CABINET DOOR LOCKING SYSTEM

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ABSTRACT
Provided are exemplary embodiments that may include a cabinet door securing system, including a rotatable shaft, a biasing member plate spring configured to disengagedly couple to the rotatable shaft, a knob coupled to a door, and the rotatable shaft coupled to the knob, configured to move from an unactuated position to an actuated position, wherein the plate spring couples to the rotatable shaft when the rotatable shaft is in an unactuated position, and may be uncoupled from the rotatable shaft when said rotatable shaft is in an actuated position.
CABINET DOOR LOCKING SYSTEM
CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This patent application is a continuation-in-part of application Ser. No. 10/746,771 filed Dec. 23, 2003, for CABINET DOOR SYSTEM, which is incorporated by reference herein in its entirety for all purposes.

BACKGROUND

[0002] Some interior doors may utilize a knob or other similar method to secure the door in the closed position. However, these types of securing configurations may not typically be used for kitchen and other cabinet doors. Kitchen and other cabinet doors may be kept closed by spring-equipped hinges or by gravity closing means. These configurations may not operate satisfactorily when intending to keep children out of the cabinet, or during an earthquake or other events when the contents of the cabinet may move.

[0003] What is needed is a securing configuration that will allow the door to remain secured to the cabinet until unsecured by a user.

SUMMARY

[0004] Provided are exemplary embodiments that may include a cabinet door securing system, including a plate spring, a shaft configured to disengagedly couple to the plate spring, a knob coupled to the door, the shaft coupled to the knob and configured to move from an unacted position to an actuated position, wherein the plate spring couples to the shaft when the shaft is in an unacted position, and may be uncoupled from the shaft, when said shaft is in an actuated position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. 1 is a perspective view of a system according to an exemplary embodiment.

[0006] FIG. 2 is a front view of a plate spring protecting housing.

[0007] FIG. 3 is a perspective view of a system in the actuated position according to an exemplary embodiment.

[0008] FIG. 4 is a cross section of shaft along line 4-4 in FIG. 3 according to an exemplary embodiment.

[0009] FIG. 5 is an elevational view of a plate spring direct mount system according to an exemplary embodiment.

[0010] FIG. 6 is a side view of plate spring with bracket according to an exemplary embodiment.

[0011] FIG. 7 is an end view of the shaft according to an exemplary embodiment.

[0012] FIG. 8 is an elevational view of a doorknob and shaft according to an exemplary embodiment.

DETAILED DESCRIPTION

[0013] The detailed description set forth below in connection with the appended drawings is intended as a description of exemplary embodiments and is not intended to represent the only forms in which the embodiments may be constructed and/or utilized. The description also sets forth the functions and the sequence of steps for constructing and operating the invention in connection with the illustrated embodiments. However, it is to be understood that the same or equivalent functions and sequences may be accomplished by different embodiments that are also intended to be encompassed within the spirit and scope of the invention.

[0014] A cabinet door securing system according to an exemplary embodiment is shown in FIG. 1, generally at 8. System 8 may include a door 10, a shelf or interior of the cabinet 11, and a shelf bracket 12, that is configured to be coupled to shelf board 11, or the interior of a cabinet. System 8 may also include a biasing member, or plate spring 14, which may have a straight end cut. System 8 may also include a rotatable shaft 16, which may couple to shaft holder 13 via pin 32 entering shaft hole 33. System 8 may also include a plate spring 14, which may be configured to couple to shaft 16 at notch 15, to secure the door in the closed position such that when shaft 16 is coupled to plate spring 14 it will not disengage unless rotated.

[0015] Biasing member 14 may be a plate spring as shown, however, other configurations may be utilized without straying from the concepts disclosed herein. Biasing member/plate spring 14 may be made from metal, plastic, other materials, or a combination thereof, as desired. Similarly shaft 16 may be made of metal, plastic, wood, or combinations thereof, among other materials, as desired. Plate spring 14 may also be configured to allow the door to move toward the cabinet, sliding along the upper surface of a first tapered end of shaft 17, until it reaches shaft notch 15, and then may couple to shaft 16 at shaft notch 15 to secure to the system.

[0016] System 8 may further include fasteners 25, which may fasten dooplate 20 to door 10, as well as plate spring 14 to bracket 12. Furthermore fasteners 25 may also fasten bracket 12 to shelf 11. Although a screw or bolt has been shown, it will be appreciated that other fastening configurations and methods may be utilized including nails, adhesives, and other configurations and methods, as desired.

[0017] FIG. 1, shows a system, according to an exemplary embodiment, with the door 10 moved toward shelf 11, or toward the interior of the cabinet, as shown by directional arrow A. As shown, the end of spring plate 14 has to slide on the taper slope 17, of a first end of shaft 16, and then rise to the top surface of shaft 16 and when reached to the notch 15 engage the notch 15 and/or shaft 16 and secure the door to the interior of the cabinet.

[0018] Shaft 16 is shown in the unacted position, or its normal steady state condition when the door is securely closed, as shown by directional arrow A. Again shown is dooplate 20 which may be fastened to door 10 via fasteners 25. Furthermore shaft 16 extends through the cabinet door 10 and is coupled to handle or doorknob 23, tightened on shaft end 29 (shown in FIG. 9) by screw 22, which enters keyhole 30 (also shown in FIG. 9), so as not to turn or slip on shaft 16.

[0019] With this configuration the door may remain closed until a user actuates the system by turning the doorknob or handle 23, and shaft 16 is actuated, and the door may be pulled open. With this configuration small children or others may not be able to open the door by just pulling the knob,
and plates and other objects forced into the door when earthquakes occur, may not open the door.

[0020] System 8 may further include a spiral or coil spring 18 which may couple to rotatable shaft 16, as well as to door 10, shaft holder 13 or bracket 20 to bias rotatable shaft 16 in the unactuated position. System 8 may further include a pin 19 which may limit the rotational travel of shaft 16 via stop 21, as shown. It will be appreciated that other systems and configurations may be utilized for biasing rotatable shaft 16 without straying from the concepts disclosed in this disclosure.

[0021] FIG. 2 is a front view of bracket 12, according to an exemplary embodiment. As shown, bracket 12 may have a cover 26 or leg/sidewalls, however it will be appreciated that this cover, or leg/sidewalls are not necessarily needed if the bracket is coupled under the shelf board or side walls of the cabinet. However, if it is used on the shelf board or on the floor of the cabinet, where objects are put, then plate springs need protection, and those may be included to further enhance the system. Also shown is plate spring 14 coupled to bracket 12. Although plate spring 14 is shown as coupled to bracket 12, it will be appreciated that plate spring 14 may also be directly connected to the interior of the cabinet and/or to shelf board within the cabinet, as desired. Furthermore other configurations may be utilized, as desired.

[0022] Bracket 12 may further include a channel 27 which would allow bracket to move laterally with respect to fastener 24 such that the bracket may be selectively positionable within the system.

[0023] FIG. 3 shows a perspective view of a system, according to an exemplary embodiment, with shaft 16 in the actuated position, and plate spring 14 uncoupled from shaft 16 and the door opening and moving away from shelf 11 as shown by direction arrow C. As shown, a user may turn the handle or knob 23 as shown by direction arrow B, to turn shaft 16 and notch 15, raising up plate spring 14 to the top surface of shaft 16, such that plate spring 14 is uncoupled from shaft 16, and there will not be anything to prevent the door from opening. When the user releases the knob, the spiral spring 18, will bias the shaft 16 to the unactuated position. In the unactuated position, the system may couple to the interior of the cabinet when the door is moved to the closed position. In this manner small children may not be able to open the door, just by pulling the knob. Additionally this may allow objects within the cabinet or other enclosure to remain inside the enclosure when an earthquake or other event occurs that may cause the contents to fall out.

[0024] FIG. 4 shows a cross section view of the shaft along line 4-4 from FIG. 3, the door plate 20, fastening screws 25, and the spiral spring 18. One end of spiral spring 18 is held by rotation limiting through pin 19, causing the other end of through pin 19 to touch the stop pin 21 and keep the shaft notch 15 upright (as shown in FIG. 1). When inactivated, the other end of spiral spring 18 is on shaft holding bracket 13, and the through pin 19, can move only between stop pin 21 and bracket 13.

[0025] FIG. 5 shows the plate spring 14 directly mounted on shelf board 11, or anywhere in the cabinet, and can be adjusted by washers 28 and screw 24.

[0026] FIG. 6 is an elevational view of bracket 12, where the plate spring 14 is fitted to bracket 12 by screw 25, and the bracket 12 may be coupled to shelf board 11 by screw 24, and may be adjusted in channel 31. This may make the system very versatile and usable with a wide variety of existing and new cabinet systems.

[0027] Bracket 12 may be made from metal, wood, plastic, rubber, or any combination thereof, or other materials, as desired. Similarly the other portions of the system may be made from similar materials, or other suitable materials as desired. It will be appreciated that other configurations and devices may be used to create the same movements and configurations, as desired.

[0028] FIG. 7 is a front view of the shaft 16. As shown, the shaft 16 is holding bracket shaft hole 33 in the middle. Further shown is the taper end 17, and the dotted line shows the depth of notch 15.

[0029] FIG. 8 is a perspective view of the handle or doorknob 23, with tightening screw 22, which when tightened, enters into key hole 30 on shaft end 29 to secure the knob from turning on the shaft, or being pulled or pushed out.

[0030] Furthermore, FIG. 8 shows an elevated view of shaft 16. Also shown are spiral or coil spring 18, one side of the trough pin 19, and second end 29 of shaft 16, where the key hole 30 is indicated, in the other end of the shaft 16, the taper end 17, and the notch 15.

[0031] As generally depicted in FIG. 1, when the cabinet door 10 is pushed closed by a slight force, or some self-closing configuration, the shaft 16 may advance by entering the housing plate 12, which is installed adjacent to the cabinet shelf board 11, until shaft notch 15 reaches the plate spring 14. Plate spring 14 may then engage notch 15, to couple with shaft 16, and thereby secure the door to the rest of the system. The door will remain secured until a user or other source of force turns the knob 23, which actuates shaft 16, and thereby disengages plate spring 14 from notch 15.

[0032] In closing it is to be understood that the exemplary embodiments described herein are illustrative of the principles of the present disclosure. Other modifications that may be employed are within the scope of the disclosure. Thus by way of example, (shaft holding bracket may be eliminated, or replaced by second plate spring,) but not of limitation, alternative configurations may be utilized in accordance with the teachings herein. Accordingly, the drawings and description are illustrative and not meant to be a limitation thereof.

What is claimed is:
1. A cabinet door securing system, comprising:
   a plate spring configured to couple to the interior of a cabinet;
   a rotatable shaft comprising a notch configured to selectively couple to said plate spring, and configured to couple to a cabinet door; and
   a knob configured to couple to said shaft,
   said shaft configured to rotate from an unactuated position to an actuated position,
   wherein said plate spring couples to said shaft when said shaft is in an unactuated position, and uncoupled from said shaft when said shaft is in an actuated position.
2. The system of claim 1, further comprising a selectively positional door bracket configured to couple to said cabinet door and to said shaft.

3. The system of claim 1 further comprising a selectively positional shelf bracket configured to couple to the interior of a cabinet, and selectively, positionally couple to said plate spring.

4. The system of claim 3, wherein said shelf bracket comprises:
   a channel; and
   an adaptor configured to couple to said shelf bracket adjacent said channel, and configured to couple to said plate spring.

5. The system of claim 1, wherein said shaft comprises:
   a first end that is tapered;
   a notch adjacent said first end, configured to couple to said plate spring; and
   a second end configured to couple to a knob.

6. The system of claim 1 wherein said biasing member is a plate spring.

7. The system of claim 1, wherein said plate spring is coupled to a shelf bracket.

8. The system of claim 1, wherein said plate spring is coupled to the interior of a cabinet.

9. The system of claim 1, further comprising a spiral spring configured to bias said shaft in said unactuated position.

10. A cabinet door securing system, comprising:
    a plate spring;
    a rotatable shaft configured to disengagedly couple to said plate spring via a notch within said rotatable shaft;
    a knob coupled to said rotatable shaft;
    a selectively positional shelf bracket configured to couple to the interior of a cabinet, and selectively, positionally couple to said plate spring; and
    a selectively positional door bracket configured to couple to said door and to said rotatable shaft;
    wherein said rotatable shaft is configured to couple to said plate spring when said rotatable shaft is in said unactuated position, and configured to uncouple from said plate spring when said rotatable shaft is in an actuated position.

11. The system of claim 10, further comprising a spiral spring configured to bias said shaft in said unactuated position.

12. The system of claim 10, wherein said shaft comprises:
    a first end that is tapered;
    a notch adjacent said first end, configured to couple to said plate spring; and
    a second end configured to couple to a knob.

13. A cabinet door securing system, comprising:
    a plate spring configured to couple to the interior of a cabinet;
    a rotatable shaft configured to rotatably couple to a cabinet door; and
    a knob configured to couple to said shaft,
    said shaft configured to rotate from an unactuated position to an actuated position,
    wherein said plate spring is configured to couple to said shaft when said shaft is in an unactuated position, and uncouple from said shaft when said shaft is in an actuated position.

14. The system of claim 13 further comprising a coil spring configured to couple to said rotatable shaft and to bias said shaft to said unactuated position.

15. The system of claim 13, wherein said shaft comprises a first end comprising a taper and a notch; and a second end configured to couple to said door and to a handle.

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