APPARATUS FOR SWINGING UP AND EMPTYING WASTE-BINS OR THE LIKE, WHICH HAVE DIFFERENT SIZE AND POSSIBLY ALSO DIFFERENT SHAPE

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ABSTRACT

An apparatus for swinging up and emptying waste-bins or the like which have different size and possibly also different shape, in a collecting container, includes (a) pivotable support means, which is common to all waste-bins and comprises carrier means having upwardly directed engaging means, adapted to engage a lifting bracket, a flange or the like on the waste-bin from below; and (b) means for holding the waste-bin in an elevated emptying position, substantially upside-down. Said holding means comprises (a) a substantially U-shaped yoke having a web for supporting abutment against one side of the waste-bin and two shanks projecting from opposite ends of the web and each having its free end pivotally connected to one side-wall of the collecting container; and/or (b) clamping means rotatably journaled on said support means in such a way that it may engage an abutment to hereby become brought into a position in which it holdfasty engages a surface of the waste-bin as a holder-on cooperating with said carrier means.

9 Claims, 4 Drawing Figures
APPARATUS FOR SWINGING UP AND EMPTYING WASTE-BINS OR THE LIKE, WHICH HAVE DIFFERENT SIZE AND POSSIBLY ALSO DIFFERENT SHAPE

This invention relates to apparatus for swinging up and emptying waste-bins or the like, which have different size and possibly also different shape, in a collecting container, comprising firstly pivotable support means, which is common to all waste-bins and comprises carrier means provided on a translationally movable part of said support means and having upwardly directed engaging means, adapted to engage a lifting bracket, a flange or the like on the waste-bin from below and secondly means for holding the waste-bin in an elevated emptying position, substantially upside-down.

The primary object of the invention is to provide improved apparatus of the abovementioned type.

This object is attained, in accordance with the invention, thanks to the fact that said holding means comprises a substantially U-shaped yoke having a web for supporting abutment against one side of the waste-bin and two shanks projecting from opposite ends of the yoke and each having its free end secured to a link, which is comprised in a two link toggle joint having its other link pivotally connected to one side-wall of the collecting container, and/or clamping means rotatably journaled on the movable part of said support means in such a way that it engages an abutment on said support means during the movement thereof to thereby become brought into a position in which it holds fast the abutment engages a surface of the waste-bin as a holder-on cooperating with said carrier means.

Further features and advantages of the apparatus according to the invention will become apparent from the following detailed description and the annexed drawings, which diagrammatically and as non-limiting example illustrate a preferred embodiment, which may be utilized for small waste-bins as well as for big ones.

FIG. 1 is a sideview of the emptying apparatus which is illustrated as cooperating with a small, round waste-bin which is shown (in its entirety or in part) with solid lines in its starting position, with dash-dot lines in raised position and in dash lines in its emptying position.

FIG. 2 is a half end view of the emptying apparatus without waste-bin.

FIG. 3 is a sideview of the emptying apparatus and illustrates the same cooperating with a big, square waste-bin, which is illustrated standing on the ground.

FIG. 4 is a sideview corresponding to FIG. 3 and illustrating the waste-bin in its emptying position.

In all figures the same reference numerals designate same or like details throughout.

1 designates a collecting container, which has an emptying hood 2 and which may be considered as provided on a refuse truck. On each side of the collecting container there is pivotally secured at 3 a hydraulic ram 4, the piston rod of which is rotatably connected at 5 to the end of the shorter arm of a single-armed bell crank 6, which is rotatable on an axis 7. The ends of the longer arms of the bell cranks are interconnected by a beam or rod 9 (FIG. 2) which is square, at least in part, and which carries support means generally designated 10 and cooperating with all waste-bins. At each end of said support means there is a provided stud or roller 11 (FIG. 2), which is stationially with respect to the beam 9, and another stationary guide 12 for a roller 13 which is shown in two positions and like the parts of the support means described below is translationally movable with respect to the beam 9 under the influence of a suitably hydraulic ram or jack 14. The movable parts of the support means comprise a pair of intermediate plates 16 on which the rollers 13 are rotatably journalled, a bar 17 adapted to engage a side wall of a waste-bin and connecting the intermediate plates 16, a lifting bail 18 comprised of a L-profile and similarly interconnecting the intermediate plates 16, a pair of curved, two-armed levers 19, which are pivotally journaled in the intermediate plates 16 on pivot axis 20, said levers being interconnected by a clamp member 21 in the form of a L-profile, and a pair of locking hooks 22, which are pivotable on pivot axis 23. Each of the levers 19 has a guide curv or fin 25 which is adapted to cooperate with the rod or roller 11 during the raising operation, and a stud 26, which cooperates with its respective locking hook 22. The locking hooks are either maintained swung away in an inoperative position below their respective stub shafts 23 (FIG. 1 and 2) or swung up by springs 27 substantially above the stub shaft (FIG. 1) in an operative position for cooperation with a waste-bin. The locking hooks 22 are provided solely for waste-bins which are too small to be caught and held by the catching means described below.

This abovementioned catching or holding means is provided on the emptying hood 2 and comprises a substantially U-shaped yoke 33, the central part of which has a lining or coating of rubber or a similar more or less elastic material with high friction, which is adapted to engage a side-wall of the waste-bin. The free ends of the shanks of the yoke 33 are each secured to the free end of a link 34 which is comprised in a toggle-joint, the other link 35 of which is pivotally journaled on an axis 36. The link 35 constitutes a two-armed lever, one arm of which engages a stationary stop 37 in the inoperative position of the catching means (FIG. 1 and 3) and the other arm of which engages another stationary stop 38 in the operative position of the catching means (FIG. 4 and 5), in which it has caught and supports a waste-bin. Said toggle-joint is necessary with regard to the fact that the pivot axis of the yoke 33 cannot be brought to the co-inside with the pivot axis 7 of the entire elevating system proper. Thanks to the toggle-joint device 34, 35, the yoke 33 will engage a suitable point on the circumferential surface of the waste-bin in respect of broader as well as narrower waste-bins. This point will come closer to the bottom of the waste-bin, the smaller it is, but the yoke remains stationary in every single case without any sliding motion between yoke and waste-bin wall. The movements of the catching or holding device when catching a waste-bin are damped or retarded by a shock absorbing or braking device 39, which may be pneumatic or hydraulic or may contain one or more springs.

To be able to become swung up and emptied by means of the apparatus according to the invention as described above, it is necessary that a small waste-bin 42 or another similar bin (FIG. 1) is provided firstly with a special lifting bracket 41 for the carrier means or lifting bail 18, and secondly with a pair of grips or the like 43, into which the locking hooks 22 can engage. A big waste-bin 44, which needs no grips for its emptying has instead of the lifting bracket 41 a flange 45 which is formed of a Z-profile or the like and defines a channel which is open as seen from below and in
which the carrier means 18 can engage, said channel being engaged from above by the catch 21 at emptying.
The elevating apparatus described above operates in the following manner:
  a. Small waste-bins.

When emptying small waste-bins 42 the hooks 22 are initially turned up to the position shown in solid lines in FIG. 1, which illustrates a small waste-bin at the start of the emptying operation, at which point the carrier means or lifting bail 18 just engages the lifting bracket 41 from below. By means of the ram or jack 14 (FIG. 2) the waste-bin 42 is first raised to the position shown in dash-dot lines in FIG. 1, the hooks 22 entering into engagement with the grips 43 by being actuated by the studs 26 on the levers 19 which are rotated counter-clockwise on account of the fact that their fins 25 engage the stationary rollers or studs 11 (FIG. 2 and 3) during the raising operation. From the position of the waste-bin 42 shown in dash-dot lines in FIG. 1 the waste-bin is rotated, together with the whole support means 10 to the position shown in dash lines in FIG. 1 by means of the hydraulic jack or ram 4 and the bell-crank 6. In this emptying position the waste-bin 42 hangs in the hooks 22. The catching or holding yoke 33 is not engaged by the small waste-bin.

b. Big bins.

These are initially raised from the ground (FIG. 3) in principle in the same way as the small bins, the carrier bail 18 in this case entering into and engaging the channel formed by the Z-profile 45 from below. During this raising operation the two-armed lever 19 is rotated counter-clockwise in the manner described above in connection with small waste-bins, so that the clamp member 21 engages the Z-profile flange 45 of the waste-bin 44 from above and firmly holds the bin during the following swinging-up movement. During this movement the waste-bin 44 is caught by the yoke 33 (FIG. 4), the central part of which is hereby swung along the arch 50 under the influence of the weight of the waste-bin.

The embodiment described above and illustrated in the drawings, is, of course, to be regarded merely as a non-limiting example and can as to its details be modified in several ways within the scope of the following claims. Thus, several omissions or substitutions of elements may be made without departing from the spirit of invention.

What I claim is:

1. An apparatus for swinging up and emptying containers, particularly waste-bins, which have different size and possibly also different shape and having a lifting projection engageable from below, in a collecting container; comprising firstly pivotable support means, which is common to all waste-bins and has a translationally movable part, carrier means provided on said support means and having upwardly directed engaging means, adapted to engage said lifting projection on said waste-bin from below; and secondly means for holding the waste-bin in an elevated emptying position, substantially upside-down, characterized in that said holding means comprises a substantially U-shaped yoke having a web for supporting said abutment against one side of the waste-bin, and two shanks projecting from opposite ends of said web; and a pair of links, which are each secured to the free end of the respective one of said shanks and are each comprised in a two link toggle-joint having its other link pivotally connected to one side-wall of the collecting container.

2. Apparatus according to claim 1, characterized in that an abutment is provided on said support means, and in that said holding means comprises clamping means rotatably journaled on said movable part of said support means in such a way that it engages said abutment on said support means during the movement of said movable part to hereby become brought into a position, in which it holdsfast engages a surface of the waste-bin as a holder-on cooperating with said carrier means.

3. Apparatus according to claim 2, comprising a pair of apertured projections provided on said waste-bin, a pair of hooks comprised in said holding means, which are pivotally journaled on the translationally movable part of said support means and are adapted to engage one of said apertured projections on the waste-bin for holding it in its upside-down position in cooperation with the remainder of said holding means, and a pair of abutments associated with said hooks and so positioned adjacent to the path of movement of the hooks on said movable part of said support means that said hooks during their translational movement engage said abutments for becoming rotated into a projection engaging position thereby.

4. Apparatus according to claim 3, characterized in that the abutments associated with the hooks are located on said clamping means.

5. Apparatus according to claim 3, characterized in that said hooks are manually and reversibly pivotable on substantially horizontal axes from an operative position, in which each hook is located above its pivotal axis substantially in its entirety, to an inoperative position, in which the hook is located below its pivotal axis substantially in its entirety.

6. Apparatus according to claim 5, comprising spring means for selectively maintaining said hooks stably in one of their said alternative positions.

7. Apparatus according to claim 1, characterized in that the two links of the toggle-joint, which are journaled in the side-walls of the collecting container, are each a two-armed lever.

8. Apparatus according to claim 7, characterized by the provision of stop means for limiting the pivotal movement of said levers.

9. Apparatus according to claim 1, characterized by the provision of shock absorbing or braking means for braking the movements of said toggle-joint.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,747,785 Dated July 24, 1973

Inventor(s) Ake Bertil Ingemar Dahlin

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading of the patent add the following:

Assignee: Norba Aktiebolag, Blomstergala, Sweden

Signed and sealed this 20th day of November 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR. RENE D. TEGTMeyer
Attesting Officer Acting Commissioner of Patents
UNIVERS STATES PATENT OFFICE
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