

“AN ELECTRO-MECHANICAL LOCK”**CROSS REFERENCE TO RELATED APPLICATION**

This application is based on and derives the benefit of Indian complete Application 201841019400 filed on 23rd May, 18, the contents of which are incorporated herein by reference.

TECHNICAL FIELD

[001] The embodiments herein generally relate to security systems, more particularly but not exclusively to an electro-mechanical lock that can be secured for securing one or more items.

BACKGROUND

[002] Electro-mechanical locks have been implemented wherein a combination of mechanical and electronic means are used to secure an object. The electro-mechanical lock typically includes one or more electronic circuits, which may include an electronically controlled mechanical lock mechanism that can be used to secure an object. Though electro-mechanical locks are available for a variety of applications with varying architecture, it typically comprises only one level of authentication, which may not provide adequate security. Further, the electro-mechanical locks do not provide a secure, but accessible override system.

SUMMARY

[002a] According to an aspect, there is provided an electro-mechanical lock including an electromagnetic circuit configured to create an electro-magnetic link, wherein the electromagnetic circuit comprises at least one magnet; at least one first electromagnetic connector mounted on a surface on which an object being secured is mounted or a first portion of the object being secured; a third electromagnetic connector mounted on the object being secured or on a second portion of the object being secured; and at least one sensor; wherein the third electromagnetic connector is electromagnetically linked with the first electromagnetic connector, the magnet and the sensor; a controller configured to raise an alert on detecting an unauthorized action based on input received from the electromagnetic circuit; and a mechanical override module comprises an exterior operating assembly; and an interior operating assembly, wherein the exterior operating assembly is configured to override a mechanical lock component by actuating the interior operating assembly by at least one of an

electromagnetic coil; and a magnet, and wherein the exterior operating assembly is configured to actuate the electromagnetic coil of the interior operating assembly.

[003] Embodiments disclosed herein provide an electro-mechanical lock for securing at least one item.

[004] Embodiments disclosed herein provide a method for detecting at least one of theft, unauthorized unlocking, vandalism, abuse and tinkering of the at least one item, wherein the item has been secured with the electro-mechanical lock.

[005] Embodiments disclosed herein provide a mechanical override mechanism for the electro-mechanical lock.

[006] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating at least one embodiment and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications.

BRIEF DESCRIPTION OF FIGURES

[007] Embodiments herein are illustrated in the accompanying drawings, through out which like reference letters indicate corresponding parts in the various figures. The embodiments herein will be better understood from the following description with reference to the drawings, in which:

[008] FIG. 1a illustrates the electro-mechanical lock, according to an embodiment as disclosed herein;

[009] FIG. 1b illustrates the mechanism for sensing the theft/ unauthorized unlocking/vandalism/removal/theft of an enclosure/structure, according to embodiments disclosed herein;

[0010] FIGs. 2a, 2b, 2c and 2d depict the mechanical override mechanism, according to an embodiment as disclosed herein;

[0011] FIG. 3 depicts a flowchart of a method for detecting theft or unauthorized unlocking of an enclosure or structure, according to an embodiment as disclosed herein; and

CLAIMS

1. An electro-mechanical lock (100) comprising

an electromagnetic circuit (108) configured to create an electro-magnetic link, wherein the electromagnetic circuit (108) comprises

at least one magnet (118);

at least one first electromagnetic connector (120) mounted on a surface on which an object being secured is mounted or a first portion of the object being secured;

a third electromagnetic connector (126) mounted on the object being secured or on a second portion of the object being secured; and

at least one sensor (122);

wherein the third electromagnetic connector (126) is electromagnetically linked with the first electromagnetic connector (120), the magnet (118) and the sensor (122);

a controller (112) configured to raise an alert on detecting an unauthorized action based on input received from the electromagnetic circuit (108); and

a mechanical override module (116) comprises

an exterior operating assembly; and

an interior operating assembly, wherein the exterior operating assembly is configured to override a mechanical lock component by actuating the interior operating assembly by at least one of an electromagnetic coil (C); and a magnet, and wherein the exterior operating assembly is configured to actuate the electromagnetic coil (C) of the interior operating assembly.

2. The electro-mechanical lock, as disclosed in claim 1, wherein the electro-mechanical lock (100) further comprises a second electromagnetic connector (124) mounted on the surface on which the object being secured is mounted or the first portion of the object being secured, wherein the second electromagnetic connector (124) is electromagnetically linked to the third electromagnetic connector (126).

3. The electro-mechanical lock, as disclosed in claim 1, wherein the electro-mechanical lock (100) further comprises a location sensing module (104), wherein the location sensing module (104) provides current location of the electro-mechanical lock (100) to the controller (112).
4. The electro-mechanical lock, as disclosed in claim 1, wherein the electro-mechanical lock (100) further comprises a G force sensor.
5. The electro-mechanical lock, as disclosed in claim 1, wherein the electro-mechanical lock (100) further comprises an accelerometer.
6. The electro-mechanical lock, as disclosed in claim 1, wherein the controller (112) is configured to provide an alert.
7. The electro-mechanical lock, as disclosed in claim 1, wherein the controller (112) is configured to provide an alarm using an alarm member (110).
8. The electro-mechanical lock, as disclosed in claim 1, wherein the exterior operating assembly comprises a second head portion (206a); and a rotatable shaft (206b) coupled to the second head portion (206a), wherein the rotatable shaft (206b) is an elongated member, which can be rotated within a predefined guide space.
9. The electro-mechanical lock, as disclosed in claim 8, wherein the exterior operating assembly comprises an electromagnetic coil and an actuator, wherein the actuator is operated wirelessly.
10. The electro-mechanical lock, as disclosed in claim 8, wherein the exterior operating assembly is configured to be operated in a changing frequency mode for power transfer.
11. The electro-mechanical lock, as disclosed in claim 1, wherein the mechanical override module (116) further includes at least one control unit for providing authentication.