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(54) Accident-preventing safety device for automatic moving closure barriers

(57) An accident-preventing safety device for automatic moving closure barriers, such as gates, main doors, overhead doors, and the like, including a first part (2) which is pivoted to a second part (4) which can be anchored to a closing edge (C) of a barrier (A) and elastic contrast means are interposed between the first and second parts (2, 4) to keep them usually mutually spaced. Electrical switching means (10) which are suitable to stop and/or reverse the motion of the barrier (A) in the presence of external forces (F) which act on the first part (2) and contrast the elastic means (5) are provided. The switching means can be constituted by at least one electrical microswitch (10), anchored to one (4) of the first and second parts and having a button (11) adapted to interact with a protrusion (12) formed in a facing position on the other part (2).

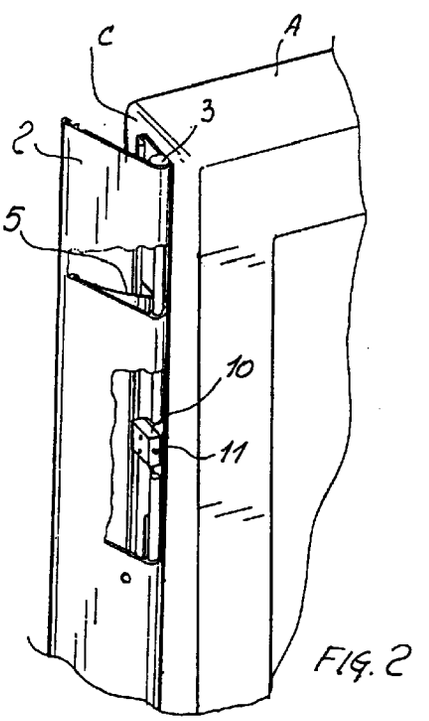

FIG. 2

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Description

The present invention relates to an accident-preventing safety device for automatic moving closure barriers, such as doors, gates, overhead doors, and the like.

In order to comply with current safety standards, automatic barriers must stop and/or reverse their direction of motion if there are obstacles along their path.

A conventional type of safety device uses photocells and/or electronic sensors that are arranged appropriately and are connected to the control unit of the automatic barrier.

A drawback of these conventional safety devices is their excessive cost; in order to achieve a high degree of safety it is in fact necessary to use several sensors and the corresponding drive systems, whose high cost is well-known.

Another drawback of conventional devices is constituted by the frequent false interventions of the sensors; for example, to trigger the intervention of the safety device it is sufficient for an insect, or an object floating in the air, to cross the path of the photocell.

In order to obviate the above drawbacks, a safety device has been provided which includes a profiled part rotatably hinged to the closing edge of the automatic barrier, with a pressure switch that is interposed and connected by virtue of a feedback line to the control unit of the automatic barrier.

The pressure switch is operated in the presence of forces that act on the profiled part, are directed against the closing edge, and are generated, for example, by obstacles that are present along the closing path of the automatic barrier.

In these conditions, the activation of the pressure switch stops the motor of the automatic barrier and optionally reverses the direction of its motion.

This conventional device, despite being relatively simple and cheap, is difficult to adjust and has the drawback that does not ensure quick and precise intervention in any operating condition.

Moreover, the pressure switch can frequently malfunction.

The aim of the present invention is to eliminate the above drawbacks by providing an accident-preventing safety device for automatic barriers that is quick-acting, reliable, and strong as well as suitable for operation in any environmental condition.

Within this aim, an object of the invention is to provide a safety device that is simple and cheap and can be applied to any kind of gate, door, and automatic barrier in general.

This aim and this object and others which will become apparent in the following description are achieved by virtue of a device as described in the preamble of claim 1, including a first part that is pivoted to a second part that can be anchored to a closing edge of an automatic barrier and elastic contrast means interposed between the first and second parts to keep them usually mutually spaced, characterized in that it comprises electric switching means adapted to stop and/or reverse the motion of the automatic barrier in the presence of external forces that act on the first part and contrast the elastic means.

More specifically, the switching means are constituted by at least one electrical microswitch, which is anchored to one of the elongated parts and interacts, for actuation, with a protrusion which is formed correspondingly on the other elongated part.

This configuration, in addition to being very simple and functional, drastically reduces the production, maintenance, and assembly costs of the safety device.

An embodiment of the safety device according to the invention is described hereinafter and illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the safety device according to the present invention, applied to an automatic sliding gate;

Figure 2 is a partially sectional enlarged-scale perspective view of the safety device of Figure 1;

Figure 3 is a transverse sectional view of the safety device of Figure 1 in the inactive condition;

Figure 4 is a transverse sectional view of the safety device of Figure 1 in operating conditions.

With reference to the above figures, the accident-preventing safety device according to the invention, generally designated by the reference numeral 1, is applied to an automatic gate A of the sliding type at the vertical closing edge C.

The safety device 1 includes a first elongated part 2, which is constituted for example by a profiled part made of synthetic or metallic material and hinged along a longitudinal axis 3 to a second elongated part 4, which is also constituted by a profiled part and can be anchored to the closing edge C of the automatic gate A.

Elastic contrast means are interposed between the two profiled parts 2 and 4 and are adapted to keep them mutually spaced toward the end that lies opposite to the hinging end.

The elastic means can be constituted for example by at least one spring 5 of the flat, wire, or spiral type, the opposite ends 6 and 7 thereof being inserted in adapted seats 8 and 9 formed in corresponding positions on the inside walls of the two profiled parts 2 and 4.

According to the invention, electrical switching means are provided which are suitable to stop and/or reverse the motion of the automatic gate A in the presence of external forces which act on the first profiled part 2 and oppose the contrast force of the spring 5.

These switching means are constituted by an electrical microswitch 10, which is anchored to the inside

wall of the part 4 and provided with a button 11, which faces a protrusion 12 formed on the other part 2.

The microswitch 10 is connected, either directly or indirectly by virtue of a relay, to the control unit of the driving motor (not shown) of the automatic gate A.

Conveniently, the microswitch 10 operates in low-voltage safety conditions and is of the sealed type suitable for outdoor environments.

The microswitch 10 is preferably of the monostable and normally-closed type, so that upon actuation it immediately interrupts the flow of current flowing through it, immediately halting the motor of the automatic gate A and optionally reversing the motion of the motor.

The safety device according to the invention can also be easily fitted to overhead doors, main doors, sliding gates or side-hung gates, even if these have already been installed.

Its simple configuration ensures maximum reliability and durability, considerably reducing costs with respect to similar conventional safety devices.

The accident-preventing safety device according to the invention is subject to numerous modifications and variations, all of which are within the scope of the inventive concept expressed by the accompanying claims. All the details may furthermore be replaced with other technical equivalents that are understood to be equally protected. The materials, the shapes, and the dimensions may be any according to the requirements.

Claims

1. An accident-preventing safety device for automatic moving closure barriers, such as gates, main doors, overhead doors, and the like, comprising a first part (2) which is pivoted to a second part (4) which can be anchored to a closing edge (C) of a barrier (A) and elastic contrast means interposed between said first and second parts (2, 4) to keep them usually mutually spaced, characterized in that it comprises electrical switching means (10) adapted to stop and/or reverse the motion of the barrier (A) in the presence of external forces which act on said first part (2) and contrast said elastic means (5).

2. A device according to claim 1, characterized in that said switching means are constituted by at least one electrical microswitch (10), which is anchored to one (4) of said first and second parts and having a button (11) which is suitable to interact with a protrusion (12) formed in a facing position on the other part (2).

3. A device according to claim 1, characterized in that said microswitch (10) is of the low-voltage type and is connected to the control unit of the automatic barrier (A).

4. A device according to claim 1, characterized in that said microswitch (10) is a normally-open monostable button.

5. A device according to claim 1, characterized in that said microswitch (10) is of the sealed type for outdoor use.

6. A device according to claim 1, characterized in that said elastic means are constituted by at least one spring (5) the opposite ends whereof (6, 7) being engaged in adapted seats (8, 9) formed correspondingly on the two parts (2, 4).

7. A device according to claim 1, characterized in that said first and second parts (2, 4) are elongated.

8. A device according to claim 7, characterized in that said first and second elongated parts (2, 4) are constituted by profiled parts made of metallic or synthetic material.

9. A device according to claim 8, characterized in that said protrusion (12) is formed monolithically in one (2) of said first and second profiled parts.

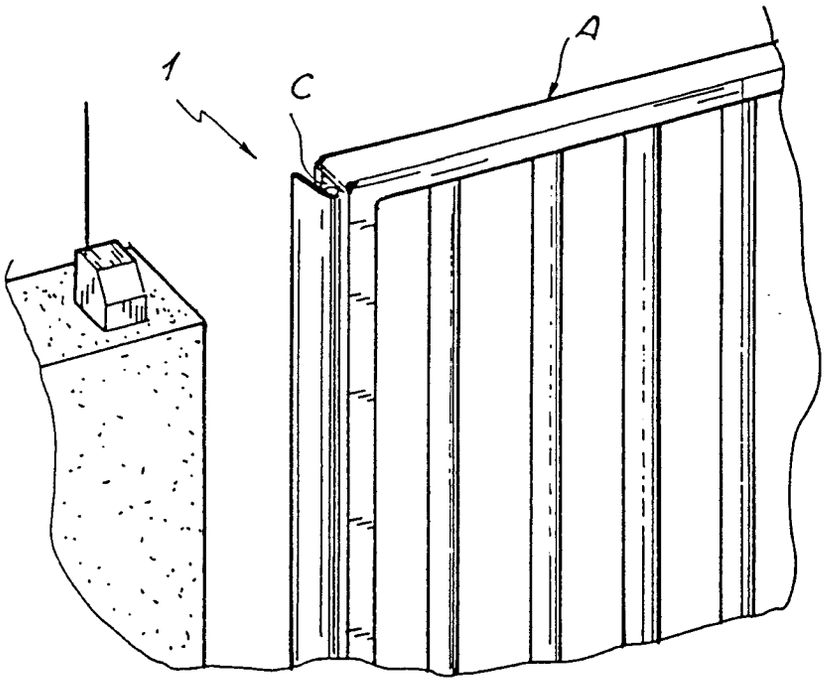

FIG. 1

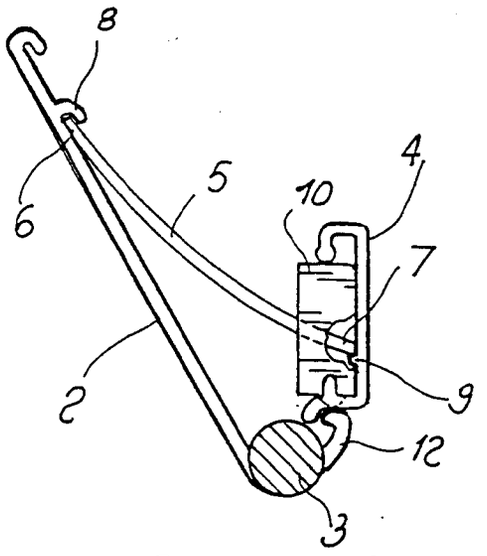

FIG. 3

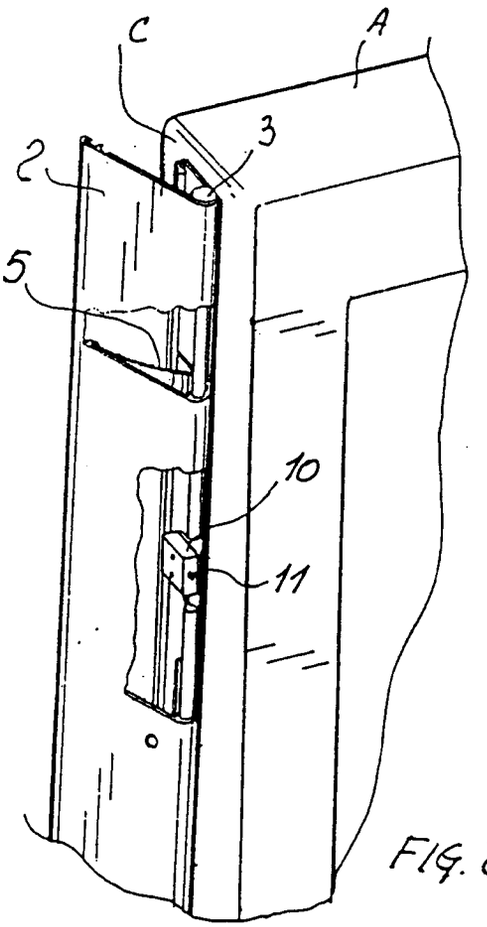

FIG. 2

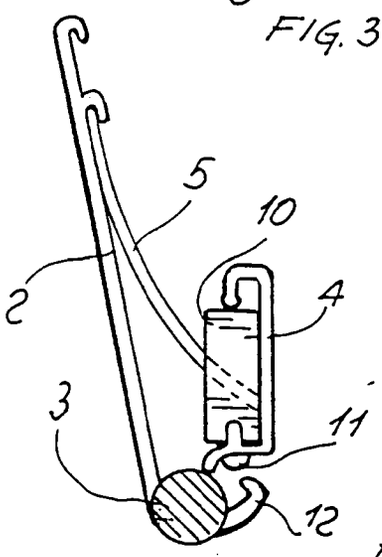

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 9259

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)
X	WO 95 32145 A (SELCOM) * page 6, line 7 - line 24; claims 1,2,7; figure 4 *	1-4,7,8	E05F15/00
A	FR 2 484 515 A (CREUSOT-LOIRE) * claims 1,2; figures 1,2 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
E05F F16P

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 March 1997	Guillaume, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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