Dec. 17, 1968 L. V. DRACE ETAL 3,416,437

LAUNDRY LOADERS

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FIG. 1.

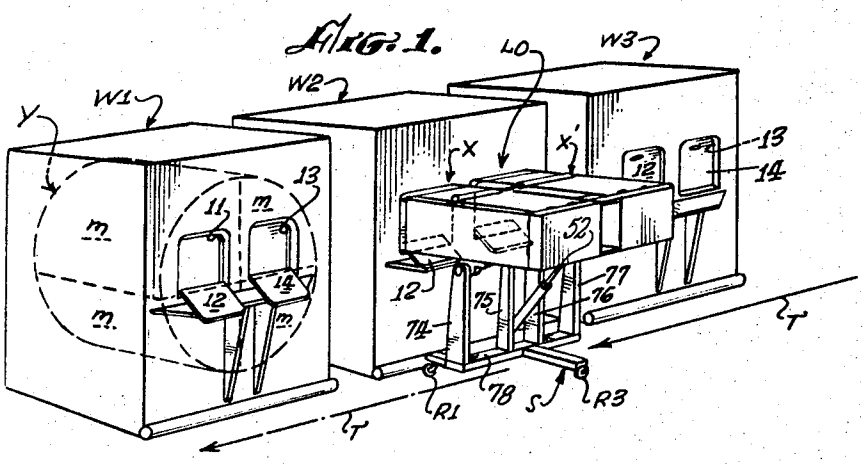
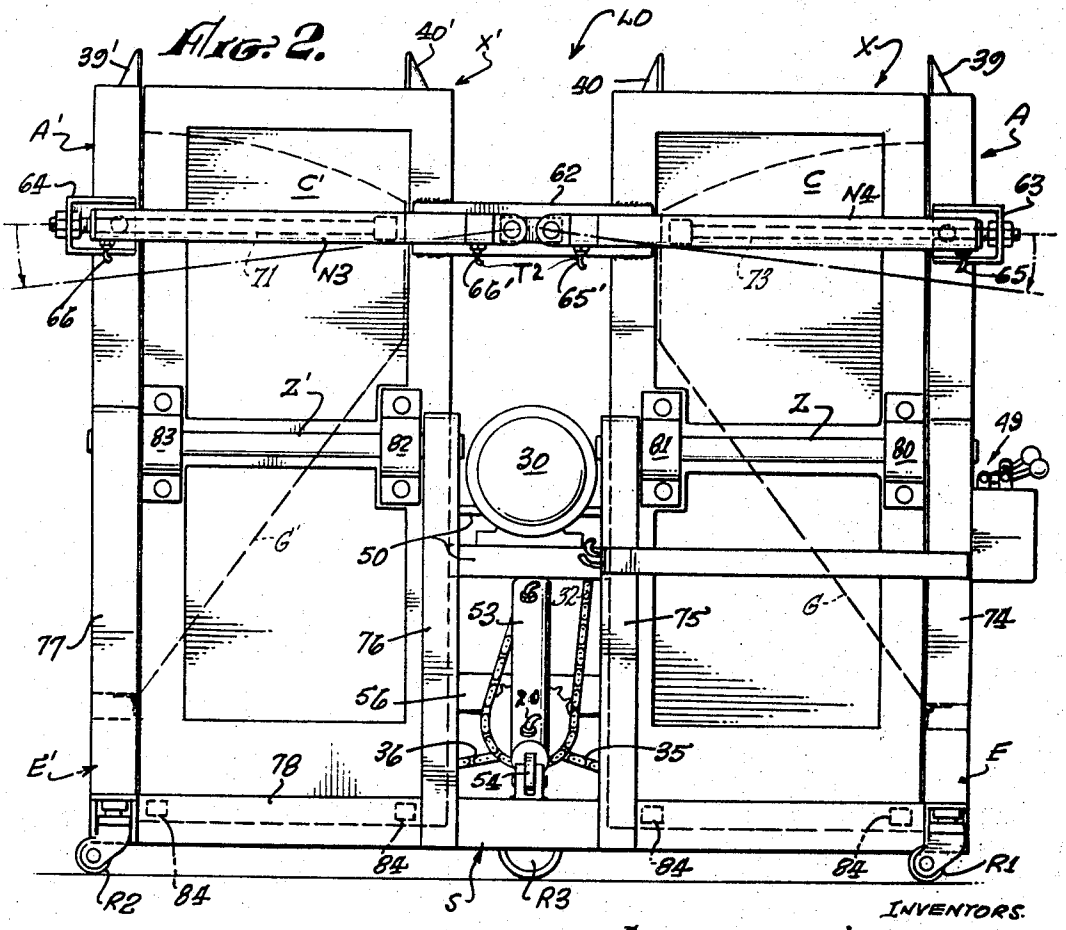


FIG. 2.



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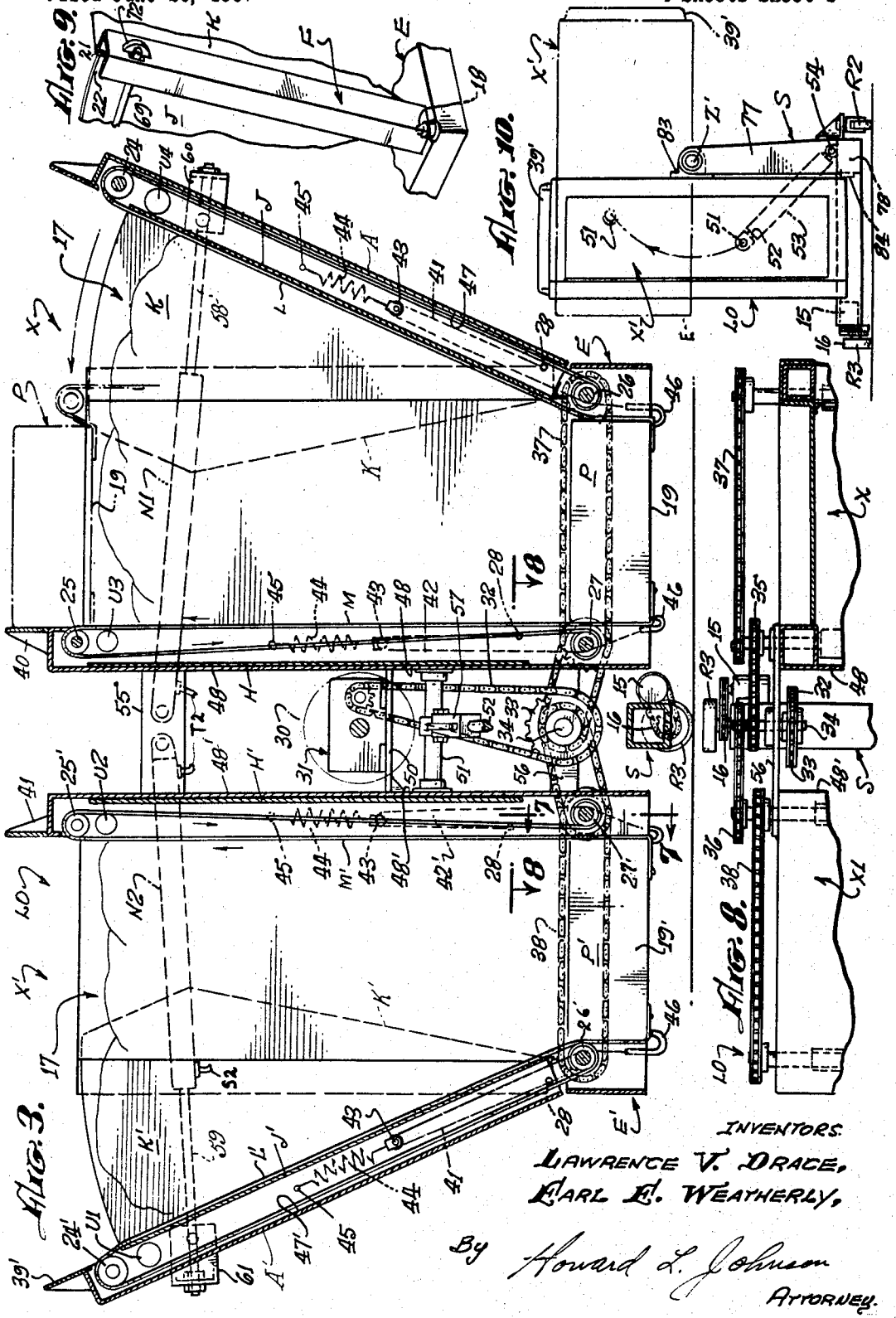


FIG. 9.

FIG. 10.

FIG. 8.

FIG. 3.

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LAUNDRY LOADERS

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FIG. 4.

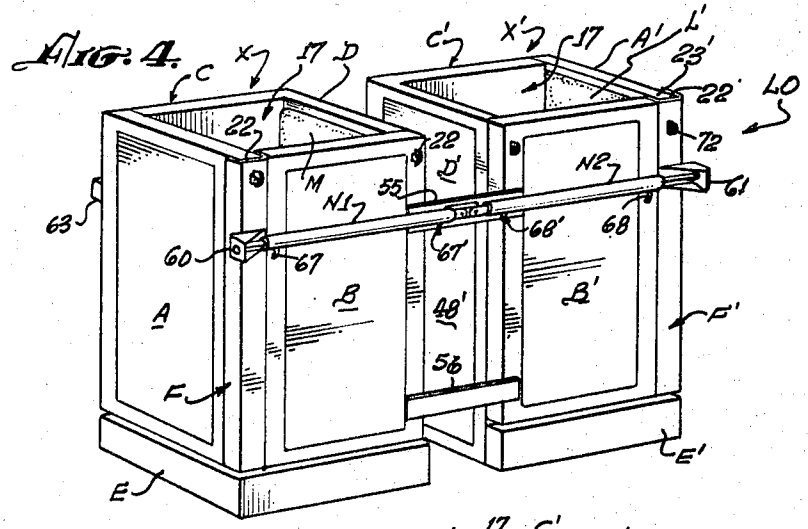


FIG. 5.

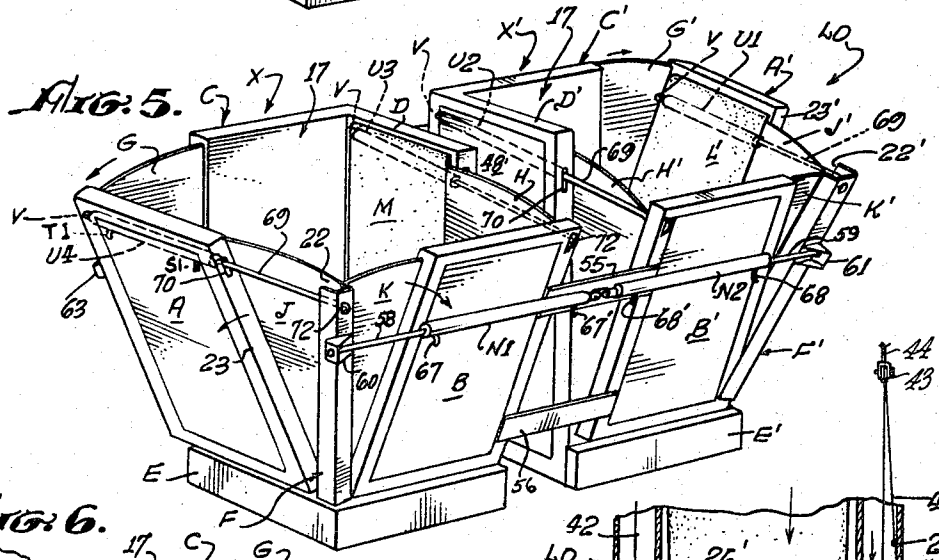


FIG. 6.

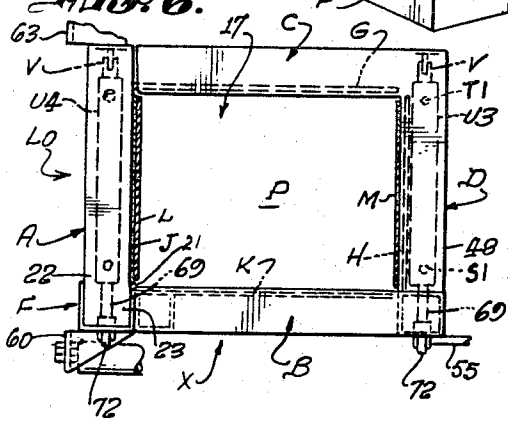
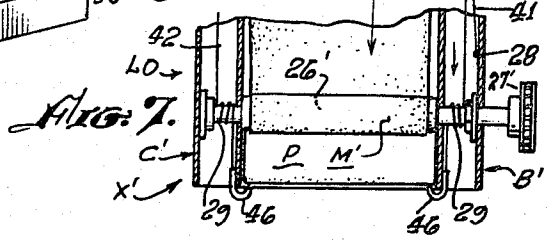


FIG. 7.

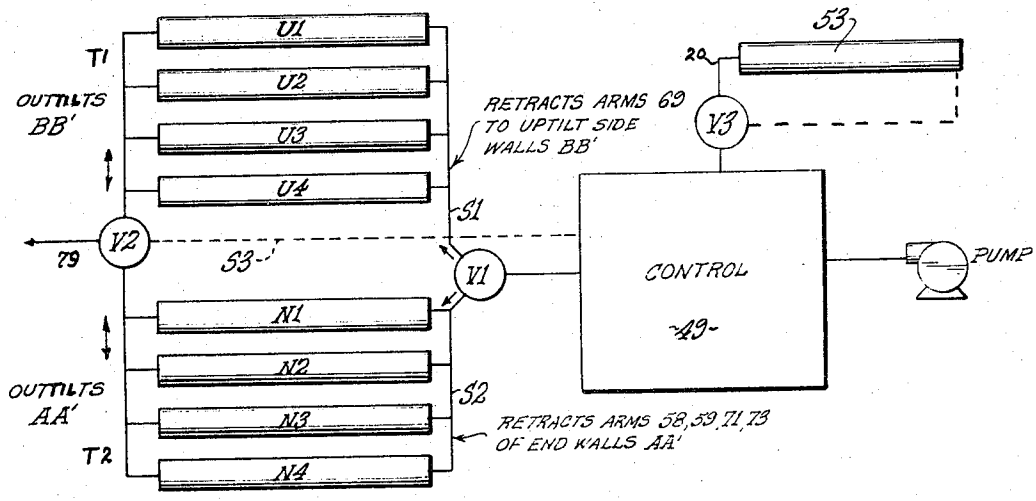


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LAUNDRY LOADERS

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FIG. 11.



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LAUNDRY LOADERS

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Filed June 26, 1967, Ser. No. 648,676
10 Claims. (Cl. 100—218)

ABSTRACT OF THE DISCLOSURE

An open-top laundry-loading bin with normally outtilted collectively-funnel-shaped side walls which sequentially intilt from a bottom hinge line to form a rectangular-shaped ejection chute upon compressed-air activation of operating pistons. Another air piston then quarter-rotates the upstanding bin in position to transversely expell its compacted contents into a side-loading washer by lengthwise movement of a bottom pallet to the mouth of the now-horizontal bin. Pallet is moved by opposite pair of side belts which line bin and are terminally wound on motor-operated reels. Pallet is initially spring-retracted from extreme discharge position in washer mouth before bin reverts quarter turn and side walls again outtilt to funnel shape.

This invention relates to devices for handling quantities of loose materials such as pieces of fabric, like clothing and laundry items. The invention provides an assembly characterized by a variable-size open-top bin adapted to have laundry and the like dropped therein, such bin having a rectangular-walled, upwardly-diverging funnel shape which after filling can be intilted to form a parallel-sided chute of uniform cross section which thus laterally compresses the loose contents thereof. Means are provided to then rotate the loaded chute to a transverse position and thereupon to eject its compacted contents, as into the mouth of a receptacle. Successive operating means then revert the assembly to its initial upright and outspread loading position, ready to begin another cycle. Such an assembly may be self-propelled in intermittently moving from one discharge receptacle to another, as in a work area containing a plurality of stationary washing machines, the path of travel of the loading assembly also being paralleled by a supply line of laundry or the like which charges the loader, so that in effect the bank of washing machines are maintained essentially in continuous operation with but brief pauses to load and unload, change the operating liquid, etc. That is, one loader services a number of washers faster than a single one could be hand-loaded.

The objects of the invention include the provision of such improved devices and the attainment of related advantages which will become apparent from the following description of a presently preferred embodiment of the invention which is illustrated in the accompanying drawings wherein

FIG. 1 is a perspective view of a row of three, conventional four-chamber, side-loading washing machines, with the present laundry loader shown in discharge position for loading two chambers of the center machine.

FIG. 2 is an elevational view of the laundry loader viewed from the washing machine side, with the hinged side walls of the loader shown intilted after loading but before rotation to discharge position.

FIG. 3 is a vertical sectional view of the laundry loader on FIG. 2 shown with the end walls in outtilted position

so as to dispose the open top of the bin in laundry-receiving position.

FIG. 4 is a schematic perspective view of the laundry loader viewed from above, with all the hinged side walls intilted so as to define the minimum or compacted capacity of the bin or chute before the loader is rotated 90° to the discharge position of FIG. 1.

FIG. 5 is a similar view with the two pairs of hinged side walls shown in open-funnel or outtilted laundry-receiving position.

FIG. 6 is a top plan view showing only one segment or bin-unit of the loader of FIG. 4.

FIG. 7 is a fragmental vertical sectional view taken through a fixed side wall along the line 7—7 of FIG. 3 and showing the pallet-connected belt, wind-up reel and spring-pulley-suspended retraction cables.

FIG. 8 is a fragmental transverse sectional view taken along the line 8—8 of FIG. 3.

FIG. 9 is a perspective view showing a floating corner post which is upstanding from the base of the loader by a ball and socket mount and is laterally connected to the adjacent upright, hinged walls of the bin (not seen) by means of respective blade extensions (shown fragmentarily) which are thus in sliding juxtaposition with the adjacent hinged walls.

FIG. 10 is an elevational view of the laundry loader as viewed from the left of FIG. 2, with its transverse discharge position and the actuating mechanism which is between the two bin-units, shown in phantom.

FIG. 11 is a schematic drawing of the fluid actuating system.

The laundry loader L0 is here illustrated in association with a row of three commercial-type or heavy-duty washing machines W1, W2, W3, each containing a cylinder Y rotatable on a horizontal axis and internally divided into four open cells or cages *m* so as to maintain mutually separate portions of the load, e.g., 150 lbs. per cell. Adjacent an end of the cylinder, each washer housing is formed with a horizontally aligned pair of loading apertures 11, 13 having corresponding downward-opening doors 12, 14 so that the two uppermost cages *m* can be rotated to alignment with the apertures for loading. The whole cylinder Y is then rotated 180° to similarly align the other two cells with the loading apertures. In this manner, with the present loading device, the four cells can be loaded in two operations.

The present loader L0 is constructed with two side-by-side segments or units X, X' which are mutually alignable with the corresponding pair of similarly spaced, washer apertures 11, 13. It will be appreciated however that a similar loader can be made with only a single unit, or with any multiple thereof, so as to be adapted to the number of loading apertures of one or more particular washing machines (or other receptacles). In a laundry, the washers are usually permanently anchored to the floor, as in the illustrated pattern, and the loader is accordingly reciprocably movable from one to another along a predetermined path T. Typically an overhead conveyor (not shown) brings successive slings of weighed laundry which are dropped into the open-top of the loader at the start of each operation. Alternately however, the loader could be stationed at a fixed position, and a succession of (movable or permanent) washing machines or other receptacles loaded therefrom. It will be realized also, that the receptacle into (or upon) which the loader discharges its compacted contents need not necessarily be a washing machine.

The laundry loader L0 is constructed with a supporting frame S, movably carried by a pair of caster-type rollers R1, R2, with a third non-swivelling wheel R3 (FIG. 3) driven by a reversible motor 15 by way of a

drive belt **16**. The loader can thus be mechanically moved, intermittently, along the path T. It may be generally guided, as to lateral deviation, simply by hand pressure of an operator if there is no permanent channel or guide rail located along the desired track T. Alternately, in the absence of the motor **15**, the loader can merely be pushed across a level floor by one or more workmen from time to time, especially when unloaded.

Each of the pair of similar segments X, X′ is constructed with four rectangular walls A, B, C, D upstanding perpendicularly from a base E so as jointly to form an open-top bin **17** in the shape of a rectangular column or chute of uniform internal cross-section along its entire length (as in FIG. 1) or height (as in FIG. 2). The appurtenant edges of the lateral walls C, D are fixedly secured to each other and to the base E at perpendicular angles, while the other pair of walls A and B are hingedly attached to the base along their lower margins to be individually (or jointly) outtiltable. The movable walls A, B are connected to the particular fixed wall C, D which is adjacent thereto, by a perpendicularly-projecting, vertically-disposed, relatively rigid blade G, H, the blade G being edgewise receivable in a corresponding slideway of the fixed wall C. The other blade H is insertable behind a movable belt M which extends across the width of the fixed wall D as detailed hereafter. The blades G, H, together with another pair of blades J, K described below, are thus slidably juxtaposed with the adjacent upright walls A, B, C, D so as to provide a continuous lateral enclosure for the bin **17** when it is thus enlarged by outtilting of either or both of the hinged walls A, B. In other words, such outtilting does not leave a gap in the surrounding lateral confinement, but increases the capacity of the bin **17**, to a maximum extent at its open top.

Along the vertical corner of the bin **17** which is diagonally opposite the occurrence of the two fixed walls C, D, there is a channel-shaped post F pivotally secured to the base E by a dependent ball and socket mount **18** (FIG. 9). Its open channel **22** is aligned for reception therein of the corresponding, lengthwise edge **23** of the hinged wall A and is maintained (approximately) in such alignment, when angularly outtilted, by a blade J which is fixedly secured to the post F and slidably received behind and in general juxtaposition with a flexible belt L which forms the inner or laundry-contacting face of wall A, opposite the similar belt M of wall D.

Another blade K is attached to the post F generally perpendicularly to the fixed blade J, along a vertical hinge **21** so as to be receivable slidably in a longitudinal guideway adjacent the inner face of wall B. It will be seen that the ball-pivot mount **18** permits the floating post F to be moved within the space of a theoretical, inverted cone which is upstanding from the apex at **18**. In combination with the hinged blade J, such construction facilities a more-or-less diagonal outtilting of the post F in forming an angular wedge-shaped separation from each hinged wall A, B as shown in FIG. 5, each fan-shaped gap being thus occupied by one of the blades J or K. At the same time, the essential bin configuration or four straight side walls—now outspread to funnel-shape—is readily shiftable from one shape to the other with a minimum of manipulation. Preferably just one of the blades J, K is fixedly secured to the post F and the other one is hinged thereto; but either one may be the hinged member.

Each segment X, X′ has an ejector plate **19** of rectangular configuration or plan, corresponding to the bottom contour of the bin, and disposed normally at the level of the base E, with a laundry-supporting pallet P spaced thereabove so as to form a false bottom to the bin **17**. Articles dropped into the open top thus pile up upon the pallet which subsequently acts as a ram in emptying the bin.

One hinged wall A and an opposing fixed wall D are from the bin side recessed outwardly like a tray, with a respective flexible belt L, M forming their inner face along opposite sides of the bin and terminally fastened along their width to the ejector plate **19**. The belts extend lengthwise therefrom to the mouth of the bin where each overlies an upper roller **24**, **25** and are then led downward within the recessed area of the wall, more-or-less adjacent to its outermost surface **47**, **48**. Adjacent the bottom of the recessed area, each belt L, M is secured to a respective motor-driven reel **26**, **27** which has the ends of its shaft journalled in the base E.

The exterior faces of the back-to-back walls **48**, **48′** of the fixed walls D, D′ of the two segments X, X′ are cross braced by a motor support bracket **50** and by a lower strut **51**, the latter providing a pivot attachment **57** for the piston arm **52** projecting from a fluid-operated piston chamber **53**. The latter is dependently pivoted to the frame S at **54** (FIG. 10). The supporting frame S comprises four upright members **74**, **75**, **76**, **77** (FIGS. 1–2) upstanding from a generally cruciform flooring **78** and laterally spaced apart in general alignment with the repsective walls A, D, A′, D′. The upper ends of the upright journal horizontally-disposed axles or shafts Z, Z′ which are affixed to the outer surface of the fixed panel walls C, C′ by means of brackets **80**, **81**, **82**, **83**. Thus, it will be seen that both segments X, X′ of the loader **L0** will be rotated 90° about the axis Z–Z′ by action of the piston arm **52** in going from the upright loading position of the bins and walls of FIG. 2, to the transverse discharge position of FIG. 1. Upon release of fluid pressure in the chamber **53**, effected from the fluid control unit **49**, the loader may drop gravitationally from the FIG. 1 position to the upright position of FIGS. 2 and 4, cushioned by the bumper stops **84** along the frame. Release of fluid pressure in the remaining piston chambers (hereafter described) then allows the walls to outtilt to the position of FIG. 5.

Within each segment X, X′, one pallet P, P′ of each bin is thus located so as to simultaneously expell the contents of its bin as the pair of ejector plates **19**, **19′** and pallets are moved along the length of the (transversely disposed) bin by means of a motor **30**. The latter, through reduction gears **31**, operates a drive belt **32** which is led over a sprocket wheel **33** carried by a stub shaft **34** between the two loading segments X, X′. Also taking off from the same shaft **34** are a pair of sprocket belts **35**, **36** (FIG. 8) which engage the projecting ends of the corresponding shafts of the wind-up reels **27**, **27′**. In turn, the latter shafts, by sprocket belts **37**, **38**, connect for simultaneous rotation, the paired wind-up reels **26**, **27** of each bin. Accordingly, it will be seen that the two reels **26**, **27** at the base of each bin **17**, wind upon themselves (at the same speed) the opposing, bin-lining, laundry-contact belts L, M of each bin so as to lift or draw the transverse pallet P along the longitudinal axis of the bin or segment X and thus expell the laundry or other material which was initially "stacked" upon the pallet from the open top of the bin.

It will be observed also that at its ultimate ejection position (FIG. 3), the pallet P extends somewhat beyond the actual mouth of the bin **17**. Thus it may even project partway into the aperture **11**, **13** of the washing machine W so as to pack the "bottommost" pieces from the bin, far enough inside the washer to prevent their falling out during the interval when the loader is upswung and the washer doors **12**, **14** then closed. Terminal fins **39**, **40** adjacent the mouth of the bin, may also be present along both sides of the rotatable segments X, X′ and thus project partway into the washer aperture in discharging the bin. It will be noted that all of the reel-driving motor **30** and its driving connections to the reels (the latter being anchored in the base E) are all fixed relative to the loader segments X, X′ rather than to the frame S; hence no adjustment need be made for their 90° rotation with the units.

A pair of take-up cables **41, 42** is individually attached to a fixed point **28** (FIG. 7) within the wall A or D and then led upward over a suspension pulley **43** and then wound several turns (29) around the drive reel **26, 27** beyond the width of the adjacent belt L, M, each cable then traversing a guide eyelet **46** for attachment to a corner of the ejector plate **19**. Each of the four pulleys **43** for each pallet, is suspended from a coil spring **44** which is upwardly anchored to the wall A or D at a point **45**. In operation, as the pallets P are moved along the length of the bin **17**, the lengths of the cables **41, 42** which are between the pulleys and the drive reels **26, 27** are wound upon the reels and the lengths between the reels and the eyelets **46** are correspondingly unwound from the same reels. This tensions the spring suspension **44** of each pulley **43** so that as soon as the drive motor **30** releases its pull on the pallet belts L, M, the springs **44** reverse the rotation of the reels **26, 27** and thereby start the retraction of the pallet from the mouth of the open bin. This pulls the pallet P out of the washing machine aperture **11, 13** (if it has projected to such distance) and clears the loader **L0** to start its upswing from the discharge position of FIG. 1. The motor **30** simultaneously reverses; this unfurls the belts L, M from the drive reels **26, 27**, but in its transverse position of FIG. 1 such belt release does not "drop" the pallet before the chute or bin is upswing; hence this initial retraction is effected by the positive pull of the cables at their attachment to the ejector plate **19** (at **46**).

Each of the hinged sides A, B is provided with a pair of fluid-actuated piston means or cylinders for retraction of the outtilted walls to upright or compressed-chute position. Release of such fluid pressure allows the walls to outtilt gravitationally. The hinged side of the loader **L0** which is away from the washers W has the walls B, B′ of its paired segments cross-braced by horizontal straps **55, 56** (FIG. 5), the upper of which (**55**) pivotally anchors one end of a horizontally-disposed pair of piston chambers **N1, N2**, the projecting arms **58, 59** being pivotally secured in brackets **60, 61** of respective channel posts F, F′. Admission of pressurized fluid such as liquid or compressed air through the conduits **65, 66, 67, 68**, also activates the piston chambers **N3, N4** which are pivoted on the cross brace **62** and at brackets **63, 64** to the walls A, A′.

The outtilted walls B, B′ are each pivotally connected along their upper margins to a pair of generally-horizontal, fluid piston chambers **U1, U2, U3, U4**, which are located within the end walls A, A′, pivotally attached thereto at the point V (FIG. 5). Each U chamber projects a piston rod **69** through an upright slot **70** from whence it terminally and loosely traverses an annular aperture of the channel post F, externally carrying a diagonally-flared head **72** which overlies the post aperture. As in the construction for retracting the end walls A, A′, it will be seen that the present fluid chambers **U1, U2, U3, U4** and their outward projecting piston rods **69** are pivotally attached to adjacent walls A and B (or alternately to the post F which is aligned for joint retraction with the hinged wall B) at points at the outermost or farthest-separated locations of the pair of cylinder-piston-arms so that the varying longitudinal axis of the latter will accommodate the angular tilting of one wall which is disposed perpendicular to the other wall. In other words, the shift of the longitudinal axis of the extended cylinder-piston-rod transverse to its length is that represented by the span of the slot **70** in which the rod **69** rides.

Preferably the cross-braced side walls B, B′ are first uptilted in unison in going from funnel-shape to chute-shape of the bin. Such movement seats the edge **23** of the end walls A, A′ in the channel **22** of the floating corner post F so as to interlock these two structures for uptilting the end walls A, A′ by the remaining bank of fluid cylinders **N1, N2, N3, N4**. Conveniently a central control unit **49** containing the necessary valves and operating levers can simply be attached to a compressed air line or pump such as is often already present in laundry establishments.

Operation

The loader **L0** being disposed upright adjacent a side-loading washing machine W, as seen in FIGS. 3 and 5, the laundry items are dropped into the open top of the funnel-shaped bin formed by the outtilted side walls A, A′, B, B′. The load is then latterly compressed by sequentially uptilting the walls, collectively to form a rectangular-chute configuration. First, the planar-coupled side walls B, B′ (together with the floating corner posts F, F′) are uptilted by retraction of piston arms **69** effected by fluid pressure channeled through valve **V1** and line **S1** to the cylinders **U1, U2, U3, U4**—FIGS. 5–6 (the line **T1** being open to vent line **79** through valve **V2**). In this position, the open channels **22, 22′** of corner posts F, F′ embrace the adjacent longitudinal edges **23** of the end walls A, A′, the latter walls being oppositely outtilted, and the corner posts F, F′ being likewise oppositely slanted, that is, in the same plane as the corresponding wall A or A′.

The valve **V1** then directs fluid pressure into line **S2** which by the piston arms **58, 59** (FIG. 5) and **71, 73** (FIG. 2) of cylinders **N1, N2, N3, N4** uptilt the end walls A, A′ to assume the position seen in FIG. 4 (the line **T2** being open to vent line **79** through valve **V2**).

The coupled pair of compacted bins are then rotated a quarter turn on the frame S to the position indicated in phantom in FIG. 10, by means of fluid admitted to line **20** and cylinder **53** through valve **V3**. While the bins are held in such position, the motor **30** is then energized to reel up the side belts L, M, L′, M′, and draw the pallets P, P′ lengthwise along the now-horizontal bins so as to progressively expell the compacted laundry into the washer apertures **11, 13**, until the pallet arrives at the position indicated in phantom at the upper right of FIG. 3. Upon stopping or reversing the motor **30**, the tensioned springs **44** take up the initial slack of the side belts L, M, L′, M′ at motor stoppage, and effect a primary retraction of the pallets from the washer mouth, by unwinding the reels **26, 27, 26′, 27′**.

The valve **V3** then releases fluid pressure in line **20** to cylinder **53**, causing the empty bins to revert 90° to their former upright position caused by retraction of piston arm **52** (FIG. 1). The valve **V2** then closes the vent line **79** and opens the supply line **S3** to the two banks of tilt cylinders, thus outtilting side walls B, B′ (line **T1**) and end walls A, A′ (line **T2**). The loader **L0** can then be moved to the next washer **W1** along the track T (FIG. 1) and the process repeated.

Various changes of construction and operation such as the substitution of functional equivalents can be effected within the present inventive concept which is intended to be construed broadly within the scope of the following claims and not limited to the precise details illustrated and described by way of example.

We claim:

1. A fabric loader of the character described for receiving and laterally compressing a quantity of loose pieces of fabric and the like and then expelling the compacted whole as into an aligned aperture of a receptacle such as a washing machine, which loader comprises in combination:

a frame having pivot means positioned along a transverse axis thereof, said frame being disposable adjacent the loading aperture of a receptacle or the like;

an open-end bin formed with a base and pivotally carried by said frame and movable about said pivot means between a loading position and a discharge position transverse thereto, being formed with lateral enclosure walls longitudinally extending from the frame and collectively secured to said pivot means

in position for partial rotation of the bin between loading and discharge positions, thereby to enable fabric pieces to be received in the bin through the open-end at loading position, and subsequently to be transversely disposable for discharge of the bin contents therefrom at discharge position, at least one of the lateral enclosure walls of said bin being movably mounted for selective contraction and expansion of the bin by movement toward and away from the longitudinal axis of said bin, thereby to vary the end opening and internal capacity of the bin between that of an outwardly-diverging funnel-shape when in loading position to that of a chute of generally uniform cross section when in discharge position;

ejector means movable along the length of the bin to progressively empty the same when in discharge position;

and operating means adapted (a) for ingathering said lateral enclosure walls from said funnel-shape to said discharge chute-shape of the bin, (b) for rotary movement of said bin about said transverse pivot means between loading and discharge positions, and (c) for moving said ejector member lengthwise of the bin toward the open-end thereof, thereby to eject its contents.

2. The loader of the preceding claim **1** wherein said bin comprises four longitudinal walls extending generally perpendicularly from said base and each disposed substantially perpendicular to the next one in the shape of a rectangular column,

two of said longitudinal walls, one of which is secured to said pivot means, being disposed mutually adjacent and fixedly attached to each other and to said base, the other two longitudinal walls being individually hinged to said base along their lower margins, each of which hinged walls is thus outtiltable therefrom in transversely enlarging the capacity of the bin and its open-end in forming said funnel-shape;

a pair of slidable blade-like walls, each one extending from a fixed longitudinal wall to an adjacent hinged longitudinal wall and disposed in sliding juxtaposition with one of said longitudinal walls so as to maintain a continuous lateral enclosure for the bin between the two fixed walls and the two adjacent hinged walls when the latter are outtilted from rectangular columnar position;

a floating corner post dependently secured to said base at a generally longitudinally disposed pivot point adjacent the concurrence of the hinged longitudinal walls so as to be movable outward therefrom within the space of a theoretical inverted-cone upstanding from the apex at said pivot point;

and a second pair of slidable blade-like walls carried by said post and disposable substantially perpendicular to each other in sliding juxtaposition with the respective adjacent hinged longitudinal walls, one of which slidable walls is hingedly secured lengthwise to the post, thereby enabling the post to outtilt from the rectangular columnar position jointly with the outtilting of either or both of the adjacent hinged longitudinal walls.

3. The loader of the preceding claim **2** wherein said floating corner post and one adjacent hinged wall which is slidingly engaged by one of said blade-like walls, are each formed with interlocking thrust-engagement means, whereby the hinged wall and post when thus selectively interlocked may be outtilted and intilted in unison and without relatively separation from each other, but may then be separated in the outtilted position.

4. The loader of the preceding claim **1** which has means for moving the ejector member lengthwise of the bin, which means include belt means disposed within said bin lengthwise along opposite sides thereof and secured to said ejector member,

and reel means adapted selectively to move said belt means and the attached ejector member from the remote end of the open-end of the bin.

5. The loader of the preceding claim **4** wherein said ejector member is additionally provided with resilient means adapted to start its retraction from discharge position adjacent the open-end of the bin, while the bin is still disposed in discharge position.

6. The loader of the preceding claim **5** wherein said resilient means comprises a retraction cable having one end secured to said ejector member, and an intermediate length wound about said reel means and disposed over a spring-tensioned pulley, whereby movement of the belt means by the reel means increases the spring-tension of said pulley, thereby at the outer end of travel of the ejector member upon cessation of the belt movement by the reel means, said cable may initiate retraction of the ejector member and counterrotation of the reel means about which it is wound by reason of resilient retraction of said spring-tensioned pulley.

7. The loader of the preceding claim **4** wherein said reel means comprise a pair of idler rollers supporting said belt means and disposed one each adjacent the open-top at opposite sides of the bin, and a motor-driven reel displaced therefrom along each of said sides toward the base of the bin and connected to the respective belt means in position to draw each in a substantially inverted U-shape path in jointly moving the ejector member from the bottom toward the open-top of the bin.

8. A loader of the character described, comprising in combination:

an open-end bin formed with a base and a plurality of longitudinal walls extending generally perpendicularly therefrom and laterally forming an enclosure of variable capacity, each wall disposable substantially in edge abutment with the next one in the shape of a polygonal column of generally uniform cross section,

at least one of said longitudinal walls being fixedly attached to said base, and two other of said walls being adjacent each other and individually hinged to said base remote from the open-end of the bin, each of which hinged longitudinal walls is thus individually outtiltable from said polygonal column in transversely enlarging the capacity and open-end of the bin to form an open-endward diverging funnel shape,

a floating corner post dependently secured to said base at a generally longitudinally disposed pivot point adjacent the concurrence of the two hinged walls so as to be movable outward therefrom within the space of a theoretical inverted-cone upstanding from an apex at said pivot point,

a pair of slidable blade-like walls carried by said post and disposable substantially angularly to each other in sliding juxtaposition with the respective adjacent, hinged longitudinal walls, one of which slidable walls is hingedly secured lengthwise to the post, thereby enabling the post to outtilt from the polygonal columnar position jointly with the outtilting of either or both of the adjacent, hinged longitudinal walls in forming said funnel shape,

and other movable walls laterally joining the two hinged walls and the other longitudinal walls so as to maintain a continuous lateral enclosure for the bin in either position.

9. The loader of the preceding claim **8** which is additionally characterized by pivot means positioned for selective rotation of the bin between loading position and a transverse position for discharge from the open-end, upon assumption of said polygonal columnar shape by intilting the hinged walls.

10. The loader of the preceding claim **9** which is additionally characterized by ejector means normally dis-

posed within said bin remote from the open-end and movable along the length thereof to progressively empty the bin when the latter is in its polyvinyl columnar shape.

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