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

(11) **EP 1 785 573 A2**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.05.2007 Bulletin 2007/20

(21) Application number: **06380295.3**

(22) Date of filing: **14.11.2006**

(51) Int Cl.:
E05G 1/04 *(2006.01)* ***E05B 47/00*** *(2006.01)*
E05B 63/12 *(2006.01)* ***E05C 3/00*** *(2006.01)*
G07F 9/06 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **14.11.2005 ES 200502777**

(71) Applicant: **Telefonica, S.A.**
28013 Madrid (ES)

(72) Inventor: **Martin Lopez, Antonio**
28020 Madrid (ES)

(74) Representative: **Primo de Rivera y Urquijo, Jose A.**
General Martinez Campos, 51
28010 Madrid (ES)

(54) Locking device for public telephone strongboxes

(57) The invention relates to a locking device for public telephone strongboxes arranged on a support (3) joined to the body (1) of the strongbox, on which an electric gearmotor (4) acting on a nut (7) is assembled, which nut (7) actuates a link rod (9) supplying in turn a 90º rotational movement to a pair of opposite shafts (14-14') with a free and beveled edge, capable of blocking respective hooks (15-15') joined to the door (2), which is joined to the body (1) through inner and hidden hinges. In this way, the electric motor (4) can be actuated by means of a remote control and the location of the hinging elements or the locking elements cannot be observed outside the strongbox, the door (2) showing a completely smooth and clear surface which makes any manipulation tending to force the strongbox considerably difficult.

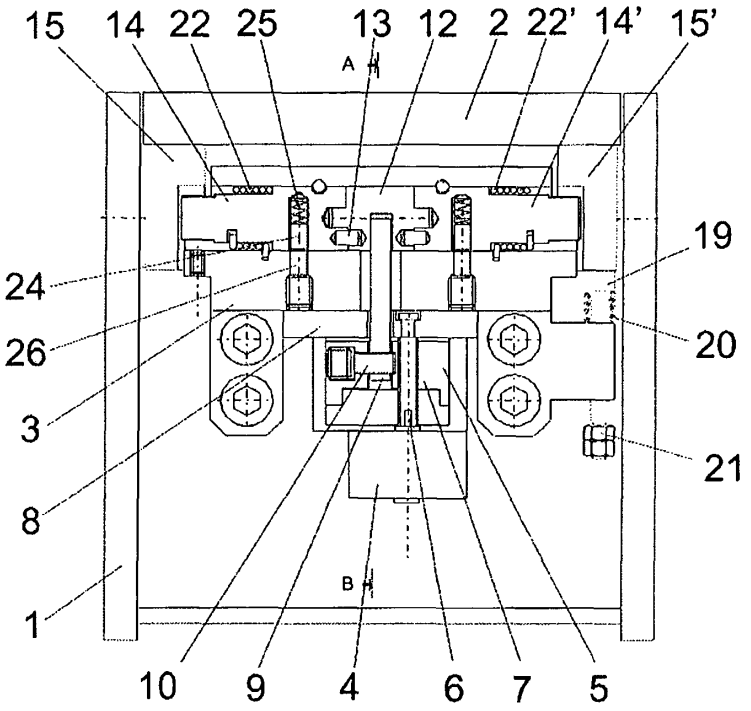

FIG. 1

EP 1 785 573 A2

Description

Object of the Invention

[0001] The present invention relates to a locking device which has been especially designed for public telephone strongboxes but which can also be used for any other container for valuable articles requiring similar features and which may be subjected to vandalistic acts tending to steal its content.

[0002] The object of the invention is to achieve a high security closure, difficult to force, with an opening kinematic chain, which against a possible breaking thereof causes the blocking of the device in the closing situation, thus optimizing the security of the device.

Background of the Invention

[0003] Due to their usual location in public pathways, telephone booths are attractive targets to be subjected to vandalistic acts with the aim of stealing the collection.

[0004] The defense against these acts has led to structuring public telephones in two clearly distinguished parts or components, an operative or functional part corresponding to the real telephone, and a lower strongbox to which the coins access after their passage through the corresponding selector-counter, said strongbox being duly armored and reinforced to withstand external attacks to which it may be subjected.

[0005] The "weak point" of these strongboxes is in the closure thereof, as the door thereof can be forced through the hinge line or through the lock by means of suitable levering means. The breaking of any one of these elements entails the direct access to the inside of the strongbox, as such breaking involves the disablement of the closure, together with the permanent risk that vandalistic acts on the booth are carried out by introducing objects in the cylinder of the lock, making the master key for periodically collecting the collection inoperative.

Description of the Invention

[0006] The closure proposed by the invention completely and satisfactorily solves the drawbacks set forth, on one hand by determining a security closure that is unreachable from the outside and virtually impossible to manipulate, with a hinging system that is also difficult to force, and on the other hand by maintaining the situation of the locking device and of the hinging means themselves hidden from the view of the users, with the further characteristic that against a possible breaking of the kinematic chain of the locking mechanism, the latter automatically tends by itself to the blocking situation or inaccessibility to the inside of the strongbox.

[0007] To that end and more specifically, the closure is formed from a small electric gearmotor which can be actuated from a distance by means of an alphanumeric key and which, duly joined to the body of the strongbox, acts on a connecting rod transmitting the movement to an intermediate transmission part which in turn transmits it to at least one locking shaft, preferably two locking shafts, which according to their angular position block or do not block a pair of locking hooks joined to the lid of the strongbox. To that end and more specifically, the mentioned locking shafts have at their ends a pair of planar, parallel and opposing bevel edges allowing their introduction in the corresponding hook, in a certain position for said shaft, but determining the blocking of said hook when they rotate 90º. This 90º rotation occurs automatically during the locking operation since the mentioned locking hooks have at the level of their entrance an extension by way of a dolly on which the corresponding shaft impinges, forcing the latter to rotate against a spring so as to adopt the position for accessing the inside of the hook, such that once said access has concluded, the mentioned spring recovers and causes the rotation of the shaft towards the definite blocking position. The purpose of these same springs, against a breaking of the locking kinematic chain due to a vandalistic act or any other reason, is that the shafts rotate to a limit facing situation of a pin housed diametrically in each of said shafts with a hole of the support or base body, towards which it is projected by an axial spring aiding it, causing the definite blocking of the locking shafts, also in a blocking situation for the locking hooks of the door.

[0008] Two parts, a hook and a stop that are respectively joined to the inner face of the door and to the inner face of the corresponding side wall of the main body, are used for the hinging of the door, both parts being linked by the real hinge which is also located inwardly and is inaccessible from the outside.

Description of the Drawings

[0009] In order to complement the description which is being made and for the purpose of facilitating the interpretation of the features of the invention according to a preferred practical embodiment thereof, the following drawings are attached where the following has been represented with an illustrative and non-limiting character:

Figure 1 shows a schematic side elevational and sectional representation of a closure for public telephone strongboxes carried out according to the object of the present invention.

Figure 2 shows, according to a representation similar to previous figure, a plan view and also a sectional view according to section line A-B of figure 1.

Figure 3 shows two positions of the locking shaft or bolt with respect to the corresponding locking shaft, in the opening cycle.

Figure 4 finally shows five sequences of the elements shown in the previous figure, corresponding to the locking cycle of the bolt.

Preferred Embodiment of the Invention

[0010] The mentioned figures show a conventional strongbox for public telephones based on a body (1) and a door (2) which can be provided in its inside with a coin receiving box with its corresponding slot such that the operations for collecting the full strongbox in order to replaced by another empty strongbox are carried out without the operator having access to its content.

[0011] The body (1) of the strongbox receives in an integral manner a support (3) near its entrance and opposite its hinging line, an electric gearmotor (4) being fixed to said support (3) next to a casing (5), a screw (6), a nut (7) and a lid (8), such that the nut (7) acts as a cam for actuating a link rod (9) which is joined to the nut (7) by means of a pin (10).

[0012] By means of another pin (11), the link rod (9) supplies rotational movement to an intermediate transition part (12) which moves in a cylindrical housing of the support (3) and transmitting by means of keys (13) its own rotational movement to a pair of locking shafts (14-14') which are opposite to each other and are intended to be interlocked through their free ends in respective locking hooks (15-15') joined to the door (2).

[0013] The shafts (14-14') have at their free end two planar and parallel bevel edges (16), whereas the hooks (15-15') have a cylindrical housing (17) with a constricted entrance (18), such that when the housing (17) has a diameter which coincides with that of the shaft (14-14'), whereas its constricted entrance (18) is in turn in accordance with the distance between the bevel edges (16) of the shaft (14-14'). In this way, during the opening operation which is carried out by supplying a 90º rotational movement to the shafts (14-14') by means of the gearmotor (4), the shafts pass from the position shown in the first sequence of figure 3 corresponding to the locking, to the opening position shown in the second sequence of said figure.

[0014] In this position, the door (2) is projected outwardly due to the effect of an ejector (19) acting on one of the hooks (15') with the collaboration of an expansion spring (20), which ejector (19) has a run limited by a stop (21) carried out in a nut and locknut set.

[0015] The shafts (14-14') always tend to the angular closing position, shown in the first sequence of figure 3, due to the effect of respective torsion springs (22-22') arranged between them and the support (3), as especially observed in figure 1.

[0016] During the operation for locking the door (2), an extension (23) with the locking hooks (15-15'), impinges on one of the bevel edges (16) of the corresponding shaft (14-14'), as shown in the first sequence of figure 4, forcing said shaft (14-14') to rotate, as shown in the following three sequences, to a limit situation in which the bevel edges (16) adopt a parallel position with respect to the middle plane of the entrance (18), in which the shafts (14-14') penetrate in the housings (17), and the respective springs (22-22') cause the automatic rotation thereof to the blocking position shown in the last sequence of figure 4.

[0017] The mentioned springs (22-22') also act on the respective shafts (14-14') causing the rotation thereof against a breaking in the mentioned kinematic chain, i.e. a breaking in any of the mentioned transmission parts. In this case, the springs (22-22') take said shafts (14-14') to a limit situation in which the pins (24), arranged diametrically inside said shafts and permanently required by respective springs (25), face respective holes (26) of the support (3) and penetrate in the latter blocking the shafts (14-14') which are introduced in the locking hooks (15-15').

[0018] As a complement to the described structure, a pair of hooks (27) is rigidly fixed to the inner face of the door (2) and in the side area opposite to that of the locking hooks (15-15'), and respective stops (28) are rigidly fixed in the inner face of the inner body (1) of the strongbox, which cause a tongue and groove coupling between these elements, as seen in figure 2, determining a high degree of security as regards the locking of the strongbox in this area, the hook (27) and the stops (28) being linked to each other by means of hinges (29) based on small articulated connecting rods clearly visible in figure 2.

[0019] As deduced from that set forth above and as has already been commented above, the device offers a completely smooth outer surface, without the hinging means or the opening means being visible to the user, which confers a high degree of security which is enhanced by the solid fixing described in four points near the vertices of the door.

Claims

1. A locking device for strongboxes, preferably for public telephones, said strongbox comprising a body (1) provided with a front entrance to which a preferably hinged door (2) is coupled, **characterized in that** it incorporates a support (5) integral with the body (1) of the strongbox on which an electric gearmotor (4) is assembled, a screw (6) being integral with the output shaft of the gearmotor, which screw acts on a nut (7) connected to an end of a link rod (9) by means of a first pin (10), the opposite end of said link rod (9) being connected by means of a second pin (11) to a transition part (12) joined by at least one key (13), transmitting its rotational movement to at least one shaft (14-14') perpendicular to the link rod (9) and said at least one shaft (14-14') being provided with means for coupling and uncoupling to at least one locking element (15-15') which is integral with the inner face of the door (2) of the strongbox and perpendicular to said at least one shaft (14-14').

2. A device according to claim 1, **characterized in that** said at least one locking shaft (14-14'), preferably two locking shafts, incorporates in its free end two

planar and parallel bevel edges (16).

3. A device according to claims 1 and 2, **characterized in that** said locking element (15-15') is a locking hook (15-15'), preferably two locking hooks, incorporating a cylindrical housing (17) with a diameter corresponding to that of the locking shaft (14-14'), with a constricted entrance (18) the width of which coincides with the distance between the bevel edges (16) of the shaft (14-14'), such that according to the angular position of said bevel edges (16) with respect to the entrance (18) of the hook (15-15'), the bevel edges are blocked with respect to the locking support.

4. A device according to claim 3, **characterized in that** the entrance (18) of the locking hook (15-15') has an extension (23) on which one of the bevel edges (16) of the locking shaft (14-14') stops when the door (2) tilts towards the closing position, causing a rotation of said shaft (14-14') against the torsion of a spring (22-22') arranged between each shaft (14-14') and the support (3) of the locking device.

5. A device according to previous claims, **characterized in that** it incorporates a retractable stop (19) against the stress of a spring (20), which in the closing position acts on at least one of the locking hooks (15') of the door (2), tending to the automatic opening or tilting thereof when at least said hook (15-15') is released by the locking shaft (14-14').

6. A device according to previous claims, **characterized in that** the locking shaft (14-14') incorporates a diametric housing in which a pin (24) with a spring (25) is arranged, such that against a breaking of any of the elements of the locking device and due to the effect of the torsion spring (22) arranged in the shaft (14-14'), said pin (24) is facing a hole (26) made in the support (3), to which it accesses blocking the locking shaft (14-14') in the angular direction, thus maintaining the blocking situation between the shaft (14-14') and the corresponding locking shaft (15-15').

7. A device according to previous claims, **characterized in that** it acts in combination with hinging means of the door (2) of the strongbox formed by at least one hook (27) and one stop (28), joined to each other by hinges and coupled by tongue and grooving in a closing position, being located inside the strongbox.

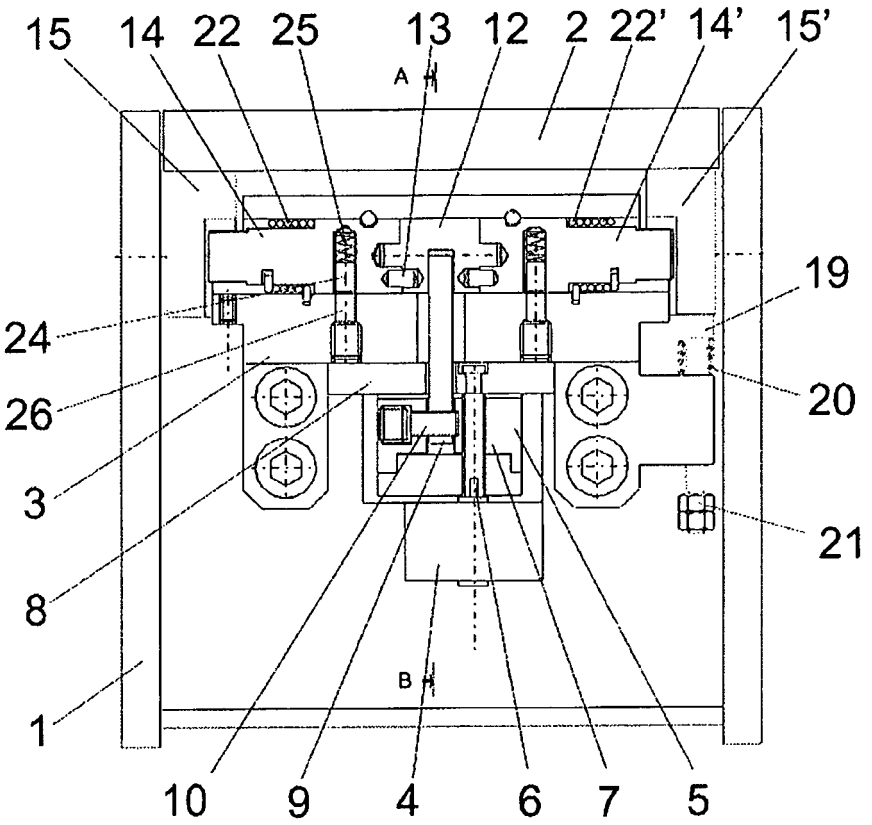

FIG. 1

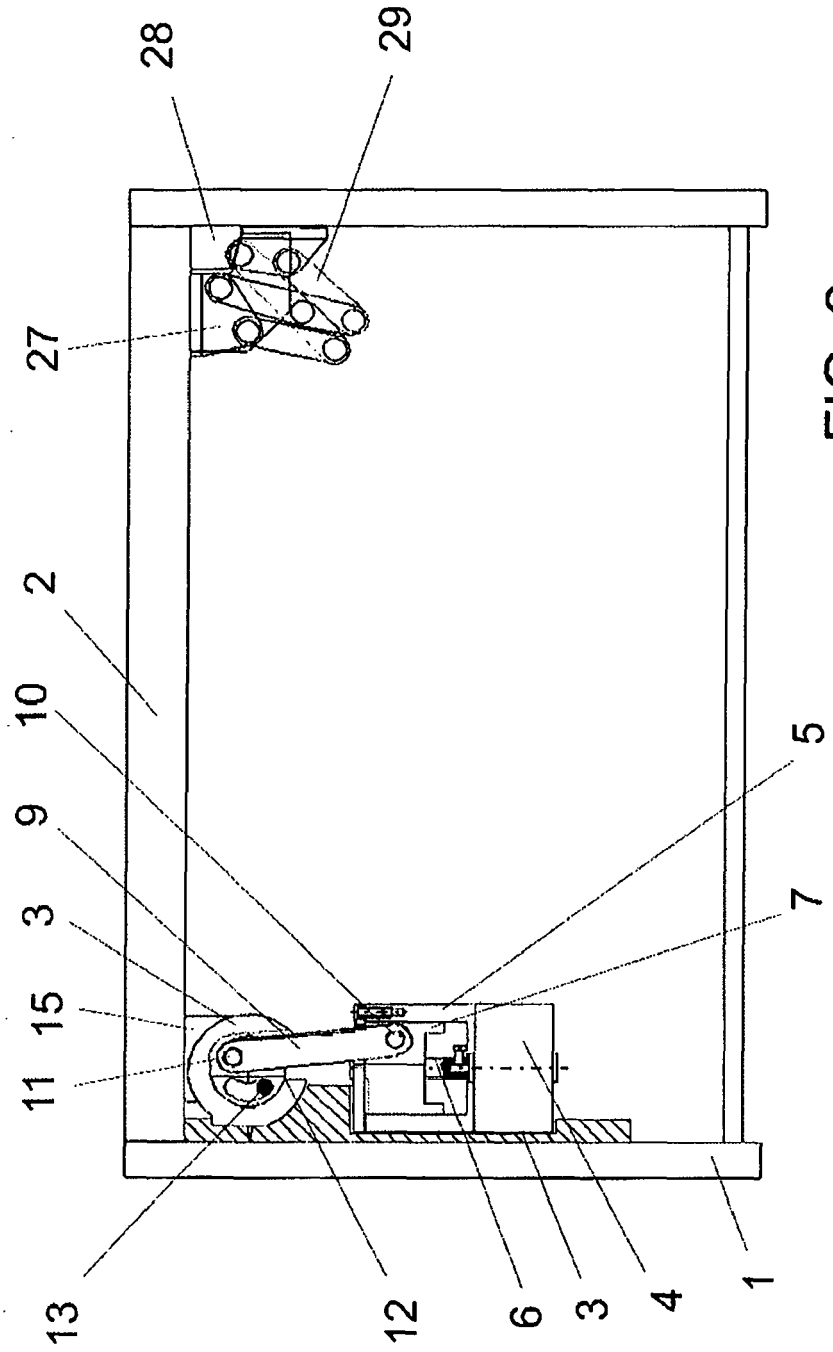

FIG. 2
A-B

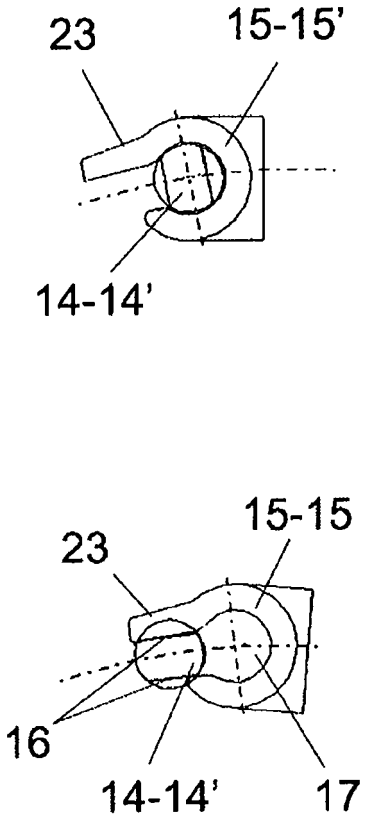

FIG. 3

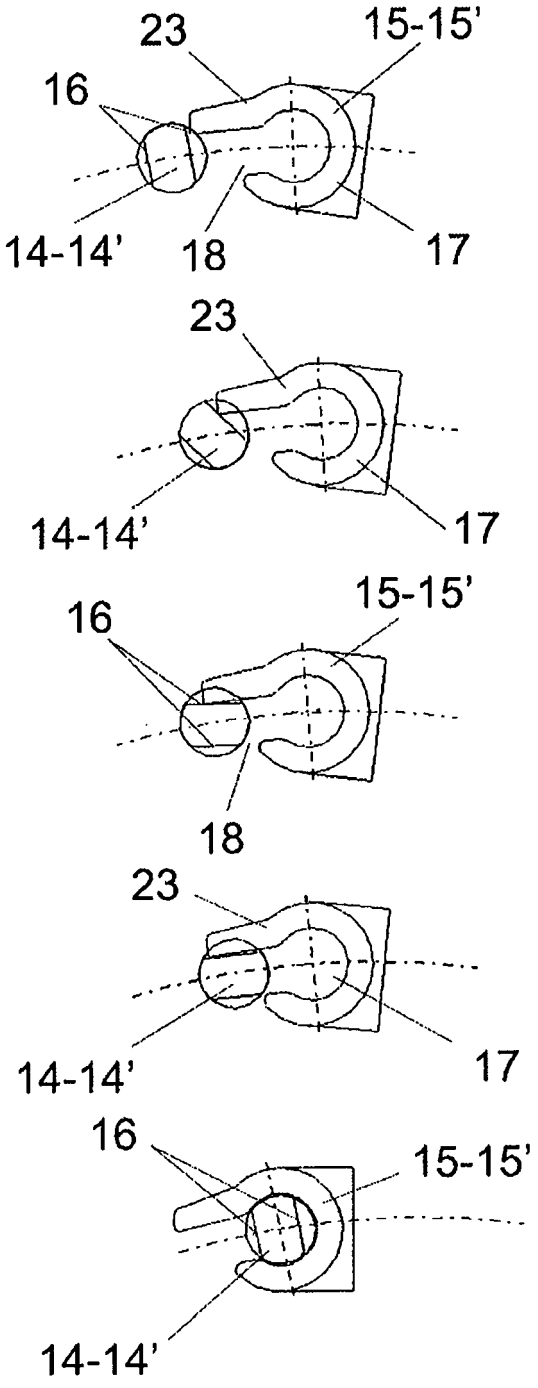
23
15-15'
16
14-14'
18
17
23
14-14'
17
15-15'
16
18
23
14-14'
17
16
15-15'
14-14'

FIG. 4