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(54) **Enhanced security outdoor use lock mechanism**

(57) The present invention relates to locks of externally used electric cabinets or voice and data communication cabinets at public places where protection against casual intruders is required. Said lock mechanism comprises a main body accommodating a handle. Rotation of said handle activates longitudinal rods movable on a locking and unlocking direction with respective slots. Rotation of said handle is allowed upon operation of two locks in a sequence according to the present invention. A mechanical lock having a conventional cylinder is accessible from the outside of the cabinet such that a person having the correct combination key can open the lock. However, rotation of said mechanical lock will not open the door until a second electric lock is activated, the latter lock being not accessible from the outside of the cabinet.

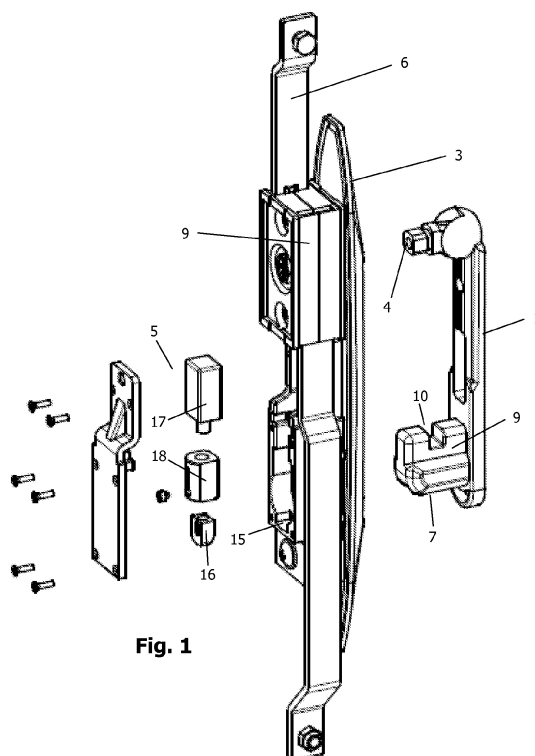


Fig. 1

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Description

Technical Field of the Invention

[0001] The present invention relates to locks of externally used electric cabinets or voice and data communication cabinets at public places where protection against casual intruders is required.

Background of the Invention/Prior Art

[0002] Data or voice communication cabinets at public places as in the streets may be subject to heavy environmental conditions as well as violent acts of intruders. To this end, to prevent damage to the valuable equipments and to ensure service maintainability to costumers, cabinets at public places require more sophisticated security locks than usual lock mechanisms.

[0003] Such cabinet locks also require that only authorized persons get access to the lock where an enhanced security is provided. Therefore standard lock mechanisms such as those with a conventional cylinder are not suitable for providing an enhanced security as those are easily vulnerable to impacts and violent acts which may involve various sharp objects or more professional tools to break the lock cylinder.

[0004] The present invention provides an outdoor cabinet security lock having a first mechanical lock and a second electrical lock. Said electrical lock is not accessible from the outside and only controlled via a remote control or online. To this end, operation of the first lock being dependant on the operation of the second provides an enhanced security. Upon operation of both locks in a sequence, a handle mechanism is then released to be rotated for operating a series of longitudinal bars to open the door of the enhanced security cabinet.

[0005] The present invention therefore provides selective access to cabinets depending on the authorization level of the person in charge. The authorization policy may also include allocation of specific time intervals in specific location for a given person in charge of maintenance and/or repair. An authorization policy detailed to such an improved extent may prove especially effective in eliminating abuse by ex-workers with no or expired authorization. This is also effective in establishing and making record of maintenance and/or repair action and the person responsible for that action.

Objects of the Invention

[0006] One of the primary objects of the present invention is to provide an enhanced security lock for outdoor use electric or voice and data cabinets.

[0007] Another object of the present invention is to provide an enhanced security lock for outdoor use electric or voice and data cabinets in which operation of a first lock is dependent on the operation of a second lock.

[0008] Another object of the present invention is to pro-

vide an enhanced security lock for outdoor use electric or voice and data cabinets with selective access to cabinets depending on the authorization level of the person in charge.

Summary of the Invention

[0009] The present invention relates to locks of externally used electric cabinets or voice and data communication cabinets at public places where protection against casual intruders is required. Said lock mechanism comprises a main body accommodating a handle. Rotation of said handle activates longitudinal rods movable on a locking and unlocking direction with respective slots.

[0010] Rotation of said handle is allowed upon operation of two locks in a sequence according to the present invention. A mechanical lock having a conventional cylinder is accessible from the outside of the cabinet such that a person having the correct combination key can open the lock. However, rotation of said mechanical lock will not open the door until a second electric lock is activated, the latter lock being not accessible from the outside of the cabinet but activated online or via a remote controller.

Brief Description of the Drawings

[0011] The figures whose brief explanations are herewith provided are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is interpreted in the absence of the description. To this end, Fig. 1 demonstrates a front perspective view of the locking mechanism according to the present invention.

[0012] Fig. 2 demonstrates a cross-sectional view of the locking mechanism according to the present invention.

[0013] Fig. 3 demonstrates a perspective view of the locking mechanism from the bottom according to the present invention.

Detailed Description of the Invention

[0014] The present invention relates to locks of externally used electric cabinets or voice and data communication cabinets at public places where protection against casual intruders is required.

[0015] Referring now to the drawings whose brief descriptions are given below, the present invention proposes a lock mechanism having a body (3) accommodating a handle (1) mechanism. Said handle (1) mechanism's rotation activates a pair of longitudinal rods (6) in turn rotating a latch (not shown) in a lock box (8) locking the cabinet door.

[0016] The handle (1) according to the present invention is embedded within the body (3). Upon unlocking of a mechanical lock (7) as explained below and also upon

unlocking of an additional electromechanical lock (5), the door of the cabinet is opened by way of rotating said handle (1) around a pivotal bearing (4) such that said latch (not shown) in association with said lock box (8) engage with a suitable slot (not shown) and said longitudinal rods (6) move in opposite directions.

[0017] Said mechanical lock (7) according to the present invention comprises a housing (9) having an upper body portion with a notch (10). Said housing (9) also comprises a lower enlarged portion (13) having a lock cylinder (11) as shown in Fig. 2, the latter conventionally opened by a key having correct combination to rotate the cylinder (11). Rotation of the cylinder (11) in turn rotates a latch (12) extending from inside said housing (9) through an opening (14) to an emptied edge portion (15) whereby said latch (12) when extended outside, bears against said emptied edge portion (15) to lock said mechanical lock (7).

[0018] Another security measure according to the present invention lies in the use of an additional lock, which is an electromechanical lock (5). Said electromechanical lock (5) according to the present invention has a latch (16) suitable for engaging with said notch (10) of said mechanical lock (7) housing (9). Said electromechanical lock (5) according to the present invention may be in any suitable form, for example may be actuatable by a solenoid mechanism as widely practiced in the art.

[0019] According to the preferred embodiment of the present invention, said electromechanical lock (5) comprises an electrical motor (17) having an adaptor member (18) coupled to said motor's (17) shaft such that said motor (17) rotates a threaded bushing fixed in said adaptor member (18) and thereby linearly displaces the same. Said adaptor member (18) advances said latch (16) through a spring member.

[0020] Said electromechanical lock (5) according to the present invention is coupled to an electronic circuit in association with a receiver for allowing actuation of said electromechanical lock (5) by means of a transmitter. Remote communication techniques such as RF communication are widely practiced in the art and need not be further mentioned herein as a skilled person would easily appreciate how to establish a remote communication to actuate an electric lock by a remote control unit.

[0021] Said electromechanical lock (5) according to the present invention may also be actuated through Internet by means of said electric circuit having a suitable data transmission port allowing Internet communication and an electronic circuit with a microcontroller for driving said electromechanical lock (5) in response to an online request or to a signal received by a remote control unit.

[0022] The electromechanical lock (5) according to the preferred embodiment of the present invention is automatically reset to its locking position by said microcontroller upon opening of the cabinet door. This has the particular advantage that reclosing of the cabinet door will automatically lock said electromechanical lock (5) as said latch (16) supported by said spring member will first

be retracted during closing and then retake its locking position in said notch (10).

[0023] The fact that the additional electromechanical lock (5) is not seen or noticeable from outside the cabinet provides an enhanced security which is desirable as in the case of outdoor use cabinets. Further, as it can be possible that a user's remote controller specific id is not authorized to activate said electromechanical lock (5) or is authorized only during a certain period of time via Internet communication, a microcontroller in the electronic circuit of a specific cabinet will not unlock said electromechanical lock (5) as long as prescribed conditions are not met. To this end, it is believed that an authorization policy detailed to such an improved extent may prove effective in eliminating use of expired authorization id remote control units as well as establishing and making record of maintenance and/or repair action and the person responsible for that action. It is to be noted that it is also common practice to verify identity of a remote control unit on an RF communication channel.

[0024] The lock cylinder (11) according to the present invention may be of any type of suitable lock cylinders available in the market. For example a radial pin cylinder in which pins supported by respective springs are radially arranged may be preferred. Such cylinders typically require tubular keys to operate the cylinder.

[0025] In a nutshell, the present invention proposes a cabinet door lock mechanism especially for externally used electric cabinets or voice and data communication cabinets. Said lock mechanism comprises a handle (1) rotatable to unlock said door. Said handle (1) is integrally attached to a mechanical lock (7) housing (9) having a lock cylinder (7) operated from outside said cabinet door. Said cabinet door lock mechanism further comprises an electromechanical lock (5) having a latch (16) engageable with a notch (10) in association with said mechanical lock (7) housing (9). Said cabinet door remains locked upon unlocking of said mechanical lock (7) as long as said electromechanical lock (5) is not unlocked.

Claims

1. A cabinet door lock mechanism especially for externally used electric cabinets or voice and data communication cabinets, said lock mechanism comprising a handle (1) rotatable to unlock said door, said handle (1) being integrally attached to a mechanical lock (7) housing (9) having a lock cylinder (7) operated from outside said cabinet door, **characterized in that** said cabinet door lock mechanism further comprises an electromechanical lock (5) having a latch (16) engageable with a notch (10) in association with said mechanical lock (7) housing (9) whereby said cabinet door remains locked upon unlocking of said mechanical lock (7) as long as said electromechanical lock (5) is not unlocked.

2. A cabinet door lock mechanism as set forth in Claim 1 wherein said mechanical lock's (7) housing (9) has an upper body portion with said notch (10) and a lower enlarged portion (13) incorporating a lock cylinder (11). 5
3. A cabinet door lock mechanism as set forth in Claim 1 or 2 wherein said latch (16) of said electromechanical lock (5) is engageable with said notch (10) of said mechanical lock (7) housing (9) in a direction parallel to the longitudinal axis of said handle (1). 10
4. A cabinet door lock mechanism as set forth in Claim 1 wherein rotation of said handle (1) activates a latch in a lock box (8) locking the cabinet door. 15
5. A cabinet door lock mechanism as set forth in Claim 2 wherein said cylinder (11) comprises a latch (12) extending from inside said housing (9) through an opening (14) to an emptied edge portion (15) of said body (3) whereby said latch (12) when extended outside, bears against said emptied edge portion (15) to lock said mechanical lock (7). 20
6. A cabinet door lock mechanism as set forth in Claim 1 wherein said electromechanical lock (5) is actuable by a solenoid mechanism. 25
7. A cabinet door lock mechanism as set forth in Claim 1 wherein said electromechanical lock (5) is coupled to an electronic circuit in association with a receiver for allowing actuation of said electromechanical lock (5) by means of a transmitter. 30
8. A cabinet door lock mechanism as set forth in Claim 7 wherein said electromechanical lock (5) is actuable through Internet by means of said electronic circuit having a data transmission port allowing Internet communication and a microcontroller for driving said electromechanical lock (5) in response to an online request. 35 40
9. A cabinet door lock mechanism as set forth in Claim 2 wherein said lock cylinder (11) is a radial pin cylinder. 45
10. A cabinet door lock mechanism as set forth in Claim 1 wherein said electromechanical lock (5) comprises an electrical motor (17) having an adaptor member (18) coupled to said motor's (17) shaft whereby said adaptor member (18) drives said latch (16). 50
11. A cabinet door lock mechanism as set forth in Claim 10 wherein said motor's (17) shaft rotates a threaded bushing fixed in said adaptor member (18) 55
12. A cabinet door lock mechanism as set forth in Claim 11 wherein said latch (16) is automatically reset to its locking position by said microcontroller upon opening of the cabinet door.
13. A cabinet door lock mechanism as set forth in Claim 12 wherein said adaptor member (18) drives said latch (16) through a spring member whereby closing of the cabinet door automatically locks said electromechanical lock (5) as said latch (16) supported by said spring member is be retracted during closing and then retakes its locking position in said notch (10).

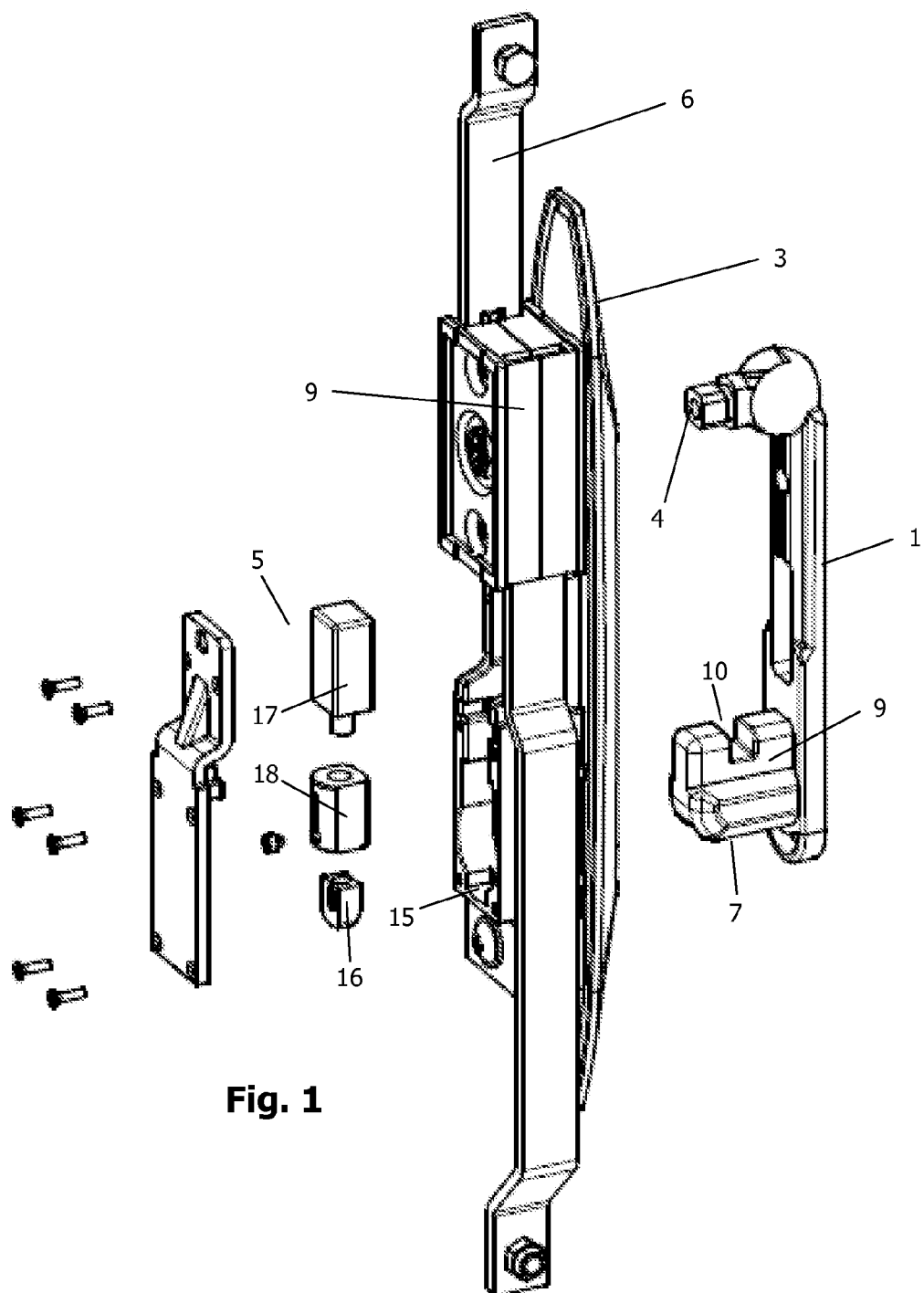


Fig. 1

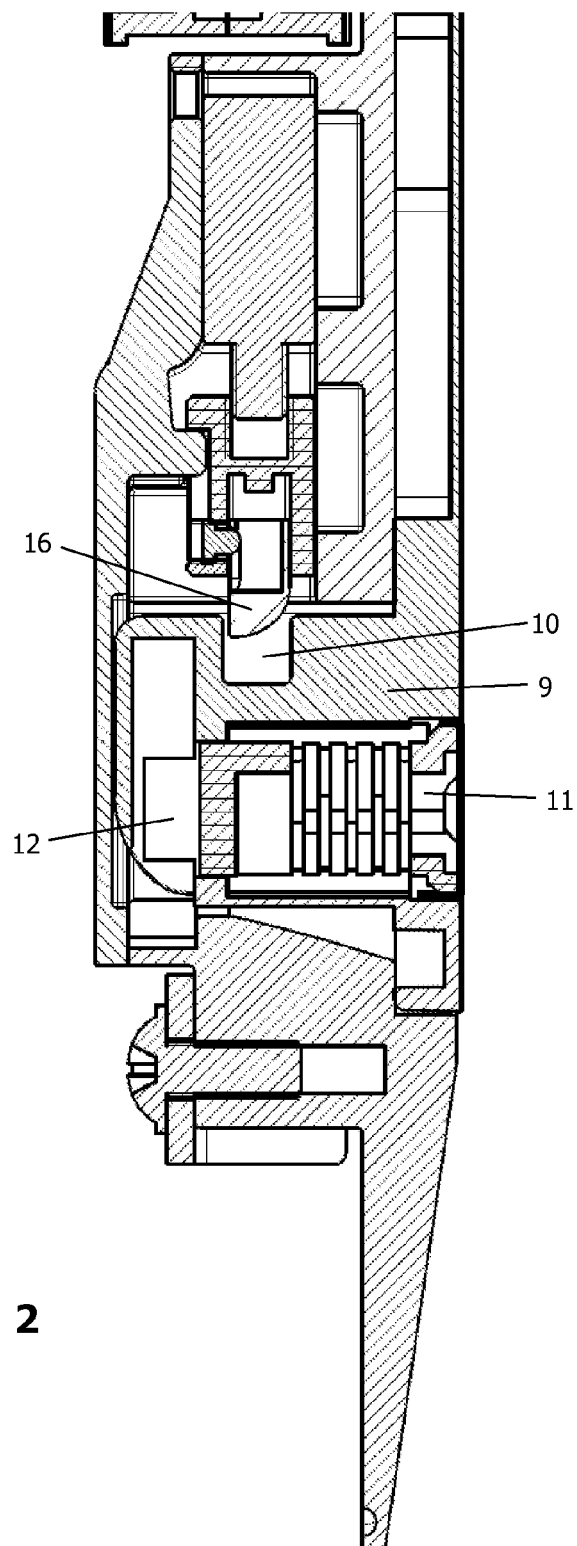


Fig. 2

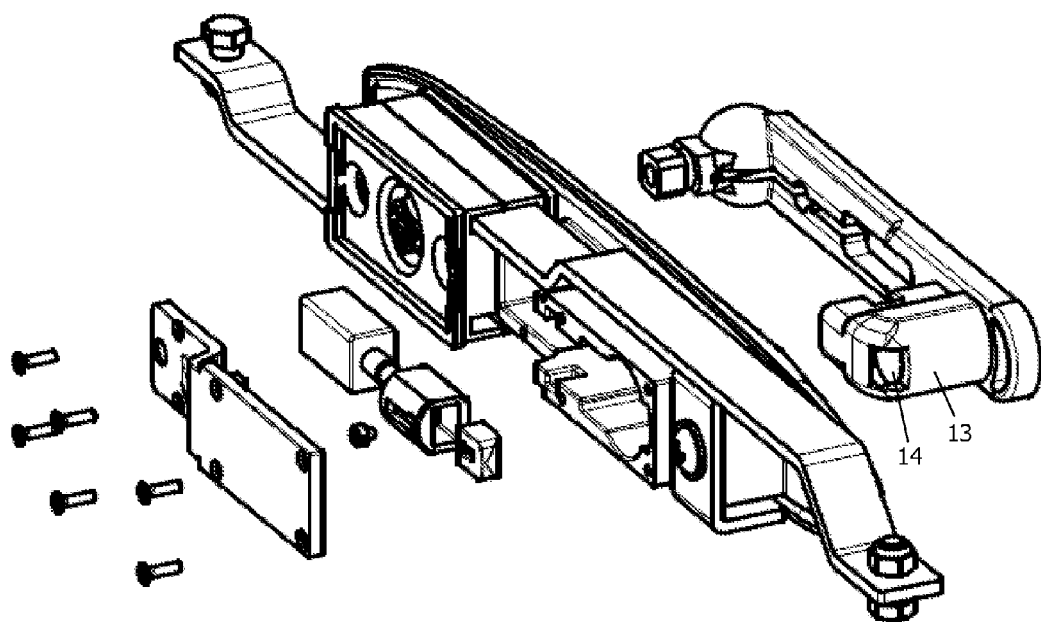


Fig. 3