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(54) Self-adjustable position detector in antinipping devices for automobile vehicles

(57) A self adjustable position detector in antinipping devices for automobile vehicles, whose purpose is to determine the elimination of the antinipping in at least one of the end zones, at which the position detectors are arranged on the exterior of the electronic box. The positioning of the window is carried out by means of a switch (21) or a Hall pick-up (2) located parallel to the rail or track. A slide (4), to which the window is fastened, presses the switch or inverts the signal of the Hall pick-up (2) as its passes, transmitting a signal to the electronic box or module, which determines whether the antinipping system should be activated or not. The Hall pick-up (2) is positioned by means of a projection (19) on the slide (4) which displaces it the first time the window winder is raised and it adjusts itself throughout the life of the unit.

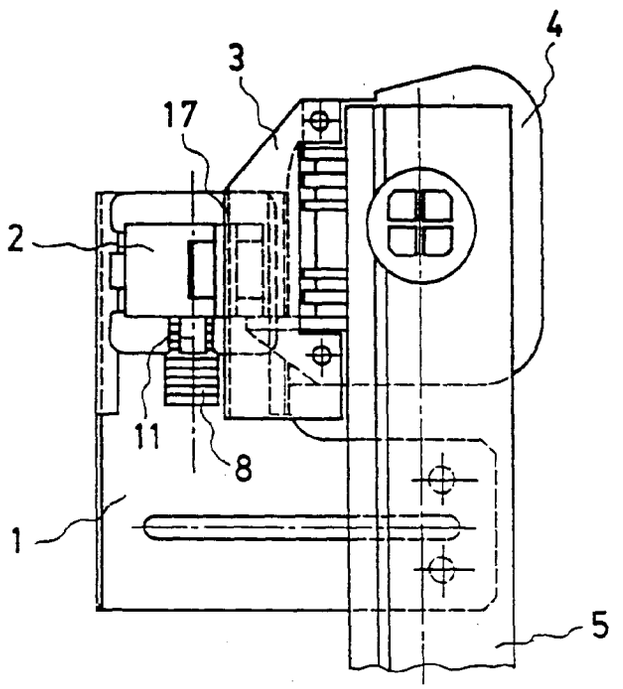

Fig.: 1

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Description

The invention relates to a self-adjustable position detector in antinipping devices for automobile vehicles, and more specifically to those devices destined to prevent door windows, sunroofs, etc. in these vehicles from nipping or trapping.

Its application is included within the general technique described in applications ES.P.9201697 and ES.P.9501647, with its primary objective being to achieve a device to detect the end of the antinipping zone that is fixed initially in every vehicle in accordance with its particular characteristics and which, moreover, is self-adjustable, so that it does not need any special maintenance during the working life of the system.

In general terms, we wish to point out as prior technology, that in devices of this type, stops are usually situated at the appropriate end points of the vehicle window travel, which limit the end of the antinipping. These detectors are generally adjusted at the beginning for the end rubber elements that limit the space for the window or sunroof, being located initially with a particular adaptation to each space, since the stop is usually different in each door or window as the arrangement of each is different.

The problem which is produced is that of determining, on the one hand, the initial position of the detector, and on the other hand, that of adjusting this said position as the system is being used and the different component elements gradually alter the characteristics of their initial positions.

A detector in accordance with the present invention is composed of a support part with two well-differentiated areas, by means of one of which it is secured to the end of the movement rail or guide on the opposite side to that of circulation of the drive slide, thus, logically, allowing the free movement of the said slide.

The other area determines a longitudinal portion, essentially parallel to that of the rail, in which the signal pick-up element in question is included.

Logically, the most elemental shape for this support part is that of an "L" although without ruling out other geometrical designs, which is hereby put on record.

This second portion of the support part is provided with a longitudinal central area which has a directional serrated area cut into it, in which the teeth are inclined towards the free end of the said portion.

In the same way, this second portion or wing of the part is also provided with at least one longitudinal side guide capable of receiving the pick-up element and allowing it to slide.

On board this second portion is situated the antinipping zone end pick-up support, with this said pick-up being provided with a least one end projection or protuberance, to fit into the side guides of the support part. In the same way, this support also has a protruding centred tooth, capable of being housed into the unidirectional serrated area in the support part or base.

In this way, once that the support has been fixed to the slide rail by conventional means, the pick-up support is fitted into the guides in this rail and the tooth on the said pick-up support, in turn, is housed in the end tooth in the support part or base.

Once that the pick-up in question has been received in its support, external action on it from the exterior will determine that the pick-up support can slide outwards on the second portion of the support part, without the possibility of returning to the initial position, by virtue of the direction of the serrated area of the support part.

In order to determine this movement, the drive slide for the window is used, which includes a projection capable of making contact with the pick-up support and transferring it to its exact position at the start of the rubber elements in the gap in the window or roof.

When the system is incorporated for the first time, the slide is situated butted up against the rubber elements, making the pick-up support move to the most possible end position along the corresponding guides and projections of both. After this, the slide is operated and it moves the pick-up support closer towards a stop position, where it is maintained, since it is impossible for it to return due to the fact that its tooth is engaged in the slots in the support part. In this way, the unit is fixed at the start of assembly, with which, on operating the pick-up slide, the end of the antinipping area takes place.

When the rubber and other elements in the system gradually become worn due to circumstances of prolonged operation, the unit regulates itself, given that the slide pushes the pick-up support until it butts up against the end.

The pick-up or sensor can be a element such as a Hall effect pick-up or a switch, as can be seen in the accompanying sheets of drawings. The slide in one or other of these assumed cases will be provided with the suitable means to enter into contact with the pick-up in question, sending an appropriate signal to the electronic box of the unit.

In the accompanying sheets of drawings, which are merely for guidance and are of a non-restrictive nature, two practical solutions for the invention are represented.

- Figure 1 shows a plan view of the unit when a Hall effect pick-up is used.
- Figure 2 represents a plan view of the support part for the solution shown in Figure 1.
- Figure 3 corresponds to a cross-sectional view on line I-I of Figure 2.
- Figure 4 is a plan view of the pick-up support, attachable and corresponding to Figure 1.
- Figure 5 is a cross-sedional view on line II-II of Figure 4.
- Figure 6 is a plan view of a ferromagnetic plate to be situated on board the slide when the solution shown in Figure 1 is used.
- Figure 7 represents a view of the slide which is common to the two variants of the invention.

- Figure 8 is a view of the end of the rail or track when the unit uses a switch.
- Figure 9 shows the support part when a switch is used.
- Figure 10 is a cross-sectional view on line III-III of Figure 9.
- Figure 11 represents the support for the switch.
- Figure 12 shows a possible switch, used according to the invention.

Looking now at Figure 1, we can appreciate the slide rail (5) for the drive slide (4) that holds the window pane, which is not shown. Mounted on the rail we can see the support part (1) fixed to the lower face or side of the rail (5). On the outer arm, the grooves (8) can be seen, against which the tooth (11) of the pick-up (2) makes contact.

The slide (4) includes the ferromagnetic plate (3) provided with a wing (14) which will come into play with the Hall effect pick-up, while the projection on the slide, not numbered in this case, can also be observed.

In accordance with Figures 2 and 3, the shape of the support part (1) can be understood, provided with the holes (6) so that it can be fixed to the rail, the teeth directed towards the right and the edges bent or crimped (7) in order to facilitate the entrance and later positioning of the pick-up support.

The pick-up support (2) or pick-up itself in this case, shown in Figure 3, has its longitudinal projections (9, 10) for housing the guides (9) and the central tooth (11) to make contact with the grooves (8), as well as the central gap or hollow (15) for the wing (17) of the ferromagnetic plate (3) to pass through.

The cross-sectional view on line II-II of Figure 5 allows us to appreciate the tooth (11) with its end (14), as well as the two central elevations (12), into the cavities (13) of which a sensor and a magnet, respectively, are received, in order to produce a flow that will be interrupted by the plate (3) when it passes or travels through the cavity (15).

The plate (3) illustrated in Figure 6 shows the wing (17) and its ends (16) with holes for its incorporation and fixing to the holes (18) of the slide (4) (Figure 7). This slide also includes the projection (19) to make contact with the pick-up support and position it appropriately.

When the pick-up is of the Hall effect type, as shown in connection with Figures 1 to 6, the slide will include the plate (3), whereas when the signal is produced by the operation of a switch, the area (20) of the slide (4) will be the part that will act on the said switch, as will be appreciated by referring to Figure 8 to 12.

In Figure 8 we can observe the variant of the invention which includes the switch (21) on the support (22) and on the base part (1). In this case, this part (1) has one single guide (23) (Figures 9 and 10) and the unidirectional teeth (8), as well as the holes for its inclusion onto the slide (4).

The switch-holder (24) shown in Figure 11 includes some portions (26) to receive the switch (21), which becomes secured through the holes (25), by means, for example, of projections on the switch itself which would fit into these holes. One longitudinal side of this support (24) is carried out as a guide (27) for its connection with the projection (23) on the support (1) and, in the same way, it is provided with a tooth (28) with its end (29) to be housed in the teeth (8).

In Figure 12, we can see the switch (21) itself, with its projection (31), to be pressed by the portion (20) of the slide (4), as well as the outlet connections (30) for the wiring to the electronic module. To preserve the integrity of the projection (31) from the repeated pressing by the slide, the existence of a strip (32, 33) can be considered or decided, arranged at any point of the switch, so that this strip makes the contact with the said projection gentler.

It is important to point out, once having described the nature and advantages of this invention, its non-restrictive character, inasmuch as changes in the shape, materials or dimensions of its constituent parts will not in any way alter its essence, as long as they do not mean a substantial variation of the whole assembly.

Claims

1. Self-adjustable position detector in antinipping devices for automobile vehicles, which is prepared as a unit provided with an electronic module and a motor-reducer with one drive wiring and another electrical connection wiring towards the rail (5) on which a drive plate (4) circulates, with sensors being situated at certain points of the rail and a magnet being situated on board the drive plate, which is characterized because on at least one of the ends of the rail (5), a support (1) is arranged, preferable L-shaped, one of whose wings is fixed to the said rail along which the drive slide travels, while the other is established parallel to the drive slide, with this wing having at least one longitudinal guide into which a support for the pick-up (2) in question is housed and a set of transversal centred grooves (8) into which a tooth (11), with which the said pick-up support is provided, makes contact and engages, thus permitting the said support to move in only one single direction, towards the outer part of the wing, when it is operated by a projection on the drive slide in its end positions, in that the drive slide is also provided with the opportune means to operate or activate the pick-up so that it transmits a signal to the electronic box which determines whether the antinipping should be active or not and in which, as wear is produced during the working life of the unit, the projection in the slide acts on the pick-up support, which self-adjusts at all times, once that it has been position by the first raising of the window winder or item in question.

2. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that when a Hall effect pick-up is used, the drive slide includes a ferromagnetic plate (3) with an L-shaped cross-section, one of whose wings passes through a slot or groove in the pick-up support, cutting of the flow generated, inverting the signal and sending an appropriate signal to the electronic module.

3. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that when the pick-up in question is a micro-switch (21), a small longitudinal extension (20) of the slide presses the projection of the said switch, causing the corresponding signal to be sent to the electronic module.

4. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that the longitudinal extension of the slide acts on a strip (32,33) arranged over the projection of the switch, which is contacted by the said extension in order to preserve the working life of the said projection.

5. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that the unit is situated at one of the ends of the slide in such a way that the pick-up comes as close as possible to the rubber elements of the door or cavity where the window is fitted.

6. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that the unit is situated at both ends of the rail.

7. Self-adjustable position detector in antinipping devices for automobile vehicles, in accordance with claim 1, characterized in that projection on the slide for positioning the support and the pick-up, is situated at the end of the slide, at the side of the centre of the rail.

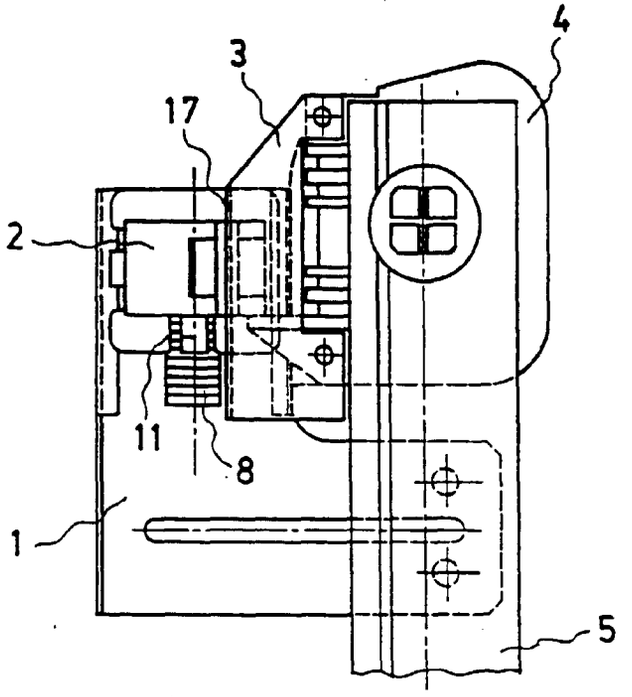

Fig.: 1

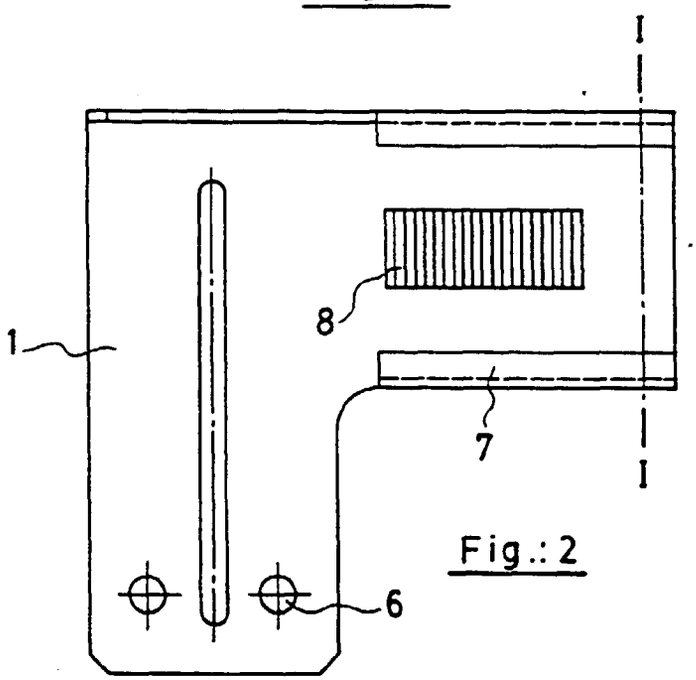

Fig.: 2

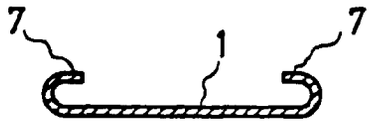

Fig.: 3

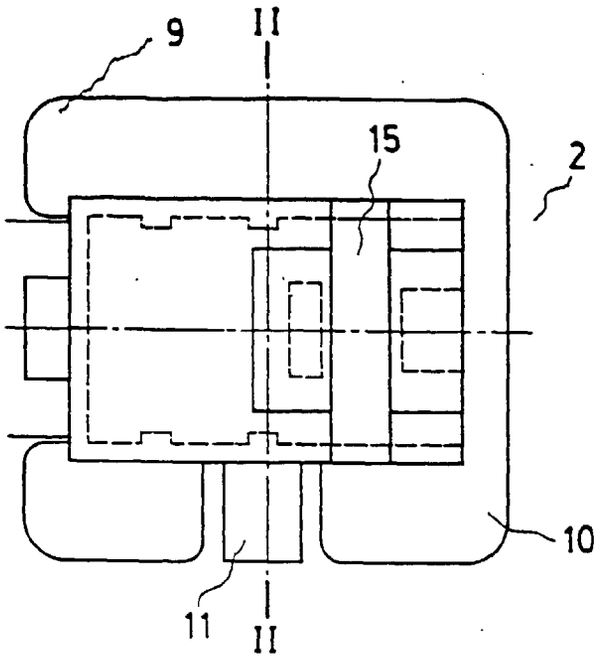

Fig.: 4

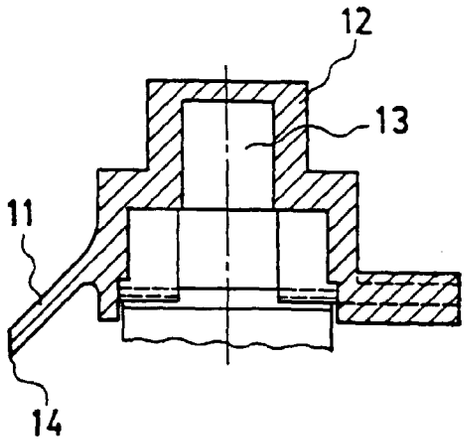

Fig.: 5

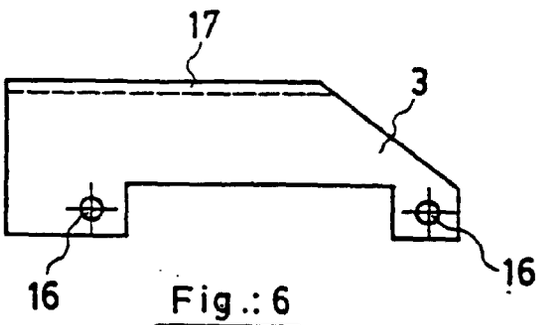

Fig.: 6

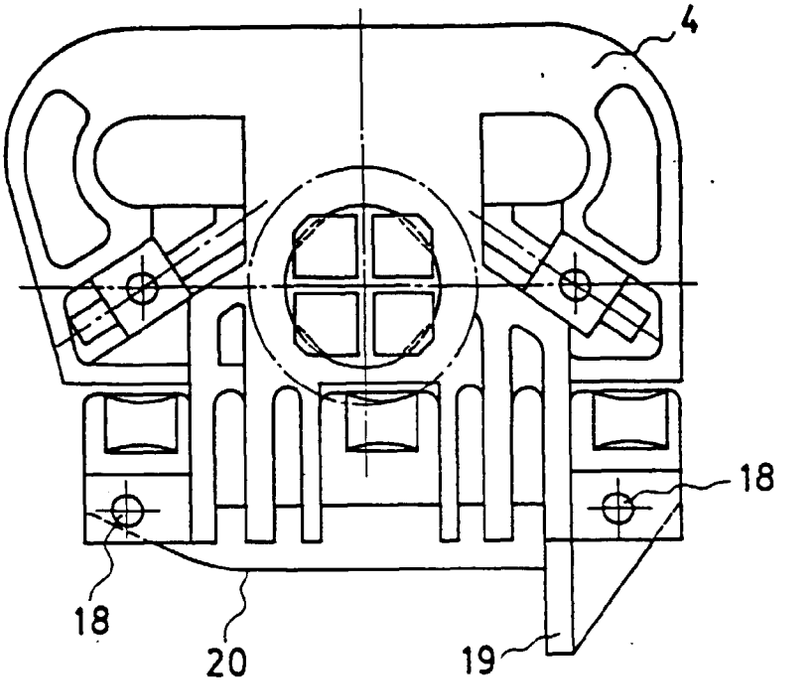

Fig.: 7

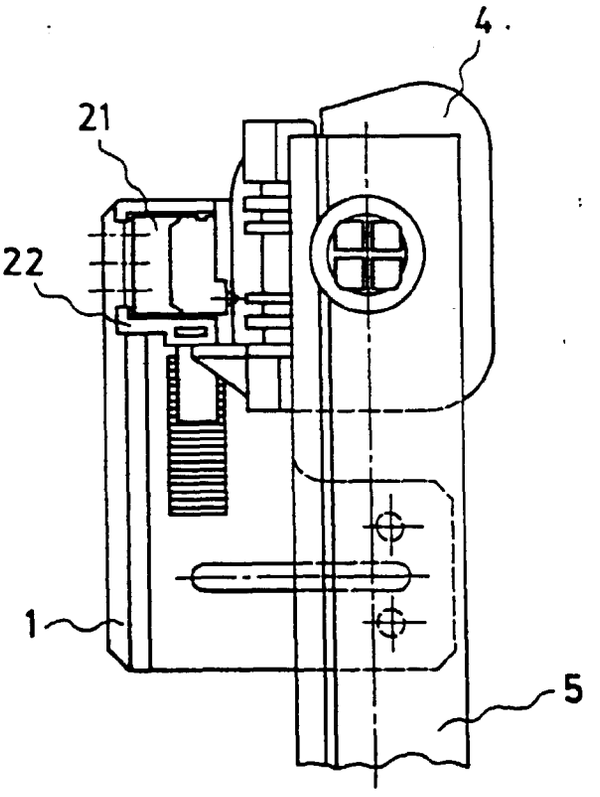

Fig.: 8

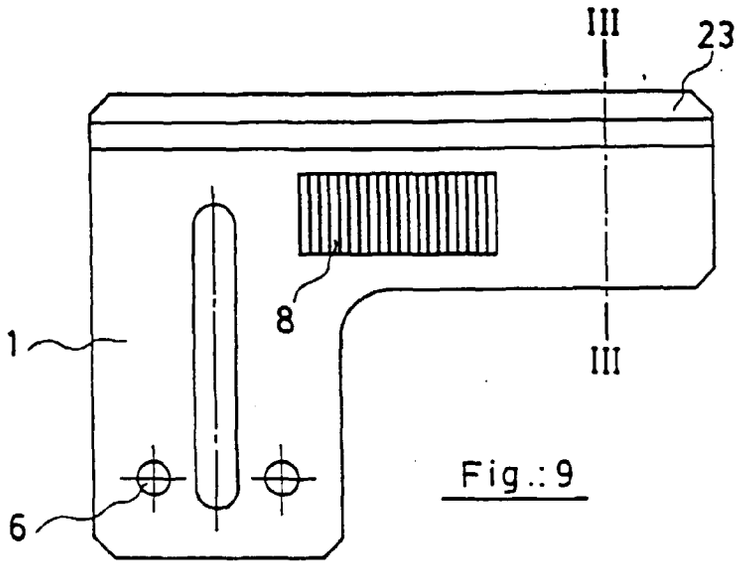

Fig.: 9

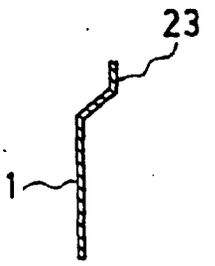

Fig.: 10

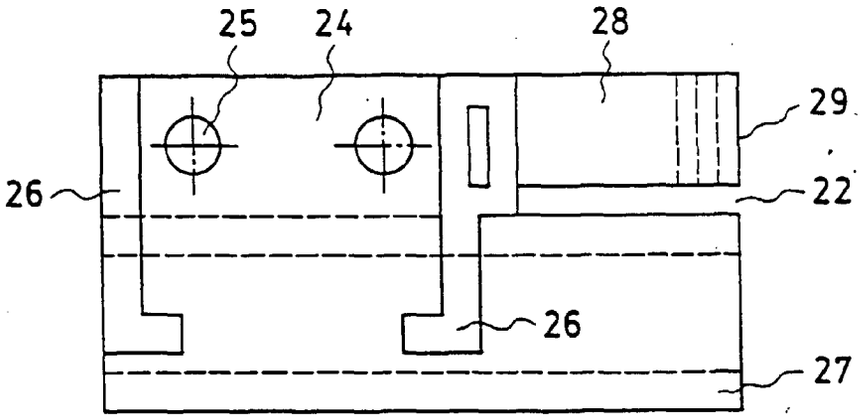

Fig.: 11

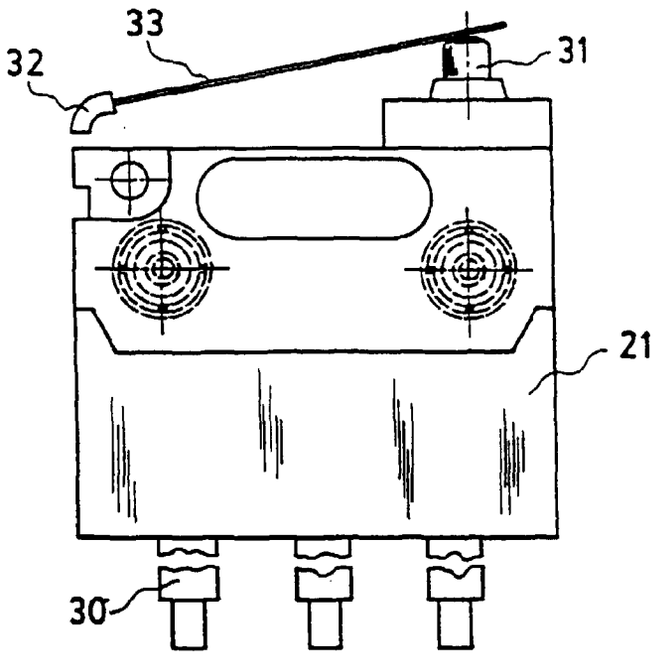

Fig.: 12

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EUROPEAN SEARCH REPORT

Application Number
EP 96 50 0118

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.6)
D,A	EP-A-0 584 033 (DISPOSITIVOS DE ACCESORIOS DE PUERTAS, S.A.) * abstract * -----	1	E05F15/00 E05F15/16

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 November 1996	Van Kessel, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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