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

Unfallverhütungssicherheitsvorrichtung für automatisch bewegende Schliessstüre

Dispositif de sécurité pour la prévention d'accidents pour portes à fermeture automatique

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(56) References cited:
**WO-A-95/32145 FR-A- 2 484 515
US-A- 3 903 647**

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Description

[0001] The present invention relates to an accident-preventing safety device for automatic moving closure barriers, such as doors, gates, overhead doors, and the like.

[0002] 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.

[0003] 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.

[0004] 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.

[0005] 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.

[0006] 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.

[0007] 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.

[0008] In these conditions, the activation of the pressure switch stops the motor of the automatic barrier and optionally reverses the direction of its motion.

[0009] 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.

[0010] Moreover, the pressure switch can frequently malfunction.

WO-A-95 32145 discloses a safety device for automatic doors of the above type and comprising the features as disclosed in the preamble of claim 1.

[0011] 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.

[0012] 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.

[0013] This aim and this object and others which will become apparent in the following description are

achieved by virtue of a device as claimed in claim 1.

[0014] 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.

[0015] This configuration, in addition to being very simple and functional, drastically reduces the production, maintenance, and assembly costs of the safety device.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] These switching means are constituted by an electrical microswitch 10, which is anchored to the inside wall of the second part 4 and provided with a button 11, which faces a protrusion 12 formed on the first part 2.

[0023] The microswitch 10 is connected, either direct-

ly or indirectly by virtue of a relay, to the control unit of the driving motor (not shown) of the automatic gate A.

[0024] Conveniently, the microswitch 10 operates in low-voltage safety conditions and is of the sealed type suitable for outdoor environments.

[0025] 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.

[0026] 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.

[0027] Its simple configuration ensures maximum reliability and durability, considerably reducing costs with respect to similar conventional safety devices.

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 normally mutually spaced, 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 a first portion of said first part (2) and contrast said elastic means (5), said switching means comprising at least one electrical microswitch (10) and a normally depressed button (11) which is released in the presence of said external forces,
characterized in that said microswitch (10) is anchored to said second part (4) such that the microswitch (10) and button (11) are arranged between the first part (2) and the second part (4) and wherein said button (11) is adapted to interact with a protrusion (12) formed in a facing position on a second portion of the first part (2), the second portion extending beyond the first portion relative to the pivot axis (3).
2. 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).
3. A device according to claim 1, **characterized in that** said microswitch (10) is a normally-closed monostable button.
4. A device according to claim 1, **characterized in**

that said microswitch (10) is of the sealed type for outdoor use.

5. 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).
6. A device according to claim 1, **characterized in that** said first and second parts (2, 4) are elongated.
7. A device according to claim 6, **characterized in that** said first and second elongated parts (2, 4) are constituted by profiled parts made of metallic or synthetic material.
8. A device according to claim 7, **characterized in that** said protrusion (12) is formed monolithically in one (2) of said first and second profiled parts.

Patentansprüche

1. Unfallverhütungssicherheitsvorrichtung für automatisch bewegende Schließtüren, wie Tore, Haupttüren, Überkopftüren und dergleichen, welche ein erstes Bauteil 2, das drehbar an einem zweiten Bauteil 4, welches an einer Schließkante C einer Schließtür A festgelegt werden kann, angelenkt ist und um das ersten und zweiten Bauteil 2, 4 im rechten Winkel von einander entfernt zu halten, zwischen diesen platzierte elastische Abstandshalter aufweist, sowie ein geeignetes elektrisches Schaltelement 10 zum Anhalten und/oder Umkehren der Bewegung der Schließtür A bei Vorliegen von äußeren Kräften, die auf einen ersten Teil des ersten Bauteils 2 einwirken und den elastischen Mitteln 5 entgegenwirken, mit wenigstens einem elektrischen Mikroschalter 10 und einem senkrechten niedergedrückten Knopf 11, welcher bei Vorhandensein der äußeren Kräfte losgelassen wird, aufweist, **dadurch gekennzeichnet, daß** der Mikroschalter 10 an dem zweiten Bauteil 4 festgelegt ist, so daß der Mikroschalter 10 und der Knopf 11 zwischen dem ersten Bauteil 2 und dem zweiten Bauteil 4 platziert sind und wobei der Knopf 11 zur Wechselwirkung mit einer Vorwölbung 12 geeignet ist, die in einer gegenüberliegenden Position an einem zweiten Teil des ersten Bauteils 2 geformt ist, wobei der zweite Teil relativ zur Drehachse 3 hinter dem ersten Teil hervorsteht.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** der Mikroschalter 10 ein Niederspannungsschalter ist und mit der Steuereinheit der automatischen Schließtür A verbunden ist.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** der Mikroschalter 10 ein senkrecht schließender monostabiler Knopf ist.
4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** der Mikroschalter 10 ein zum Außengebrauch abgedichteter Schalter ist.
5. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** die elastischen Mittel durch wenigstens eine Feder 5 gebildet ist, deren gegenüberliegende Enden 6, 7 in geeignete Sitze 8, 9 eingreifen, welche entsprechend an den beiden Bauteilen 2, 4 geformt sind.
6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** die ersten und zweiten Bauteile 2, 4 langgestreckt sind.
7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, daß** die ersten und zweiten langgestreckten Bauteile 2, 4 durch profilierte Bauteile gebildet sind, die aus einem metallischen oder synthetischen Material gemacht sind.
8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet, daß** die Vorwölbung 12 einteilig in einem der ersten und zweiten profilierten Bauteile 2 geformt ist.

Revendications

1. Dispositif de sécurité anti-accident destiné à des barrières de fermeture mobiles automatiques, comme des portails, des portes principales, des portes basculantes et analogues, comportant : une première partie (2) qui est montée pivotante par rapport à une seconde partie (4) qui peut être ancrée sur un bord de fermeture (C) d'une barrière (A), et des moyens d'opposition - élastiques interposés entre lesdites première et seconde parties (2, 4) pour les maintenir normalement mutuellement espacées, des moyens de commutation électriques (10) adaptés pour stopper et/ou inverser le mouvement de la barrière (A) en présence de forces extérieures qui agissent sur une première portion de ladite première partie (2) et qui s'opposent auxdits moyens élastiques (5), lesdits moyens de commutation comportant au moins un micro-rupteur électrique (10) et un bouton normalement enfoncé (11) qui est libéré en présence desdites forces extérieures,
caractérisé en ce que ledit micro-rupteur (10) est ancré sur ladite seconde partie (4), de sorte que le micro-rupteur (10) et le bouton (11) sont disposés entre la première partie (2) et la seconde partie (4), et ledit bouton (11) étant adapté pour interagir avec une saillie (12) formée dans une position

en vis-à-vis sur une seconde portion de la première partie (2), la seconde portion s'étendant au-delà de la première portion par rapport à l'axe de pivotement (3).

2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit micro-rupteur (10) est du type basse tension, et est connecté à l'unité de commande de la barrière automatique (A).
3. Dispositif selon la revendication 1, **caractérisé en ce que** ledit micro-rupteur (10) est un bouton monostable normalement fermé.
4. Dispositif selon la revendication 1, **caractérisé en ce que** ledit micro-rupteur (10) est du type rendu étanche pour une utilisation extérieure.
5. Dispositif selon la revendication 1, **caractérisé en ce que** lesdits moyens élastiques sont constitués par au moins un ressort (5), dont les extrémités opposées (6, 7) sont en prise dans des sièges adaptés (8, 9), formés de manière correspondante sur les deux parties (2, 4).
6. Dispositif selon la revendication 1, **caractérisé en ce que** lesdites première et seconde parties (2, 4) sont allongées.
7. Dispositif selon la revendication 6, **caractérisé en ce que** lesdites première et seconde parties allongées (2, 4) sont constituées de parties profilées fabriquées en un matériau métallique ou synthétique.
8. Dispositif selon la revendication 7, **caractérisé en ce que** ladite saillie (12) est formée de manière monolithique dans une (2) desdites première et seconde parties profilées.

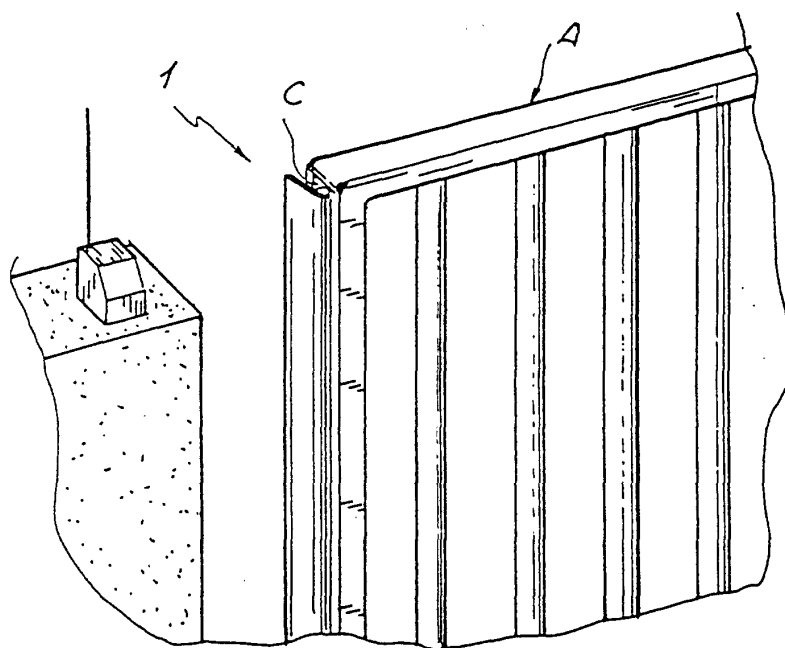


FIG. 1

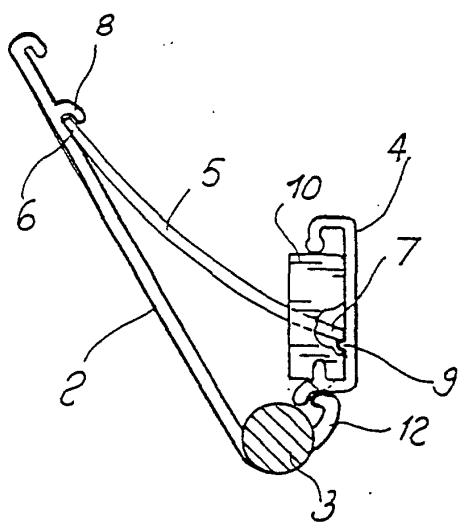


FIG. 3

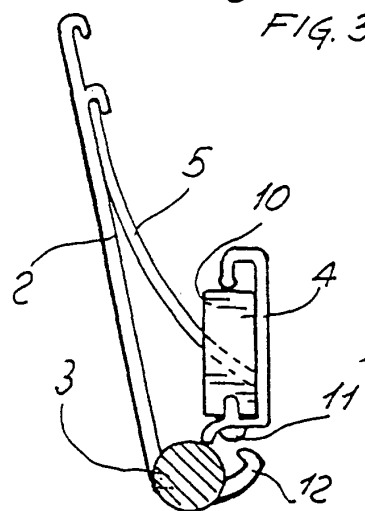


FIG. 4

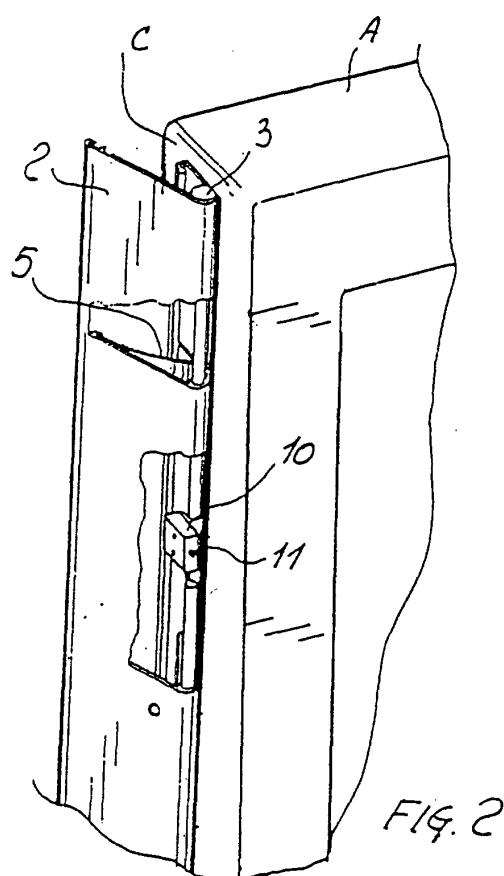


FIG. 2