Nov. 14, 1950 D. MARINI 2,530,336

DISAPPEARING REFUSE HOLDER

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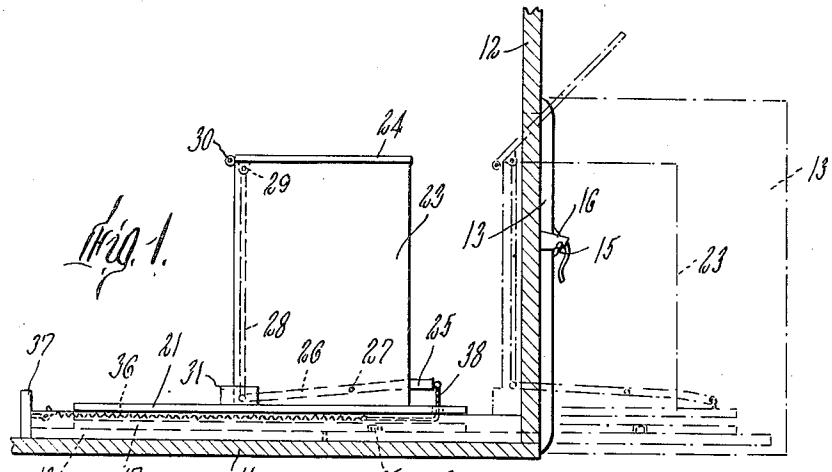


Fig. 1.

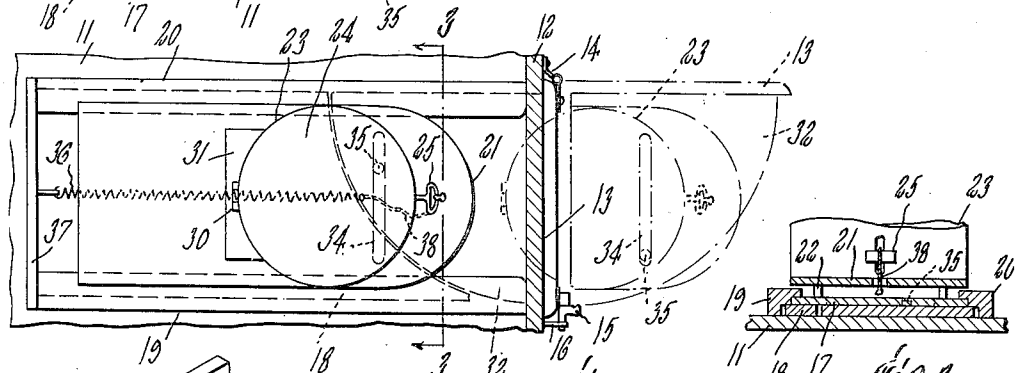


Fig. 2.

Fig. 3.

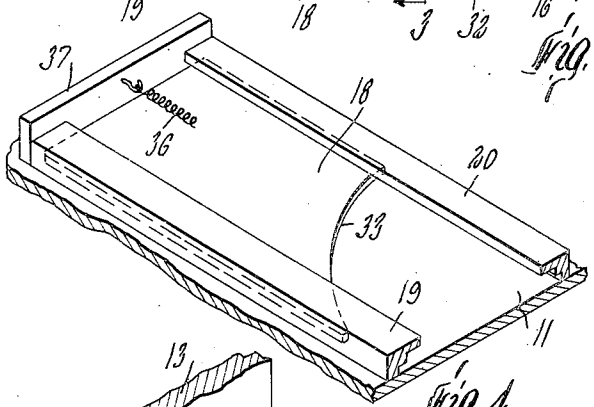


Fig. 4.

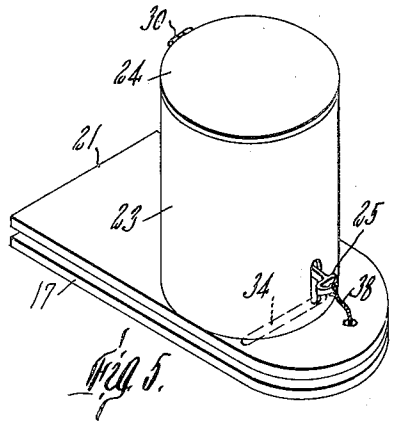


Fig. 5.

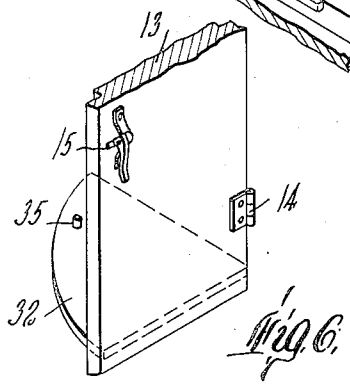


Fig. 6.

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UNITED STATES PATENT OFFICE

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DISAPPEARING REFUSE HOLDER

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5 Claims. (Cl. 312—175)

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The present invention relates to receivers for garbage and other refuse which are combined with cupboards in kitchen cabinets or counters so as to be contained within the cupboard and concealed when the door of the cupboard is closed, and to be brought out into accessible position by opening of the cupboard door. The objects of the invention are to furnish an improved, simple and inexpensive construction for carrying a refuse receiver into the open and retiring it into a cupboard when the door of the cupboard is opened and closed, to enable the carrying means to be stably and firmly supported by the cupboard door when it is drawn out by opening of the door, to provide means applicable to any conventional garbage receiver which is equipped with a cover and a cover operating treadle device, so that such a standard receiver can be mounted on the carrier and its cover will be automatically opened when the carrier is projected into the open; and to provide other useful features which appear in the following specifications and accompanying drawings.

The principles of the invention can be applied operatively in connection with any enclosed space in a kitchen or other room, when such space is bounded in part by a door. For instance, it may be applied in a kitchen cabinet, in a built in counter having walls enclosing an inner space, in the space beneath a sink when such space is enclosed by walls, and in other situations.

In the drawings furnished herewith—

Fig. 1 is a vertical section of the floor and front wall of a cupboard or other enclosed space of the character referred to, and a side elevation of an embodiment of the invention operatively combined with such floor and front wall;

Fig. 2 is a plan view of the structure shown in Fig. 1 except that the front wall is represented in horizontal section;

Fig. 3 is a vertical cross section taken on line 3—3 of Fig. 2;

Fig. 4 is a perspective view of a portion of a floor and supporting and guiding means thereon for the receptacle carrier which forms part of the present invention;

Fig. 5 is a perspective view of the receptacle carrier referred to and a standard kitchen garbage can mounted thereon;

Fig. 6 is a perspective view of the lower part of a cupboard door with a carrier supporting and operating part secured thereto.

Like reference characters designate the same parts wherever they occur in all the figures.

The enclosing walls of a cupboard or other

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enclosed space are indicated fragmentarily in these drawings by the section of a floor 11 and front wall 12 to which a door 13 is represented as connected by hinges 14 so as to swing about a vertical axis. A latch 15 on the door is adapted to engage a hook 16 on the wall to secure the door in its closed position.

A slide 17 is movable back and forth over the floor 11, being supported on a filler piece 18 which is secured to the floor and confined between parallel guides 19 and 20 which overlap the filler piece and the slide, extending directly rearward from the front wall 12. Slide 17 supports a platform 21 by means of posts 22 so that an intermediate space is left sufficiently high for a purpose later described, and so that the lateral margins of the platform overlap the guides 19 and 20, preferably without rubbing contact.

The slide 17, platform 21, and posts 22 together constitute a carrier for the refuse receptacle 23. The receptacle here shown represents a standard commercial garbage can having a hinged cover 24 and being provided with a removable inner pail or can which rests on a supporting structure near the bottom of the receptacle 23. Cans of this type are equipped with a lever pivoted beneath the support for the inner pail and having a protruding arm at one side which serves as a treadle operable, when depressed, to raise the cover 24. I have here shown such a treadle at 25 and have illustratively represented means for raising the cover as comprising a lever 26 pivoted at 27 (the treadle being the extremity of one arm of the lever), and a link 28 rising from the opposite arm of the lever connected to a lug 29 on the cover near the hinge 30 thereof. This can and the cover-lifting mechanism represent all articles of the general class of covered receptacles having cover-opening mechanisms. It is secured rigidly to the platform member 21 of the carrier with its treadle 25 projecting forwardly, and with its rear side in contact with a gauge block 31 which is secured to the platform.

A sector shaped shelf 32 is secured to the bottom of the door on the inside extending horizontally in the same plane with the filler piece 18. Its curved edge is concentric with the door hinge axis, and its radius is substantially equal to the width of the door. The forward end of the filler piece 18 is cut away on an arc 33 complemental to the curve of the shelf. Thus, when the door is closed, the shelf 32 and filler piece are approximately in abutting relation.

The slide member 17 of the receptacle carrier is so located that its forward end overlaps shelf

32, and a transverse slot 34 is provided in the overlapping portion. A stud 35 projects upward from the shelf into slot 34. This stud is adapted to slide in the slot lengthwise thereof as the shelf swings with opening and closing movements of the door and, in swinging around the hinge axis, the stud draws the carrier outward from the mouth of the cupboard when the door is opened wide, and pushes it back when the door is closed. These parts are respectively located and proportioned so that the can is carried out of the cupboard far enough to permit opening of its cover when the door 13 is opened. Broken line constructions in Figs. 1 and 2 show the positions of the carrier and can when the door is opened to a position at right angles to the front wall 12. In this position the can is part way out of the cupboard. Further movement of the door causes the can to emerge fully. The protruding end of slide 17 is then supported by shelf 32, while its rear end remains in the cupboard.

Raising of the can cover 24 when the can emerges from the cupboard doorway is effected by a spring 36 which is anchored at one to an abutment 37 at the rear of the cupboard, and the forward end of which is coupled with the cover actuator or treadle 25 by an inextensible cord or chain 38. This spring and the contiguous part of the cord are contained in the space between the slide 17 and platform 21 of the carrier (such space being made deep enough for the purpose by the provision of posts 22 of appropriate length), and the cord passess upward through a hole in the platform to connection with the treadle 25. Any desired suitable means for reducing friction, such as a guide pulley, may be mounted at the rim of the hole where the cord changes direction in rising to the treadle.

Spring 36 is a so called tension spring in the form of a long helix. Its length, and that of the cord 38, are made such that the spring is unstressed and the cord is slack when the carrier is fully withdrawn into the cupboard. Enough slack is provided in the cord to permit advance of the can into, or part way through, the doorway before the cover is raised far enough to interfere with the lintel of the doorway; but at the same time the length of slack is so limited that the spring is stressed before the can is carried all the way out, enough to raise the cover widely when the can has fully emerged. A spring is selected which has sufficient strength to operate the cover raising mechanism when stretched to a minor part of its possible elastic elongation, and the resilience of the spring causes the force which it exerts to be only moderately increased as the progress of the can continues after raising of the cover has commenced. The combination of the spring and inextensible cord enables the point at which rise of the cover begins to be accurately established, and the further rise of the cover to continue gradually and smoothly.

This spring and cord combination, with possible modification in lengths of its constituent parts, is applicable to covered cans of different designs having different types of lid raising means. It does not require the provision of any special mechanism or any modification in existing commercial cans. The cord can be easily tied or connected by a simple hook or clip to any downwardly operating part of any such mechanism.

An important features of the device is that the shelf 32 is not only a connecting means for moving the receptacle carrier when the door is opened and closed, but it also serves as a support for the forward end of the carrier when the latter is projected out of the cupboard. The rear end of the carrier, being sufficiently long for the purpose, rests on the filler piece 18 while its forward end rests on the shelf. Any tendency of the receptacle and carrier to tip over when fully projected is effectively prevented by the overlapping guides 19 and 20, the forward ends of which extend preferably all the way to the front wall 12, while the rearward projection of the carrier is such that its rear end remains within the cupboard at all times.

The filler piece 18, shelf 32, slide 17 and platform 21 are made, in the present illustration, of pieces of wooden boards, preferably plywood, and the guides 19 and 20 are wooden strips of suitable cross section. The material, however, is not of the essence of the invention, and these or equivalent parts may be made of any other suitable materials, including metal, molded plastics, etc. The element 38, previously described as a cord or chain, typifies any flexible or articulated inextensible connecting means that might be applied between a spring and the lid lifting means of a receptacle for the purpose and with effects equivalent to those described.

I claim:

1. In combination with a floor and front wall of an enclosed space, and a door hinged to said front wall so as to cover and uncover a doorway in the wall, parallel guides extending rearwardly from the front wall adjacent to opposite sides of the doorway, a shelf on the lower portion of the doorway extending into the space between said guides when the door is closed and having a curved edge concentric with the hinge axis of the door, a filler piece on the floor between the guideways in the same plane with said shelf having a forward edge substantially complemental to the curved edge of the shelf, a slide lying on said filler piece and shelf with its lateral margins confined by said guides, and a pin on the shelf projecting upwardly into a transverse slot in the overlapping part of the slide.

2. In combination with the floor and swinging door of an enclosed space, a receptacle carrier including a slide in said space, guides flanking said slide extending from the interior of the space toward the doorway thereof arranged to guide the slide outward and inward, a receptacle mounted on the carrier and having a hinged lid and means for opening the lid comprising a downwardly movable actuating element coupled with the lid to cause raising of the lid when said element is moved downwardly, an abutment mounted in fixed position in the inner part of said space, an elongated tension spring connected at one end to said abutment and extending thence toward the doorway, a flexible inextensible coupling connected to the other end of said spring extending forwardly therefrom beneath the receptacle-supporting portion of said carrier, and upwardly to connection with said actuating element, the carrier having guide means around which the flexible coupling is bent, and coupling means between the door and carrier constructed and arranged to project the carrier out of the doorway when the door is opened and to project it into the enclosed space when the door is closed; said spring and flexible coupling having a combined length such that they are slack when the carrier is in the enclosed space

and are put under tension when the carrier is projected from the doorway, whereby the lid actuator is then moved downward.

3. In combination with the floor and front wall of an enclosed space and a door hinged to said front wall to cover and uncover a doorway in the wall, a receptacle carrier contained in said space, guides extending rearwardly from the front wall adjacent to opposite sides of the doorway in slidingly confining engagement with said carrier, a receptacle mounted on the carrier having a hinged cover, means interengaged between the door and carrier for effecting outward and inward movement of the carrier and receptacle when the door is opened and closed, respectively, and means for opening the receptacle lid when the carrier is moved outwardly through the doorway, comprising an elongated helical spring, an inextensible flexible connector coupled at one end to one end of the spring, anchoring means holding one end of the combined spring and connector unit in the rear portion of the enclosed space, and motion transmitting means between the other end of said unit and the receptacle lid constructed to cause raising of the lid in consequence of force applied through the spring and connector unit.

4. In combination with space-enclosing means, a slide guided to move into and partly out of the space enclosed by said means and having a receptacle supporting upper portion, a receptacle mounted on said supporting upper portion and movable with the slide into and out of said space, said receptacle being provided with a hinged lid and a downwardly movable actuating element connected to cause raising of the lid when the element is moved downwardly, a flexible inextensible connector coupled with said element extending downwardly therefrom to a level below the receptacle supporting portion of the slide and thence rearwardly, said receptacle supporting portion having a guiding part around which the flexible connector is bent, and an elongated helical spring anchored in the rear portion of said space and coupled to said inextensible connector arranged to be put under tension by movement of the slide outwardly from the enclosed space; the connector having such length that it is slack when the receptacle is within the enclosed space and is put under tension and exerts stretching force on the spring when the receptacle is partially emergent from the enclosed space.

5. In combination with the floor and swinging door of an enclosed space, a receptacle carrier including a slide in said space, guides flanking said slide extending from the interior of the space toward the doorway thereof arranged to guide the slide outward and inward, a receptacle mounted on the carrier, a sector-shaped shelf projecting from the lower part of the door beneath the forward part of the carrier, said shelf being substantially concentric with the hinge axis of the door and having a radius substantially equal to the width of the doorway, and a pin mounted on the outer part of the shelf projecting upwardly, the carrier having a transverse slot in which the pin is contained with provision for relative sliding movement lengthwise of the slot and for propelling engagement with opposite sides of the slot when the door is opened and closed, respectively, the end of the slide which protrudes from the enclosed space when the door is opened being supported by the shelf.

DONATO MARINI.

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