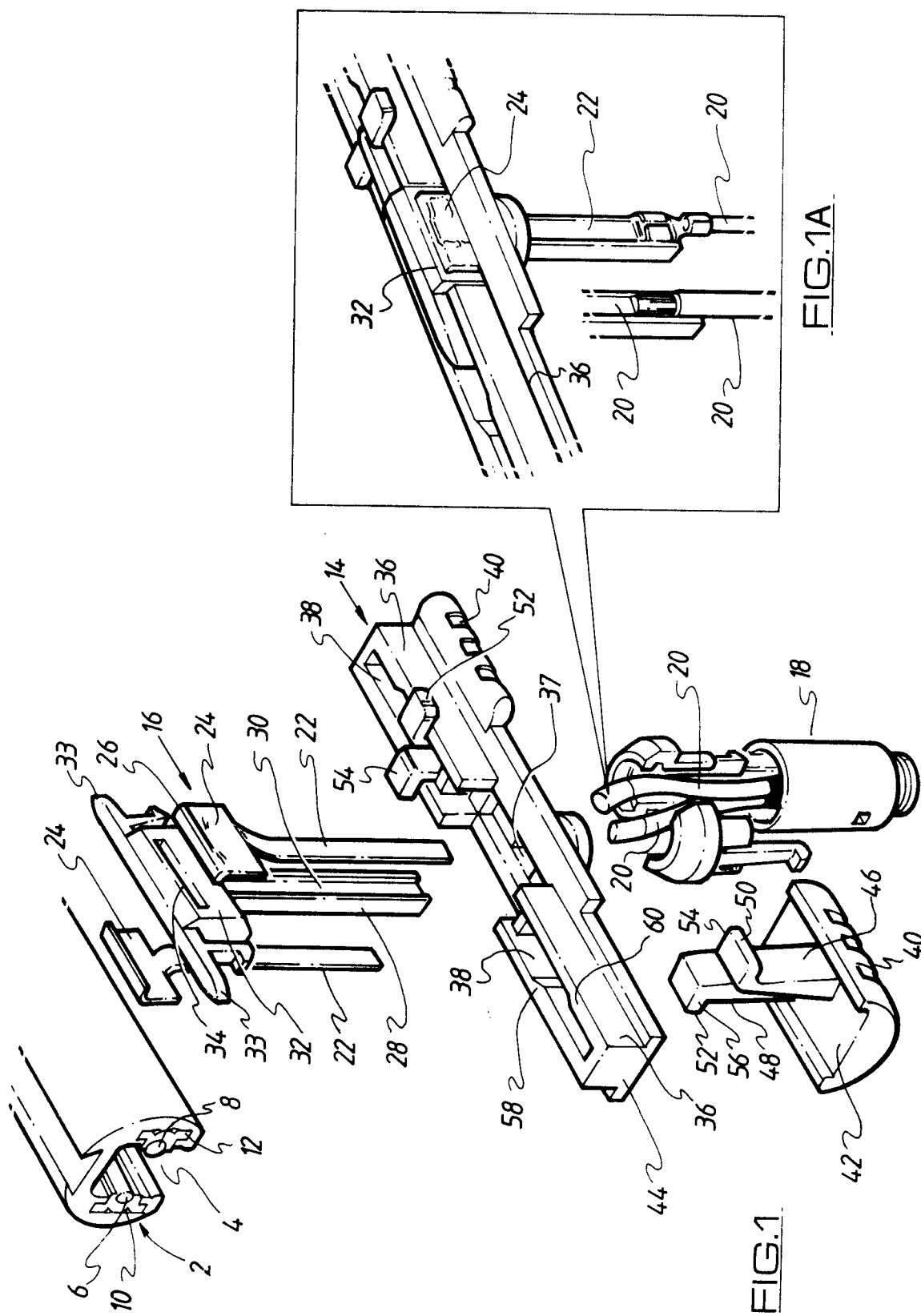
2. A lighting track system according to Claim 1, wherein said retaining means comprises at least one pair of mutually opposed abutment members. 10

3. A lighting track system according to Claim 2, wherein the abutment members (46, 48) comprise at least one pair of mutually opposed wings or claws which are resiliently biased apart, towards an outward locked position, and two sets of camming means (33, 38) one set comprising a tapered slot (38), the wings or claws being mounted on a sub-assembly (40) of the carriage (14) and being slidable in the said tapered slot (38); so as to be urged together by the taper of the slot at one extreme position, whilst the other set of camming means (33) comprises a tapered member which projects between the wings at the other extreme position so as to hold them apart. 15
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4. A lighting track system according to Claim 2 or 3, wherein each set of abutment members (46, 48) comprises resiliently deflectable members which are engageable by the camming means upon the camming means being slidably moved relative to the abutment members to spread the abutment members from the protracted position in which the abutment members are unstressed to the protruding position in which the abutment members are resiliently spread apart. 30
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5. A lighting track system according to Claim 1, wherein the track has a longitudinally extending recess which incorporates the electrical contact means, and said locking means is adapted to be moved between a retracted position (the first position) in which the carriage can be inserted into or released from the track, and a protruding position (the second position) in which they engage with corresponding opposed internal faces of the recess. 45
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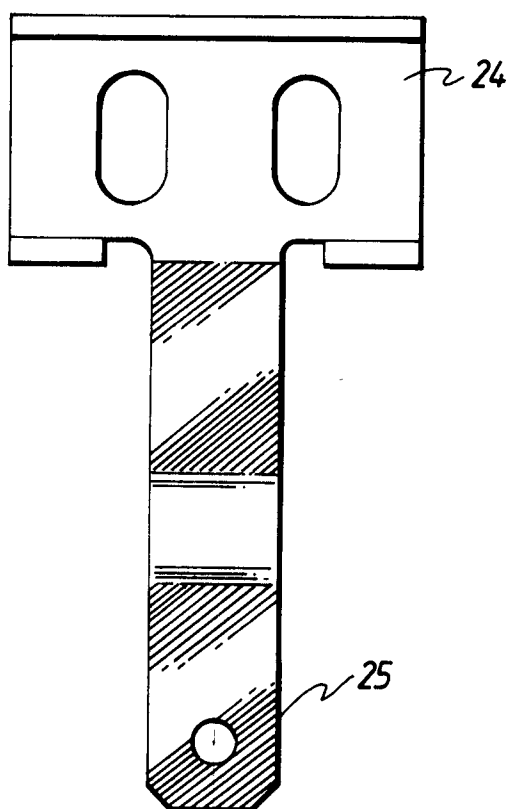


FIG. 2A

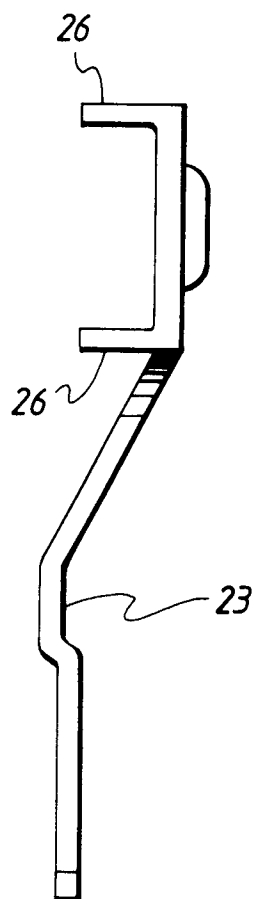


FIG. 2B

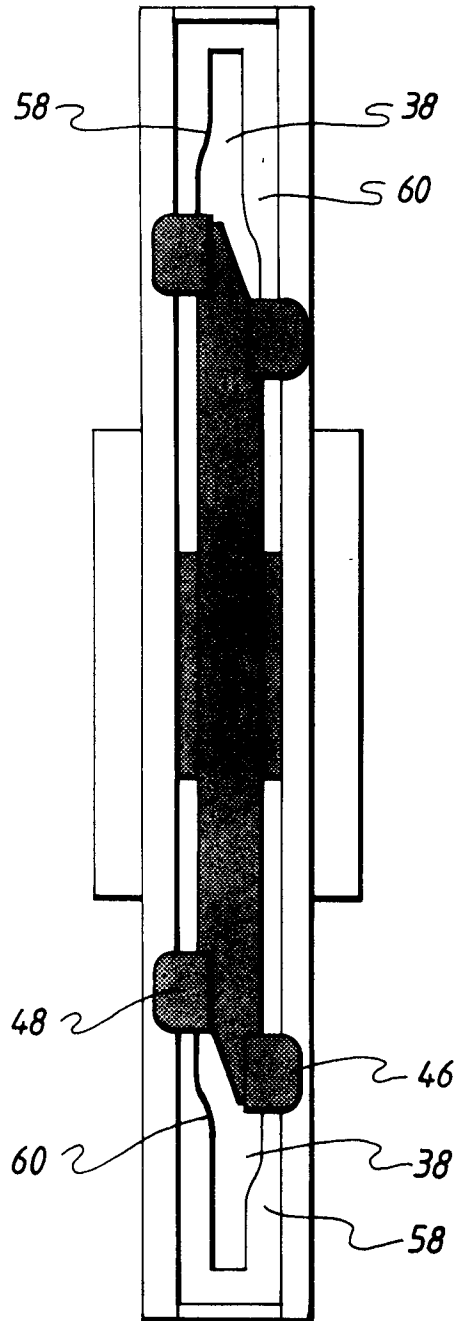


FIG. 3A

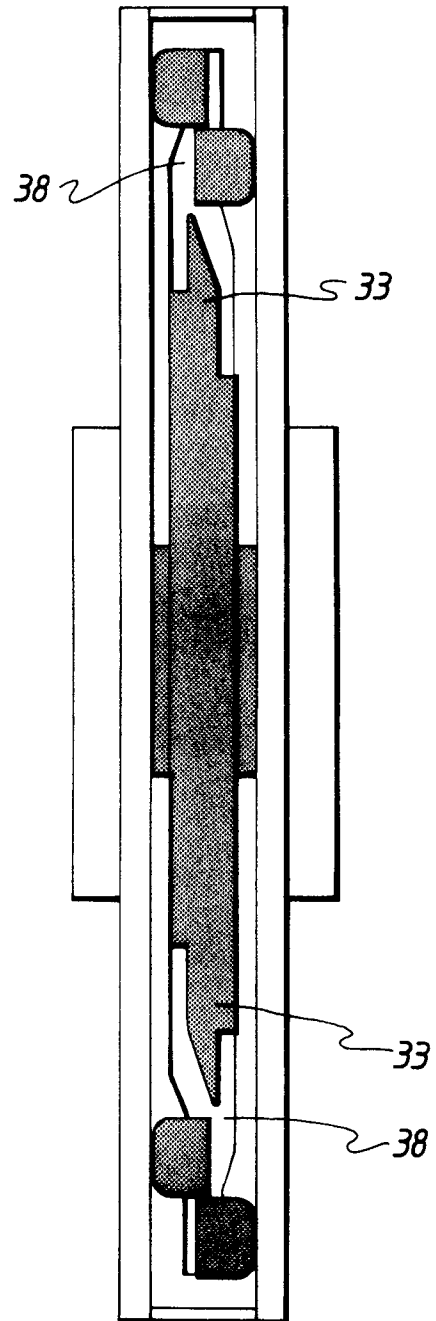


FIG. 3B

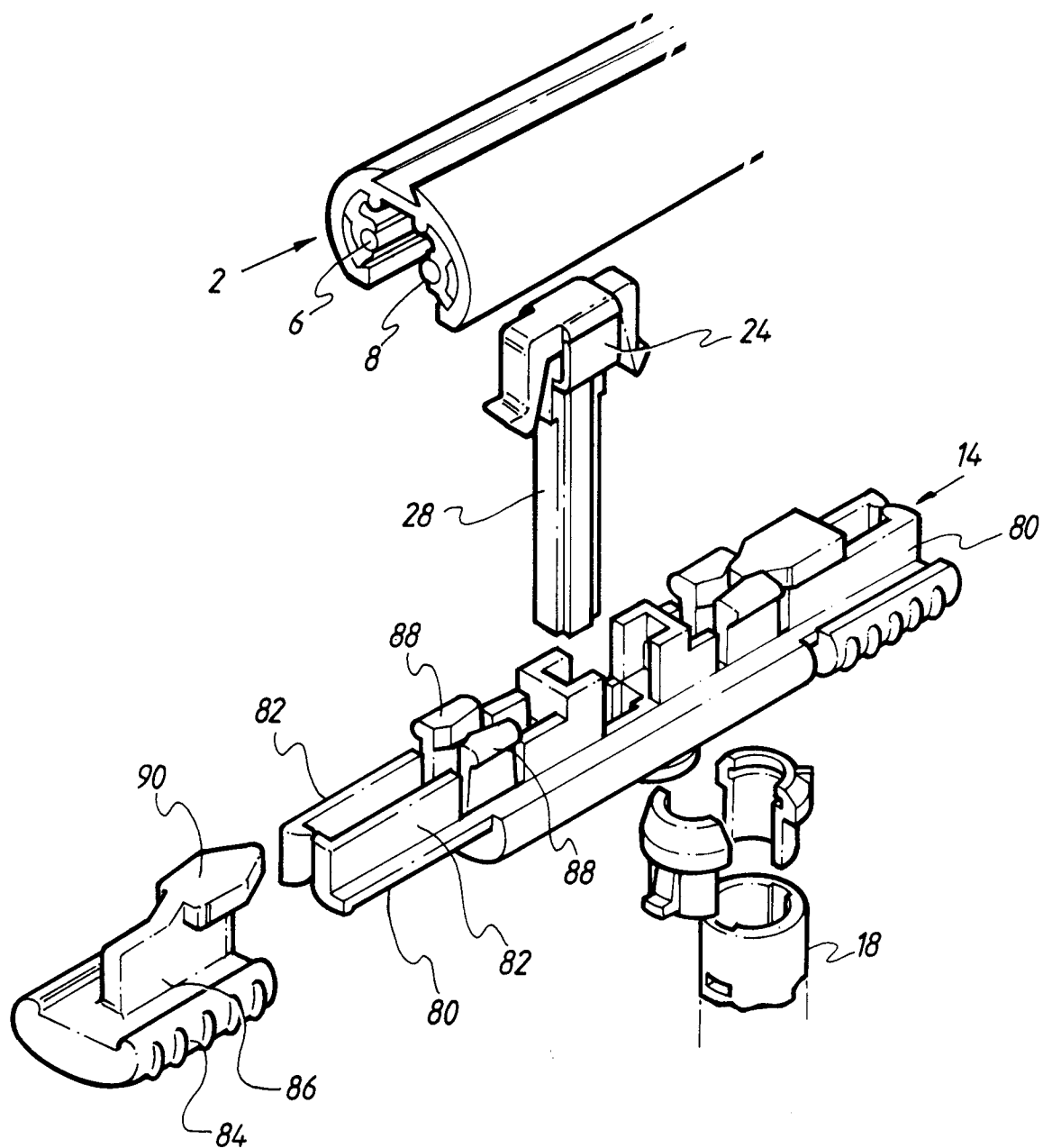


FIG.4



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EUROPEAN SEARCH REPORT

Application Number

EP 91 11 1254

DOCUMENTS CONSIDERED TO BE RELEVANT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 241 318 (LIGHT SOURCE ELECTRICAL EQUIPMENT LTD) * column 2, line 53 - column 3, line 29; figures 1,2 *	1,4-6	H01R25/14 F21V21/34
X	EP-A-0 159 078 (N.V. PHILIP'S GLOEILAMPENFABRIEKEN) * page 5, line 30 - page 7, line 5; figures 1,3,4 *	1,4-6	
A	BE-A-1 000 459 (TEKNOLIT S.R.L.) * page 4, line 17 - page 6, line 5; figure 1 *	1,5,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H01R F21V
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09 OCTOBER 1991	Examiner KOHLER J.W.
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