(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 544 366 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **92203572.0**

(51) Int. Cl.5: **F21V 21/00**, F21S 3/14

(22) Date of filing: **19.11.92**

(30) Priority: **27.11.91 EP 91203111**

(43) Date of publication of application:
02.06.93 Bulletin 93/22

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

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(54) Segment for line lighting device and device provided with such a segment.

(57) The segment (1) for a line lighting device (1, 1', 1'') comprises a gutter-shaped housing (2) having first and second open end portions (3 resp. 4). A gutter-shaped aligning member (30) is arranged in the firt end portion, extending with a forked portion (31) thereof from the housing. A first plural contact element (21) is secured to the aligning member (30), a second contact element (22) fitting to the first one is movably mounted in the second end portion (4). On introduction of the aligning member of the segment (1) into a second element (1'), a mechanical and an electrical coupling of the elements is achieved. Adjusting means (9) may be present, which adjust an aligning member (30') introduced into the second end portion (4) to the aligning member (30) to bring them in line. Said means (9) may have a mechanically locking function (32).

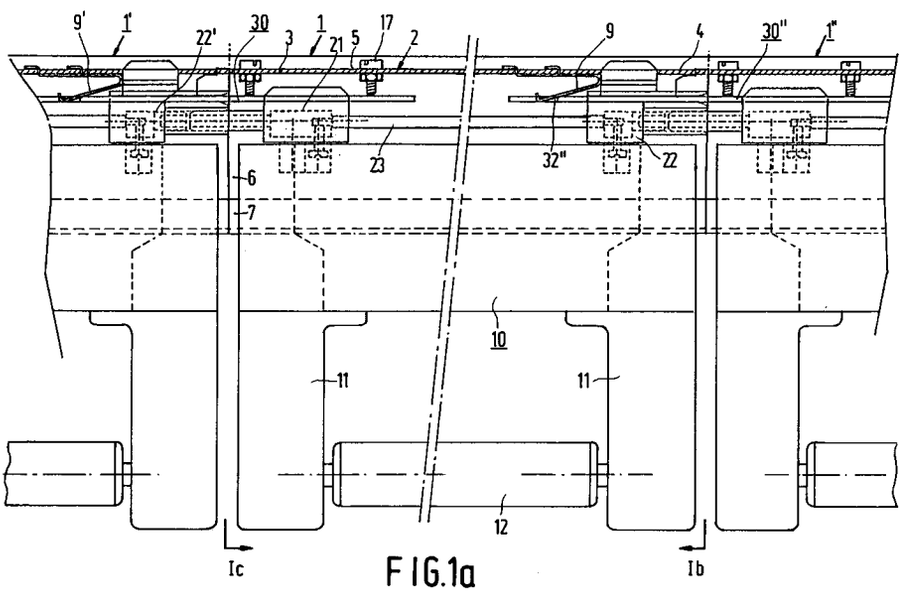

FIG.1a

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The invention relates to a segment for a line lighting device comprising:

a gutter-shaped housing open at a first and a second end portion and provided with a base and with walls connected to this base, which walls each have a rim remote from said base,

a first and a second multipole contact element of mutually mating design and mutually connected by conductors, arranged in line and facing away from one another on the base in the housing at respective ends thereof,

an aligning member arranged on the base, in the housing, projecting to outside the first end portion,

which housing is shaped so as to provide a grip to means for fastening it to a carrier.

Such a segment for a line lighting device is known from DE-GM-1 890 672.

The rims of the walls in that segment are bent inwards parallel to the base. A double Z-profile is fastened against the underside of a horizontal carrier and grips behind the bent rims.

An attractive characteristic of the known segment is that it can be electrically coupled to another segment so as to form a line lighting device in that its first end portion is made to butt against the second end portion of the other segment in alignment. To facilitate this, an aligning member is present which aligns the two houses laterally, *i.e.* transversely to the wall portions, relative to one another so that the relevant contact elements come into line laterally before they touch one another. The object of this is that all poles of the first contact element come into contact with respective poles of the second contact element.

A disadvantage of the known segment is that spread in the spacing between the bent rims and the base has the result that the segments are not aligned transverse to the base. The male and adjoining female connectors of two segments may be at different heights, so that they do not mate automatically.

The electrician must keep the known segments vertically aligned when bringing them into contact with one another. Once achieved, the electric coupling will be mechanically loaded. The aligning member is a flat plate which may become bent under the influence of the weight of the segment which was rifled during coupling. The risk of a mechanical load on the electric coupling between segments is a serious drawback.

The invention has for its object to provide a segment for a line lighting device of the kind mentioned in the opening paragraph which is of a simple construction and which counteracts a mechanical load on the contact elements of coupled segments. The invention also has for its object to provide a line lighting device fitted with such segments.

According to the invention, this object is achieved in that the aligning member is gutter-shaped and has a base and walls connected thereto,

the aligning member is rigidly fixed in the housing, with its base facing the base of the housing and substantially rigidly connected to the first contact element, and has a furcate portion outside the housing for accommodating a second contact element, and

the second contact element is movably arranged.

Owing to its gutter shape, the alignment member is rigid and suitable for absorbing lateral forces. The furcate portion is capable of aligning a second contact element relative to the first contact element which is rigidly connected to the aligning member, while supporting said second contact element, owing to the movability of the latter.

In a favourable embodiment, the second end portion of the housing has means for aligning an aligning member entering therein relative to the aligning member in the first end portion, transverse to the base.

These aligning means may consist of, for example, a flanged rim at the walls, for example U- or V-shaped, and a resilient member or a guide which forces the aligning member towards this rim, away from the base. Such a flanged rim has the additional advantage of rendering the wall more rigid.

In a favourable modification, however, the means may consist, for example, of a resilient member, or of a guide of a different kind which forces the aligning member towards the base of the housing.

The alignment has the advantage that the coupling of segments becomes more rigid. In addition, the linearity of a device formed by coupled segments is increased, in spite of manufacturing tolerances.

It is advantageous for easy mounting of a device if the aligning means are at a distance from the corresponding end. An aligning member may then be shifted into the second end portion more easily, whereby it is not aligned until shortly before reaching its end position, by which it experiences an increased friction.

In a favourable embodiment, the aligning member has a recess into which the aligning means grip with locking action in the end position. The aligning means then give an even stronger fixation of two segments against the insertion direction than would be the case without locking. The locking, however, need not be undetachable.

The housing may be provided with electrical components, such as a lampholder member, possibly also with an electric device, for example, for

limiting a current through a lamp to be mounted and/or a starter for igniting a lamp, and with a cover. A favourable embodiment, however, is one in which the housing is closed off opposite the base with a cover which carries such components. Such a cover, for example batten-shaped, may be provided with piercing contact for making electrical connections with the conductors interconnecting the contact elements. In addition, a reflector or a screen plate may be connected to the cover, possibly with refracting, scattering, or mirroring elements.

The segment offers the possibility of being coupled fully mounted, and provided with a lamp, for example a tubular fluorescent lamp, to a segment already mounted against a carrier, and of emitting light immediately upon achieving this coupling.

The embodiment of the segment in which the aligning member is forced towards the base of the housing has the advantage that, if a cover for the housing is used, the position of this cover relative to the housing may be a position relative to the base of the housing. It is achieved by this that the dimensions of the housing together with the cover perpendicular to the base can be kept constant within narrow limits, so that the segments are capable of forming a straight line lighting device. The cover may for this purpose be included between the walls of the housing. It is favourable in this connection if the housing provides its grip to means for fastening the housing to a carrier remote from the rims of the walls, for example in the form of a bracket formed at the base, folds shaped in the walls near the base, into which folds a fastening member, for example a hook, can grip.

To support the aligning means, for example the resilient means, which force the aligning member towards the base of the housing in the said embodiment, the aligning member may have a tapering abutment member at its base for the corresponding end of an adjoining segment to be mounted, which member catches the base of the latter segment and aligns it with the base of its own segment.

It is favourable to construct the first contact element as a male connector and the second contact element as a female connector. Projecting connector pins of the first contact element are then protected in the aligning member prior to assembly of a line lighting device.

Embodiments of the segment for a line lighting device according to the invention are shown in the drawings, in which:

Fig. 1a shows a device with first segments in side elevation, partly in longitudinal section;

Figs. 1b and 1c are cross-sections taken on the lines Ib and Ic, respectively;

Fig. 2a shows a detail of a second embodiment of a segment, partly in longitudinal section, partly in side elevation;

Figs. 2b and 2c show the aligning member of Fig. 2a taken on the lines IIb and IIc, respectively;

Fig. 3a shows aligning means for the segment of Fig. 2;

Fig. 3b shows the first contact element of the segment of Fig. 2 in front elevation; and

Figs. 3c and 3d show the second contact element of the segment of Fig. 2 in front elevation and taken on the line IIId, respectively.

The line lighting device of Fig. 1 comprises a segment 1 which is coupled to identical segments 1' and 1''. The segments each have a gutter-shaped housing 2 which is open at a first 3 and a second end portion 4 thereof and which is provided with a base 5 and with walls 6 connected to this base and each having a rim 7 remote from the base.

A first 21 and a second multipole contact element 22, of mutually mating design and interconnected by conductors 23, are arranged on the base 5 in the housing 2 at respective ends thereof, in line and facing away from one another.

An aligning member 30 is arranged on the base 5 in the housing 2, projecting to beyond the first end portion 3. The housing 2 is so shaped as to provide a grip 8 to means for fastening it to a carrier.

The aligning member 30 (see also Figs. 1a and 1b) is gutter-shaped and has a base 35 and walls 36 connected thereto. The aligning member 30 is rigidly fastened in the housing 2, with its base 35 facing the base 5 of the housing, and substantially rigidly connected to the first contact element 21. The aligning member has a furcate portion 31 outside the housing for accommodating a second contact element 22'. The second contact element 22 is movably arranged.

The second end portion 4 of the housing 2 has aligning means 9, 7 for aligning an aligning member 30'' entering therein relative to the aligning member 30 in the first end portion 3. The rim 7 of the walls 6 is U-shaped, flanged inwards, and thus renders the walls more rigid. The aligning member 30'' is pressed into this rim by the compression spring 9 (Fig. 1a). The spring 9 grips into and locks itself in a recess 32'' in the aligning member 30'' in order to fix the latter in its end position. It is difficult to lift the locking action of the spring without auxiliary means owing to the shape of this spring.

The aligning member 30 is also pressed into the rim 7 by means of screws 17.

A batten-shaped cover 10 carrying one or more electrical components, among them a pair of lampholders 11, is enclosed between the walls 6 of the housing 2, thus closing the housing. The pair of

lampholders 11 supports a lamp 12, for example, a low-pressure mercury discharge lamp. The housing 2 has a fold 8 in each of its side walls 6 remote from the rim 7 so as to offer a grip to means for suspending the segment from a carrier, for example, a ceiling. Such means may be formed by, for example, brackets which grip around the base 5. Alternatively, the base may comprise a bracket into which, for example, a pendant grips. The grip may then consist of one or several holes in the base.

The compression spring 9 is at a distance from the end of the housing 2, separated therefrom as it is by the second contact element 22.

In Figs. 2a, b, c, parts corresponding to parts of the preceding Figures have the same reference numerals. The aligning member 40 here is drawn with its base 35 against the base 5 of the housing 2, away from the rim 7. The aligning member 40 presses against the base 5 with its rounded, stamped-out tags 34. These facilitate assembly of the segment and mounting of a device which uses several of these segments. A forward sloping tongue 41 and the adjoining tag 34 together form a tapering abutment 33 at the base 5 for the base of a segment to be coupled. The latter segment slides as it were automatically into this and is aligned with its base relative to the base 5.

The aligning member 40 has a furcate portion 31 for accommodating a second contact element of an adjoining segment in a device, which element has a bevelled edge 37 and a narrowing entrance 38 so as to be self-locating in directions which are perpendicular to one another for said contact element. An opening 39 is present for fastening the first contact element of Fig. 3b therein. Aligning means, for example, a resilient member of Fig. 3a, can grip with locking action into the recesses 32.

The resilient member 19 in Fig. 3a has tags 13 which project to the exterior through respective openings in the base 5 of the housing 2 (*cf.* Fig. 1a) and grip behind the base. The tongue 14 projects into one of these openings and fixes the member. Two spring blades 15 lying one behind the other in the Figure are tensioned when an aligning member 40'' enters so as to press the aligning member towards the base 5. Folds 16 enter recesses 32'' in the end position with locking action.

In Fig. 3b, the first contact element 21 has contact pins 24 so as to form a male connector. A wedge-shaped stud 25 is intended for projecting through the opening 39 in the aligning member 40, and connecting the element substantially rigidly therewith. The element then has little clearance transverse to the base of said member and is thus accurately positioned relative to the base.

The second contact element 22 in Figs. 3c and d has contact bushes 26 so as to form a female connector. A wedge-shaped stud 25 can project through the base 5 of the housing 2 (*cf.* Fig. 1a). Elastic tags 27 press the element away from the base. The element has grooves 28 for cooperating with the furcate portion 31'' of an aligning member 40''. The grooves have a narrowing entrance to facilitate the accommodation of the aligning member. In the position drawn, the element is lifted by the member and at the same time aligned laterally so as to come into line with the first contact element of the adjoining segment. When the aligning member is then forced towards the base 5 by the resilient member 19, the contact element 22 is still further lifted against the pressure of the elastic tags. The two contact elements 21, 22, however, are securely supported by the aligning member during this, so that the electrical coupling of the relevant segments remains mechanically unloaded. The segments are then also mutually aligned as regards their housings, so that a substantially linear device is obtained.

When a segment provided with a cover and a lamp is coupled to a segment which is already electrically energized, the lamp of the coupled segment starts burning the moment the relevant contact elements come into connection with one another. After fixing of the mechanical coupling to a carrier, if applicable, the segment has been mounted and the device has been prolonged by one segment.

Claims

1. A segment for a line lighting device comprising:

a gutter-shaped housing (2) open at a first (3) and a second end portion (4) and provided with a base (5) and with walls (6) connected to this base (5), which walls (6) each have a rim (7) remote from said base,

a first (21) and a second multipole contact element (22) of mutually mating design and mutually connected by conductors (23), arranged in line and facing away from one another on the base (5) in the housing (2) at respective ends thereof,

an aligning member (30) arranged on the base (5), in the housing (2), projecting to outside the first end portion (3),

which housing (2) is shaped so as to provide a grip (8) to means for fastening it to a carrier,

characterized in that

the aligning member (30) is gutter-shaped and has a base (35) and walls (36) connected thereto,

the aligning member (30) is rigidly fixed in the housing (2), with its base (35) facing the

base (5) of the housing and substantially rigidly connected to the first contact element (21), and has a furcate portion (31) outside the housing for accommodating a second contact element, and

the second contact element (22) is movably arranged.

2. A segment as claimed in Claim 1, characterized in that the second end portion (4) of the housing (2) has aligning means (9) for aligning an aligning member (30'') entering therein relative to the aligning member (30) in the first end portion (3).

3. A segment as claimed in Claim 2, characterized in that the aligning means (19) force the aligning member (40) towards the base (5) of the housing (2).

4. A segment as claimed in Claim 2 or 3, characterized in that the aligning means (19) comprise a resilient member.

5. A segment as claimed in Claim 2, 3 or 4, characterized in that the aligning means (9, 19) are at a distance from the corresponding end.

6. A segment as claimed in Claim 4 or 5, characterized in that the aligning member (40) has a recess (32) into which the aligning means (19') of a second segment (1') grip with locking action in an end position.

7. A segment as claimed in Claim 3, characterized in that the aligning member (40) has a tapering abutment member (33) for the base (5') of the housing (2') of a second segment (1').

8. A segment as claimed in Claim 1, 3 or 7, characterized in that the housing (2) is closed off with a cover (10) which carries electrical components (11).

9. A segment as claimed in Claim 8, characterized in that the cover (10) is enclosed between the walls (6) of the housing (2).

10. A segment as claimed in Claim 1, 3, 7 or 9, characterized in that the housing (2) offers a grip (8) to means for fastening to a carrier remote from the rim (7) of the wall (6).

11. A segment as claimed in Claim 1, characterized in that the first contact element (21) has contact pins.

12. A line lighting device provided with several segments (1, 1', 1'') as claimed in any one or several of the preceding Claims.

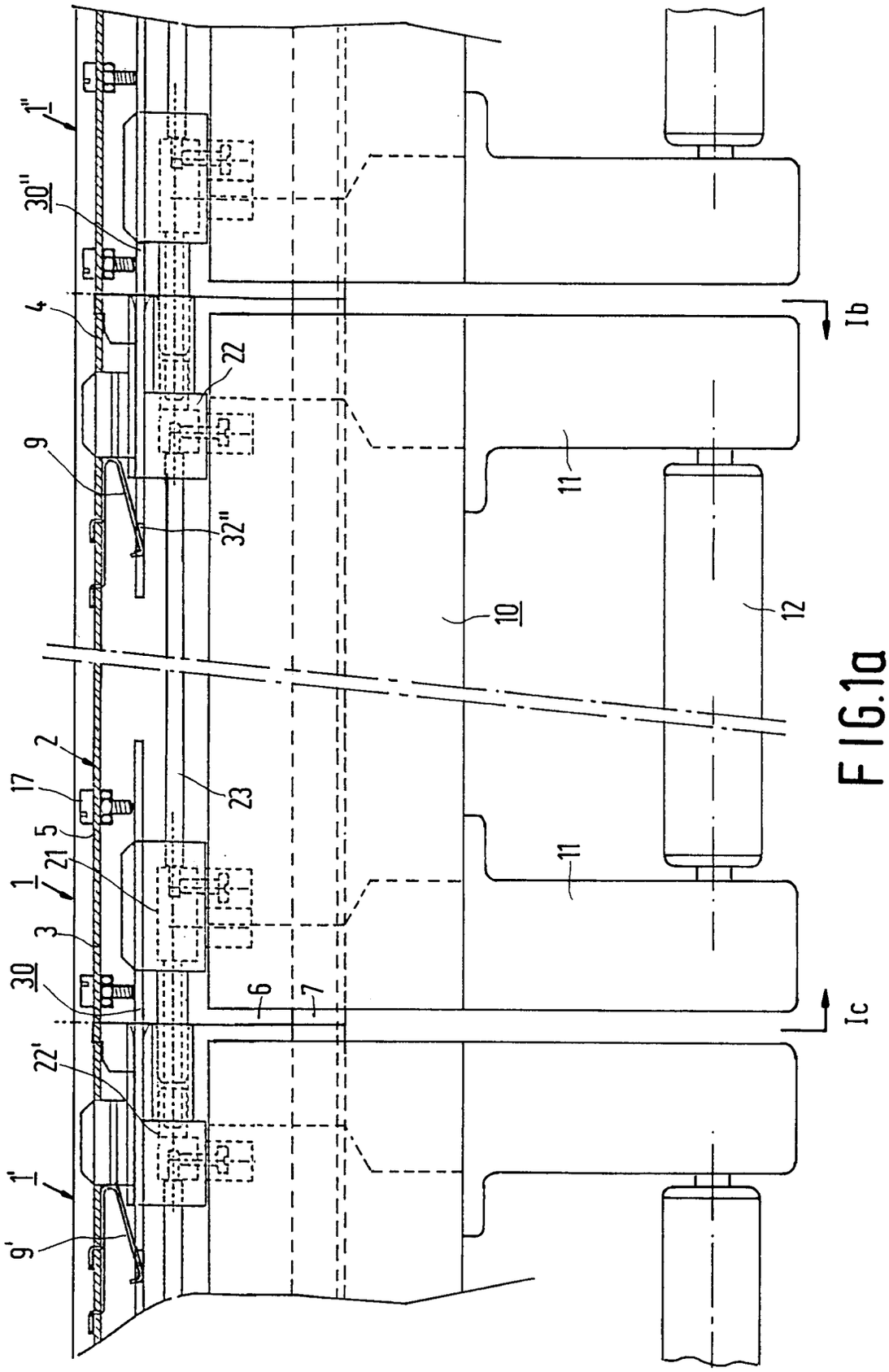


FIG.1a

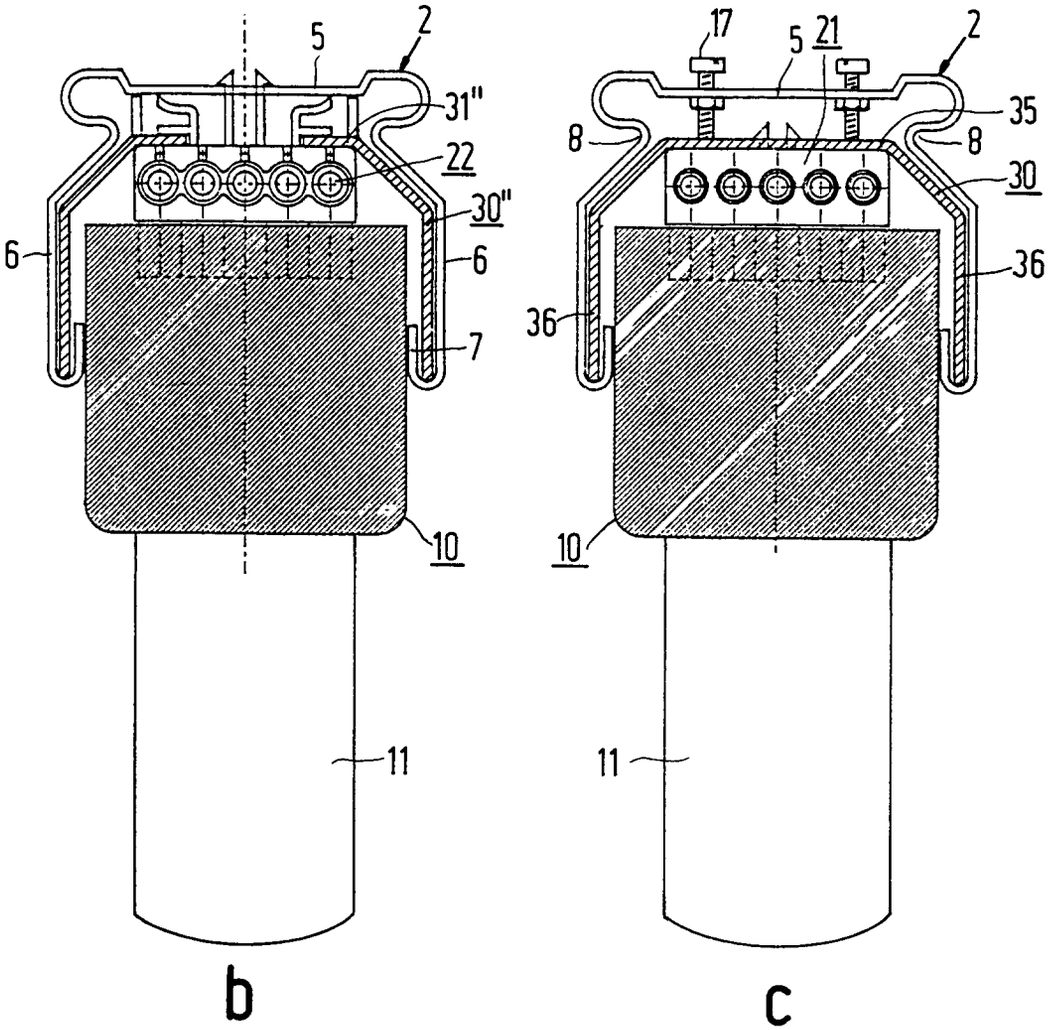
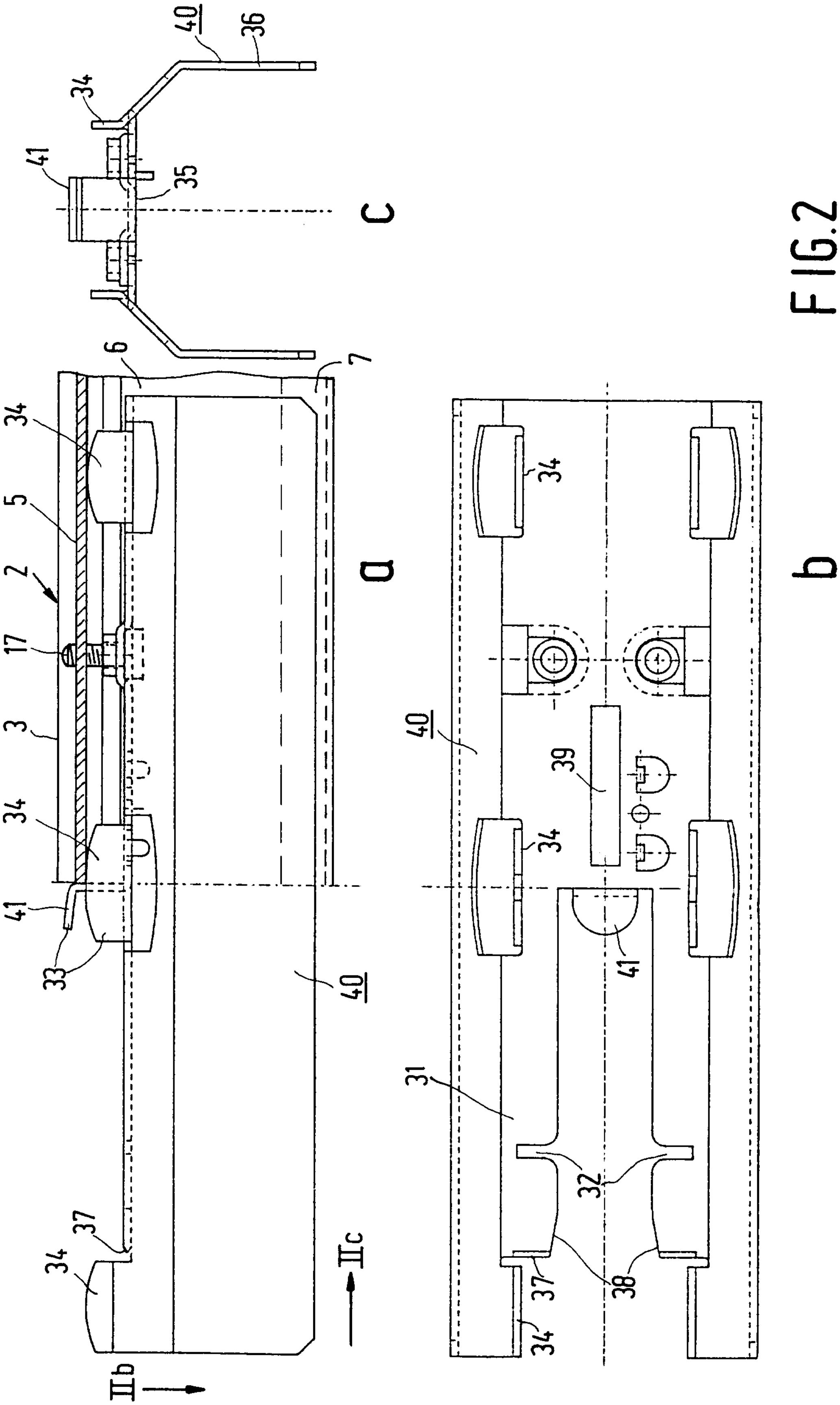


FIG.1


40
36
34
41
35
c
6
7
34
5
2
17
3
34
41
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a
37
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IIb
IIc
34
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39
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41
31
32
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38
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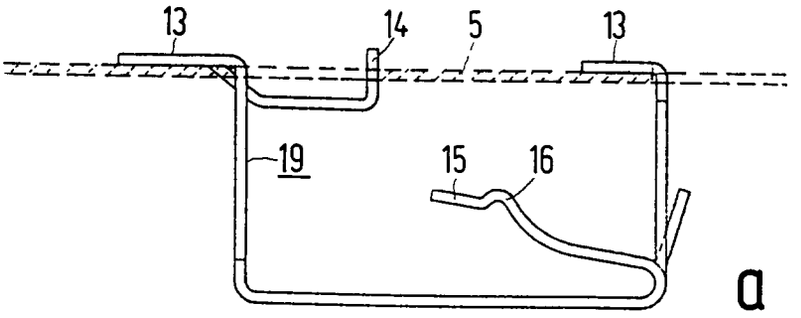
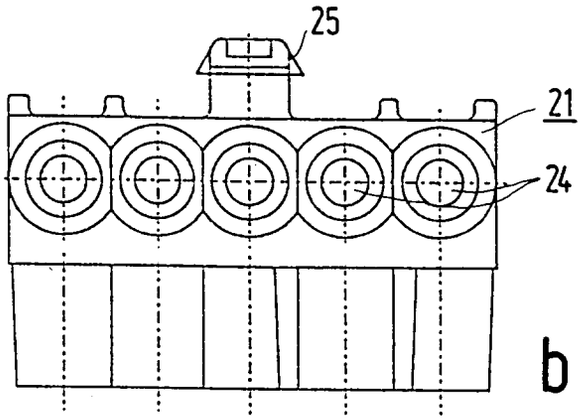
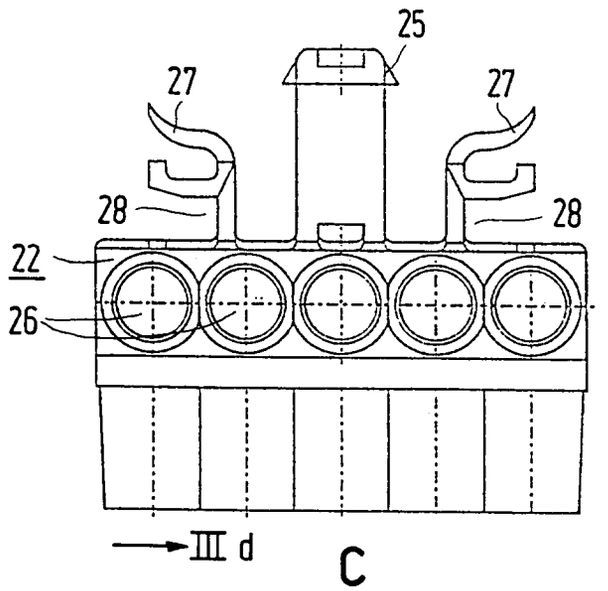
b

FIG.2







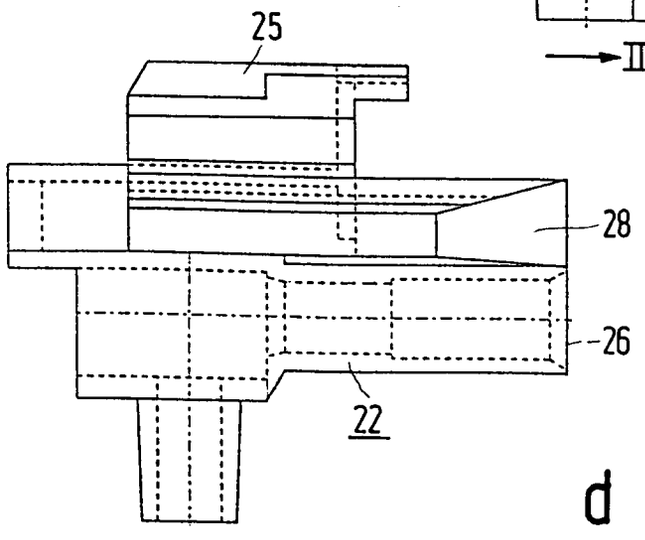


FIG.3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 92 20 3572

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	US-A-2 818 497 (ALDEN) * column 2, line 9 - line 54 * * column 3, line 47 - line 63 * * figures 1-14 *	1,2,4,8, 9,11,12	F21V21/00 F21S3/14
A	---	3,10	
A	CH-A-486 661 (NOVELECTRIC AG) * the whole document *	1-7,12	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F21V
F21S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 FEBRUARY 1993	DE MAS A.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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