SLIDING DISPLAY OR STORAGE UNITS AND CATCH MECHANISMS THEREFOR

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Fig. 3.

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Patent drawing for sliding display or storage units and catch mechanisms therefor.
ABSTRACT OF THE DISCLOSURE

A sliding display or storage unit in which a sliding member such as a shelf unit, cupboard or television receiver is mounted for vertical movement on a guide assembly, and a locking mechanism is provided to lock the sliding member in position on the guide. Preferably, the locking mechanism is a self-locking device, and particular mechanisms are described.

The invention relates to furniture or fittings incorporating a sliding member moveable along a guide, and to self-locking catch mechanisms therefor. For storage purposes, it is frequently found necessary to provide a cupboard, shelf or the like positioned at an inconvenient height, in order to make adequate use of available space. For display purposes, a cabinet, shelf or the like may require complex adjustable mountings to make it possible to arrange items in a configuration that is attractive to the eye.

According to one aspect, the invention consists in a storage or display unit in which a sliding member is mounted for vertical movement along a guide, and a locking mechanism is provided to lock said sliding member in position on said guide, said locking mechanism being mounted to move with said sliding member, and including a control member adapted to free said locking mechanism when manually displaced from a rest position.

The term "storage or display unit" is used here to refer to a cupboard, cabinet or shelf arrangement, which may be a free-standing item of furniture, or may be a built-in fitting. Preferably, the locking mechanism is self-locking, and another object of the invention is to provide a simple self-locking catch that is reliable in operation.

According to another aspect, therefore, the invention consists in a self-locking catch mechanism for use on a sliding member moveable along a guide, said mechanism including at least one latching arm for engagement with a guide, an operating wedge for driving said latching arm into engagement with said guide, when in use, and a control member for displacing said operating wedge to free said latching arm when manually displaced from a rest position.

The locking mechanism may be mounted on said sliding member, or it may be separately mounted on a guide and mechanically coupled to move with the sliding member, by a cord or cable, for example. The use of such a separately mounted locking mechanism permits the use of a pulley system, the sliding member of the unit being suspended by a cable which goes over a pulley and down to the locking mechanism, which is mounted in a convenient position on an auxiliary slide.

The object will now be described with reference to the accompanying drawings, in which:

FIG. 1 illustrates an exemplary embodiment of the self-locking catch mechanism;

FIG. 2 is a front view of an exemplary embodiment of a piece of furniture constructed in accordance with the present invention; and

FIG. 3 is a perspective view of one alternative self-locking catch mechanism.

The self-locking catch mechanism illustrated in FIG. 1 comprises a plate 1 provided with fixing holes for mounting on a sliding member moveable along a guide rail 2. The sliding member engages between the surfaces 3a and 3b of the guide 2, which extend around the edges of the sliding member to prevent side-play, and so prevent two opposed surfaces 4a and 4b upon which the self-locking mechanism acts, in a manner to be described. A plurality of guide rails may be provided for an embodiment having a large mass, in which case the opposite faces of two guide rails may act as the surfaces 4a, 4b. Similarly, a plurality of control mechanisms may be provided, each having two pivoted catching arms 5a, 5b, an operating wedge 6, and a control lever (not shown).

Each catching arm is mounted on the plate 1 at a pivot 7, and is so shaped that gravity causes the arms to fall towards each other. The operating wedge 6 is positioned centrally between the two catching arms, and has an elongated aperture 8 in which there is engaged a locating pin 9 mounted on the plate 1, which serves to retain the operating wedge 6 approximately. The operating wedge 6 has shoulders 11 which engage with the catching arms and drive them against the opposed surfaces 4a and 4b of the guide rails when the operating wedge is pulled in an upward direction, each catching arm having a face 12 adapted to engage the surface 4a or 4b, and so restrain the sliding member to which the plate 1 is attached from vertical movement. A separate baseplate 1 is not essential, as the catching arms and operating wedge may be directly mounted on the sliding member.

The force required to effect locking action acts upon the operating wedge in the direction of the arrow 13. This may be provided by a spring, not shown, but in this embodiment it is provided by means of a cord 13A which is anchored to the upper end of the operating wedge 6 and extends up to pass over a pulley P and support a counterbalance weight 24A for the sliding member. In order to release the lock and permit movement of the sliding member, a cord 14 extends from the bottom of the operating wedge 6, for example to a control lever mounted on the sliding member at a central position. The control lever may be in the form of a handle pivoted at one end, or at a central point, which drives a bobbin on which the cord 14 is anchored. Alternatively, the end of the cord may be anchored, and the portion of the cord exposed to act as a control member which is pulled to release the lock, or in the case of a cupboard or shelf mounted to be raised to a high position for storage the cable can hang free and itself acts as a control member which is pulled to release the lock when the cupboard is to be lowered. Alternative forms of construction can be employed, however, as the only requirement is that the control member must permit the operating wedge 6 to move to the locked position when the control member is free and must be adapted to drive the operating wedge down (by means of the cord 14 in this embodiment) when the control member is manually operated prior to adjustment of the vertical position of the sliding member. It will be seen that the use of a self-locking catch mechanism permits the adjustment of the sliding member to any required position whilst the control member is holding the lock disengaged, and to effectively lock the sliding mem-
ber in that position immediately the control member is released. When light articles are to be controlled, the locking action can be provided by a spring, and a counterbalance may not be necessary. In such embodiments, the use of a locking mechanism complete with control member mounted on a baseplate may also be advantageous.

Although the latching arms and guide retaining the embodiment described exhibit flat co-operating surfaces, it will be appreciated that a notched surface may be provided on the guide, if desired, in which case the face 12 of the latching arm may be provided with one or more teeth.

In some applications, additional return springs or levers may be employed, for example to provide the locking action or to provide a force to move the latching arm or arms to the freed position, and auxiliary bridge members or straps such as the projecting lugs 6A may be provided to locate and position the operating wedge and/or latching arms.

FIG. 2 illustrates in simplified form a part of a piece of built-in furniture constructed in accordance with the invention. In this case, four corner posts 21 form part of a fixed upper enclosure 22 having a front panel 23. A shelf unit 24 forms a sliding member which is movable in the vertical direction into or out of the enclosure 22 between the corner posts 21, which are shaped to provide guide surfaces co-operating with surfaces on the shelf unit. At each side of the shelf unit, there is a self-locking catch mechanism 1, engaging with the opposed surfaces of the associated part of posts 21. A separate cord 13A passes up from the locking member of each mechanism, over an associated pulley P within the enclosure 22, to support a counterbalance weight W, one at each side of the enclosure. A control member 25 is positioned centrally on the lowest shelf of the shelf unit 24, which can be operated to release the locking mechanism and so permit adjustment of the vertical position of the shelf member. Preferably, the self-locking catch mechanism is of the type described with reference to FIG. 1, or of the type described later with reference to FIG. 3.

The construction shown in FIG. 2 may be designed for use as a wall-cabinet, or can be suspended from a supporting frame to act as a room-divider. The shelf space can be simply pulled to an accessible position or pushed out of sight, and as the enclosure 22 does not require hinged doors or other opening arrangements, it can be of simple construction and attractive style.

Where the furniture is designed as a room-divider, the shelf unit may be provided with a single control member 25, at the centre of its under surface, for example, or with separate control members, one on or near each face.

If desired, a guard rail 26 may be provided adjacent the edge of one or more shelves to prevent accidental displacement of articles placed thereon, and to enhance the appearance.

In the embodiment illustrated in FIG. 2, the lowest shelf carries a front panel 27 which fits flush with the front panel 23 in the closed position, but gives increased head room for the top shelf in the lowered position.

The invention is not limited to the use of a sliding member in the form of a simple shelf unit within a fixed enclosure, as described with reference to the drawing, but may include a complete sliding cupboard. Furthermore, the sliding member may be provided with drawer fittings, etc. etc., or it may be provided with plumbing fixture fittings, etc.

When intended to be used for display purposes, the enclosure 22 may be replaced by an open framework, or provided with glass panels. Instead of forming a built-in suspended cupboard fitting, a movable piece of furniture may be constructed, the parts 21 extending down from the enclosure 22 to a base at floor level, or to a working surface at the base.

In yet another alternative arrangement, the sliding member may be designed to be pushed down into or lifted from a base enclosure, so providing a neat cabinet when closed, and exposing equipment such as a television set mounted on the sliding member, when in the open position.

Furthermore, a locking mechanism and control member can be mounted on a baseplate to form an auxiliary sliding member from which a cord or cable extends over a pulley to the main sliding member, which may then be remotely controlled, if desired. Where counterbalancing is required, this can then be fitted within the enclosure, or is preferably carried by the baseplate of the locking mechanism.

The mechanism described with reference to FIG. 3 represents a simple but effective self-locking catch which employs the minimum number of parts, and the parts themselves are of simple construction, and of a nature readily manufactured, for example, as plastic components. The symmetrical configuration of the parts, and of the assembly, is particularly advantageous.

A baseplate 31 has an undercut groove 32 adapted to retain an operating wedge piece 33, which is free to slide therein. Transverse grooves 34 intersect the groove 32, and are adapted to retain latching arm pieces 35 slideable therein. Each piece 35 has an inner face 35A contoured to engage an associated shoulder 35A of the operating wedge, to drive the notched outer face 35B into engagement with the associated guide surface. In this embodiment, the wedge 33 has anchoring holes for cords 13A, 14A, as described with reference to FIG. 2.

In some applications, the weight 24A may comprise the shelf or storage unit itself and the locking mechanism may be guided in an auxiliary guide. Such an arrangement is shown schematically in FIGS. 1 and 3.

An in other applications, additional return springs or levers may be employed, for example to provide the locking action, or to provide a force to move the latching arm or arms to the freed position, and auxiliary bridge members or straps may be provided to locate and position the operating wedge and/or latching arms.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. A storage or display unit in which at least one sliding member is mounted for vertical movement along a guide means and a self-locking mechanism is operatively connected with said sliding member and said guide means to lock said sliding member in selected positions on said guide means, said self-locking mechanism including at least one movably mounted latching member having a locking surface engageable with said guide means to lock said sliding member against movement relative to said guide means, an operating wedge operatively engageable with said latching member to urge it into said locking engagement, a cord or the like connected with said operating wedge and engaging upwardly over a pulley and supporting a counterbalance, said counterbalance offsetting the weight of said sliding member and moving said operating wedge into operative engagement with said latching member, and control means operatively connected with said operating wedge to move it out of operative engagement with said latching member to free said locking mechanism enabling said sliding member to move along said guide means.

2. A storage or display unit as in claim 1, wherein said sliding member comprises at least one shelf or storage unit or the like.

3. A storage or display unit as in claim 1, wherein said counterbalance comprises at least one shelf or storage unit or the like, and said sliding member is mounted for movement in an auxiliary guide.

4. A storage or display unit as in claim 1, wherein said locking mechanism comprises a pair of latching arms each having a locking surface for locking engagement with said guide means, and said operating wedge is disposed between said latching arms and includes a pair of oppositely facing tapered shoulders engageable with said latching
arms to wedge them apart into operative engagement with said guide means.

5. A storage or display unit as in claim 4, wherein said locking mechanism includes a plate and said latching arms are pivotally mounted in back-to-back relationship at one end thereof on said plate, said latching arms each having enlarged protruding shoulder means at their other end, the shoulder means of each arm extending toward the shoulder means of the other arm in a converging manner, and said operating wedge is slidably mounted on said plate between said latching arm shoulders for engagement with said shoulders to pivot said latching arms outwardsly into operative locking engagement with said guide means.

6. A storage or display unit as in claim 4, wherein said locking mechanism includes a plate having a first groove in one face thereof extending vertically substantially the entire length of the plate, and a pair of opposite upwardly angularly extending grooves in said face intersecting said first groove, said latching arms slidably received in said angularly extending grooves with one end of each arm extending partially into said first groove and the other end of each arm being substantially flush with the edge surface of said plate, said operating wedge slidably mounted in said first groove between said one ends of said latching arms and engageable therewith to slide said latching arms outwardsly with their other ends in operative locking engagement with said guide means.

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