United States Patent

Smith

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[54] PLUNGER SHIELD FOR REFUSE VEHICLE LOADING CHAMBER

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[21] Appl. No.: **3,839**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 703,214, Jan. 18, 1968, which is a continuation-in-part of Ser. No. 591,996, Nov. 4, 1966, abandoned.

[52] **U.S. Cl.** **214/83.3**

[51] **Int. Cl.** **B65f 3/00**

[58] **Field of Search** 214/503, 83.3

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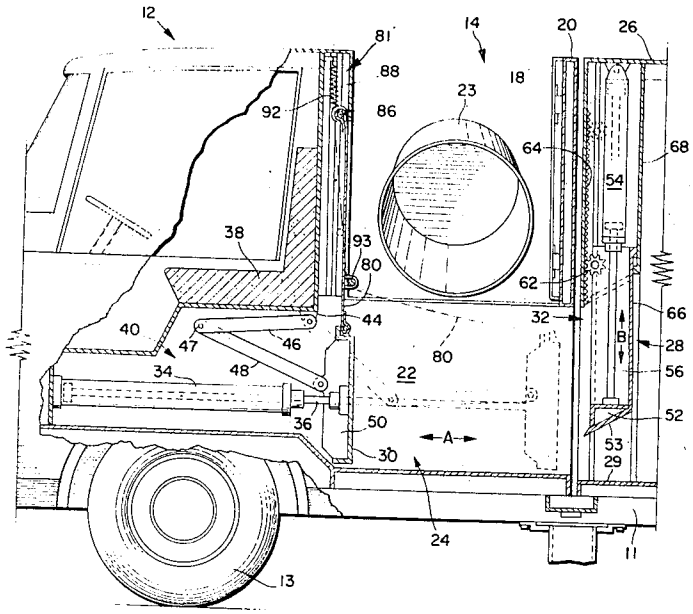
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[57] **ABSTRACT**

A refuse-collecting apparatus or vehicle includes a supporting frame or chassis having a refuse-receiving receptacle pivotally mounted thereon for tilting movement between a generally horizontal loading position and a tilted dumping position. A loading plunger is provided within a fixed loading chamber on the chassis for the purpose of pushing refuse from the loading chamber through a loading aperture into the refuse-receiving receptacle when the latter is disposed in its generally horizontal loading position. A contractable shield is affixed to the loading plunger and extends outwardly therefrom relative to the refuse-receiving receptacle and is movable with the loading plunger for the purpose of preventing refuse falling into the loading chamber outwardly of the loading plunger. In one arrangement, such a contractable shield includes a flexible curtain and a resiliently extensible spring means attached to the flexible curtain and suitably anchored on the vehicle. In another construction, the contractable shield includes a pair of generally planar plates which are movable between an extended position of minimum overlap and a retracted telescoped configuration.

2 Claims, 9 Drawing Figures



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SHEET 1 OF 3

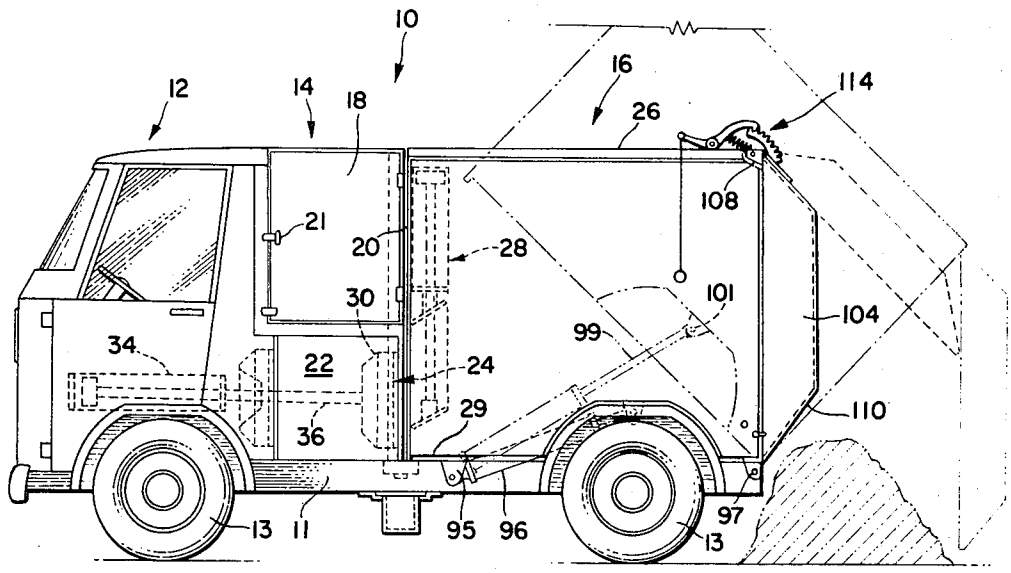


FIG. 1

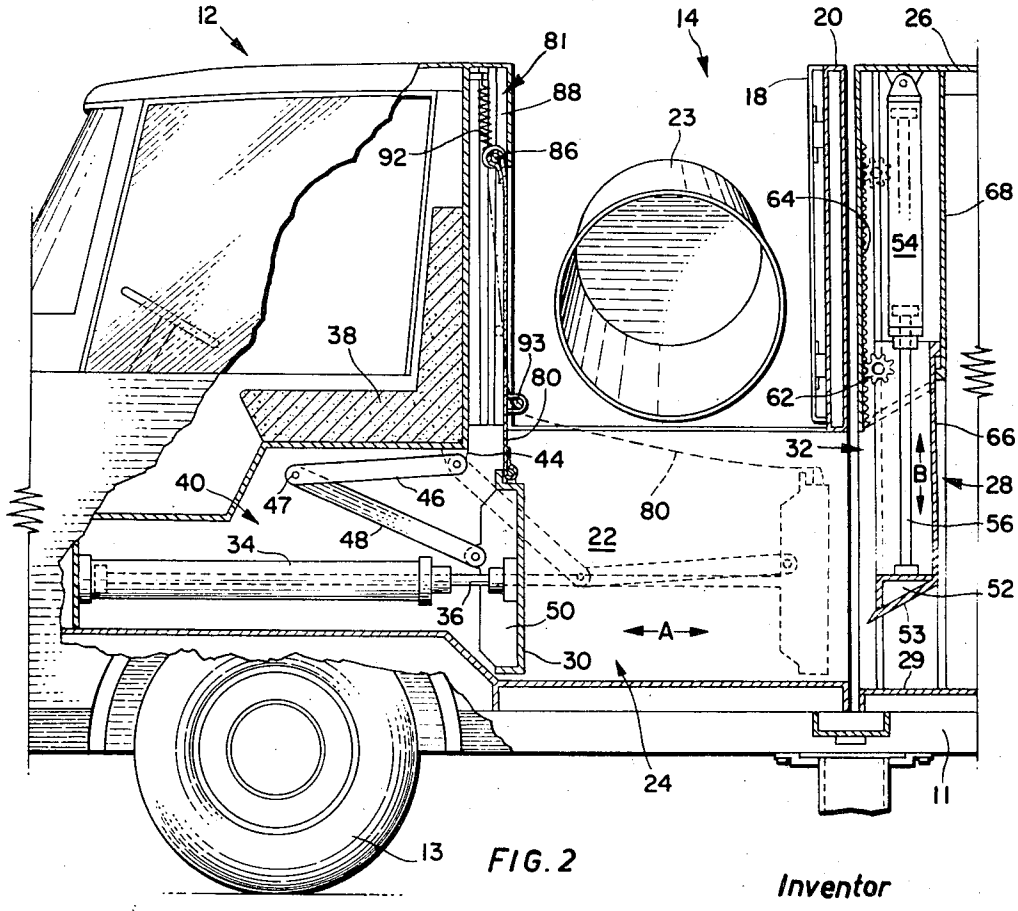


FIG. 2

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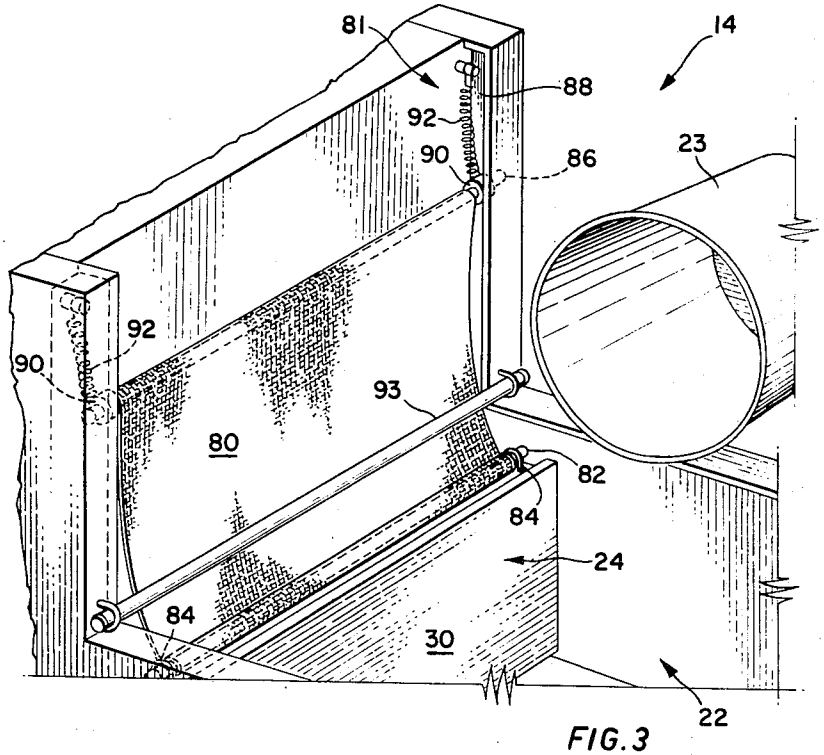


FIG. 3

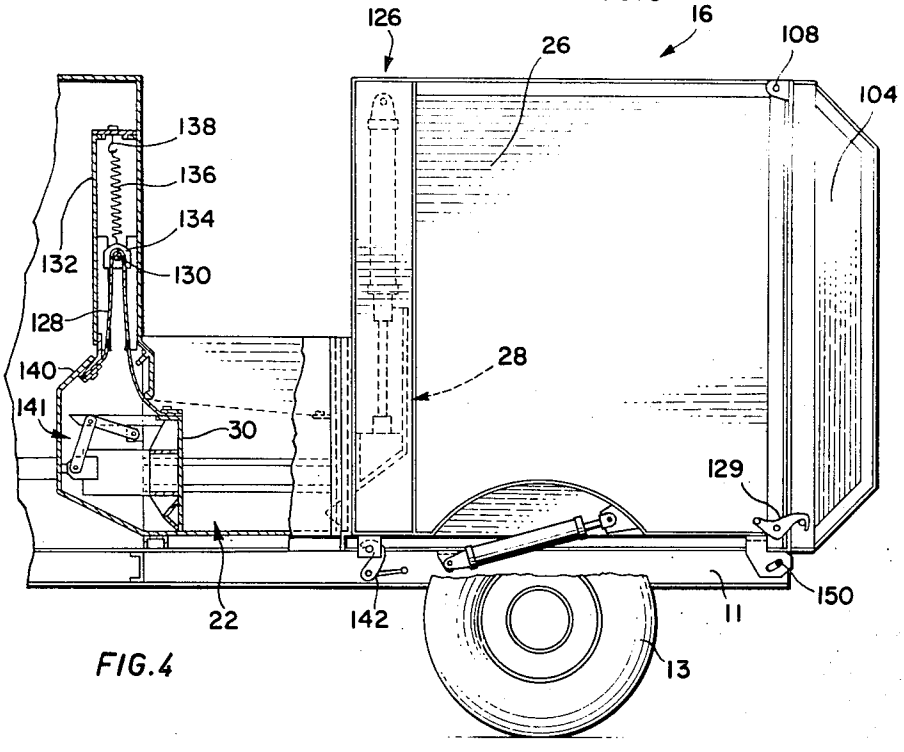


FIG. 4

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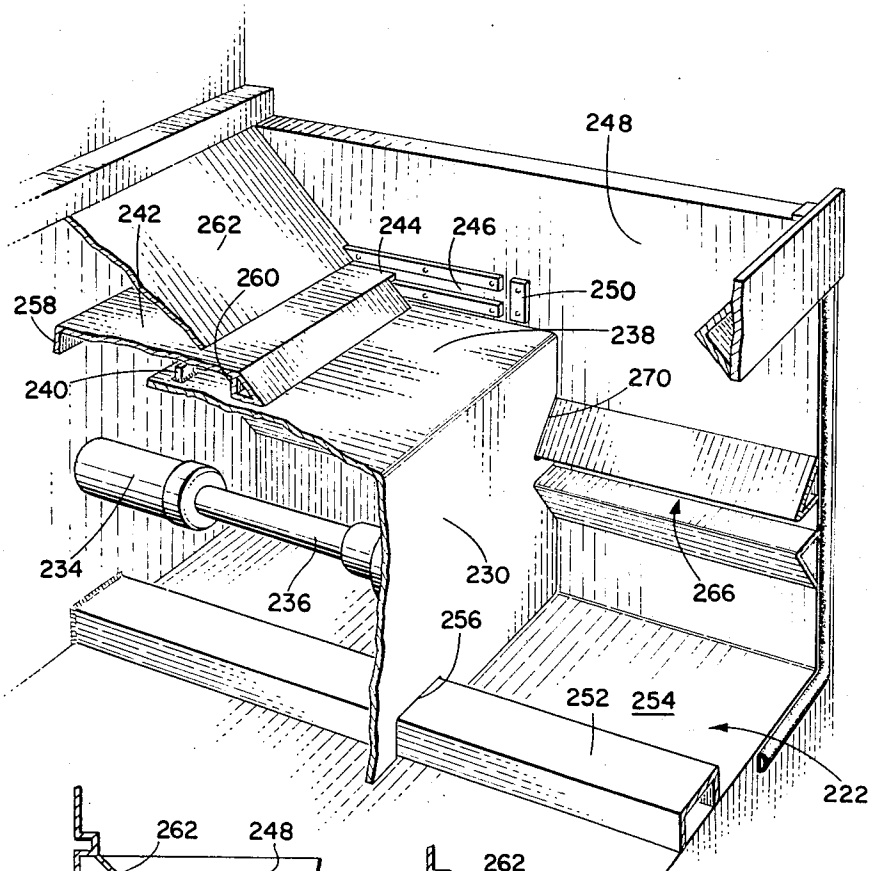


FIG. 5

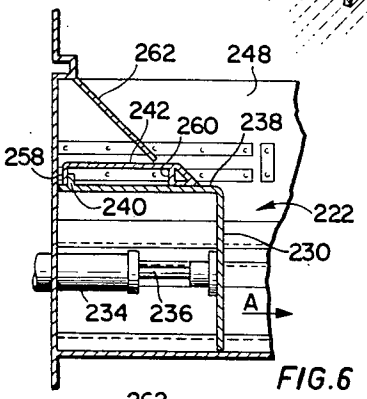


FIG. 6

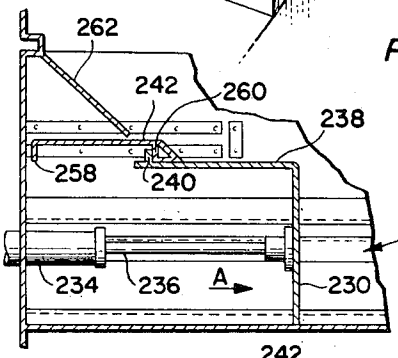


FIG. 7

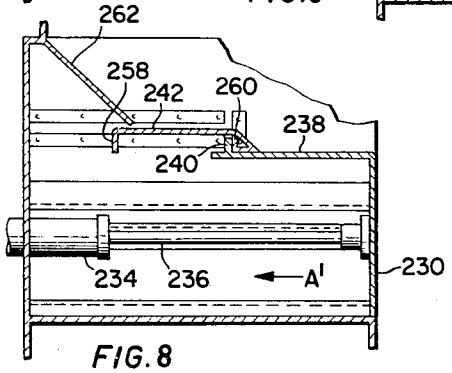


FIG. 8

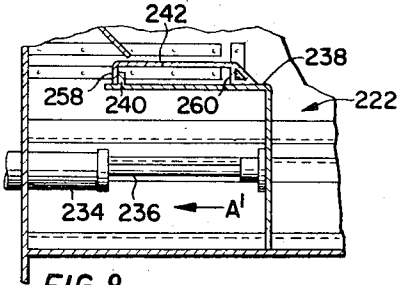


FIG. 9

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PLUNGER SHIELD FOR REFUSE VEHICLE LOADING CHAMBER

This application is a continuation-in-part of my pending application, Ser. No. 703,214 filed Jan. 18, 1968, and entitled "Refuse Collecting Apparatus," which is in turn a continuation-in-part of application, Ser. No. 591,996 filed Nov. 4, 1966 (now abandoned).

BACKGROUND OF THE INVENTION

The present invention relates to refuse-collecting apparatus and more particularly to a refuse-collecting vehicle including a refuse-receiving receptacle mounted on a supporting frame or chassis, usefully for movement between a generally horizontal loading position and a tilted dumping position. A refuse-collecting vehicle to which the present invention is applicable also includes a loading chamber mounted on the supporting frame or chassis of the vehicle so as to be disposed adjacent a loading aperture of the refuse-receiving receptacle for the transfer of refuse from the loading chamber into the refuse-receiving receptacle of the vehicle when such receptacle is disposed in its generally horizontal loading position.

In a refuse-collecting vehicle of the aforementioned type, the refuse-receiving receptacle is usefully pivotally mounted on the chassis of the vehicle for tilting movement between a generally horizontal loading position and a tilted dumping position for dumping refuse through a door or tailgate suitably mounted on the rearward end of the refuse-receiving receptacle. In such a vehicle, the aforementioned loading chamber is disposed on the supporting frame or chassis forwardly of the forward end of the refuse-receiving receptacle. Since the carrying capacity of such a vehicle is determined by the capacity of the refuse-receiving receptacle, it is required to make such a receptacle as large as possible and consequently to utilize a loading chamber having a minimum length in order to obtain the largest possible carrying capacity for a chassis of a given size.

To prevent refuse falling into the loading chamber of such a vehicle or apparatus forwardly of the loading plunger therein, i.e. outwardly of the loading plunger relative to the refuse-receiving receptacle, it is desirable to provide a cover or shield secured to the loading plunger and extending outwardly therefrom for conjoint movement therewith. Since such a shield moves conjointly with the loading plunger, space must be provided either above the chassis of the vehicle or longitudinally outwardly thereof, for example, forwardly thereof, to accommodate such a shield when it is disposed in its outermost position.

This space requirement for accommodating such a shield is particularly troublesome in the case of a refuse-collecting vehicle of the aforementioned type in which the loading chamber is disposed immediately behind the driver's cab. When, in such a vehicle, the loading plunger is operated by means of a hydraulic cylinder, such a cylinder can often be accommodated beneath or between the seats within the cab structure but, since the afore-mentioned shield will generally be disposed above such a cylinder, it will frequently be difficult to adapt the cab structure so that it will also accommodate the shield when the latter is disposed in its outermost or forwardmost position.

It is accordingly a principal object of the present invention to provide a refuse-collecting apparatus or

vehicle of the aforementioned type and in which a shield or cover is provided for preventing refuse dropping into the loading chamber forwardly of the loading plunger during operation of that loading plunger within the loading chamber and which shield or cover can be accommodated without requiring the use of a larger chassis or of a smaller length refuse-receiving receptacle.

It is another object of this invention to provide a refuse-collecting vehicle of the aforementioned type in which a shield or cover can be provided for preventing refuse dropping into the loading chamber of such a vehicle forwardly of the loading plunger disposed therein without requiring extensive modification of the driver's cab of the vehicle for the purpose of accommodating such a shield or cover when the latter is disposed in its forwardmost position corresponding to the fully retracted position of the loading plunger.

Yet another object of this invention is to provide a refuse-collecting apparatus of the aforementioned type in which the construction of the shield or cover provided therein for the purpose specified has a simple and reliable construction.

Other objects of the present invention will become apparent as the description herein proceeds.

SUMMARY OF THE INVENTION

In its broadest scope, the present invention provides a refuse-collecting apparatus comprising a supporting frame; a refuse-receiving receptacle mounted on said supporting frame and including a wall with a loading aperture extending therethrough; a loading chamber disposed on said supporting frame so as to be adjacent said loading aperture; a loading plunger within said loading chamber for longitudinal movement therethrough toward and away from said loading aperture for pushing refuse through said loading aperture into said refuse-receiving receptacle; a loading plunger drive mechanism operatively associated with said loading plunger for effecting said movement of said loading plunger toward and away from said loading aperture; and a contractable shield affixed to said loading plunger, extending outwardly therefrom relative to said refuse-receiving receptacle and movable with said loading plunger, said shield being positioned to prevent refuse from falling behind said loading plunger when said loading plunger is moved toward said loading aperture.

In one type of refuse-collecting vehicle or apparatus in accordance with this invention, the aforementioned contractable shield comprises a flexible cover or curtain affixed to the loading plunger and a resiliently extensible means affixed to such a flexible cover remotely from the loading plunger and adapted transversely to retract the flexible cover on longitudinal movement of the loading plunger away from the loading aperture of the refuse-receiving receptacle. With such use of a flexible cover and a resiliently extensible means, the cover can, for example, be accommodated in a generally vertical housing located immediately behind the cab structure of the vehicle. The required height for such a housing can be reduced by anchoring an outer or forward edge of such a flexible cover on the vehicle and disposing the aforementioned resiliently extensible means so that it engages the flexible cover intermediate its for-

ward and rearward edges to retract said cover vertically into the vertical housing on retraction of the loading plunger away from the loading aperture and to enable the flexible cover to straighten or unfold on movement of the loading plunger toward the loading aperture.

In another type of refuse-collecting vehicle or apparatus in accordance with this invention, the aforementioned contractable shield includes a first generally planar member affixed to the loading plunger in proximity to an upper edge thereof and extending outwardly therefrom relative to said refuse-receiving receptacle for conjoint generally horizontal movement therewith toward and away from the loading aperture of the refuse-receiving receptacle and a second generally planar member guidedly disposed within the loading chamber of the vehicle for longitudinal movement therein in a generally horizontal plane toward and away from said loading aperture and adapted to be engaged by the first generally planar member for conjoint movement therewith toward the loading chamber in minimum overlapping relationship therewith and for telescoping movement of said first generally planar member relative thereto away from said loading aperture until said first and second generally planar members are disposed in a maximum overlapping disposition for subsequent conjoint movement of said first and second generally planar members away from said loading aperture.

Other objects, features and advantages of the invention will become apparent as the description herein proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described merely by way of illustration with reference to the accompanying drawings in which:

FIG. 1 is a side elevation of a refuse-collecting vehicle embodying the present invention with certain parts shown in phantom outline and illustrating the manner in which a refuse-receiving receptacle of such a vehicle can be pivotally tilted between a generally horizontal loading position and a tilted dumping position thereof;

FIG. 2 is an enlarged and fragmentary side elevation of the refuse-collecting vehicle of FIG. 1 with certain parts shown in section to reveal the structure of one embodiment of a contractable shield including a flexible cover or curtain provided in the vehicle for the purpose of preventing refuse from falling into a loading chamber forwardly of a loading plunger provided in that chamber for transferring refuse into the refuse-receiving receptacle thereof;

FIG. 3 is an enlarged and fragmentary perspective view of the loading chamber of the refuse-collecting vehicle of FIGS. 1 and 2 showing in greater detail the construction and mounting of the contractable shield including the flexible curtain provided therein in accordance with this invention;

FIG. 4 is a fragmentary side elevation of an alternative embodiment of a refuse-collecting vehicle embodying the present invention with certain parts shown in section and others in phantom outline for the purpose of revealing the internal structure of the vehicle;

FIG. 5 is a fragmentary perspective view partly in section of yet another construction for a contractable shield for use in a loading chamber of a refuse-collecting vehicle embodying the present invention;

FIG. 6 is a longitudinal vertical sectional view through the loading chamber of FIG. 5 showing the loading plunger disposed in its forwardmost or fully retracted position therein;

FIG. 7 is a longitudinal vertical sectional view similar to that of FIG. 6 but showing the loading plunger disposed in a partially extended position thereof during rearward movement of that loading plunger;

FIG 8 is a longitudinal vertical sectional view similar to those of FIGS. 6 and 7 but showing the loading plunger thereof disposed in its fully extended or rearwardmost position; and

FIG. 9 is a longitudinal vertical sectional view similar to those of FIGS. 6, 7 and 8 but showing the loading plunger disposed in a partially retracted position thereof during forward movement or retraction of that loading plunger.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIG. 1, there is shown therein one embodiment of a refuse-collecting apparatus in the form of a refuse-collecting vehicle **10** in accordance with the present invention. The vehicle **10** includes a chassis or supporting frame generally indicated at **11**, a cab section generally indicated at **12**, wheels **13**, a loading chamber section generally indicated at **14** and a receptacle section generally indicated at **16**.

Because of the high degree of compaction possible with the apparatus embodying the invention, the overall refuse vehicle can be about the size and shape of a bakery or milk truck, for example. Basically, in operation, refuse is dumped into the loading chamber section **14** from which it is pushed into the refuse receptacle section **16** wherein it is compacted and from which it is subsequently dumped.

The loading section **14** can be open at the top and equipped with loading doors **18** on each side, the doors **18** being hinged to and supported by suitable frame members **20**. Latch mechanisms **21** are provided for securing these doors **18** in their closed positions. A loading chamber **22**, formed below the doors **18**, can be relatively small and with low side walls to enable a garbage can **23** (FIG. 2) or the like to be dumped thereinto when either door **18** is open. A loading plunger assembly generally indicated at **24** in the loading chamber **22** is operated continually for reciprocating movement in the chamber **22** as indicated by the double-headed arrow A to push deposited refuse or garbage into the receptacle section **16**. Because of this continuous operation, the loading chamber **22** is constantly cleared and can consequently be of small size to further the overall compact design of the vehicle.

The receptacle section **16** includes a tiltable refuse-receiving receptacle **26** which receives the refuse from the loading chamber **22**. When the refuse has been pushed into the receptacle **26**, a refuse-compacting plunger assembly **28** usefully compacts such refuse against a floor **29** or other stationary surface, independently of the amount of refuse already in the receptacle **26**. With the double plunger arrangement illustrated, a five cubic yard receptacle can carry approximately seventy percent of the load carried in a sixteen cubic yard truck heretofore known.

The loading plunger assembly **24**, as shown in FIGS. **2** and **3**, includes a loading plunger **30** which extends

across the width of the loading chamber 22 but is only about twodthirds as high as the loading chamber 22 and about two thirds as high as a discharge opening or loading aperture 32 communicating with the interior of the refuse-receiving receptacle 26. The loading plunger 30 is operated by a hydraulic cylinder 34 from which extends a cylinder rod 36 connected to a central portion of the loading plunger 30. The cylinder 34 can extend into the cab section 12 of the vehicle between or below seats 38 therein. The stroke of the cylinder 34 is of sufficient length to enable the loading plunger 30 to move between a retracted position in which it is disposed at the forward end of the loading chamber 22, as shown in full lines in FIG. 2, and an extended or rearwardmost position in which it is disposed adjacent the discharge opening or loading aperture 32 as shown in dotted lines in FIG. 2.

A torque bar assembly omitted from FIG. 1 and generally indicated at 40 in FIG. 2 is provided for maintaining the loading plunger 30 generally perpendicular to the direction in which that plunger is moved. The torque bar assembly 40 includes a main transverse torque bar which is also disposed generally perpendicularly to the direction of travel of the loading plunger 30. The torque bar is rotatably mounted in ears 44 which are attached to and supported by a suitable framework portion of the cab section 12 of the vehicle 10. A pair of transversely spaced apart torque arms 46 are affixed to the aforementioned torque bar and extend forwardly therefrom generally parallel to each other. At their forward ends, the torque arms 46 are pivotally connected as at 47 to pivotal connecting links 48 which are in turn pivotally attached to transversely spaced apart flange portions 50 of the loading plunger 30. With this arrangement, any tendency for the loading plunger 30 to cock or twist will tend to twist the aforementioned torque bar which is sufficiently heavy to resist such twisting and so maintains the loading plunger 30 at all times generally perpendicular to its direction of travel.

As already indicated, the particular vehicle 10 illustrated in FIGS. 1 and 2 is also provided within the refuse-receiving receptacle 26 with a refuse-compacting plunger assembly 28 which includes a refuse-compacting plunger 52 having a refuse-compacting undersurface 53 which slopes upwardly and rearwardly at a small angle so as to tend to move refuse rearwardly into the refuse-receiving receptacle 26 during compaction of such refuse. The compacting plunger 52 is mounted on the lower end of a cylinder rod 56 of a hydraulic cylinder 54 for generally vertical reciprocating movement as indicated by the double-headed arrow B across the loading aperture 32 for the purpose of compacting refuse introduced into the receptacle 26 by the loading plunger 30. In addition to serving to compact refuse disposed within the receptacle 26 below the compacting plunger 52 against the floor 29 of the refuse-receiving receptacle 26, the compacting plunger 52 also provides a useful function of shearing any article of refuse which may, from time to time, extend from within the receptacle 26 into the loading chamber 22 above the loading plunger 30 after such refuse has been pushed toward and partially through the loading aperture 32. For this reason, the vertical extent of the loading aperture 32 is usefully greater than the height of the end face of the loading plunger 30 as already explained herein.

The refuse-compacting plunger 52 is maintained generally perpendicular to its direction of travel by means of a torque shaft extending across the plunger 52 and rotatably held by side walls thereof. A pair of pinion gears 62 are affixed to and rotate with this shaft and engage gear racks 64 during the entire movement of the refuse-compacting plunger 52 between its extended and retracted positions. Any tendency for the refuse-compacting plunger 52 to cock will tend to twist the aforementioned torque shaft which is sufficiently heavy to resist such twisting. If desired, the refuse-compacting plunger 52 can have a cover wall 66 extending upwardly therefrom and telescoping within a fixed cover 68 to prevent the possibility of refuse being jammed upwardly of the plunger 52.

The refuse-receiving receptacle 26 has an open rear discharge end for dumping refuse from the receptacle 26. A door or tailgate 104 is pivotally mounted at its top edge by ears 108 from movement between the open and closed positions shown in FIG. 1. Latch means (not shown) are usefully provided for holding the door 104 in its closed position while ratchet means generally indicated at 114 are usefully provided for holding the door 104 in its open position but, since the structure and mounting of the door 104 and the aforementioned latch means and ratchet means 114 form no part of the present invention, these members will not be described herein in greater detail. The door 104 also has a slanted lower portion 110 which causes refuse to move upwardly toward the top of the vehicle as it is compacted and pushed rearwardly in the receptacle 26. This enables the compacted refuse to fill the receptacle 26 quite uniformly.

The refuse-receiving receptacle 26 is mounted on the chassis or supporting frame 11 of the vehicle 10 for pivotal tilting movement about a pivot generally indicated at 97 between the generally horizontal loading position shown in solid lines in FIG. 1 in which position the aforementioned loading aperture 32 is aligned with the loading chamber 22 and a tilted dumping position as shown in broken lines in FIG 1.

In order to prevent the leakage of liquid waste through the gap between the loading chamber 22 and the refuse-receiving receptacle 26, a resiliently compressible seal or gasket (not shown) may suitably be provided on the rear edge surfaces of the loading chamber 22. The particular vehicle 10 shown in FIGS. 1 and 2 of the accompanying drawings also includes a tilting drive mechanism comprising a double-acting hydraulically operated dumping cylinder 96 pivotally mounted at its lower end in a bracket 95 suitably secured to the chassis 11. A cylinder rod 99 extends generally rearwardly and upwardly from the cylinder 96 and is pivotally connected at 101 to the refuse-receiving receptacle 26 forwardly of the aforementioned pivot 97.

It will be understood that, in order to be operative to move the refuse-receiving receptacle 26 between its loading and dumping positions, the cylinder rod 99 must be operative to apply an upwardly and rearwardly directed force to the receptacle 26 when the latter is in its generally horizontal loading position. From FIG. 1, it will be seen that for this purpose, the cylinder 96 extends rearwardly and upwardly when the receptacle 26 is disposed in its loading position.

It will further be understood that the hydraulic cylinder 96 will be provided with appropriate hoses (not shown) connected to a suitable source of pressurized hydraulic fluid and that appropriate valves or other controls will be provided for controlling the supply of hydraulic fluid to the cylinder 96 and for controlling the discharge of such hydraulic fluid therefrom. Similarly, appropriate valves and controls will be provided for controlling the flow of hydraulic fluid to and from the cylinders 34 and 54 for operating the loading plunger 30 and the refuse-compacting plunger 52 respectively.

In such operation of the vehicle 10, the loading plunger 30 preferably operates continually between its forward and rearward positions to constantly clear the loading chamber 22. The refuse-compacting plunger 52 preferably moves downwardly each time the loading plunger 30 has moved to its extended or rearward position.

Since refuse will frequently be dumped into the loading chamber 22 when the loading plunger 30 is disposed rearwardly of its fully retracted position, means are provided in accordance with the invention to prevent refuse from dropping into the loading chamber 22 forwardly of the loading plunger 30 and possibly causing jamming of that plunger. If such means is in the form of a rigid plate secured to the upper edge of the loading plunger 30 and extending forwardly therefrom for conjoint movement therewith toward and away from the loading aperture 32, difficulties arise in accommodating such a plate in the cab section 12 of the vehicle 10 without requiring an unduly large increase in the length of the vehicle. As hereinbefore indicated, the present invention resides in the provisions of a contractable shield for preventing refuse from falling behind, i.e. forwardly, of such a loading plunger. In the particular vehicle 10 illustrated in FIGS. 1, 2 and 3, such a contractable shield includes a flexible cover or curtain 80 attached along a lower rear edge thereof to an upper edge portion of the loading plunger 30 by a rod 82 sewn into the rear edge of the flexible curtain 80 and received in ears 84 affixed to the upper edge of the loading plunger 30. It should perhaps be indicated at this juncture that references herein to "front" and "rear" edges of the curtain 80 are intended to denote the forward and rearward edges of that curtain relative to the normal forward direction of movement of the vehicle 10. The contractable shield provided in the vehicle 10 also comprises a resiliently extensible means generally indicated at 81 and attached to the forward end of the flexible curtain 80 to enable the latter to move with the loading plunger 30 and yet to retract transversely when the loading plunger 30 moves away from the loading aperture 32.

In the particular construction shown in FIGS. 1 to 3, the resiliently extensible means 81 includes an upper rod 86 sewn into the upper edge of the flexible curtain 80 and extending beyond the side edges thereof into tracks 88 provided in a suitable framework assembly mounted on the chassis 11 of the vehicle 10. Wheels or rollers 90 carried by the ends of the rod 86 enable the upper forward edge of the flexible curtain 80 to be guided with less friction. Long helical tension springs 92 are connected to the ends of the upper rod 86 and are suitably anchored at their opposite ends. The springs 92 are extended when the loading plunger 30 moves toward the loading aperture 32 and cause the flexible curtain 80 to retract transversely when the loading plunger 30 moves away from the loading aperture 32. A guide rod 93 is useful in clearing refuse off the top surface of the flexible curtain 80 when the latter is retracted.

The flexible curtain 80 is positioned approximately as shown in broken lines in FIG. 2 when the loading plunger 30 is extended toward the loading aperture 32 so that refuse dumped on the curtain 80 will tend to move or slide toward the refuse-receiving receptacle 26 particularly during retraction of the loading plunger 30. Suitable stops (not shown) can be provided to limit the extent of downward movement of the wheels 90 and the upper rod 86 to prevent the flexible curtain 80 from moving downwardly too far in the event that very heavy refuse is dumped thereon when the loading plunger 30 is extended toward the loading aperture 32.

The flexible curtain 80 is advantageous in that it requires little maintenance and has a low initial cost. Replacement can be accomplished easily and relatively inexpensively, when necessary. It should be noted that the aforementioned contractable shield comprises the combination of the flexible curtain 80 per se and the resiliently extensible means 81.

A modified refuse-collecting vehicle 126 embodying the present invention is shown in FIG. 4 of the accompanying drawings, this vehicle 126 being generally similar to the vehicle 10 already described herein. The same legends are used for identifying the same components on the two vehicles. Briefly, it can be noted that the vehicle 126 includes a refuse-receiving receptacle 26 pivotally mounted as generally indicated at 150 on a chassis or supporting frame 11 of the vehicle 126 for movement between a generally horizontal loading position and a tilted dumping position in much the same manner as hereinbefore described for the vehicle 10 of FIGS. 1 and 2. A door or tailgate 104 is pivotally mounted at 108 on the rear end of the refuse-receiving receptacle 26 and latch means generally indicated at 129 are provided for holding the tailgate 104 in its closed position.

The vehicle 126 also comprises a vertically reciprocable refuse-compacting plunger assembly generally indicated at 28 within the refuse-receiving receptacle 26 at the forward end thereof for movement across a loading aperture provided in the forward end wall thereof for alignment with a loading chamber 22 when the refuse-receiving receptacle 26 is disposed in its generally horizontal loading position. Manually releasable latch means 142 are provided for holding the refuse-receiving receptacle 26 in its generally horizontal loading position as actually shown in FIG. 4.

A loading plunger 30 is provided within the loading chamber 22 for horizontal longitudinal reciprocation therein for pushing refuse through the loading aperture into the refuse-receiving receptacle 26. A torque bar system generally indicated at 141 is provided to prevent twisting of the loading plunger 30.

As was the case for the vehicle 10 of FIGS. 1 to 3, a contractable shield is provided in the vehicle 126 for preventing refuse from falling into the loading chamber 22 thereof forwardly of the loading plunger 30. This contractable shield includes a flexible cover or curtain

128 which is affixed along its rearward lower edge in any suitable manner to the upper edge of the loading plunger 30. From the loading plunger 30, the flexible curtain 128 extends over a transversely disposed roller 130 and is suitably affixed at its lower forward edge to a frame member 140. The roller 130 is rotatably carried by a pair of end plates 134 which are supported by helical tension springs 136 and adjustable hangers 138 in a vertical housing 132. With this arrangement, the overall height of the space required for housing the flexible cover 128 can be considerably reduced.

Referring now to FIGS. 5 to 9 of the accompanying drawings, the structure and operation of another embodiment illustrated therein for a contractable shield for use in a refuse-collecting apparatus or vehicle in accordance with the present invention will now be described. It will be appreciated that the arrangement now to be described with reference to FIGS. 5 to 9 can be utilized in the vehicles shown in FIGS. 1 to 4 and in modified vehicles and other refuse-collecting apparatus.

From FIG. 5, it will be seen that a loading plunger 230 illustrated therein is disposed in a loading chamber generally indicated at 222 for longitudinal reciprocating movement as indicated by the arrows A and A' (FIGS. 6 to 9) under the control of a hydraulic cylinder 234 having a cylinder rod 236 which extends longitudinally rearwardly therefrom and is secured in any appropriate manner to the loading plunger 230.

Referring more particularly to FIG 5, it will be seen that the loading plunger 230 has a forwardly extending and generally horizontal planar member 238 integrally formed therewith along its upper edge for conjoint movement therewith. In general proximity to its forward (i.e. left-hand) edge, the planar member 238 is provided with transversely spaced apart and upstanding abutment members or stops 240, one of which is visible in FIG. 5.

A second generally horizontal planar member 242 has transversely extending edge flanges 244 which are freely supported in longitudinally extending guideways 246 provided on inner surfaces of side walls 248 of the loading chamber 222. Stops 250 are provided at the rearward ends of the guideways 246 to restrict rearward movement of the planar member 242 rearwardly beyond the position actually shown in FIG. 8.

Along each of its forward and rearward edges, the second generally horizontal planar member 242 is integrally formed with downwardly extending flanges 258 and 260 respectively which flanges function as abutment members by engagement with the aforementioned stops 240 in a manner yet to be described in greater detail with reference to FIGS. 6 to 9 of the accompanying drawings.

In the particular construction illustrated in FIGS. 5 to 9, a fixed sloping shield 262 is secured within the loading chamber 222 at the forward end thereof above the second planar member 242. If desired, wiping seals may be provided between the planar members 238 and 242 and between the sloping shield 262 and the second planar member 242. During its longitudinal movement in the loading chamber 222, the loading plunger 230 is guided by a longitudinally extending and upstanding generally rectangular section guide bar 252 fixed to a floor 254 of the loading chamber 222 and slidingly received within a corresponding recess 256 provided, for this purpose, in the loading plunger 230. Additional guidance for the loading plunger 230 is provided by guideways 266 mounted on inner surfaces of the side walls 248 of the loading chamber 222 and received within corresponding recesses 270 formed in the loading plunger 230.

The manner of operation of the structure illustrated in FIG. 5 will now be described with reference to FIGS. 6 to 9 from which certain structural components have been omitted for the sake of clarity. Assuming that the loading plunger 230 is disposed in its fully retracted or forwardmost position as actually shown in FIG. 6, flow of hydraulic fluid to the forward end of the cylinder 234 will cause rearward extension of the loading plunger 230. Such rearward movement of the loading plunger 230 will continue essentially independently of the upper planar member 242 until the loading plunger 230 reaches the position actually shown in FIG. 7. During this initial movement of the loading plunger 230 between the positions shown in FIGS. 6 and 7, the upstanding abutment members or stops 240 move rearwardly between the downwardly projecting flanges 258 and 260 of the second planar member 242.

On the continued flow of hydraulic fluid to the forward end of the cylinder 234, rearward extension of the loading plunger 230 from the position shown in FIG. 7 to that shown in FIG. 8 occurs with abutment of the upstanding stops 240 against the rearward flange 260 of the second planar member 242 causing the latter to be moved in the guideways 246 rearwardly conjointly with the loading plunger 230.

When the loading plunger 230 reaches its rearwardmost or fully extended position as shown in FIG 8, control means (not shown) are operative to cause the flow of hydraulic fluid to the rearward end of the cylinder 234 to cause forward retraction of the loading plunger 230. Such forward retraction of the loading plunger 230 proceeds essentially independently of the second planar member 242 with the upstanding stops 240 moving forwardly between the flanges 260 and 258 of the second planar member 242 until the stops 240 abut the forward flange 258 as actually illustrated in FIG. 9. Further flow of hydraulic fluid to the rearward end of the cylinder 234 causes conjoint forward retraction of the loading plunger 230 and the second planar member 242 from the position shown in FIG. 9 to that shown in FIG. 6, at which stage the operating cycle already described herein is repeated.

Although the loading plunger construction shown in FIG. 5 has been described with reference to the use of two generally horizontal and longitudinally reciprocating planar members, namely planar members 238 and 242, it will be appreciated that, if required, a larger number of such planar members may be used in a structure in accordance with the present invention.

What I claim is:

1. A refuse-collecting apparatus comprising:
a supporting frame;
a refuse-receiving receptacle mounted on said supporting frame and including a wall with a loading aperture extending therethrough;
a loading chamber disposed on said supporting frame so as to be adjacent said loading aperture;

a loading plunger within said loading chamber for longitudinal movement therethrough toward and away from said loading aperture for pushing refuse through said loading aperture into said refuse-receiving receptacle;

a loading plunger drive mechanism operatively associated with said loading plunger for effecting said movement of said loading plunger toward and away from said loading aperture;

a contractable shield affixed to said loading plunger, extending outwardly therefrom relative to said refuse-receiving receptacle and movable with said loading plunger, said shield being flexible along its length whereby it can be flexed progressively along its length, said shield being positioned to prevent refuse from falling behind said loading plunger when said loading plunger is moved toward said loading aperture;

a guide and scraper element for said shield extending across said loading chamber in the vicinity of the extreme displacement of said plunger from said loading aperture; and

yieldable tensioning means coupled to said shield and arranged to draw said shield about said guide and scraper element along a linear path generally normal to the path of approach of said shield to said guide and scraper element from said loading plunger whereby said shield is guided and scraped during movement of said loading plunger to permit extension and contraction of said shield as said plunger is moved toward and away from said loading aperture.

2. A combination in accordance with claim 1 wherein said yieldable tensioning means comprises a rod; means securing said flexible shield to said rod; a guide extending generally normal to the path of longitudinal movement of said loading plunger and coupled to said loading chamber in the vicinity of the extreme displacement of said plunger from said loading aperture; means coupling said rod to said guide for guided movement and biasing means yieldably urging said rod along said guide in a direction away from said plunger.

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