March 3, 1964 S. A. MAXWELL 3,123,419

LOCK FOR DRAWER ASSEMBLIES

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Fig. 3.

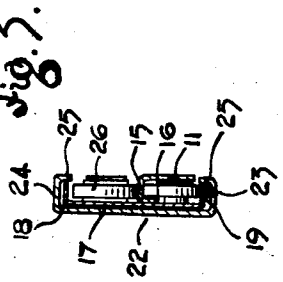


Fig. 5.

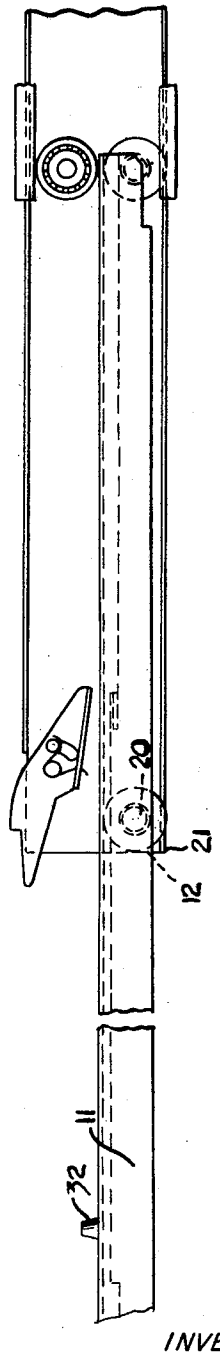
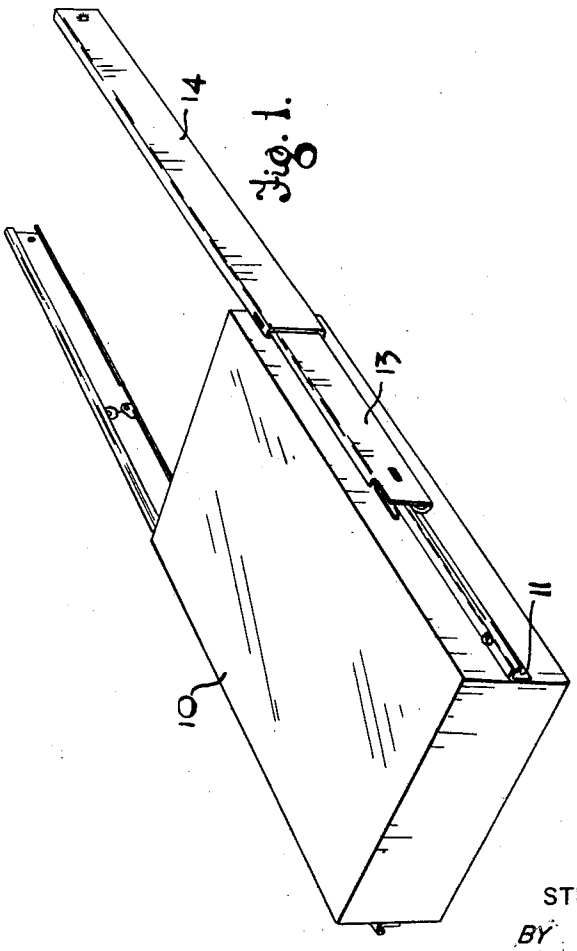


Fig. 1.



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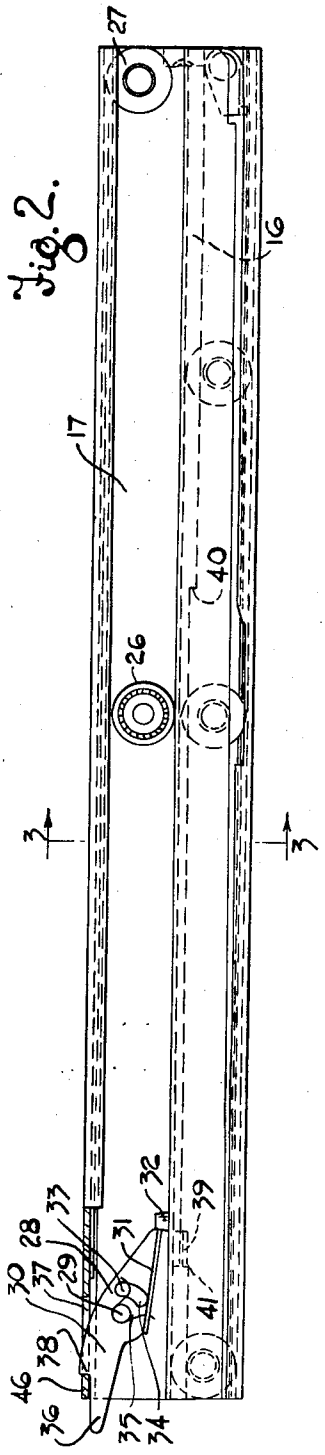


Fig. 2.

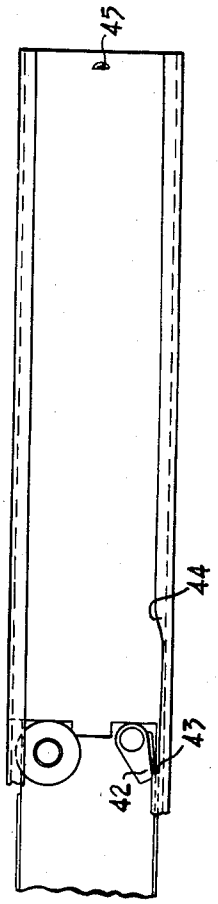


Fig. 4.

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LOCK FOR DRAWER ASSEMBLIES

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Claims priority, application Great Britain Aug. 23, 1961

7 Claims. (Cl. 312—333)

This invention relates to locks for drawer assemblies of the kind (hereinafter referred to as the kind specified) comprising a drawer, tray or the like (hereinafter referred to as a drawer) which is mounted in a frame for sliding movement between a fully closed position and a fully open position, the frame being a cabinet or housing or a part thereof, or a separate member which is itself slidably mounted with respect to the cabinet or housing. An example of the latter is the type of filing cabinet in which an intermediate sliding frame is disposed between the drawer and the cabinet to support the former in the fully open position. The object of the invention is to provide a new or improved construction of lock for a drawer assembly.

According to the present invention we provide in or for a drawer assembly of the kind specified, a locking member adapted to be secured to the frame and operable from an operative position in which mutual engagement means carried by the locking member and the drawer are engaged to lock the drawer in the fully closed position to an inoperative position in which the said mutual engagement means are disengaged to permit the opening of the drawer, the drawer and frame having mutual abutment means which when engaged prevent removal of the drawer from the frame when the drawer is in the fully open position and when disengaged permit of such removal, and release means being associated with the locking member, which release means in the operative position of the locking member prevent disengagement of the abutment means and which in the inoperative position of the locking member when the drawer is in the fully open position permit disengagement of the abutment means to allow removal of the drawer from the frame.

Preferably the said mutual abutment means are such that they are disengageable by upward movement of the drawer in the fully open position with respect to the frame, the release means being constituted by an upwardly presented part of the drawer and a downwardly presented part of the locking member, the latter part being sufficiently close to the former part in the operative position of the member to prevent a sufficiently large upward movement of the drawer to permit disengagement of the said mutual abutment means and being raised in the inoperative position of the locking member to permit such upward movement.

Conveniently the engagement means comprises a nose portion on the locking member and an upstanding projection on the upwardly presented part of the drawer. Preferably the locking member is spring urged into its operative position, and the nose portion and projection are so formed that the nose portion is automatically raised over the projection by cam action when the drawer is returned to its fully closed position. Operation of the locking member for the purpose of opening the drawer may be effected by manipulation of a projecting finger on the member or alternatively by camming of the nose portion over the projection when sufficient force is exerted to pull the drawer open.

The operative position of the locking member may be determined by mutual abutments on the locking member and the frame so disposed that the downwardly presented part of the locking member is held out of contact with

the upwardly presented part of the drawer in order to reduce frictional resistance to movement of the drawer.

If desired, a plurality of projections may be formed on the drawer to limit movement thereof between desired positions. This arrangement is helpful if the direction of sliding movement of the drawer is not exactly horizontal, for example, in the case of a filing cabinet standing on an uneven surface.

Where the frame is itself slidably mounted with respect to the cabinet or housing the locking member and the cabinet or housing may also be provided with mutual engagement means, the locking member being preferably operable to disengage both engagement means by pivotal movement.

The invention is illustrated in the accompanying drawing wherein:

FIGURE 1 is a perspective view showing the slide assembly in the fully extended position,

FIGURE 2 is a side elevation to an enlarged scale of the slide assembly in the closed position,

FIGURE 3 is a section on line 3—3 of FIGURE 2,

FIGURE 4 is a detail showing the frame and the bracket secured to the housing in the fully extended position and

FIGURE 5 is a view similar to FIGURE 4 but showing the bracket secured to the drawer and the frame.

The invention will now be described by way of example with reference to the accompanying drawing in which is shown a tray assembly in which the frame is slidable in a cabinet or housing, which, for the sake of clarity, is not shown on the drawing.

In the form of our invention illustrated each side of the tray **10** which may carry the ingredient dispensing mechanism for a beverage vending machine, has secured thereto a bracket **11** which rests on a plurality of rollers **12** mounted on the frame **13**. The rollers **12** themselves rest and roll on a bracket **14** secured to the housing or cabinet of the machine so that, when extended, the distance moved by the tray **10** is twice the distance moved by the frame **13**.

Each bracket **11** on the tray **10** extends in a horizontal direction for substantially the whole of the tray and in cross-section, i.e. in a plane perpendicular to the direction of sliding movement of the drawer the bracket **11** is of inverted L shape, the horizontal arm **15** of the L having a short downwardly projecting flange **16** which engages behind the rollers **12**.

The frame **13** consists of an elongated horizontal channel member, the base **17** of the channel being disposed in a vertical plane and the sides **18** and **19** being disposed in horizontal planes and projecting towards the tray **10**.

Near the lower side **19** are rotatably mounted the rollers **12** upon which the bracket **11** rides, the rollers being supported by studs **20** secured to the base **17** of the frame **13** and the periphery of the rollers **12**, at their lowest point, projecting a short distance through apertures **21** formed in the lower side **19** of the frame.

Each bracket **14** on the cabinet comprises a channel member of the same general form as the frame **13** but slightly larger so as to be able to receive the frame **13** with the base **17** thereof closely adjacent the base **22** of the bracket **14**. The projecting peripheries of the rollers **12** rest on the lower side **23** of this bracket **14** so that the frame **13**, bracket **11** and tray **10** secured thereto are movable along the length of the bracket **14**. The sides **23** and **24** of the bracket **14** are provided with short mutually approaching flanges **25** which extend along the full length thereof and which overlie the free edges of the sides **18** and **19** of the frame **13**. Thus lateral separation between the frame **13** and bracket **14** is prevented and lateral separation between the frame **13** and bracket **11** being

prevented by virtue of the engagement of the flange 16 behind the rollers 12.

As the tray 10 is withdrawn from the cabinet so a downward load is exerted on the projecting end of the bracket 11 and in order to restrain the bracket against tilting movement and to permit free sliding movement thereof even under load conditions a ball bearing mounted bearing ring 26 is supported from the frame 13 and adapted to engage the upper face of the horizontal arm 15 of the bracket 11. Similarly the frame 13 is provided at the rear upper corner thereof with a rotatable wheel 27 which, when the frame 13 is subject to a tilting movement bears against the underside of the upper side 24 of the bracket 14.

The locking member 28 is pivotally mounted on a stud 29 fixed to the base 17 of the frame 13 between the upper side 18 thereof and the horizontal arm 15 of the bracket 11 on one side of the tray 10. The locking member 28 comprises a flat plate 30 having along its lower edge a transverse flange 31 extending towards the tray 10. When the tray 10 is disposed within the cabinet the inner end of the flange 31 abuts against an upstanding stud 32 which is secured to the horizontal arm 15 of the bracket 11 and thus serves to lock the bracket 11 against outward movement relative to the frame 13.

A second stud 33 projects from the base 17 of the channel section frame 13 through a slot 34 formed in the locking member 28. This slot 34 is arcuate having as its centre the pivotal axis, i.e. stud 29, of the locking member 28. A spring 35 acts between the stud 33 and the locking member 28 so that the latter is biased to the position shown in FIGURES 2 and 5, the slot 34 and the stud 33 being so disposed that the inner end of the flange 31 of the locking member 28 is spaced a short distance above the horizontal arm 15 of the bracket 11 on the tray 10.

At its upper and forward edge the locking member 28 is formed with a finger 36 which projects into a position which is readily accessible when the tray is in its closed position. A slot 37 is formed in the upper side 24 of the bracket 14 which is secured to the housing, the slot 37 being formed near the front end of the bracket 14 and this slot 37 receives, in the operative, i.e. spring biased position of the locking member 28, a nose portion 38 formed on the upper edge of the locking member. Depression of the finger 36 pivots the locking member 28 about the stud 29 and against the action of the spring 35 and brings the nose portion 38 out of engagement with the slot 37 and brings the flange 31 clear of the stud 32 and thus permits the bracket 11 to slide relative to the frame 13 and the frame 13 to slide relative to the bracket 14.

In order to prevent inadvertent complete withdrawal of the tray 10 from its housing, suitable stop means are provided. The first of these stop means comprises a tongue 39 pressed out from the base 17 of the frame 13 and adapted to be engaged, in the fully extended position of the bracket 11, by a shoulder 40 formed on the downwardly projecting limb 16 of the bracket 11. As will be seen from FIGURE 2, a further shoulder 41 again formed on the downwardly extending portion 16 of the bracket 11 engages the opposite face of the tongue 39 when the bracket 11 is in the fully retracted or closed position.

In order to limit the forward or withdrawal movement of the frame 13 relative to the bracket 14, the lower rear edge of the base 17 of the frame 13 has pivoted thereto a finger 42 which is pivoted adjacent one end so that it will tilt downwardly under its own weight and will tend to take up the position shown in FIGURE 4. As seen from FIGURE 4, the finger 42 is adapted to abut against a shoulder 43 formed in the lower flange 25 of the bracket 14 when the frame 13 is in its fully advanced position. To the rear of the shoulder 43 the flange 25 is formed with a cam face 44 so that when the frame 13 moves inwardly

with respect to the housing the finger 42 will be lifted by its engagement with the cam 44. In order to limit inward movement of the frame 13 relative to the bracket 14, the base 22 of the bracket 14 is provided, adjacent its inner end, with a struck-out stop 45 which is adapted to engage the rear or inner edge of the base 17 of the frame 13.

When the tray is being moved out of, or into, the housing, the bracket 11 moves relatively to the frame 13 and such movement causes rotation of the supporting wheels 12. These wheels are running in the bracket 14 and thus simultaneously with the movement of the bracket 11 relative to the frame 13, the frame 13 will move relative to the bracket 14. When the frame 13 approaches its fully retracted position the upper edge of the locking member 28 will engage against that portion 46 of the upper flange 24 of the bracket 14 which bounds the front of the slot 27 and this engagement will cause the locking member to pivot about the stud 29 against the action of the spring 35 and will thus lift the flange 31 clear of stud 32.

It is sometimes desired to withdraw the tray completely from the housing and this is normally done by removing the tray and bracket 11 from the wheels 12 upon which bracket 11 runs. When the tray 10 is fully extended from the housing the shoulder 40 is abutting against the tongue 39 and it is necessary to tilt the bracket 11 in order that the shoulder 40 may clear the tongue 39. Such tilting movement is prevented due to the fact that in its spring loaded position the lower rear edge of the flange 31 of the locking member 28 is positioned above the horizontal arm 15 of the bracket 11 by a distance less than the thickness of the tongue 39. In other words, tilting movement will be restrained by the locking member 28 and it is therefore necessary for the locking member to be tilted against the spring bias before the tray can be completely withdrawn from the housing.

If desired, the horizontal arm 15 of the bracket 11 may have a plurality of axially spaced upwardly projecting studs secured thereto so that the forward movement of the bracket 11 relative to the housing will be arrested at a plurality of positions and can be released from each such position as a result of depression of the locking member.

What I claim then is:

1. In or for a drawer assembly of the kind specified, a locking member adapted to be secured to a frame and operable from an operative position in which mutual engagement means carried by the locking member and the drawer are engaged to lock the drawer in the fully closed position to an inoperative position in which the said mutual engagement means are disengaged to permit the opening of the drawer, the drawer and frame having mutual abutment means which, when engaged, prevent removal of the drawer from the frame when the drawer is in the fully open position and, when disengaged, permit of such removal, and release means associated with the locking member and serving in the operative position of the locking member to prevent disengagement of the abutment means and which in the inoperative position of the locking member when the drawer is in the fully open position, permit disengagement of the abutment means to allow removal of the drawer from the frame.

2. A locking member as claimed in claim 1, wherein the mutual abutment means are such that they are disengageable by upward movement of the drawer relative to the frame when the drawer is in the fully open position, the release means being constituted by an upwardly presented part of the drawer and a downwardly presented part of the locking member, the latter part being sufficiently close to the former part in the operative position of the locking member to prevent a sufficiently large upward movement of the drawer relative to the

frame to permit disengagement of the said mutual abutment means.

3. A locking member as claimed in claim 1, wherein the engagement means comprise a nose portion on the locking member and an upstanding projection on the drawer.

4. A locking member as claimed in claim 1, wherein the locking member is spring loaded into its operative position, means being provided for camming the locking member into its operative position during closing movement of the drawer.

5. A locking member as claimed in claim 1, wherein the locking member is provided with a projecting finger accessible in any position of the drawer and operable to move the locking member from its operative to its inoperative position.

6. A locking member as claimed in claim 1, wherein the operative position of the locking member is determined by mutual abutments on the locking member and

on the frame, said abutments being so positioned that in its operative position the nose portion of the locking member is held clear of the adjacent face associated with the drawer.

7. A locking member as claimed in claim 1, wherein the frame is itself slidable with respect to the housing in which the drawer is mounted, the locking member and the housing, being provided with mutual engagement means whereby, in the operative position of the locking member the frame is also locked relative to the housing.

References Cited in the file of this patent

UNITED STATES PATENTS

2,769,551 Just ---------- Nov. 6, 1956

FOREIGN PATENTS

202,562 Great Britain ---------- Aug. 23, 1923
345,539 Great Britain ---------- Mar. 26, 1931
801,255 Great Britain ---------- Sept. 10, 1958