

[54] **REFUSE BODY LOADING MECHANISM**

[72] Inventors: **John E. Wieschel**, Hartland; **Jerald G. Zanzig**; **Robert M. Czarnecki**, both of Milwaukee; **Claire W. Murray**, West Allis, all of Wis.

[73] Assignee: **The Heil Co.**, Milwaukee, Wis.

[22] Filed: **March 17, 1971**

[21] Appl. No.: **125,059**

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

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

[58] Field of Search **214/83.3, 503; 100/213**

[56] **References Cited**

UNITED STATES PATENTS

3,280,994	10/1966	Herpich et al.	214/83.3
3,615,029	10/1971	Anderson	214/83.3

Primary Examiner—Albert J. Makay
Attorney—Morsell & Morsell

[57] **ABSTRACT**

A refuse body has a position controlling member pivotally connected to an upper portion of the tailgate for oscillatory movement, with said controlling member having a lower telescopic section, there being a packer blade pivotally connected to the lower edge of said telescopic section. There is power operated means for causing telescopic movement of said telescopic section and power operated means for causing swinging movement of the packer blade to transfer refuse from the bottom of the tailgate hopper into the refuse body. There is also means on the tailgate pivotally connected to the packer blade for guiding the adjacent parts in a generally quadrangular circuit during cycling of the mechanism and as the blade controlling member oscillates.

13 Claims, 11 Drawing Figures

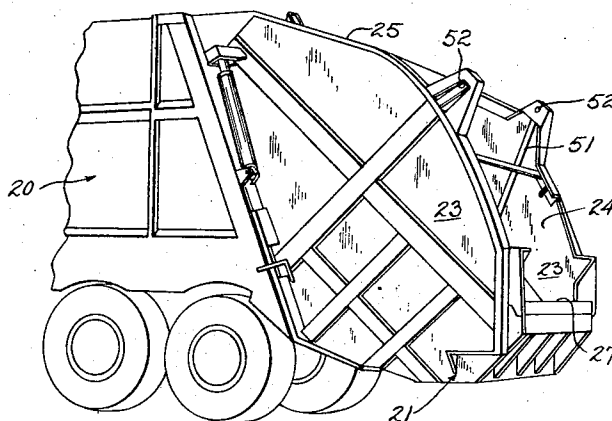


Fig. 3

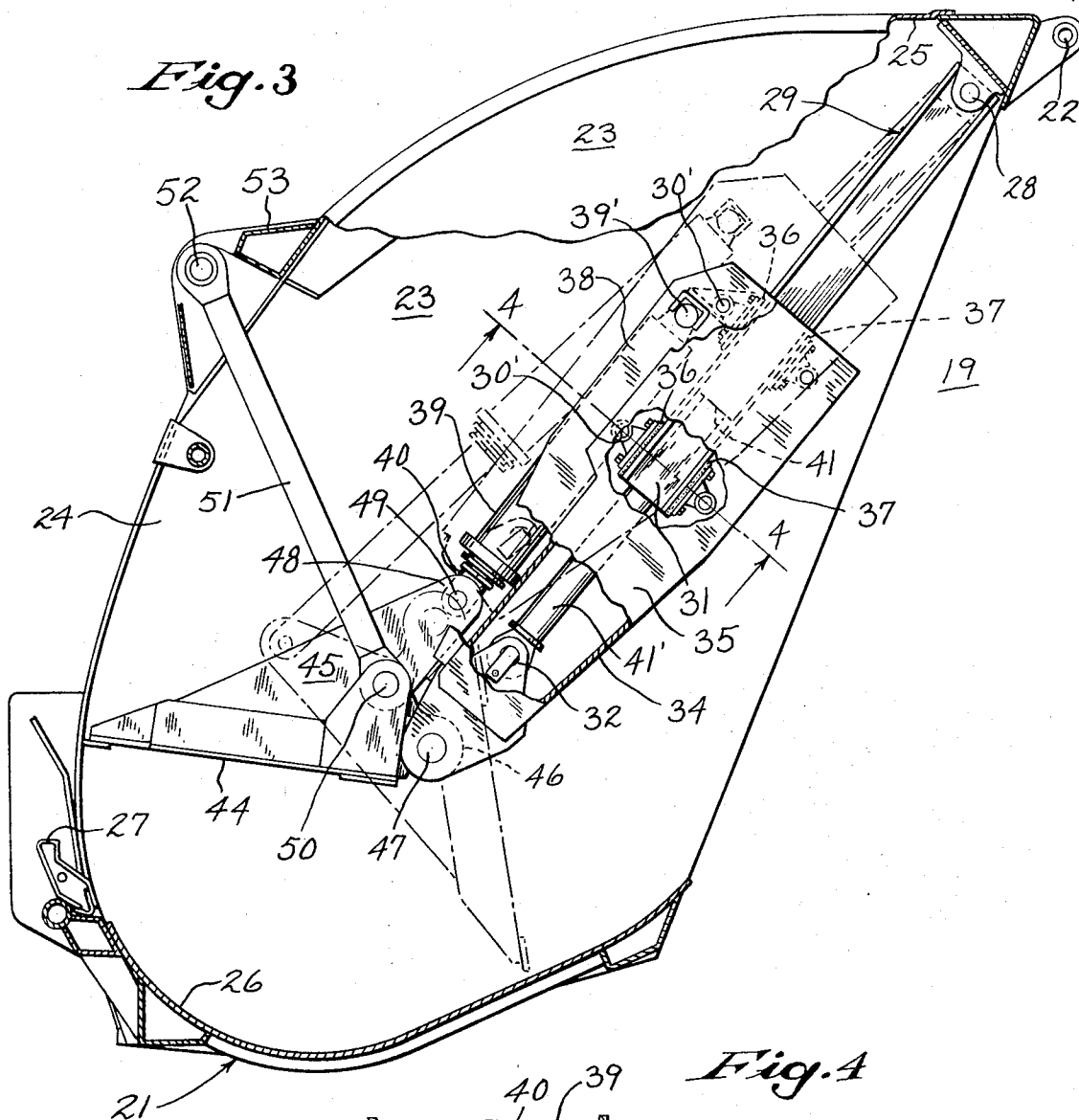
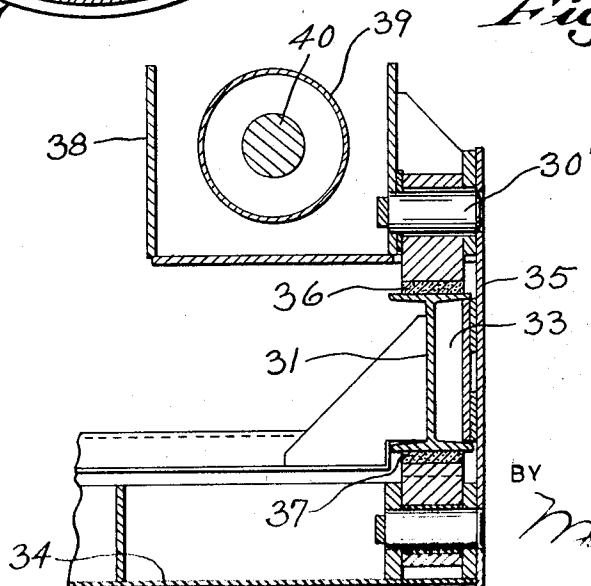


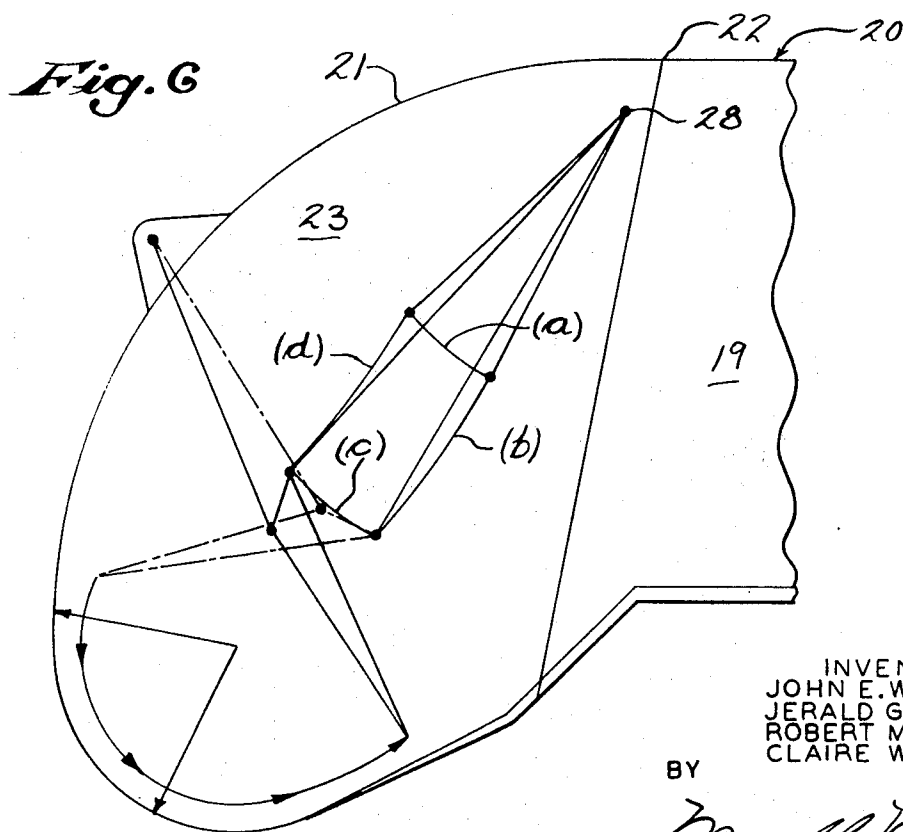
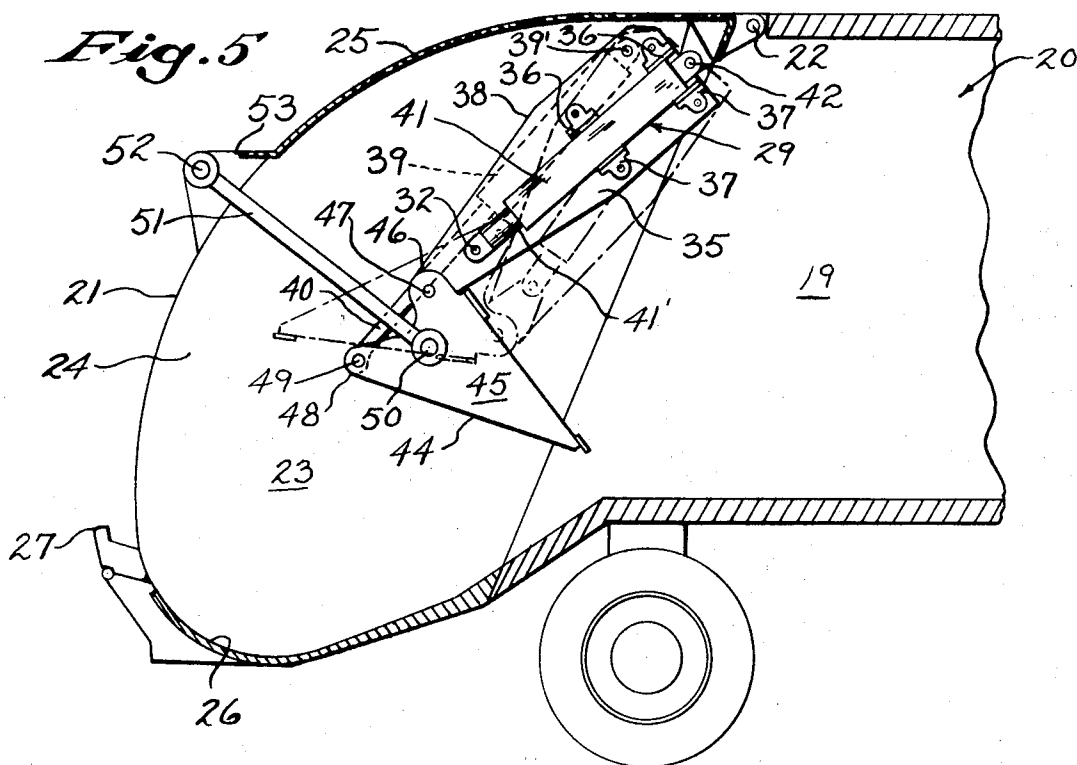
Fig. 4



INVENTORS
JOHN E. WIESCHEL
JERALD G. ZANZIG
ROBERT M. CZARNECKI
CLAIRE W. MURRAY

BY

Mosell Mosell
ATTORNEYS

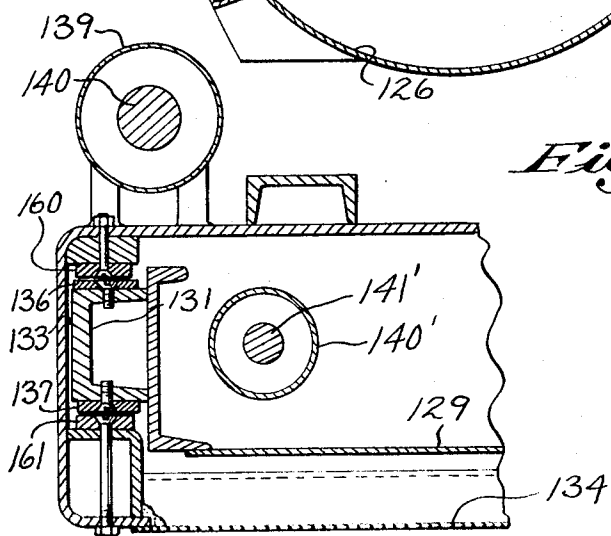
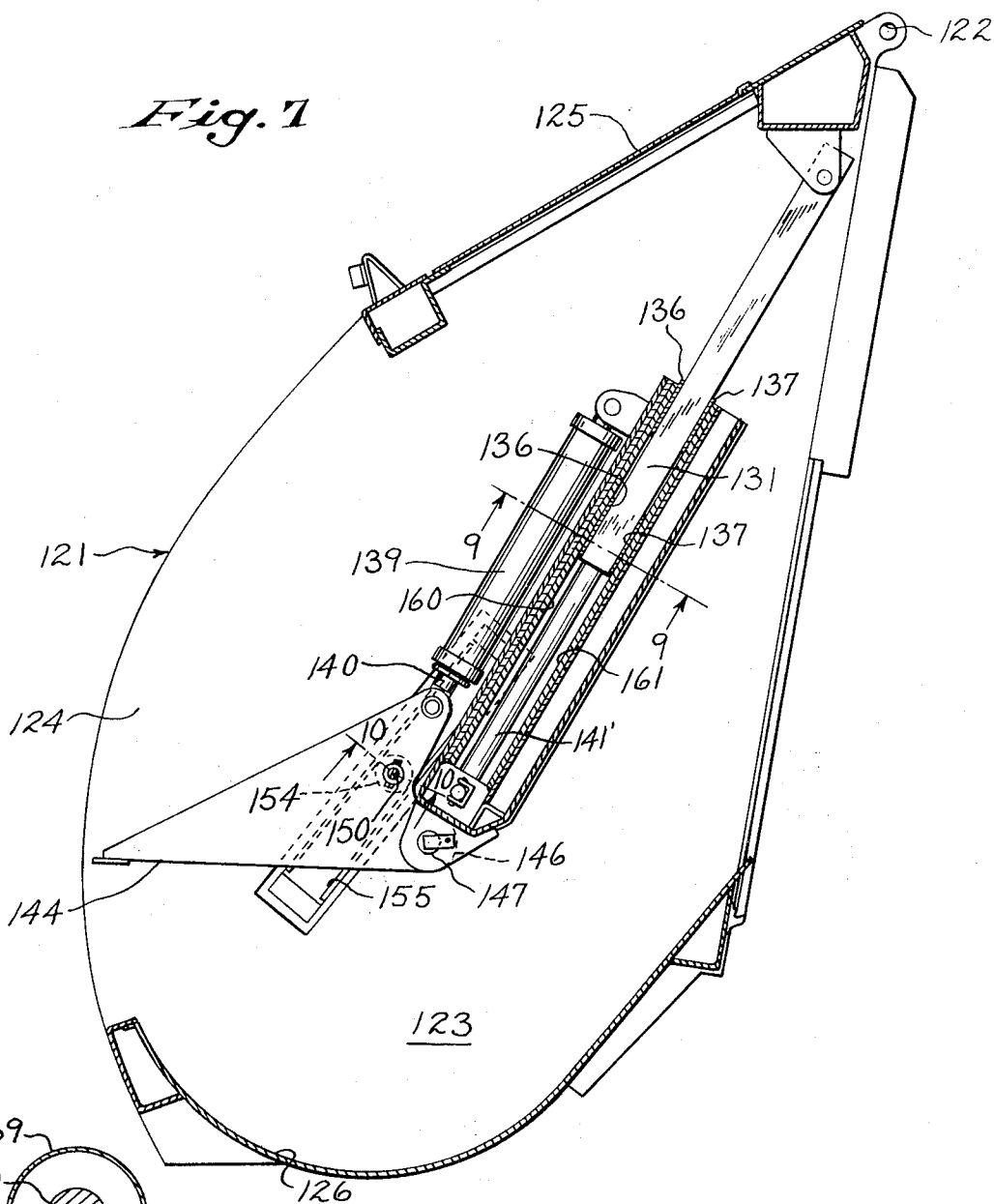


INVENTORS
JOHN E. WIESCHEL
JERALD G. ZANZIG
ROBERT M. CZARNECKI
CLAIRE W. MURRAY

BY

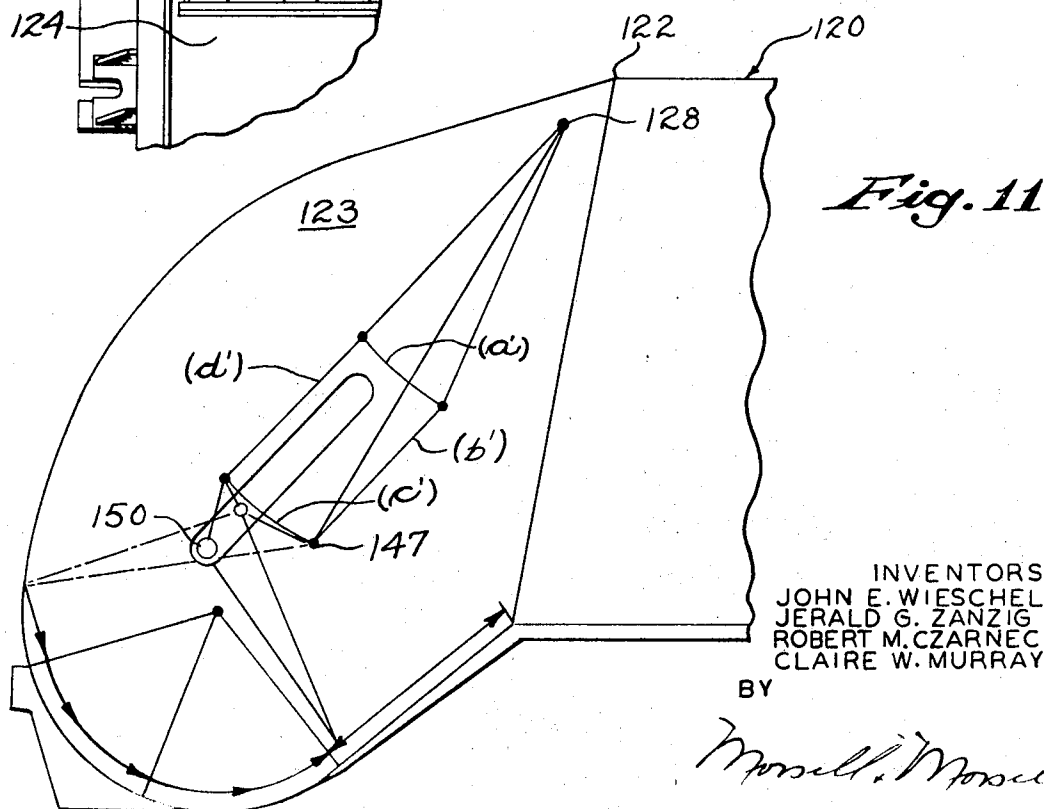
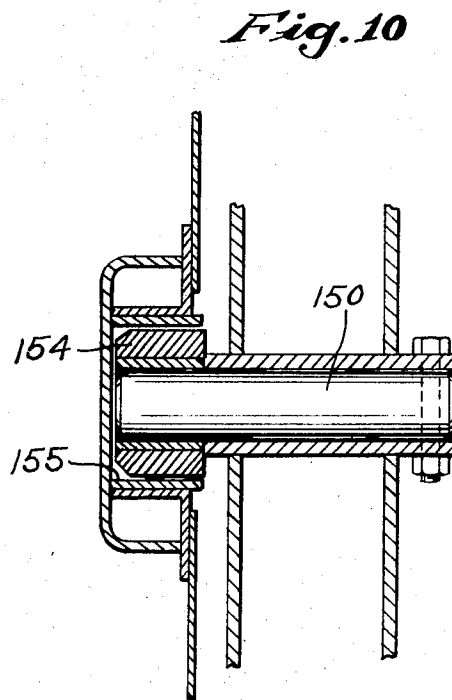
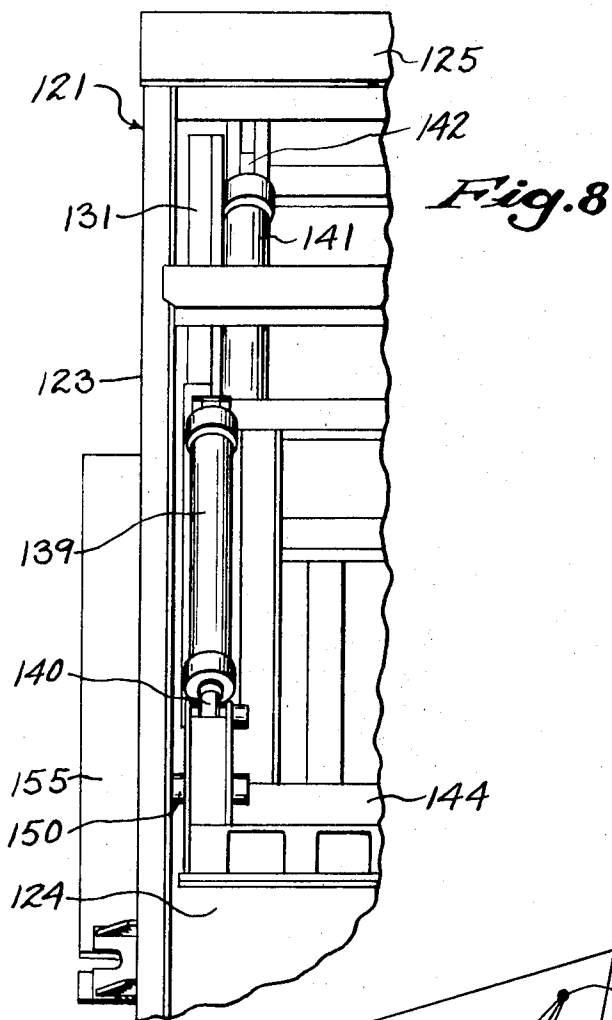
Mossell & Mossell

ATTORNEYS



INVENTORS
 JOHN E. WIESCHEL
 JERALD G. ZANZIG
 ROBERT M. CZARNECKI
 CLAIRE W. MURRAY

BY
Monello Monello
 ATTORNEYS



INVENTORS
JOHN E. WIESCHEL
JERALD G. ZANZIG
ROBERT M. CZARNECKI
CLAIRE W. MURRAY

BY

Mossell, Mossell

ATTORNEYS

REFUSE BODY LOADING MECHANISM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is adapted for use in the tailgate of a rear loaded refuse body for moving and packing refuse into the storage chamber of the vehicle.

2. Description of the Prior Art

Refuse bodies have heretofore been proposed wherein a packer blade transfers refuse from a hopper at the rear of the body into the storage chamber, with the packer blade movable in the return direction over a new load in the hopper. One refuse vehicle of this general type is disclosed in expired Golnick U.S. Pat. No. 2,639,216. In Golnick U.S. Pat. No. 3,143,230 a construction is disclosed wherein a carrier plate in an upper portion of the tailgate has a straight reciprocating motion in slots in the side walls of the tailgate, with the packer blade being pivoted to the rear end of the carrier plate. In this type of construction the tip of the packer blade describes a simple arc during its swinging movement, with the face of the packer blade in effect equal in length to the radius of the arc of the bottom of the hopper. This arrangement limits loading hopper shape to that which conforms to the simple arcuate movement of the blade tip, and therefore it does not permit shaping of the hopper in ways which would increase efficiency for the receipt of refuse. Furthermore, in these prior constructions the blade is supported by the carrier plate, which places a limitation on the distribution of load forces.

SUMMARY OF THE INVENTION

The present invention provides a novel refuse body loading mechanism in which there is a blade position controlling member pivotally connected to an upper portion of the tailgate for oscillatory movement, said member having a lower telescopic section. Pivots for the packer blade are supported on the tailgate either from the ends of swinging links or in side wall slots. The telescopic section has a connection with the packer blade which is offset from the axis of the before-mentioned packer blade pivots so that the movement of the blade creates a novel downward and inward movement of the blade position controlling member. There is power operated means connected to the telescopic section for causing swinging movement of the blade, and there is power operated means connected to the oscillatory blade supporting member for controlling telescopic movement of the telescopic section. The axis of the pivotal connection between the telescopic section and the packer blade moves through a generally quadrangular circuit during cycling of the mechanism and as the blade supporting member oscillates.

A general object of the present invention is to provide an improved refuse body loading mechanism which permits a loading hopper shape which has a more efficient refuse receiving shape which can be made deeper below the hopper lip.

A further object of the invention is to provide a refuse body as above described wherein the novel blade position controlling member and its telescopic section provides a complete barrier against spillback of refuse in all positions of adjustment. Thus no separate baffle is required.

A further object of the invention is to provide an improved arrangement wherein the pivotal connection between the blade and telescopic section is independent of and offset from the pivotal connection between the blade and a special support for the blade.

A further object of the invention is to provide in a device as above described an improved arrangement wherein the pivotal connection between the blade and its support on the tailgate is so located that its position is advantageous during the packing stroke to absorb the load forces and thus transmit them to the tailgate frame.

A further object of the invention is to provide an improved refuse body loading mechanism in which the pivotal support for the blade with respect to the tailgate is such as to influence the motion of the telescoping platen section of the blade controller. This is accomplished in a way to achieve a motion which acts as an additional packing and holding force upon the refuse being packed in that, as the blade is swung upwardly at the end of the packing stroke, it causes downward and inward movement of the blade position controlling member, which exerts extra pressure on the packed load at this period in the cycle of operation, which position of the platen is maintained to produce a refuse holding effect for a portion of the cycle thereafter.

Other objects of the invention are to provide a refuse body loading mechanism which is relatively inexpensive in construction, strong and durable, fast in action, and otherwise well adapted for the purposes described.

With the above and other objects in view, the invention consists of the improved refuse body loading mechanism and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings illustrating two embodiments of the invention, in which the same reference numerals designate the same or similar parts in all of the views:

FIG. 1 is a perspective view looking principally at the rear end portion of a refuse truck, showing the tailgate equipped with one form of the improved packing mechanism;

FIG. 2 is a view partially in perspective, looking principally into the rear of the tailgate, showing the packing mechanism with the blade extended and about to sweep refuse from the hopper into the storage compartment of the truck, part of the top of the tailgate being broken away;

FIG. 3 is a side elevational view, partially in vertical cross section, with the side of the tailgate removed to show a side view of the packing mechanism, parts of which have been broken away and shown in section, the packer plate being about to move refuse from the hopper toward the storage compartment, the broken lines showing the packing blade at the end of its swinging stroke;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3;

FIG. 5 is a partially diagrammatic view showing the parts advanced beyond the broken line position of FIG. 3 and in final refuse packing position;

FIG. 6 is a diagrammatic view showing the motions of the parts and the quadrangular path of the pivot between the blade and the telescopic platen section;

FIG. 7 is a vertical cross-sectional view through the tailgate showing a modified form of the invention;

FIG. 8 is a fragmentary rear end view of the modification of FIG. 7;

FIG. 9 is a sectional view taken on the line 9—9 of FIG. 7;

FIG. 10 is a fragmentary sectional view taken on the line 10—10 of FIG. 7; and

FIG. 11 is a diagrammatic view illustrating the movement of the parts of the form of the invention of FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawings, the numeral 20 designates a refuse body with a storage chamber 19, the body having a tailgate 21, the lower portion of which forms a hopper for receiving refuse, the tailgate being pivotally connected to the rear of the storage chamber as at 22 in the usual manner so that it can be swung upwardly on the pivots 22 when it is desired to discharge the load. The hopper has side walls 23, a rear opening 24, and a closed top portion 25. Below the loading opening 24 is a loading lip 27 over which refuse is adapted to be dumped, which lip forms the rear edge of a curved hopper portion 26. Due to the novel features of the loading mechanism, it has been possible to make this bottom hopper portion of more efficient shape for its capacity than has heretofore been practical in this general type of device since it can extend more deeply below the lip 27.

Pivoted as at 28 near the upper end of the tailgate and on opposite sides thereof is the upper end of a blade position controlling member 29 having side members 31, the member being completely closed by sheet material 30 from its upper to its lower edges and from one side to the other so that it always forms a barrier against spillback of refuse. The pivotal connection 28 is accomplished by pivoting the upper ends of the side members 31 to the sides of the tailgate. Thus the blade controlling member 29 is mounted for oscillatory movement. The sides 31 of the blade controlling member are in the form of rails as shown in FIG. 4. They are slideably received in side recesses 33 of a lower telescopic platen section 34, the platen section having upwardly projecting side plates 35. Pivoted to these side plates on pins 30 are bearing shoe slide assemblies 36 engageable with the upper flanges of the rails 31. There are also sets of lower bearing shoe slide assemblies as at 37 which are engageable with the lower flanges of the side rails 31. Also supported inwardly of the side plates 35 (see FIG. 4) and parallel thereto are housings 38 for hydraulic cylinders 39, the latter being pivotally connected at their upper ends as at 39' to the upper portion of the telescopic platen section 34 and having piston rods 40 which are extendible from their lower ends.

Other hydraulic cylinders 41 having piston rods 41' are pivotally connected as at 42 to the upper end of the tailgate on the same pivot axis as the pivot 28 for the blade controlling member, and have their lower ends pivotally connected to the lower portion of the telescopic platen as at 32 to cause the telescopic movement of the latter relative to the oscillatory blade controlling member 29.

A packer blade 44 has upstanding triangular end wings 45. The inner end of each wing has two extension

ears as shown in FIG. 5. One set of ears 46 is pivotally connected as at 47 to the lower end of the telescopic platen 34. The other set of ears 48 is pivotally connected as at 49 to the ends of the piston rods 40 of the cylinders 39. The packer blade is supported in a novel manner from the tailgate for pivotal movement and, in the form of the invention of FIGS. 1—6, is pivoted at 50 at the lower ends of swinging links 51. The upper ends of the links 51 are pivotally connected as at 52 to extension brackets 53 on the sides of the tailgate.

In the form of the invention of FIGS. 7—11 all corresponding parts are designated by the same reference numerals preceded by the digit "1." The principal difference between this form of the invention and the first described form of the invention is that links such as the links 51 are not employed. Instead, the pivots 150 for the support of the packer blade are connected with rollers 154 which roll in guideways 155 in slots in the side walls of the tailgate as is shown more particularly in FIGS. 7 and 10. In this form of the invention the side members 131 of the blade position controlling member 129 are in the form of channels and have upper shoes 136 thereon which slide against continuous bearing surfaces 160 of suitable material in the recess 133 of the telescopic platen member 134, as shown in FIG. 9. Lower shoes 137 on the channels 131 slide against bearing surfaces 161 of the platen member. The action of the parts relative to one another is substantially the same as in the form of the invention first described.

OPERATION

Referring now to the operation of the first described form of the invention, first to FIG. 5, this illustrates the completion of a packing cycle after the refuse in the hopper has been delivered and packed into the storage chamber of the body. When the parts are in this position the rams 40 of the cylinders 39 are extended and the rams 41' of the cylinders 41 are retracted. Refuse may now be dumped into the bottom hopper portion 26 of the tailgate. When a substantial amount of refuse has been dumped into the tailgate bottom, the packer blade may be cycled. First the hydraulic control valves are operated to cause retraction of the rams 40 of the cylinders 39 to cause swinging of the packer blade around the pivots 47 from the full line position of FIG. 5 to the broken line position therein. During such swinging movement the pivots 47 between the packer blade and the front end of the telescopic platen first act on the oscillatory two-part blade controlling member to move the lower end of the telescopic section 34 in a downward and rearward direction from the full line position of FIG. 5 to the broken line position therein. Thus this pivot 47 moves along the path (a) (FIG. 6) forming one side of a quadrangular path. Next the piston rods 41' of the rams 41 are extended. This causes outward movement of the telescopic platen section 34 to carry the pivot point 47 along path (b) of FIG. 6, which forms a second side of the quadrangular path. This brings the parts to the position of FIG. 3. Then the hydraulic rams 40 of the cylinders 39 are extended to act on the pivot points 49 of the blade and cause swinging movement of the blade in a downward and inward direction. However, during such swinging movement of the blade the pivot points 47 move upwardly and rearwardly along the path (c) of FIG. 6 in a

direction to change the relationship between the pivot points and the bottom of the hopper. Thus the bottom of the hopper is not shaped on a simple arc of a circle. Instead it has a more or less complicated shape which increases its depth and gives it a more efficient shape. At the same time, due to the unusual action of the oscillating platen with the pivot point 47 going through the quadrangular path shown in FIG. 7, there is efficient clearing of refuse from the hopper as the packer blade swings from the full line position of FIG. 3 to the broken line position therein. After the blade has completed its swinging movement then the rams of the cylinders 41 are retracted to cause inward telescoping movement of the platen section and an inward pull on the blade from the broken line position of FIG. 3 to the position of FIG. 5, carrying the refuse inwardly and compacting it into the storage compartment 19 of the refuse body. During this last part of the movement the pivot points 47 move along the path (d) of FIG. 6 back to the starting point (a).

In the form of the invention of FIGS. 7-11, the pivots 150 for the swinging movement of the blade are not supported on the end of links. Instead these pivots are connected with the rollers 154 which ride in the side tracks 155 in the sides of the tailgate. Thus at the start of a cycle from its final position, similar to the position of FIG. 5, the rams 140 connected with the cylinders 139 are retracted to cause swinging of the packer blade around the pivots 147 of FIG. 11 to a position corresponding to the broken line position of FIG. 5. During such movement the pivots 147 between the telescopic platen and the wings 146 of the packer blade move downwardly through the path (a') of FIG. 11. Next the rams connected with the cylinders 141 are extended to move the packer blade along the path (b') of FIG. 11, carrying the packer blade to the position of FIG. 3. Then, by extending the rams 140 of the cylinders 139, the packer blade is swung in a downward direction around the pivots 147. However, because of the novel type of support, the pivot points 147 will move through the path (c') of FIG. 11, thus changing the position of the pivot points with respect to the hopper bottom. As before mentioned, this makes it possible to have a hopper bottom of a more advantageous shape.

Thereafter the rams of the cylinders 141 are retracted, pulling the packer blade upwardly while the pivot 147 moves along the path (d') back to the starting point (e') of FIG. 11. It is thus apparent that in the form of the invention of FIG. 11 the action is practically the same as the action of the first-described form of the invention in that the pivot 147 between the packer plate and the telescopic platen section 34 travels through a quadrangular path (a'), (b'), (c'), (d') while the packing mechanism is going through its cycle. This produces a very advantageous and novel effect.

In addition it is to be pointed out that as the blade swings upwardly from the full line position of FIG. 5 to the broken line position therein, the rearward and downward movement of the pivot 47 or 147 along path (a) or (a') causes an inward movement of the lower portion of the telescopic platen to nudge the refuse into tighter compaction.

If desired, the inward movement of the blade may be stopped short of the position of FIG. 5 or at the opposite end of its travel and then swung upwardly or downwardly. Such short cycle is useful when portable containers are being used to dump refuse into the hopper, as it makes it possible to speed up the operation by getting the refuse out of the way quickly while it is being dumped in.

It is to be noted from FIGS. 6 and 11 that the radius of curvature of the hopper bottom 26 is much shorter than the distance which the packer blade projects from the rear end of the telescopic platen. The swinging movement of the packer blade is not on a simple arc because the position of the pivot point 47 is shiftable. Therefore the swinging movement of the tip of the packer blade is along a relatively complex path. Due to this novel arrangement and the novel quadrangular path through which the pivot points 47 or 147 travel, as shown in FIGS. 6 and 11, a more efficient refuse receiving shape is possible for the hopper bottom than has been possible in prior constructions.

It is to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What we claim is:

1. In a refuse vehicle having a storage compartment and having a tailgate with side walls, the bottom of which forms a refuse-receiving hopper behind and in communication with said compartment, a blade position-controlling member extending transversely of the tailgate and pivoted at its upper end to the upper portion of the tailgate for oscillatory movement, said blade-controlling member having a platen section telescopically associated therewith, a packer blade having a pivotal connection with a lower portion of said platen section, a shiftable pivotal support between the tailgate and blade pivotally supporting the blade above the hopper and also positioned to maintain the blade-controlling member in a generally downwardly and rearwardly inclined position, said pivotal support being in a location on the blade which is independent of and offset from the pivotal connection between the blade and platen section, power means for causing telescopic movement of the platen section, and power means between the platen section and blade for causing swinging movement of the latter whereby the blade may be cycled to move refuse from the hopper and pack it into the storage compartment.

2. A refuse vehicle as claimed in claim 1 in which the power means for causing telescopic movement of the platen section includes fluid pressure-operated cylinder and ram means, and in which the power means for causing swinging movement of the blade includes fluid pressure-operated cylinder and ram means pivotally connected at one end to the telescopic platen section and at the other end to the blade.

3. A refuse vehicle as claimed in claim 1 in which the shiftable pivotal support between the tailgate and blade comprises links pivotally connected at their upper ends to the tailgate above the blade and pivotally connected at their lower ends to the blade.

4. A refuse vehicle as claimed in claim 1 in which the shiftable pivotal support between the tailgate and blade comprises slots in the side walls of the tailgate extend-

ing in the general direction of telescopic movement of the platen section, and roller means carried by the blade and engaged in said slots.

5. A refuse vehicle as claimed in claim 2 in which the blade has first and second sets of ears projecting from the ends thereof, one set of said ears being pivotally connected to the telescopic platen section and the other set of said ears being pivotally connected to the ram for causing swinging movement of the blade.

6. A refuse vehicle as claimed in claim 1 in which there is means for causing the pivotal connection between the platen section and packer blade to travel through a quadrangular course during cycling of the packer blade to vary the relationship between the blade and hopper bottom during different portions of the cycle.

7. A refuse vehicle as claimed in claim 3 in which there is means for causing the pivotal connection between the platen section and packer blade to travel through a quadrangular course during cycling of the packer blade to vary the relationship between the blade and hopper bottom during different portions of the cycle.

8. A refuse vehicle as claimed in claim 4 in which there is means for causing the pivotal connection between the platen section and packer blade to travel through a quadrangular course during cycling of the packer blade to vary the relationship between the blade and hopper bottom during different portions of the cycle.

9. A refuse vehicle as claimed in claim 2 in which the blade has first and second sets of ears projecting from the ends thereof, one set of said ears being pivotally connected to the telescopic platen section and the other set of said ears being pivotally connected to the ram for causing swinging movement of the blade, and

in which the shiftable pivotal support between the tailgate and blade comprises links pivotally connected at their upper ends to the tailgate above the blade and pivotally connected at their lower ends to the blade between the spaced ears.

10. A refuse vehicle as claimed in claim 2 in which the blade has first and second sets of ears projecting from the ends thereof, one set of said ears being pivotally connected to the telescopic platen section and the other set of said ears being pivotally connected to the ram for causing swinging movement of the blade, and in which the shiftable pivotal support between the tailgate and blade comprises slots in the side walls of the tailgate extending in the general direction of telescopic movement of the platen section, and roller means carried by the blade in a location between the spaced ears and engaged in said slots.

11. A refuse vehicle as claimed in claim 1 in which the refuse-receiving hopper has an arcuate bottom portion, the radius of which is substantially less than the distance which the packer blade projects from its pivotal connection with the telescopic platen section.

12. A refuse vehicle as claimed in claim 1 in which the blade position-controlling member and its telescopic platen section are constructed to form a complete barrier against spill-back of refuse from the storage compartment in all positions of movement.

13. A refuse vehicle as claimed in claim 6 in which the pivotal connection between the telescopic section and blade and the shiftable pivotal support between the tailgate and blade are so arranged with respect to one another that when the blade is swung upwardly after the completion of a packing stroke an inward force is exerted on the telescopic platen section and blade position-controlling member.

* * * * *

40

45

50

55

60

65