United States Patent [19]

Hemphill

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[54] **OFFICE EQUIPMENT LOCKING DEVICE**

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[73] Assignee: **Sekur-It Products, Inc.,** Newark, N.J.

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[52] **U.S. Cl.** **70/58,** 70/232

[51] **Int. Cl.** **E05b 73/00**

[58] **Field of Search** ..... 70/57, 58, 62, 232; 248/25, 203, 361; 312/215; 211/4; 85/9 R

[56] **References Cited**

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3,574,080	4/1971	Jones	204/197
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[57] **ABSTRACT**

A locking device for portable equipment, such as typewriters, adding machines, television sets, etc., comprises a rectangular metal plate adapted to be fastened to the underside of said equipment in substantially completely covering relation to said underside e.g., adjacent the supporting legs thereof. At least one elongated shaft extends at right angles to and below the plate for insertion through a pre-drilled hole in a supporting surface for the piece of equipment. A key-operated lock member engages the shaft below the supporting surface to lock the piece of office equipment to the supporting surface.

5 Claims, 5 Drawing Figures

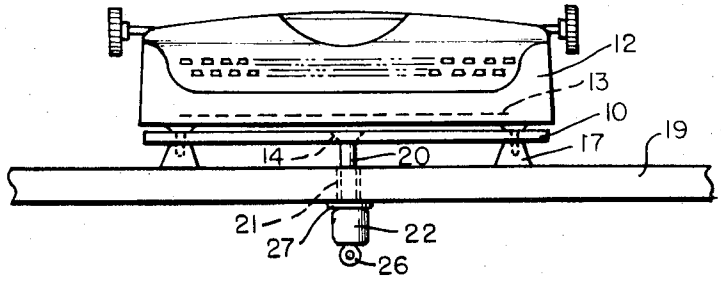


FIG. 1.

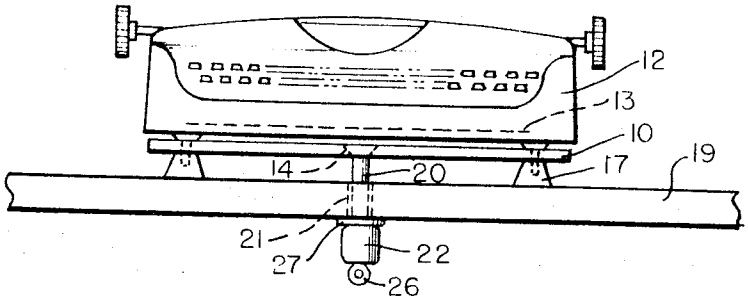


FIG. 2.

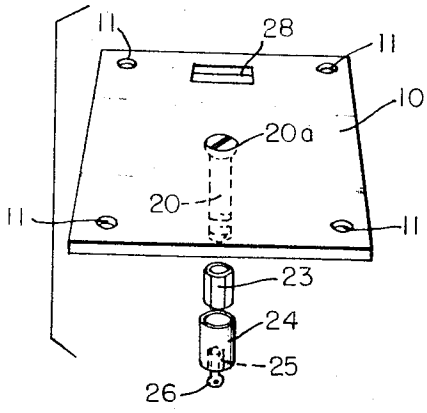


FIG. 3.

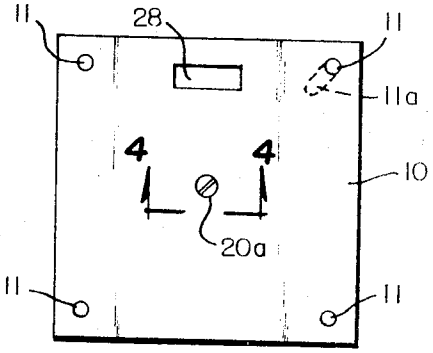


FIG. 4.

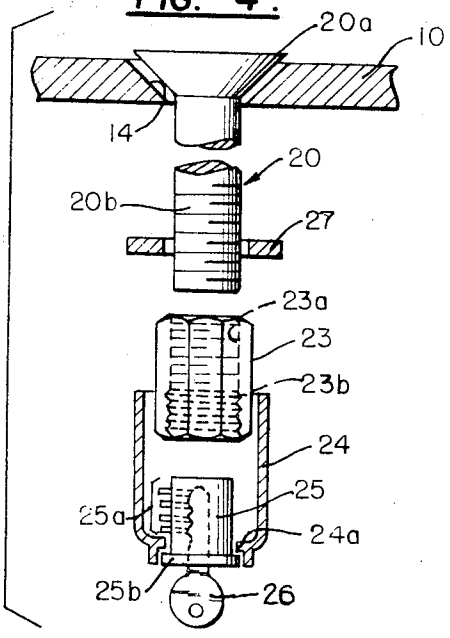
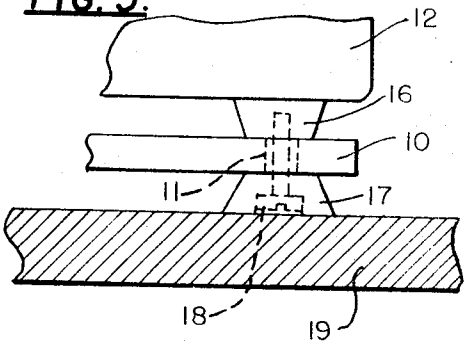


FIG. 5.



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OFFICE EQUIPMENT LOCKING DEVICE

BACKGROUND OF THE INVENTION

In recent years, incidents of theft and burglary have risen at an alarming rate. The problem has become especially serious in business offices due to the fact that modern office equipment, e.g. typewriters, adding machines, calculators, etc., have become lighter in weight, smaller in size, and much more costly in price; and since most business offices are unstaffed after business hours, the unauthorized removal of office equipment has become quite prevalent. This has necessarily resulted in major losses to business establishments, and has also produced significant increases in insurance rates.

Various suggestions have been made heretofore of devices adapted to safeguard highly vulnerable office equipment from unauthorized removal or theft. However, for the most part, the arrangements which have been suggested thus far have not experienced any significant commercial acceptance since they have tended to be complex in construction, costly, unsightly, and difficult to install and remove.

By way of example, prior suggestions for safeguarding office equipment are described in Buchman U.S. Pat. nos. 2,434,312 and 3,514,172. The Buchman arrangements are adapted to lock a typewriter, or the like, to a table or desk; and the arrangements suggested include a housing which is designed to be disposed below the table, and which cooperates with a pair of bolts extending from said housing through the table. One of the bolts is fastened directly to the table on its upper side, and the other bolt is threaded into a bolt hole in the bottom of the typewriter. A lock extends through the housing on the underside of the table, and the lock is so positioned that it inhibits access to the heads of the aforementioned bolts. While this structure is capable of safeguarding the equipment in question, it typifies the difficulties discussed earlier, i.e. it is a comparatively large, costly, and complex piece of equipment, is difficult to install or remove requiring substantial time for either operation, and is clearly visible when installed thereby making for an unsightly installation.

A similar arrangement is disclosed in Bennett U. S. Pat. No. 3,564,879. The Bennett device again provides a housing below the table with the housing being adapted to conceal the heads of a pair of screws which extend from the housing through the table into thread engagement with the underside of a business machine. A lock is inserted into the housing to prevent access to the screw heads. The Bennett device suffers from the various disadvantages already described in reference to the Buchman devices.

The present invention, recongizing the disadvantages of the prior art, is concerned with a highly improved, completely reliable, locking device of extremely simple and inexpensive construction, adapted to lock a piece of office equipment to a supporting surface. As will be apparent, the device is capable of use on various different types of portable equipment, including those used in offices (e.g., typewriters) and in the home (e.g. television sets); and the term "office equipment" used herein, and in the appended claims, is intended to be generic to all such portable equipment.

The device of the present invention is capable of rapid installation on a piece of office equipment to be protected, and provides substantially fool-proof protection when installed. The device, moreover, lends itself to ready removal from a piece of old equipment when it is desired to transfer the locking device to a piece of replacement equipment. When installed, the device is, for all practical purposes, invisible; and this feature not only enhances the decor of a home or office employing the locking device, but also makes the device far less vulnerable to tampering or attempts at unauthorized removal.

SUMMARY OF THE INVENTION

In accordance with the present invention a locking device is provided which comprises a rectangular, substantially uninterrupted, planar steel plate having an array of apertures therein for attaching said plate to the underside or base of a piece of office equipment, e.g., through the agency of bolt or screw holes pre-existing in said underside or in the superstructure of the machine or equipment to be locked in place. In accordance with an alternative embodiment of the invention, for use in those cases where the equipment is not provided with pre-existing bolt holes in its underside, the apertures in said plate can be dimensionally and positionally spaced from one another in accordance with the dimensional and positional spacing between the supporting legs of the piece of equipment to be protected; and in this embodiment of the invention, the plate is attached to said piece of equipment by unscrewing the legs screws provided by the machine manufacturer (e.g., to hold leg cushions or rubber scratch guards in place) whereafter the plate is placed substantially flush with the bottom of the equipment and fixedly attached thereto by inserting the leg screws back in place via the apertures in said plate.

When the plate is installed in either of these fashions, i.e., directly to the base of the equipment or, alternatively, via the leg screws of the equipment, the plate is integrated with the base, substantially completely covers the base, and is substantially invisible to the eye; and, in addition, when the equipment is then placed on a supporting surface the screws or bolts holding the plate in place become totally inaccessible.

The steel plate is provided with an elongated shaft which extends in a transverse direction, preferably at substantially right angles, to and below the plate. This shaft is adapted to be inserted through a pre-drilled hole in the equipment supporting surface so that, when the plate and its associated shaft is attached to the underside of the piece of equipment and said equipment is then placed on a supporting surface with the shaft inserted through said pre-drilled hole, a portion of said shaft extends below the supporting surface. This latter portion of the shaft is associated with a key-operated locking member adapted to engage said shaft and the underside of said supporting surface to hold the shaft, plate, and equipment in fixed position on said supporting surface.

More than one such shaft can be employed, e.g. two shafts extending in parallel relation to one another, and at right angles to and below the plate, can be provided for insertion through a pair of predrilled holes in the equipment supporting surface, with the lowermost ends of that pair of shafts being associated in turn with a lock member having a pair of bores extending therethrough for slidable insertion onto the shafts. Locks of this type are available from various manufacturers under generic

designations such as "through-shackle", "barrel", or "bicycle" locks. A parallel shaft arrangement of this type requires, however, the pre-drilling of a pair of accurately spaced holes in the supporting surface; and, accordingly, the preferred embodiment of the present invention utilizes a single shaft associated with a locking member. A plurality of such single shafts, extending at right angles to the aforementioned plate, could, of course, be provided; but again, this requires the drilling of a plurality of accurately spaced holes in the supporting surface. Since it has been found in practice that reliable locking is achieved by use of only one shaft, this represents the preferred embodiment of the present invention.

The aforementioned shaft can be fixedly attached to the plate, at right angles thereto, by techniques such as welding. When the shaft is permanently attached to the plate by such a technique, however, the weld joint represents a point of possible vulnerability since the joint can sometimes be broken by a screw driver or crowbar. Moreover, when the shaft is permanently attached to the plate, the overall locking device becomes rather bulky making it difficult to package the locking device for transportation and sale. For these reasons, therefore, the shaft structure, in the preferred embodiment of the present invention, comprises an elongated shaft removably insertable through a complementary aperture in said plate, and provide with an enlarged head adapted to engage the upper side of said plate when the shaft is inserted in place. With this arrangement, the shaft can be shipped in separated relation to the plate for attachment to said plate when the overall locking device is later installed; and, when installed in place, the shaft then becomes completely invulnerable to tampering by a screw driver or crowbar.

If the equipment being protected is motor driven, the aforementioned plate can be provided with one or more vent holes disposed adjacent the driving motor of the equipment to facilitate ventilation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a locking device constructed in accordance with the present invention, as installed on a piece of portable equipment;

FIG. 2 is a perspective view of the locking device;

FIG. 3 is a plan view of the structure shown in FIG. 2;

FIG. 4 is a view taken on line 4—4 of FIG. 3 illustrating the details of the shaft and associated lock member; and

FIG. 5 is a detail view illustrating one technique for attaching the locking device to a piece of equipment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the several figures, like numerals of which refer to like parts throughout, it will be seen that a locking device constructed in accordance with the present invention comprises a plate **10** preferably constructed of metal, e.g. steel, and having a thickness in the order of one-eighth inch. The plate **10** is preferably rectangular and is provided with an array of countersunk apertures **11** which, in the particular embodiment illustrated, comprises four such apertures **11** disposed adjacent the corners respectively of the rectangularly shaped plate **10**.

The actual positions and numbers of apertures **11** may vary from one installation to another in dependence upon the office equipment which is to be locked in place, and the nature of the bolt or screw holes which are present in the underside of said equipment. More particularly, the office equipment **12** customarily includes a superstructure **13** which, in some cases, is provided with a plurality of pretapped bolt or screw holes which are intended, by the equipment manufacturer, to be utilized either to secure the equipment to a supporting surface, or to receive auxiliary members for leveling or steadying the equipment. When such pretapped bolt or screw holes already exist in the equipment, the plate **10** is dimensioned to fit between the supporting legs of the equipment; and the apertures **11** are positioned and spaced in accordance with the existing pretapped bolt holes in the equipment so that said plate can be attached to the underside or superstructure **13** of the equipment by means of appropriate bolts or screws inserted through apertures **11**.

In those cases where the superstructure **13** of the equipment **12** is not provided with pretapped holes, and it is not convenient or desirable to add such holes to the equipment for use in stalling the locking device of the present invention, the various apertures **11** are dimensioned and positionally spaced from one another in accordance with the dimensional and positional spacing between the supporting legs of the equipment. More particularly, as best illustrated in FIG. **5**, the equipment **12** may be provided with leg structures comprising leg members **16** having leg cushions **17** attached thereto by means of a bolt or screw member **18** (the term "legs" used herein being intended to refer to the supporting legs themselves, or to the supporting cushions for said legs, or to other supports or steadying structures provided, as the case may be, for supporting and/or steadying the piece of equipment **12** on the supporting surface **19** such as a table, desk or the like). The plate **10** may, in such case, be installed on the equipment **12** by first unscrewing the leg screws **18** provided by the machine manufacturer, then placing the plate **10** against the underside of the equipment with its several apertures **11** positioned adjacent the legs **16**, and finally reinserting the leg screws **18** in place. By this procedure, the plate is again firmly attached to the underside of the equipment through the agency of the pre-existing leg screws of that equipment; and when the equipment is thereafter placed on the supporting surface **19**, the leg screws become totally inaccessible and invulnerable to tampering.

While it is contemplated that the plate **10** and its associated apertures **11** are preferably shaped and dimensioned to permit installation of the locking device on a predetermined specific type (manufacturer and/or model) of office equipment, some universality may be achieved, permitting a given plate to be installed on various different types of office equipment (having various different spacings between its underside bolt holes, or between its supporting legs, within a predetermined range of spacings) by using "universal" apertures. One possible such universal aperture is designated, in broken line, at **11***a* in FIG. **3**, and comprises an aperture of slotted configuration in place of a round aperture. Such a slotted configuration, or other configurations serving similar purposes, could be employed at selected one or all of the aperture **11** positions.

Plate 10 is provided with a countersunk hole 14 located at a generally central position in said plate. Hole 14 is adapted to receive an elongated shaft comprising, in a preferred embodiment of the invention, a one-half inch diameter flathead cap screw 20 having a conical head 20*a* and a threaded shaft 20*b* (see FIG. 4). The sides of head 20*a* are complementary to hole 14 so that when the bolt comprising shaft 20 is inserted through hole 14 from its upper side, the shaft extends below plate 10 at substantially right angles thereto and is limited in downward movement, and retained in place, by the abutment between the sides of head 20*a* and hole 14.

It will be appreciated, of course, that other arrangements serving a similar purpose could be provided, e.g., the hole 14 could be cylindrical, and the head 20*a* could be of enlarged configuration adapted to engage the upper side of plate 10. In either event, the bolt or shaft 20 is separable from plate 10 to facilitate packaging and shipping of the locking device. When bolt 20 is inserted through the upperside of plate 10, and the locking device thereafter is installed in place, the head which retains the shaft in place becomes completely concealed and inaccessible.

In practice, supporting surface 19 is provided with a predrilled hole 21 adapted to receive shaft 20. The shaft 20 is first inserted through hole 14 in plate 10 from its upper side, whereafter plate 10 is attached to the underside of equipment 12 in one of the fashions already described. The assembly is then placed on supporting surface 19 with shaft 20 extending through the aforementioned predrilled hole 21; and the length of shaft 20 is so chosen that, at this time, approximately three-fourths inch of the threaded portion 20b extends below the lower side of supporting surface 19. This lowermost portion of the shaft 20 receives a key operated locking member, generally designated 22 in FIG. 1.

The details of the key-operated lock member 22 are best shown in FIG. 4. The lock structure is commercially available from On Guard Corp. of America, of Carlstadt, N.J., and is presently sold by that company as a "wheel lock" for automobiles. The particular structure shown in FIG. 4 corresponds to Model No. 3–18 of said "wheel lock", and comprises a combination nut and lock housing 23, a lock housing shield 24, and a lock cylinder 25 operated under the control of a key 26. These various parts are separable from one another, but can be assembled to provide the desired locking structure.

More particularly, after the assembly is placed on supporting surface 19 with a portion of shaft 20 extending therethrough, a steel washer 27 is first placed over shaft 20 adjacent the underside of surface 19. The upper end (as shown in FIG. 4) of structure 23 comprises a lock nut and is provided with a plurality of interior threads 23*a* which mate with the threads on portion 20*b* of shaft 20. Structure 23 is threaded onto shaft portion 20*b* and turned down to a position in engagement with washer 27 closely adjacent the underside of surface 19. At this time, the lower (lock housing) end of structure 23 extends below the lowermost end of shaft 20; and this lower end is provided with a plurality of interior grooves 23*b* which are adapted to selectively receive outwardly extending locking bars 25*a* forming a portion of the locking cylinder 25.

When element 23 has been turned down completely, the lock housing shield 24 is placed over element 23, in freely spaced relation thereto, with its upper end in engagement with washer 27. Lock cylinder 25 is then inserted through the lowermost end of shield 24 with collar 25*b* of said cylinder 25 in abutment with an interior shoulder 24*a* of shield 24; and cylinder 25 is inserted into the lower, lock housing, end of structure 23 so that its locking bars 25*a* engage the grooves 23*b* to retain the structure in assembled configuration. At this time, shield 24 is freely rotatable relative to both structure 23 and cylinder 25, and completely encloses element 23 to prevent its removal from the threaded portion 20*b* of shaft 20.

Lock cylinder 25 is so constructed that insertion of the key 26 causes locking bars 25*a* to retract, while removal of key 26 causes said locking bars 25*a* to automatically extend in an outward direction. The lock can accordingly be removed simply by inserting key 26 to retract locking bars 25*a* thereby permitting the entire lock cylinder 25 to be removed. This in turn permits the rotatable shield 24 also to be removed so as to provide access to lock nut 23.

In those cases where the office equipment to be protected is motor driven, (e.g., if the piece of office equipment 12 comprises a typewriter of the electric type) the plate 10 can be provided with an edge recess or with one or more interior vent apertures 28, located at that portion of plate 10 which is disposed adjacent the equipment motor when the plate is installed in place, to facilitate motor venilation.

While I have thus described preferred embodiments of the present invention, many variations will be suggested to those skilled in the art. For example, while the particular lock structure shown in the drawings is actuated by a key member 26, other locks could be employed which are of the combination lock type; and the term "key" used herein, and in the appended claims, is intended to be generic to this latter type of lock as well. Still other variations have already been described. It must therefore be understood that the foregoing description is intended to be illustrative only and not limitative of the invention; and all such variations and modifications as are in accord with the principles described are meant to fall within the scope of the appended claims.

Having thus described may invention, I claim:

1. A locking device for use with office equipment of the type having a substantially rectangular base provided with leg members at the four corners of said base normally adapted to support said equipment on a supporting surface, said locking device comprising a rectangular metallic plate having a substantially uninterrupted surface configuration dimensioned to substantially equal the dimensions of the rectangular base of said office equipment, said rectangular plate being provided with four countersunk round holes at its four corners adapted to receive bolts for thread engagement with said base at locations adjacent said leg members respectively whereby said plate may be integrated with the base of said office equipment in closely adjacent substantially completely covering relation to said base, an elongated shaft attached to said plate and extending in a direction transverse to the plane of said plate, said shaft being adapted for insertion through a pre-drilled hole in the supporting surface for the piece of office equipment, and a removable key-operated lock mem-

ber adapted to engage with and lock to that portion of said shaft which extends through and beyond the underside of said supporting surface to lock said piece of office equipment to said supporting surface.

2. The device of claim 1 wherein said shaft includes a threaded portion, said lock member comprising a nut threadengaging said threaded portion of said shaft, and a shield structure covering said nut to render it manually inaccessible.

3. The device of claim 1 wherein said plate includes a centrally located round aperture, said shaft being removably insertable from the upper side of said plate through said aperture and including a head engaging a portion of said plate adjacent the upper surface of said plate to limit downward movement of said shaft relative to said plate.

4. The device of claim 3 wherein said aperture comprises a countersunk hole having inclined sides, said head being of conical configuration for engagement with said inclined sides.

5. The device of claim 1 wherein said four round holes in said plate are dimensionally and positionally spaced from one another precisely in accordance with the dimensional and positional spacing between the supporting legs of said piece of office equipment, whereby said plate can be attached to the underside of said piece of office equipment by removing said supporting legs from said piece of equipment and then reattaching said supporting legs to said piece of equipment via said apertures.

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