July 14, 1970 F. M. WHITE ET AL 3,520,568

DOOR LATCH FOR APPLIANCE CABINETS AND THE LIKE

Filed April 2, 1969

FIG.3

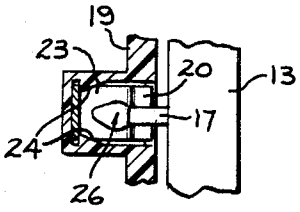
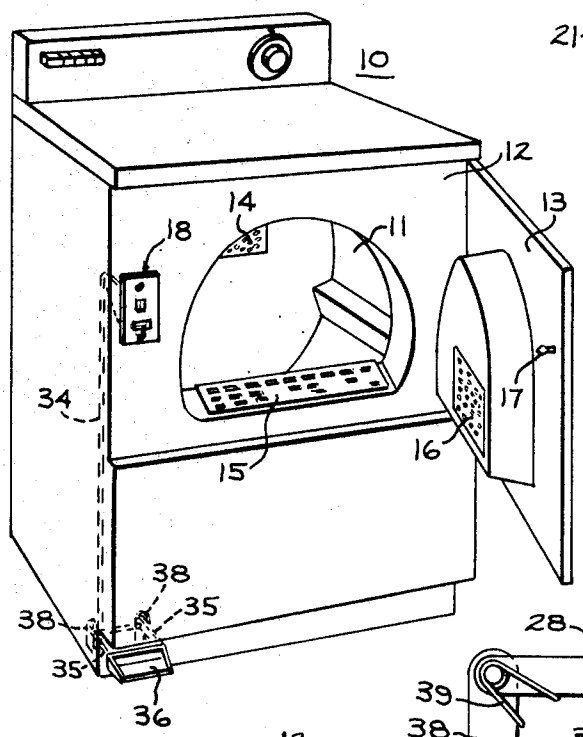


FIG.1



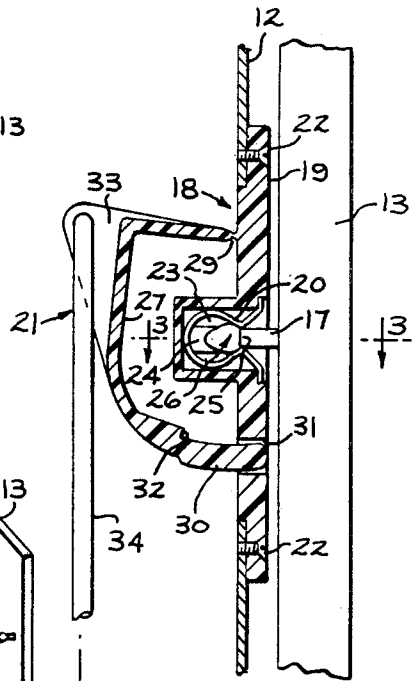
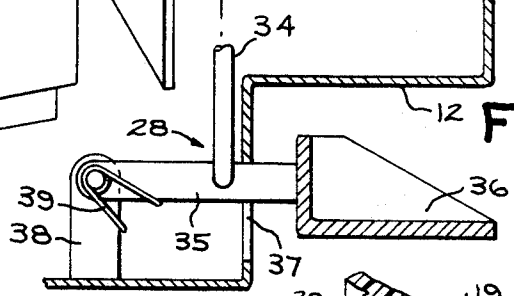


FIG.2



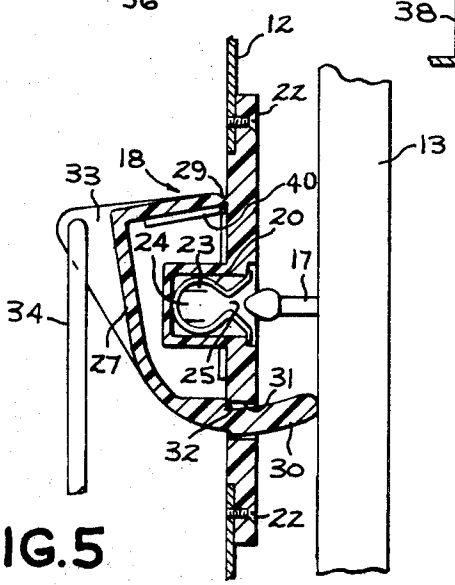


FIG.5

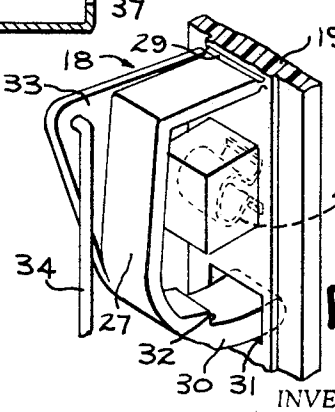


FIG.4

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DOOR LATCH FOR APPLIANCE CABINETS AND THE LIKE

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U.S. Cl. 292—255 5 Claims

ABSTRACT OF THE DISCLOSURE

A latch assembly is provided having a door-mounted strike and a resilient cooperating cabinet-mounted keeper. Unitary means are provided for mounting the keeper on the cabinet member and for releasing the strike from the keeper. The unitary means comprises a rigid element supporting the keeper and an integral release arm connected by a flexible hinge at the juncture thereof. An opening is formed in the rigid element, through which a portion of the release arm may be extended when the release arm is rotated about the flexible hinge. A foot operated means is adapted to rotate the release arm about the flexible hinge and to extend the portion through the opening and into engagement with the door member. A biasing means is provided to normally maintain the release arm in such a rotary position relative to the flexible hinge that the portion is withdrawn from contact with the door member.

BACKGROUND OF THE INVENTION

This invention relates generally to foot operated latches and, more particularly, to a foot operated latch for use on appliance and other household cabinets, such as automatic clothes dryer cabinets.

A variety of foot operated latch arrangements are known to the prior art. However, most of these devices are of a complex design employing a multiplicity of intricate latch mounting and operating parts. For example, reference is made to U.S. Pat. No. 2,844,402, issued July 22, 1958 to Mr. Philip G. Hughes and assigned to the assignee of the instant invention. That patent teaches a foot operated latch of a magnetic type employing a pair of pole pieces, at least one of which is pivotally mounted for breaking a magnetic circuit and exerting a force against the cabinet door. The Hughes device further discloses a complex assembly for supporting and biasing the pivotal pole member to facilitate operation.

Latches designed for use in automatic dryer cabinets and the like must also be designed with safety in mind, as such cabinets frequently present the problem of being attractive to children who may climb through the dryer access opening and into the dryer drum, closing the door after them. It is therefore essential to provide a door latching arrangement which is readily releasable by a force exerted from the interior of the cabinet, as well as being operable from the exterior. In addition to being readily releasable with a minimum of force, the latching arrangement must be designed to provide adequate closure force to hold the door in a sealed relationship against the compression gasket to prevent the outside air from entering the drying chamber or to prevent the escape of moisture or moist air during the operation of the dryer.

It is, accordingly, an object of this invention to provide a new and improved foot operated latch which is simple and inexpensive in design and which provides a firm holding action but yet is readily releasable for access to the interior of the cabinet.

SUMMARY OF THE INVENTION

This invention comprises an improved latch assembly having a strike secured to a door member and a cooperating resilient keeper secured to a cabinet member. Unitary means are provided for mounting the keeper on the cabinet member and for releasing the strike from the keeper, the unitary means comprising a rigid element supporting the keeper and an integral release arm connected to the rigid element by a flexible hinge at the juncture thereof. An opening is formed in the rigid element through which a portion of the release arm may be extended when the release arm is rotated about the flexible hinge. A foot operated means is provided to rotate the release arm about the flexible hinge and to extend the portion through the opening and into engagement with the door member. A biasing means is adapted to normally maintain the release arm in such a rotary position relative to the flexible hinge that said portion is withdrawn from contact with the door member.

BRIEF DESCRIPTION OF THE DRAWING

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed that the invention will be better understood from the following description of the preferred embodiment taken in connection with the accompanying drawing, in which:

FIG. 1 is a perspective view of a clothes dryer incorporating the invention;

FIG. 2 is a vertical sectional view of one embodiment of the latch of FIG. 1 illustrating the latch in a closed position;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a partial perspective view of the latch of FIG. 2; and

FIG. 5 is a vertical sectional view of a second embodiment of the latch showing the cabinet door partly open.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, and initially to FIG. 1 thereof, there is illustrated an automatic clothes dryer **10** having a clothes tumbling basket **11** arranged for rotation about a horizontal axis. The basket **11** is mounted within an outer cabinet **12**, and a door **13** is provided on the cabinet for access to the interior of the basket. During operation of dryer **10**, warm dry air is blown or drawn into the basket **11** through an opening **14** in a rear bulkhead closing the back of the basket. After passing through the basket and extracting moisture from the clothes therein, this air is then discharged into an exhaust opening **15** through a passageway **16** in the door **13**. It will be understood that dryer **10** is provided with suitable air moving and heater means for creating this flow of warm dry air.

In order to hold the door **13** closed during the operation of the dryer, a latch assembly is provided. In accordance with one embodiment of the invention as shown in FIG. 2, the latch assembly comprises a strike **17** and a

cooperating keeper **18**, the strike **17** being secured to door **13** and the keeper **18** being secured to cabinet **12**. Keeper **18** comprises a mounting plate **19**, a resilient means **20** for releasably capturing the strike **17**, and an unlatching means generally indicated by the numeral **21**.

Mounting plate **19** is secured to cabinet **12** by suitable fastening means such as screws **22**. Centrally positioned within mounting plate **19**, as seen in FIGS. 2 and 3, is a cavity **23** having tabs or projections **24** for securing resilient means **20** therein. Resilient means **20** comprises a substantially U-shaped leaf spring having concave leg portions which bow inwardly to form a restriction **25** which cooperates with an enlarged blunt head portion **26** formed on strike **17**. By this arrangement, resilient means **20** may releasably capture strike **17** thereby releasably holding the door **13** in a closed position adjacent the cabinet **12**.

Unlatching means **21** comprises a release arm **27** pivotally mounted for rotation relative to the mounting plate **19**, and a foot operated means **28** adapted to rotate the release arm **27**. Release arm **27** is integrally formed with the mounting plate **19** and has a flexible hinge **29** at the juncture thereof whereby the release arm may pivot about its point of connection to the mounting plate. Mounting plate **19** and integral release arm **27** may be made of any suitable material such as polypropylene which will enable the formation of a durable resilient flexible hinge **29** by a severe reduction in cross section between the mounting plate and the release arm. From its point of connection to the mounting plate, the release arm **27** extends inwardly and downwardly so as to avoid contact with the molded cavity area of mounting plate **19** which supports resilient means **20**. The lower portion of release arm **27** terminates in an arcuate projection **30** adapted to extend through an opening **31** in mounting plate **19**. Arcuate projection **30** has a radius of curvature about the point of connection of the release arm **27** with the mounting plate **19** substantially equal to the distance between the aforementioned point of connection and the opening **31**. Also formed on the lower portion of release arm **27** is an enlarged stop **32** adapted to engage the rear face of mounting plate **19** and thereby limit the rotation of the release arm **27**.

A projection **33**, as may be seen in FIGS. 2 and 4, extends from the release arm **27** and has a hole therein for connection with one end of a depending link **34**. The other end of link **34** connects with one of two inwardly extending arms **35** of a foot pedal **36**. As shown in FIGS. 1 and 2, the foot pedal **36** extends outwardly through an opening **37** in cabinet **12** and is pivotally supported from the cabinet **12** by a pair of supports **38** extending upwardly from the base thereof.

A biasing means is provided to normally maintain the release arm **27** out of contact with the door **13**. In the embodiment of FIG. 2, the biasing means comprises a spring **39** adapted to exert a force on foot pedal arm **35** and the cabinet connected support **38**. In an alternate embodiment of the invention shown in FIG. 5, the spring **39** is not utilized. In this embodiment the biasing means compresses a torsion spring **40** disposed adjacent the point of connection of the release arm **27** and the mounting plate **19**. Spring **40** has its release arm **27** and mounting plate **19** to maintain the release arm out of contact with door **13**.

Door closure is effected by manually exerting a force on the outer surface of door **13** thereby causing the enlarged blunt head portion **26** of strike **17** to engage resilient means **20** and to extend thereinto past the restriction **25** To open the door, a downward force is manually exerted on foot pedal **36** which causes the inwardly extending arms **35** to pivot downwardly. As arms **35** pivot downwardly, link **34** is caused to translate downwardly and release arm **27** is pivoted about flexible hinge **29**, as shown in FIG. 4. The arcuate portion **30** of release arm **27** is thereby caused to extend through opening **31** into contact

with door **13**. The force exerted on door **13** by the release arm causes strike **17** to disengage resilient means **20**, and door **13** then snaps open. The extension of portion **30** through opening **31** is limited by stop **32**, and when a force is no longer exerted on the foot pedal **36**, the biasing means, **39** or **40**, causes the unlatching means **21** to reassume the configuration of FIG. 2.

As was previously mentioned, my system is particularly adapted for use in appliance cabinets or the like wherein it is desirable to provide a foot operated latch which is simple and inexpensive in design and which provides a firm holding action, yet which is readily releasable. From the foregoing description it should now be apparent that the present invention, by providing a keeper having an integrally formed mounting plate and release arm, is extremely simple and inexpensive in design. Furthermore, by providing a biasing means for releasably capturing the strike, the door may be opened from the interior of the cabinet by a direct manual force on the door itself, or may be opened from the exterior of the cabinet by the use of the foot pedal.

As will be evident from the foregoing description, certain aspects of the invention are not limited to the particular details of the construction of the examples illustrated, and it is contemplated that other variations, modifications or applications will occur to those skilled in the art. It is therefore intended to cover such variations, modifications and applications as do not depart from the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. In a latch assembly having a strike secured to a door member and a cooperating keeper secured to a cabinet member:

(a) unitary means for mounting said keeper on said cabinet member and for releasing said strike from said keeper, said unitary means comprising a rigid mounting plate and an integral release arm connected to said mounting plate by a flexible hinge at the juncture thereof;

(b) an opening formed in said mounting plate through which a portion of said release arm may be extended when said release arm is rotated about said flexible hinge;

(c) foot operated means adapted to rotate said release arm about said flexible hinge and to extend said portion through said opening and into engagement with said door member; and

(d) biasing means adapted to normally maintain said release arm in such a rotary position relative to said flexible hinge that said portion is withdrawn from contact with said door member.

2. The invention of claim **1** wherein said portion of said release arm comprises an arcuate projection having a radius about said flexible hinge substantially equal to the distance between said hinge and said opening.

3. The invention of claim **1** wherein said release arm has an enlarged stop adjacent said portion to limit the rotation of said release arm about said flexible hinge.

4. The invention of claim **1** wherein said biasing means comprises a torsion spring disposed adjacent said flexible hinge and having ends adapted to exert a force on said release arm and said mounting plate.

5. The invention of claim **1** wherein:

said foot operated means includes a foot pedal pivotally supported from the cabinet member, and means connecting said foot pedal to said release arm whereby a downward rotation of said foot pedal causes said portion of said release arm to extend through said opening; and

said biasing means comprises a spring adapted to exert a force on said foot pedal and said cabinet member.

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16—150; 292—340