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LID-LIFTING DEVICE FOR TRASH CANS

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FIG. 1

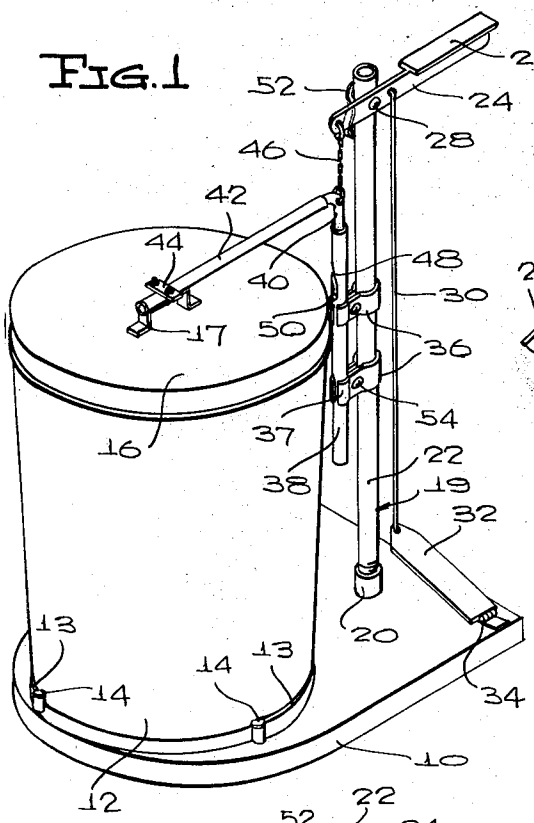


FIG. 3

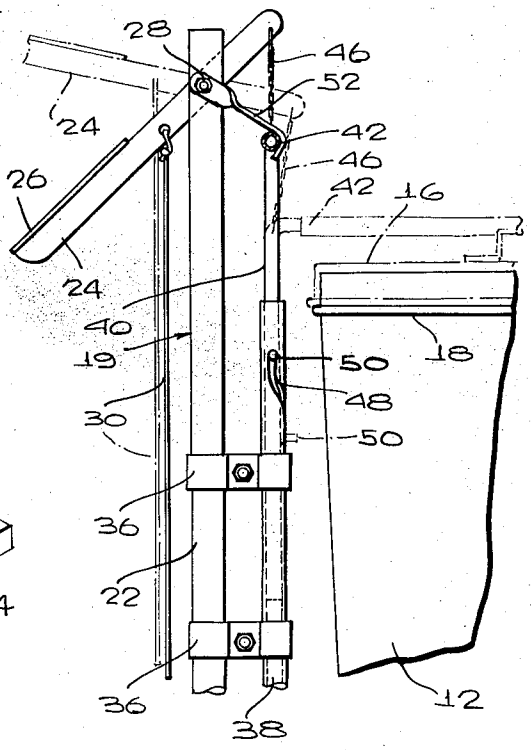
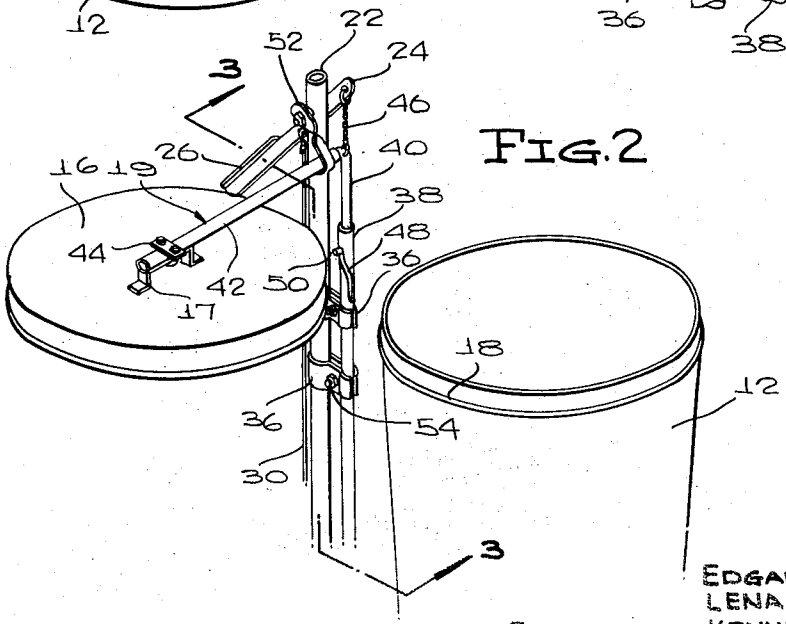


FIG. 2



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LID-LIFTING DEVICE FOR TRASH CANS

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2 Claims. (Cl. 248—147)

This invention relates to a device adapted for elevating the lid of a trash can responsive to depression of a foot pedal or, alternatively, operation of a handle, the device being so designed that on swinging of the handle or depression of the foot pedal, the trash can lid will be lifted from closed position and will be swung laterally through ninety degrees, to permit trash to be deposited in the can.

It is well known that considerable inconvenience attends the deposit of trash in a trash can. This results from the fact that one must first remove the lid, and place the same on an adjacent support, or upon the ground. Then, after the trash is deposited in the container, the lid must be picked up and returned to its closed position. This is inconvenient and troublesome, in view of the fact that in many instances, one may have both hands occupied in holding the trash that is to be deposited in the container. It is thus necessary in these circumstances to first place the trash upon the ground or other support surface, then remove the lid, and after picking up the trash and depositing it in the can, again pick up the lid and return it to place. In other instances, one may desire to empty the trash can, and this of course requires the use of both hands, so that the removal and replacement of the lid again is an inconvenient and troublesome requirement.

The main object of the present invention is to provide a lid-lifting mechanism which will eliminate the inconveniences and annoyances described above.

A more specific object is to design the lifting mechanism in such a manner as to cause the lid to be lifted and swung out of the way in a simple operation involving no more than the depression of a foot pedal or the swinging of a handle, whichever is most convenient for the particular user.

Another object is to effect the lifting and the lateral swinging movement of the lid in minimum time, and with a minimum amount of difficulty.

Still another object is to form the device in a manner such that it will be particularly characterized by its simplicity and low cost, while still being possessed of a high degree of ruggedness, resistance to deterioration on exposure to the elements, and adaptability for long and efficient use without requiring maintenance and repair.

Still another object is to provide a lid-lifting mechanism and associated support for trash cans which can be used on a conventional container or trash can, without requiring modification of the trash can in any way.

Still another object of the invention is to design the structure in such a manner that it will be usable on conventional trash cans and containers of different sizes, without requirement of any change in the structure other than the lengthening of a suspension chain.

Still another object is to so design the mechanism that the lid will automatically return to its closed position, swinging laterally back into position over the trash container and then downwardly to close the container, responsive merely to releasing of the downward pressure previously exerted upon the handle or foot pedal, and/or the release of a simple, easily operated locking hook.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawing in which like reference characters designate like parts throughout the several views and wherein:

Figure 1 is a perspective view of a lid-lifting mechanism and associated support, as it appears when in its operative relationship to a conventional trash can, the lid being in closed position;

Figure 2 is a perspective view of the upper portion of the mechanism and of the trash can, in which the lid has been swung to its open position; and

Figure 3 is an enlarged vertical sectional view substantially on line 3—3 of Figure 2, with the mechanism and lid being shown in dotted lines in the normal position thereof and in full lines in the position assumed by the lid and the associated parts of the mechanism when the trash container is opened.

Referring to the drawings in detail, at 10 there has been designated a flat base, on which is supported a conventional trash can 12. The trash can is located in a predetermined position upon the base, through the medium of positioning arms 13 having at their outer ends pins 14 extending through the base. The trash can positioning means defined by arms 13 and pins 14 constitutes subject matter for a different patent application, filed concurrently herewith.

The trash container 12 includes the usual lid 16, which ordinarily is manually lifted by grasping its handle 17. The container, in this connection, has the usual circumferential bead 18 spaced downwardly a short distance from the open upper end of the container to support the peripherally flanged periphery of lid 16.

The lifting mechanism constituting the present invention has been generally designated at 19, and includes a socket 20 that is rigidly secured to and projects upwardly from the base, said socket being internally threaded to receive the complementarily threaded lower end of an elongated, vertically disposed, tubular standard 22.

Adjacent the upper end of the standard a lever 24, having at one end a handle element 26, is pivotally connected adjacent its other, inner end to the upper end of the post 22 by means of a pivot pin 28 extending horizontally, transversely through the post 22.

Between the outer end of lever 24 and the fulcrum point 28 thereof, there is loosely, pivotally connected to the lever the upper end of an elongated connecting rod 30, the lower end of which is similarly loosely, pivotally connected to one end of an inclined foot pedal 32 hinged as at 34 at its other end to the base 10.

Intermediate the ends of the standard 22, and spaced longitudinally of the standard, there are provided clamps 36, projecting laterally from the standard and provided at their outer ends with clamping arms 37 grippingly engaging an elongated sleeve 38, which is thus fixedly connected to the standard 22 in a position laterally spaced from and parallel to the standard.

Sleeve 38 is formed open at its opposite ends, and extending into the sleeve through the open end thereof is the vertical leg of a lifting arm 40, which arm 40 is of inverted L-shape, including in addition to the vertical leg a horizontal leg adapted to extend radially, inwardly of the lid 16. The horizontal leg of the lift arm 40 may be fitted with a sleeve 42, and adjacent the outer end of the sleeve there is provided a U-clamp 44 which fixedly connects the sleeve to the handle 17 of the lid 16.

At the juncture between the vertical and horizontal legs of lift arm 40, there is loosely connected a suspension chain or other flexible element 46, the upper end of which is loosely connected to the inner end of the lever 24.

Intermediate its opposite ends, sleeve 38 is formed with a spirally extending cam slot 48. The slot 48, while generally extended spirally of the sleeve 38, has in actuality

straight portions, connected by a spiralling intermediate portion, the end portions being angularly spaced ninety degrees apart circumferentially of the sleeve 38. The vertical leg of lift arm 40 has a radially projecting lug 50 slidably engaging in the cam slot.

Due to the construction illustrated and described, it will be seen that with the lid in closed position as in Figure 1, and assuming that one desires to remove the lid by operation of the foot pedal, the foot pedal 32 is depressed. This pulls downwardly on the connecting rod 30, which in turn causes the lever 24 to swing from its normal dotted line position shown in Figure 3 to its full line position in this figure of the drawing. The lever in the position to which it is swung responsive to depression of the foot pedal is also shown in Figure 2.

In any event, this causes the inner end of the lever to swing upwardly, and through the medium of the suspension chain 46, an upward pull is exerted upon the lifting arm 40 attached to lid 16.

Arm 40 is slidable and rotatable in sleeve 38, and accordingly, when it is pulled upwardly, its lug 50 will travel upwardly within the slot 48, from the dotted line position of the lug shown in Figure 3 to the full line position thereof shown in the same figure of the drawing.

As the lug moves upwardly, it travels through ninety degrees circumferentially of the sleeve 38 due to the spiralling intermediate portion of the cam slot. Therefore, not only is the lid raised, but also it is swung laterally after being raised sufficiently to clear the upper end of the container 12, from its Figure 1 to its Figure 2 position. The lid is now disposed wholly to one side of the container 12, thus permitting trash to be deposited in the container or permitting, alternatively, removal of the container for the purpose of emptying the same.

It may be noted that the provision of the straight lower end portion of the cam slot 48 insures that initially, the lid will move straight upwardly from the body of the trash can, before there is any lateral movement imparted to the lid. Obviously, lateral movement cannot be imparted to the lid until it has fully cleared the upper end of the container 12.

Thus, responsive merely to depression of the pedal 32, the lid is first moved straight upwardly to clear the container, after which, as the lug 50 begins to move through the spiralling intermediate portion of the cam slot, the lid travels laterally ninety degrees about an axis defined by the sleeve 38, to its final position shown in Figure 2.

Obviously, if the user finds it more convenient to operate the device by means of the handle, the foot pedal 32 need not be used. Instead, one merely exerts downward pressure on the handle element 26 of the lever and the same operation as previously described takes place.

When the lid has been swung to its Figure 2 position, it will of course remain in this position if the downward pressure on the foot pedal or on the handle element 26 is maintained. However, in some instances it will not be convenient to continue to exert said downward pressure on the pedal or handle. Therefore, there is provided a locking arm 52 pivoted upon the upper end of the standard 22 at the side of the standard opposite that on which the lever 24 is mounted. The pin 28, can in fact, be used for pivotally supporting both the lever and the locking arm 52. The locking arm 52 has a hook-shaped free end, and thus can be manually swung into the position shown in Figure 3, in which position the hook-shaped end thereof engages over the horizontal leg of the lift arm 40 to hold the lid against return movement from its Figure 2 position. When the lid is to be returned to its Figure 1 position, the locking arm is merely swung upwardly, and the weight of the lid and of the lift arm causes the lift arm to tend to move downwardly within the sleeve 38. As a result, the lug, now traveling downwardly within the slot 48, travels back through ninety degrees of the sleeve circumference, to position the lid over the container 12. Then, as the lug travels downwardly through the straight lower end portion of the cam slot, the lid moves straight downwardly into its container-closing position shown in Figure 1.

As will be apparent, the device can be used with a wholly conventional trash container, and to be operatively associated with said container, need merely be clamped to the lid as at 44, with the container being disposed between the holding arms 13, which properly center the container relative to the lid when the lid is attached to the lift arm of the device.

Further, the device is usable with containers of different sizes and heights. Assuming that, for example, a container lower in height than that shown in Figure 1 is to be associated with the device, one need merely loosen the bolts 54 carried by the clamps 36. This permits the clamps to be adjusted downwardly on the standard 22. The sleeve 38 is thus correspondingly adjusted downwardly along the length of the standard 22 to locate the lift arm 40 in a lower position, where it will be clampable to the lid 16 of the container. One need merely provide in this instance a longer suspension chain 46, to provide for efficient operation of the device with a container smaller in size than that shown.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. A device for lifting from a trash container a container lid, and for moving said lid laterally to one side of the container, comprising: a base adapted for supporting said container; an elongated, vertically extending standard fixedly secured to and projecting upwardly from the base adjacent the area of the base on which the container is supported; a lever pivotally connected intermediate its ends to the upper end portion of said standard for swinging movement in a vertical plane, said lever having one end in close proximity to said area though terminating outside the area, so as to be closely, laterally spaced from a container and lid supported within said area, said lever having its other end spaced outwardly a substantial distance from said area and formed as a handle, for rocking of the lever about its pivot axis between a normal position in which the lid is supported upon the container and an operative position in which the lid is elevated from the container and is shifted laterally thereof to permit access to the interior of the container; vertically spaced support elements on and projecting laterally from said standard at a location spaced longitudinally downwardly of the standard from the lever, said elements projecting from the standard toward said area and being disposed in substantial vertical alignment with the first named end of the lever; an elongated, vertical sleeve carried by said elements and rigidly connected by the elements to said standard in a position laterally spaced from the standard in the direction of said container-suppport area, said sleeve extending in substantial vertical alignment with said first named end of the lever, the sleeve being formed intermediate its ends with a spirally extending cam slot extending through substantially 90°; a lift arm of inverted L-shape including a vertical and a horizontal leg, the vertical leg being slidably, rotatably engaged in the sleeve and projecting upwardly from the sleeve to terminate below the first named end of the lever, the horizontal leg of said lift arm projecting inwardly of said area from the sleeve and having a connection to said lid remote from the vertical leg, said lift arm including a lug which is slidably engaged in the cam slot, whereby to rotate the lift arm through 90° in respectively opposite directions on raising

and lowering, respectively, of the lift arm within the sleeve; and a connecting member of flexible formation over its entire length, connected between the first named end of the lever and the upper end of said vertical leg and extending in approximate longitudinal alignment with the vertical leg in the respective positions of said lever, whereby to elevate the lift arm responsive to rocking of the lever in one direction to in turn raise the lid and shift the same laterally to one side of the container, said flexible element being axially twistable for turning thereof with the vertical leg during raising and lowering, respectively, of the lift arm.

2. A device for lifting from a trash container a container lid, and for moving said lid laterally to one side of the container, comprising: a base adapted for supporting said container; an elongated, vertically extending standard fixedly secured to and projecting upwardly from the base adjacent the area of the base on which the container is supported; a lever pivotally connected intermediate its ends to the upper end portion of said standard for swinging movement in a vertical plane, said lever having one end in close proximity to said area though terminating outside the area, so as to be closely, laterally spaced from a container and lid supported within said area, said lever having its other end spaced outwardly a substantial distance from said area and formed as a handle, for rocking of the lever about its pivot axis between a normal position in which the lid is supported upon the container and an operative position in which the lid is elevated from the container and is shifted laterally thereof to permit access to the interior of the container; vertically spaced support elements on and projecting laterally from said standard at a location spaced longitudinally downwardly of the standard from the lever, said elements projecting from the standard toward said area and being disposed in substantial vertical alignment with the first named end of the lever; an elongated, vertical sleeve carried by said elements and rigidly connected by the elements to said standard in a position laterally spaced from the standard in the direction of said container-support area, said sleeve extending in substantial vertical alignment with said first named end of

the lever, the sleeve being formed intermediate its ends with a spirally extending cam slot extending through substantially 90°; a lift arm of inverted L-shape including a vertical and a horizontal leg, the vertical leg being slidably, rotatably engaged in the sleeve and projecting upwardly from the sleeve to terminate below the first named end of the lever, the horizontal leg of said lift arm projecting inwardly of said area from the sleeve and having a connection to said lid remote from the vertical leg, said lift arm including a lug which is slidably engaged in the cam slot, whereby to rotate the lift arm through 90° in respectively opposite directions on raising and lowering, respectively, of the lift arm within the sleeve; a connecting member of flexible formation over its entire length, connected between the first named end of the lever and the upper end of said vertical leg and extending in approximate longitudinal alignment with the vertical leg in the respective positions of said lever, whereby to elevate the lift arm responsive to rocking of the lever in one direction to in turn raise the lid and shift the same laterally to one side of the container, said flexible element being axially twistable for turning thereof with the vertical leg during raising and lowering, respectively, of the lift arm; and a locking arm pivotally connected at one end to the upper end portion of the standard for swinging movement about an axis common to that of said lever, said lever and locking arm rocking at diametrically opposite locations on the standard, the locking arm having a hook-shaped free end overlying the horizontal leg of the lift arm in the laterally shifted position of said horizontal leg, for engaging about said horizontal leg to hold the same in the position to which it is laterally shifted.

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