



(19)

Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 0 834 847 B1**

(12)

## **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**31.10.2001 Bulletin 2001/44**

(51) Int Cl.<sup>7</sup>: **G08B 29/04**

(21) Application number: **97200123.4**

(22) Date of filing: **15.01.1997**

**(54) Electrical equipment for anti-theft installations or similar**

Elektrische Vorrichtung für Anti-Diebstahlanlagen

Equipement électrique pour installations antivol

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

Designated Extension States:

**AL LT LV RO SI**

(30) Priority: **07.10.1996 IT MI962064**

(43) Date of publication of application:  
**08.04.1998 Bulletin 1998/15**

(73) Proprietor: **BTICINO S.P.A.  
20154 Milano (IT)**

(72) Inventors:

• **Aldizio, Antonio  
28041 Arona (Novara) (IT)**

• **Santini, Ernesto  
28060 Sozzago (Novara) (IT)**

(74) Representative: **Maggioni, Claudio et al  
Jacobacci & Partners S.p.A.,  
Via Senato, 8  
20121 Milano (IT)**

(56) References cited:

<b>EP-A- 0 786 751</b>	<b>DE-U- 8 616 036</b>
<b>FR-A- 2 602 078</b>	<b>GB-A- 2 212 343</b>
<b>US-A- 4 092 641</b>	<b>US-A- 4 267 549</b>
<b>US-A- 5 486 665</b>	

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

**[0001]** The present invention relates to electrical installations for civil and industrial applications and, more particularly, to electrical equipment for anti-theft installations and installations for indicating break-in or tampering, as defined in the preamble of claim 1.

**[0002]** There are known applications of electrical equipment of this type, as disclosed in US-A-4 267 549, GB-A-2 213 343 and US-A-4 092 641 in which the removal or the opening of a panel causes the triggering of an alarm or indicator device following the opening or closing of an electrical contact or the actuation of an equivalent device included in the equipment. For this purpose, use is made, for example, of mechanical push-button switches or magnetically operated switches, fitted in a box-shaped structure together with other components of the installation, in a predetermined position with respect to the panel, in such a way that their actuating member interacts with the panel when this is in position.

**[0003]** Furthermore, FR-A-2 602 078 discloses a box with an aperture, a switch having an operating member and an actuating member in the form of a screw which is fixed removably to the box; the screw closes the aperture and acts on the switch by pushing it. US-A-5 486 665 discloses a box with an aperture, a switch having an operating element and an actuating member, which is fixed removably to the box; the piston acts on the switch when it is pressed. EP-A-0 786 751 (a European patent application filed prior to the priority date of the present application and published after that date) discloses a box with an aperture, a switch having an operating lever and an actuating member in the form of a screw which is fixed removably to the box; the screw projects from a wall on which the box is mounted and acts on the lever.

**[0004]** In some applications, different pieces of equipment of this type may be fitted together, for example in a box embedded in a wall, but not all of them are to be activated by the removal of the covering panel of the box. In these cases, it is necessary to modify the actuating member of the switch device of the equipment which is not to be activated, for example by shortening in the case of a rod, to prevent any interaction with the panel, or to change the circuit in such a way as to make it insensitive to the actuation of the switch. This requires operations which reduce the speed of installation of the equipment, and which may also result in irreversible modifications of the equipment, so that it can no longer be used in such a way that it is activated by the removal of the panel, but, if this becomes necessary, must be replaced.

**[0005]** These disadvantages are overcome by the electrical equipment according to the invention as specified and characterized in a general way in Claim 1.

**[0006]** The characteristics and advantages of the invention will be more clearly understood from the follow-

ing description of a preferred embodiment of the invention, which is chosen by way of example and is therefore not restrictive, with reference to the attached drawing, in which the single figure is a perspective view of an embodiment of the electrical equipment according to the invention with three separate parts which may be used as alternatives to each other.

**[0007]** The equipment which is illustrated comprises a box-shaped structure 10, made of transparent plastic for example, containing a push-button switch 11 fitted on a printed circuit board 12 together with other components which are not shown because they are irrelevant for the purposes of the description of the invention.

**[0008]** A flat spring 13, shaped in such a way that it has a projection 14 in the proximity of the operating element 15 of the switch 11 and an end arm 16, is fixed to, and projects from, the board 12.

**[0009]** The box-shaped structure 10 has a circular aperture 17 in its upper wall 9, next to the arm 16 of the spring 13.

**[0010]** A closing and actuating element 18, in the form of a cylindrical plug with a flange 8, may be inserted into the aperture 17 and fixed removably; once fixed, this element presses with its end part 7 on the arm 16 of the spring in such a way that it acts on the operating element 15 and thus actuates the switch 11.

**[0011]** As an alternative to the plug 18, an actuating unit 19 may be inserted and fixed removably in the aperture 17. This actuating unit comprises a push rod 20 which is axially slid able inside a bush 21 which is of cylindrical shape and has a flange 8' so that it can be inserted and fixed removably in the aperture 17 in the same way as the plug 18. Once in position, the push rod 20 has its inner end in contact with the arm 16 of the spring but does not move it. If a sufficient axial force is applied to the outer end of the push rod 20, the elastic resistance of the spring is overcome and the projection 14 of the spring is moved in such a way that it acts on the operating element 15 and thus actuates the push-button switch 11.

**[0012]** For the fixing of the plug 18 or of the actuating unit 19, the aperture 17, which has a diameter slightly larger than that of the plug 18 and of the bush 21, has two diametrically opposed notches 22, and the plug and the bush have two corresponding projections, indicated by 23 and 23' respectively. The edge of the aperture 17 also has two inclined planes 24 which enable the plug 18 or the unit 21 to be fastened in the aperture by the interference between the flange 8 or 8', the wall 9 and the projections 23 or 23'.

**[0013]** It is clear from what has been disclosed above that the equipment described may be used in two separate configurations, namely with the plug 18 inserted and therefore with the switch 11 permanently actuated, or with the actuating unit 19 inserted and therefore with the switch actuated only when the push rod 20 is pressed. It is thus possible to use identical pieces of equipment fitted together in the same box and, by using

the plug or actuating unit selectively, making only one piece of equipment or only some of the equipment sensitive to the removal of the covering panel of the box. It is also possible, when necessary, to change the initial disposition simply by replacing a plug with an actuating unit, or vice versa.

**[0014]** The structure described above is also suitable for being fitted upside down on a surface of a mounting element, for example on the base of a box which in turn is fixed to a wall. In this case the box, indicated by the number 30 in the drawing, is provided with a rod 31 projecting from the base and integral with it, and has a shape and size such that it has a housing in which the box-shaped structure 10 may be fixed removably by suitable fixing means 32, 32'. When the structure 10 is mounted in its housing, the rod 31 is inserted into its aperture 17 and engages with the arm 16 of the spring, so that the push-button switch 11 is actuated. In this case, therefore, the actuating member of the switch consists of the rod 31, and the triggering of an alarm or indicator device associated with the electrical equipment is caused by the detachment of the structure 10 from its housing in the box 30.

**[0015]** It is clear that, although the equipment according to the invention is suitable for use with particular advantage in association with other identical equipment, it may also be used on its own, combined with any of the actuating members described. In all cases, therefore, there is the advantage of being able to form different configurations of anti-theft installations or similar, using a single basic piece of equipment adaptable from time to time to specific requirements, with an evident saving in terms of costs of manufacture and storage.

## Claims

1. Electrical equipment for anti-theft installations and installations for indicating break-in or tampering, comprising:

- \* a box-shaped supporting structure (10) having a wall (9) with an aperture (17),
- \* a switch device (11) mounted inside said structure and having an operating element (15),
- \* a closing and actuating element (18) having fixing means (23) for fixing removably said closing and actuating element to said aperture, closing means (8) for closing said aperture, and actuating means (7) for permanently actuating said operating element when said closing and actuating element is fixed to said aperture,
- \* an actuating unit (19) having fixing means (23') for fixing removably said actuating unit to said aperture, and an axially slidable push rod (20) for actuating said operating element in response to an externally applied axial force acting on said rod when said actuating unit is fixed

to said aperture.

### characterized in that

- \* said fixing means of said closing and actuating element (18) are substantially identical to those of said actuating unit (19), and
- \* said closing and actuating element (18) and said actuating unit (19) are interchangeable with respect to said aperture.

- 10 2. Electrical equipment according to claim 1, wherein the aperture (17) is circular and has fastening means (24) on its edges and wherein said fixing means (23, 23') of both said closing and actuating element (18) and said actuating unit (19) have the shape of a cylindrical plug with a flange and with means (23) for fixing the plug (18) to the edges of said aperture (17).
- 15 3. Electrical equipment according to claim 1 or 2, wherein said switch device (11) is fitted on a printed circuit board (12) and wherein a flat spring (13) is fixed to the printed circuit and is shaped and positioned in such a way that it acts on said operating element (15) when it is pressed by said actuating means (7) of said closing and actuating element (18) or by said push rod (20) of said actuating unit (19).
- 20 4. Electrical equipment according to any of the preceding claims, comprising a box (30) with a housing for receiving therein and removably fixing said supporting structure (10).

- 25 5. Electrical equipment according to claim 4, wherein said box (30) comprises a rod (31) projecting from a surface of said housing and acting on said operating element (15) when said supporting structure (10) is fixed to said housing.

## Patentansprüche

1. Elektrische Ausrüstung für Anti-Diebstahl-Einrichtungen und Einrichtungen zum Anzeigen eines Einbruchs oder Manipulierens, wobei die Ausrüstung folgende Merkmale aufweist:

eine kastenförmige Trägerstruktur (10), die eine Wand (9) mit einer Öffnung (17) aufweist,

eine Schaltvorrichtung (11), die im Inneren der Struktur angebracht ist und ein Wirkungsbauglied (15) aufweist,

ein Schließ- und Betätigungsselement (18), das eine Befestigungseinrichtung (23) zum abnehmbaren Befestigen des Schließ- und Betätigungselements an der Öffnung, eine

Schließeinrichtung (8) zum Schließen der Öffnung und eine Betätigungsseinrichtung (7) zum dauerhaften Betätigen des Wirkungselementes, wenn das Schließ- und Betätigungssegment an der Öffnung befestigt ist, aufweist,

eine Betätigungsseinheit (19), die eine Befestigungseinrichtung (23') zum abnehmbaren Befestigen der Betätigungsseinheit an der Öffnung und eine axial gleitfähige Stößelstange (20) zum Betätigen des Wirkungselementes entsprechend auf eine äußerlich angelegte Axialkraft, die auf die Stange wirkt, wenn die Betätigungsseinheit an der Öffnung befestigt ist, aufweist,

**dadurch gekennzeichnet, daß**

die Befestigungseinrichtung des Schließ- und BetätigungsElements (18) im wesentlichen identisch mit der der BetätigungsEinheit (19) ist, und

das Schließ- und Betätigungslement (18) und die Betätigungsseinheit (19) bezüglich der Öffnung austauschbar sind.

2. Elektrische Ausrüstung gemäß Anspruch 1, bei der die Öffnung (17) kreisförmig ist und an ihren Rändern eine Anbringungseinrichtung (24) aufweist, und bei der die Befestigungseinrichtung (23, 23') des Schließ- und BetätigungsElements (18) und der Betätigungsseinheit (19) die Form eines zylindrischen Stöpsels mit einem Flansch und einer Einrichtung (23) zum Befestigen des Stöpsels (18) an den Rändern der Öffnung (17) aufweist.

3. Elektrische Ausrüstung gemäß Anspruch 1 oder 2, bei der die Schaltervorrichtung (11) auf eine gedruckte Schaltungsplatine (12) aufgesetzt ist, und bei der eine flache Feder (13) an der gedruckten Schaltung befestigt und auf eine Weise geformt und positioniert ist, daß sie auf das Wirkungselement (15) wirkt, wenn sie durch die Betätigungsseinrichtung (7) des Schließ- und BetätigungsElements (18) oder durch die Stößelstange (20) der Betätigungsseinheit (19) gedrückt wird.

4. Elektrische Ausrüstung gemäß einem der vorhergehenden Ansprüche, die einen Kasten (30) mit einem Gehäuse zum Empfangen der Trägerstruktur (10) in demselben und zum abnehmbaren Befestigen derselben aufweist.

5. Elektrische Ausrüstung gemäß Anspruch 4, bei der der Kasten (39) eine Stange (31) aufweist, die von einer Oberfläche des Gehäuses vorsteht und auf das Wirkungselement (15) wirkt, wenn die Träger-

struktur (10) an dem Gehäuse befestigt ist.

## Revendications

- 5

1. Equipement électrique pour installations antivol et installations pour l'indication d'une effraction ou d'une spoliation, comportant:

10        \* une structure de support (10) en forme de boîte ayant une paroi (9) présentant une ouverture (17),  
          \* un dispositif de commutation (11) monté à l'intérieur de ladite structure et ayant un élément de manœuvre (15),  
          \* un élément (18) de fermeture et d'actionnement ayant des moyens de fixation (23) pour la fixation amovible dudit élément de fermeture et d'actionnement à ladite ouverture, un moyen de fermeture (8) pour fermer ladite fermeture, et un moyen d'actionnement (7) pour actionner de façon permanente ledit élément de manœuvre lorsque ledit élément de fermeture et d'actionnement est fixé à ladite ouverture,  
20        \* une unité d'actionnement (19) ayant des moyens de fixation (23') pour la fixation amovible de ladite unité d'actionnement à ladite ouverture, et une tige (20) de poussée pouvant coulisser axialement pour actionner ledit élément de manœuvre en réponse à une force axiale appliquée extérieurement, agissant sur ladite tige, lorsque ladite unité d'actionnement est fixée à ladite ouverture,

25  
30

caractérisé en ce que

- 40                    \* lesdits moyens de fixation dudit élément de fermeture et d'actionnement (18) sont sensiblement identiques à ceux de ladite unité d'actionnement (19), et

\* ledit élément de fermeture et d'actionnement (18) et ladite unité d'actionnement (19) sont interchangeables par rapport à ladite ouverture.

45                    2. Equipement électrique selon la revendication 1, dans lequel l'ouverture (17) est circulaire et comporte des moyens (24) d'assujettissement sur ses bords, et dans lequel lesdits moyens de fixation (23, 23') à la fois dudit élément de fermeture et d'actionnement (18) et de ladite unité d'actionnement (19) ont la forme d'un obturateur cylindrique ayant un rebord et des moyens (23) pour fixer l'obturateur (18) aux bords de ladite ouverture (17).

50                    55                    3. Equipement électrique selon la revendication 1 ou 2, dans lequel ledit dispositif de commutation (11) est monté sur une plaque (12) à circuit imprimé et dans lequel un ressort plat (13) est fixé au circuit

imprimé et est configuré et positionné d'une manière telle qu'il agit sur ledit élément de manoeuvre (15) lorsqu'il est pressé par ledit moyen d'actionnement (7) dudit élément de fermeture et d'actionnement (18) ou par ladite tige de poussée (20) de ladite unité d'actionnement (19). 5

4. Equipement électrique selon l'une quelconque des revendications précédentes, comportant une boîte (30) avec un logement pour recevoir en lui et fixer 10 de façon amovible ladite structure de support (10).

5. Equipement électrique selon la revendication 4, dans lequel ladite boîte (30) comporte une tige (31) faisant saillie d'une surface dudit logement et agissant sur ledit élément de manoeuvre (15) lorsque 15 ladite structure de support (10) est fixée audit logement.

20

25

30

35

40

45

50

55

