A security alarm and theft prevention apparatus that is secured to electronic equipment such as a computer to prevent unauthorized usage and/or removal. The apparatus is comprised of a metallic enclosure (20) that surrounds the computer's electrical and electronic cables (56). The enclosure (20) includes an opening (30) in the back that allows the cables (56) to enter the enclosure and notches (52) with cable ports (54) in the front cover (42) that allows the cables to exit to their mating connectors. The mounting holes (38) and hooks (40) on the apparatus provide attachment points that utilize the existing computer (32) hardware. A motion-sensitive audio alarm (60) with a built-in time delay circuit is removably disposed within the enclosure with a spring clip (62). The alarm emits a loud audio signal when the computer is moved by unauthorized persons. In another embodiment, a switch cover (58) is provided on the side of the enclosure (20) to encompass the power-on switch of the computer.
### FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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<tr>
<th>Code</th>
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A SECURITY ALARM AND THEFT PREVENTION APPARATUS

TECHNICAL FIELD

The invention pertains in general to alarm devices and more particularly to a theft prevention apparatus that incorporates an electronic motion-sensitive alarm housed within an enclosure. The apparatus is designed to be mounted to equipment, such as a microcomputer, and to activate the alarm during an unauthorized removal of the equipment.

BACKGROUND ART

Previously, many types of alarms have been used in endeavoring to provide an effective means for producing an audible alarm as well as physical protection to prevent the unauthorized removal of an article. In most cases this protection has been limited to a motion responsive system attached to the article itself. A search of the prior art did not disclose any patents that directly read on the claims of the instant invention.

However, the following U.S. patents were considered related:

<table>
<thead>
<tr>
<th>PATENT NUMBER</th>
<th>INVENTOR</th>
<th>ISSUED</th>
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<tbody>
<tr>
<td>3,836,901</td>
<td>Matto, et al</td>
<td>17 September 1974</td>
</tr>
<tr>
<td>4,327,360</td>
<td>Brown</td>
<td>27 April 1982</td>
</tr>
<tr>
<td>4,385,288</td>
<td>Bitko</td>
<td>24 May 1983</td>
</tr>
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The Matto et. al., patent discloses a motion sensitive alarm that is in operation only when the power source to the protected article has been removed. Matto accomplishes this by deenergizing a holding coil that places a storage battery in the circuit that causes a reed switch to close the motion sensing switch to operate and sound the audible alarm.

The U.S. patent issued to Brown similarly employs an alarm adapted to be mounted on an article to be
protected. The alarm senses not only movement, but a
disruption of an applied voltage source or a disruption
of an alarm ground path. This invention avoids high
power drain associated with art requiring constant appli-
5 cation of energy to a coil and further provides a
separate means for detecting the loss of a ground path
to the alarm device. This device, however, is adapted
for mounting on an article such as a painting that
utilizes no electrical power source or interconnecting
cabling.
10 The Bitko patent discloses an alarm device that
is physically attached to an article and either movement
of the article or removal of its cover will actuate a
conventional type of buzzer providing the audible signal.
The three basic components of the alarm circuit are
15 a self-contained power supply, an alarm, such as a buzzer,
and a motion sensitive pendulum type switch. Sensitivity
is achieved by adjusting the height of two contacts in
the switch relative to each other, thereby providing a
variation in sensitivity. With this type of alarm only
movement is sensed with no provisions for locked mechani-
cal protection of any projecting electrical appendages.
20 In the above prior art, all the inventions take
advantage of a battery powered audible signal with a
motion sensitive switch, however, the combination of
mechanical protection is not suggested.
For background purposes and as indicative of the
25 art to which the invention relates reference may also
be made to U.S. Patents No. 4,316,181 issued to Primont
et. al., No. 4,284,983 issued to Lent, and No. 4,103,289
issued to Kolber.

DISCLOSURE OF THE INVENTION

Recently due to increased production and popular-
ity, large numbers of home and office computers have
30 become available to the public. Further, office computers
are now compatible with peripheral equipment available for
the home market and computer programs dealing with household activities and a myriad of electronic games are also compatible, in many cases, to both home and office computers. The reduced size of the computers has made them easily portable and technological and manufacturing advances have reduced the cost somewhat of computers; thus, the demand for computers has increased creating a ready market for resale of a valuable product and increasing the likelihood of theft.

It is, therefore, the primary object of the invention to prevent removal of office equipment, such as computers and word processing equipment, by the utilization of a combination of an alarm device responsive to movement in conjunction with a mechanical enclosure. The enclosure structurally surrounds the electrical and electronic cables connected to the rear of a computer preventing their removal, also offering visual indication of the security measures taken. The alarm, however, is not readily visible preventing tampering with the enclosure by those unaware of its presence. The enclosure mechanically isolates and captivates cables such as utilized to convey power, and interconnect a printer, keyboard, video monitor, etc.

An important object of the subject invention is to provide protection of the system from inadvertently disconnecting any of the above cables affecting the power or interface with peripheral equipments. The configuration of the enclosure also allows visual indication that the connections are properly seated into their respective receptacles while still offering the desired protection.

Another object provides an audible signal that cannot be silenced without a key and will continue to sound until the internal power source has dissipated all of its energy. Since this source is complete independent and self-contained, removal of the protected device is unlikely as attention is immediately drawn to the
obviously distinct and prolonged signal.

Still another object allows a permanent attachment to a particular model and configuration of computer or similar equipments. This attachment includes using existing cap screws that hold the cabinet together and/or brackets utilizing a particular aperture or physical characteristic of the computer cabinet itself. As an example, the fan shroud and discharge orifice is utilized in conjunction with a "J" shaped bracket for the International Business Machines Corporation (IBM) personal computer design along with the mounting hardware on the rear of the device. As such, the invention becomes a permanent part of the computer, however, its location is not apparent to the user as it is behind and hidden from view.

The utilization of a key latch in a removable cover is yet another object in the invention as it allows only authorized personnel access to the plugs of the electrical and electronic cords. The key latch is located on one side of the cover and a recessed angle leg is formed on the other joining with a similar leg in the side providing a flush surface that allows complete removal of the cover for unlimited access. As the audio motion sensitive alarm has a time delay, this door and lock arrangement allows sufficient access to manually set the alarm, fit the door in place and lock the latch.

In the preferred embodiment a further object of the invention provides a switch cover that is attached to the side of the body extending the mechanical protection of the enclosure to the on/off power switch of the computer. This feature precludes inadvertent shutdown of the equipment, as well as unauthorized use.

These and other objects and advantages of the present invention will become apparent from the subsequent detailed description of the preferred embodiment and the claims taken in conjunction with the accompanying drawings.
BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a partial isometric view of the preferred embodiment with the computer and cables partially illustrated.

FIGURE 2 is a partial isometric of the spring clip to hold the alarm completely removed from the assembly for clarity.

FIGURE 3 is a partial isometric view of the preferred embodiment with the key in place.

FIGURE 4 is a partial isometric view of the rear of the preferred embodiment with sections cut-away in the top and back illustrating the spring clip and alarm mounted inside.

FIGURE 5 is a partial isometric view of the removable cover separated from the assembly for clarity.

FIGURE 6 is a partial isometric view of a second embodiment with the computer and cables partially illustrated and with the key removed.

FIGURE 7 is a partial isometric and cut-away view of the second embodiment.

FIGURE 8 is a partial isometric view of the rear of the second embodiment with sections cut-away in the top and back illustrating the spring clip and alarm mounted inside.

FIGURE 9 is a partial isometric view of the removable cover separated from the assembly for clarity.

FIGURE 10 is a partial isometric view of a third embodiment completely removed from the computer.

FIGURE 11 is a partial isometric view of the third embodiment taken from the rear completely removed from the computer.
FIGURE 12 is a partial isometric view of the third embodiment viewed from the front with the cover removed.

FIGURE 13 is a partial isometric view of the cover of the third embodiment separated from the enclosure.

FIGURE 14 is a partial isometric view of the 90 degree locking bolt and bracket of the third embodiment separated from the enclosure.

BEST MODE FOR CARRYING OUT THE INVENTION
The best mode for carrying out the invention is presented in terms of a preferred, second and third embodiments. All three embodiments are primarily designed and particularly with microcomputers and associated peripheral units. The preferred embodiment, as shown in FIGURES 1 through 5, is comprised of an enclosure 20 which includes a body 21, with a top 22, a bottom 24, a first side 26, and a second side 28. This body 21 is preferably fabricated of sheet metal with slots, holes, and notches pierced in the flat and then broken into shape with applicable corners overlapped and spot welded forming the structure. The material may be any suitable metal, such as aluminum, corrosion resistant steel, and the like, with cold or hot rolled steel being preferred. An electrolytic zinc coated sheet may also be utilized. Surface treatment is applied to inhibit corrosion and enhance the appearance, such as paint or plating. The body 21 contains a cutout opening 30 at the back 31 in the location of the electrical connectors when the enclosure 20 is attached to a computer cabinet 32. This opening 30 allows clearance for the connectors in the form of jacks or plugs to protrude into the interior of the enclosure 20 providing the security provisions requisite for utility of the invention.
The first side 26 further contains a latch slot 34 with a flange nearest the front bent inward forming a register upon which the pawl of a latch may rest.

The sides 26 and 28 and bottom 24 of the enclosure 20 include a plurality of ventilating slots 36 that are arranged in geometrical array. These slots 36 allow air to move freely within the enclosure 20 dissipating heat from the computer 32 to the surrounding ambient air.

In operation the enclosure 20 is attached to the back of a computer cabinet 32 using the existing mounting fasteners and/or bracketry. The preferred embodiment utilizes both of the above. There is a hole 38 in direct alignment with the computer fastener allowing connection without disrupting the cabinet itself. This connection is accomplished by removing the threaded fastener from the back of the computer 32 placing the enclosure 20 contiguously thereupon and replacing the fastener through the hole 38. A mounting hook 40 is also utilized that is permanently attached to the enclosure top 22 and is flush with the back 31. The hook 40 is in "J" shape with the radial portion overlapping the first side 26. The configuration of the hook 40 is compatible with the exhaust opening of the computer 32 allowing the hook portion to be inserted into the opening and holding one end tight. The threaded fastener of the computer attaching through the hole 38 in the back 31 firmly mounts the other end. It will be noted that the preferred embodiment is configured to be compatible with a line of computers manufactured by International Business Machines Corporation located in Florida, United States of America. A separable cover 42, best illustrated in FIGURE 5 is sized to fit into the body 21 flush with the outside surface. This cover 42 becomes the front of the enclosure 20 when installed providing an accessible but enclosed structure. One end of the cover 42 is formed into a "V" shape 44 that is compatible with a flange on the
second side 28 allowing the cover 42 to be retained in place in hinge fashion. On the opposite end a key latch 46 is installed through the cover 42 near the body first side 26 acting as the keeper holding the cover in place. The key latch 46 includes a key 48 on the outside and a tumbler arrangement inside with a rotatable pawl 50 on the back. When the cover 42 is inserted into the body 21 and closed flush with the outside surface the pawl 50 of the key latch 46 is rotated by the key 48 until it embraces the flange of the latch slot 34. This arrangement allows the cover 42 to be held tightly in place while touching only the body 21 on the sides 26 and 28.

The lower edge of the cover 42 contains a notch 52 with a plurality of cable ports 54 spaced integral with the notch. These ports 54 allow the computer cables 56 to extend through the enclosure 20, however, the size is such that only the cable may pass through. The plugs or connectors, being much larger in size, are thereby captivated inside even if they were disconnected from the sockets in the computer 32.

The preferred embodiment, depicted in FIGURES 1 through 5, includes a switch cover 58 that is attached to the body 21 on the second side 28. This cover 58 is in box shape with one side open and a radial corner planar to the top 22. The cover 58 extends beyond the rear surface of the body 21 and is so positioned as to envelope the power-on switch of the computer 32. This element is not mandatory in the invention, but adds an additional feature physically isolating the power switch preventing inadvertent power disruption of the computer 32.

As well as mechanical theft protection, described above, the invention further includes a security audio alarm integral with the enclosure. This motion sensitive alarm 60 is completely self-contained having a battery powered audio system with a time delay circuit allowing
an interval of time, preferably 10 to 15 seconds from energization to audio signal. The alarm 60 has an on/off switch and is actuated by external movement after this interval of time has lapsed. This alarm 60 may be any type suitable for the purpose with the preferred alarm being an "all purpose alarm" manufactured by Y Square Limited, Inc. of Santa Ana, California, United States of America. The alarm 60 is attached inside the enclosure 20 with a spring clip 62, illustrated in the assembly in FIGURE 4 and depicted completely removed from the body 21 in FIGURE 2. This spring clip 62 intimately embraces the alarm 60 holding it in place with spring tension on each side. The clip 62 is attached to the inside of the body 21 by spot welding, or the like. The function of the clip 62 allows not only a rigid mounting surface, but also removal of the alarm 60 to replace its batteries or external setting.

A second embodiment, illustrated in FIGURES 6 through 9, has all of the same features as the preferred embodiment, except switch cover 58 is omitted. Some computers do not have the switch in that specific location, or the feature is not required by the user.

A third embodiment is depicted in FIGURES 10 through 14 and is directed to a line of computers which are manufactured by Apple Computer, Inc. located in California, United States of America. All of the same functions apply, except the shape and interface connections differ slightly. A flange 64 fits over the cabinet of the computer and the hole 38 interfaces, as previously described with the computer 32 hardware. Cut-out openings 30 are positioned in a plurality of locations in the back 31 interfacing with the orientation of the computer cables 56 and associated connectors. This embodiment does not include a switch cover 58, as utilized previously. It will be seen that the enclosure may be easily adapted to any available computer and will obviously not be limited to the above mentioned
manufacturers.

In operation the enclosure 20 is installed on the back of a computer 32 by first positioning the cables 56 through the openings 30 in the back with the cover 42 removed. Existing hardware from the workpiece is removed and replaced through holes 38 in the back of the body 21. In some embodiments a hook 40 is also inserted into the cabinet for mounting, and a 90 degree locking bolt with bracket 66 is inserted into a knock-out opening in the rear of the computer cabinet and rotated 90 degrees, as shown in FIGURE 14. The alarm 60 is then energized sliding the control switch into the "on" position by inserting ones hand into the interior of the enclosure 20. An alternate method is to remove the alarm 60 from the spring clip 62 and replacing after energization. In either case, after the switch is properly set the cover 42 is replaced and locked into position with the key latch 46. This procedure is easily accomplished within the required time delay period of the alarm 60 and any further movement after this interval will energize the audio alarm. Disconnection of the alarm is accomplished in reverse order with care taken not to move the device, or at least be prepared to quickly turn the switch off.

While the invention has been described in complete detail and pictorially shown in the accompanying drawings, it is not to be limited to such details, since many changes and modifications may be in the invention without departing from the spirit and the scope thereof. Hence, it is described to cover any and all modifications and forms which may come within the language and scope of the claims.
CLAIMS

1. A security alarm and theft prevention enclosure comprising:
   a) a top, bottom, back, a first side and a second side,
   b) a motion-sensitive alarm removably secured with attaching means to said enclosure for producing an audible signal in response to external movement,
   c) a separable cover removably attached to said enclosure, defining a front, allowing access into the interior of the enclosure for energizing said alarm,
   d) a key latch within said separable cover having a pawl interfacing with said first side for locking thereto, and,
   e) means to attach said enclosure to equipment such as a computer allowing the enclosure to cover all appendages protruding therefrom preventing removal and tampering.

2. The apparatus as recited in claim 1 wherein said alarm includes a time delay circuit allowing an interval of time to lapse, when energized, before said audible signal is produced in response to external movement.

3. The apparatus as recited in claim 1 wherein said alarm attaching means further comprises a spring clip disposed within said enclosure on the inside of said top for securing said motion sensitive alarm allowing removal thereof.
4. The apparatus as recited in claim 1 wherein said means to attach said enclosure to the back of a computer further comprises a said back having one or more holes in direct alignment with said computer enclosure housing attaching fasteners in such a manner as to interface said apparatus back contiguously to said computer allowing attachment by the existing computer threaded fastener when removed and replaced therein.

5. The apparatus as recited in claim 1 wherein said means to attach said enclosure to the back of a computer further comprises a mounting hook juxtaposed on said enclosure top with a hook portion planarly extending at right angles to said first side providing a structural attachment when distended into the interior of the back of said computer.

6. The apparatus as recited in claim 1 further comprising a plurality of cable ports notched into the lower edge of said separable cover providing clearance for electrical interface cables protruding from said computer defining containment of connectors attached thereto within the confines of the enclosure preventing theft.

7. The apparatus as recited in claim 1 further comprising:
   a) a said back containing a cut-out in the location of electrical connectors protruding from the back of said computer providing clearance into the enclosure interior,
   b) a said first side containing a latch slot to receive said key latch pawl when rotated thereinto, and,
   c) a said enclosure containing a plurality of ventilating slots in said bottom, sides, and cover arranged in a geometrical array so as to allow air movement such that heat emitted from said computer is
dissipated by surrounding ambient air.

8. The apparatus as recited in claim 1 further comprising a switch cover attached to said second side of the enclosure distending planar to and at right angles with said back to enclose and mechanically isolate the power-on switch of said computer.
### I. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both National Classification and IPC:
- INT. CL. G08B 13/14
- U.S. CL. 340/571

### II. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched.

### III. DOCUMENTS CONSIDERED TO BE RELEVANT

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<tr>
<th>Category</th>
<th>Citation of Document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to Claim No.</th>
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* Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

** Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

*** Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

**** Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

#### IV. CERTIFICATION

- Date of the Actual Completion of the International Search: 17 May 1985
- Date of Mailing of this International Search Report: 05 JUN 1985
- ISA/US
- Signature of Authorized Officer: Glen R. Swann III
FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A  US, A, 4,335,376, 15 June 1982, Marquardt 1-8
A  US, A, 2,916,733, 08 December 1959, Hirsch 1-8
A  US, A, 4,462,023, 24 July 1984, Nielsen et al 1-8

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE 10

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers ........., because they relate to subject matter 15 not required to be searched by this Authority, namely:

2. Claim numbers ........., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out 14, specifically:

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING 11

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest
☐ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.