

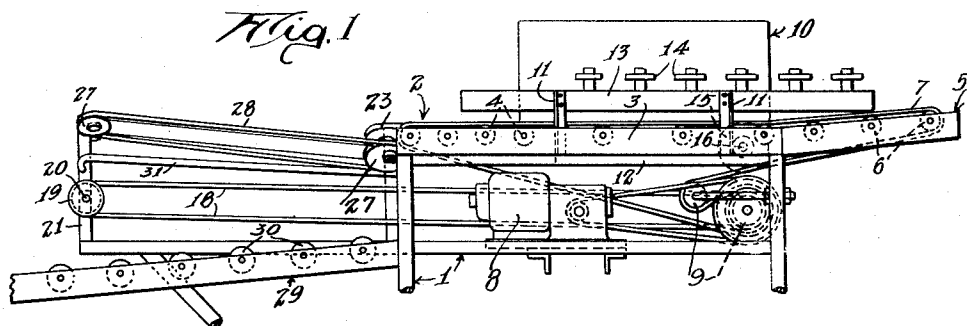
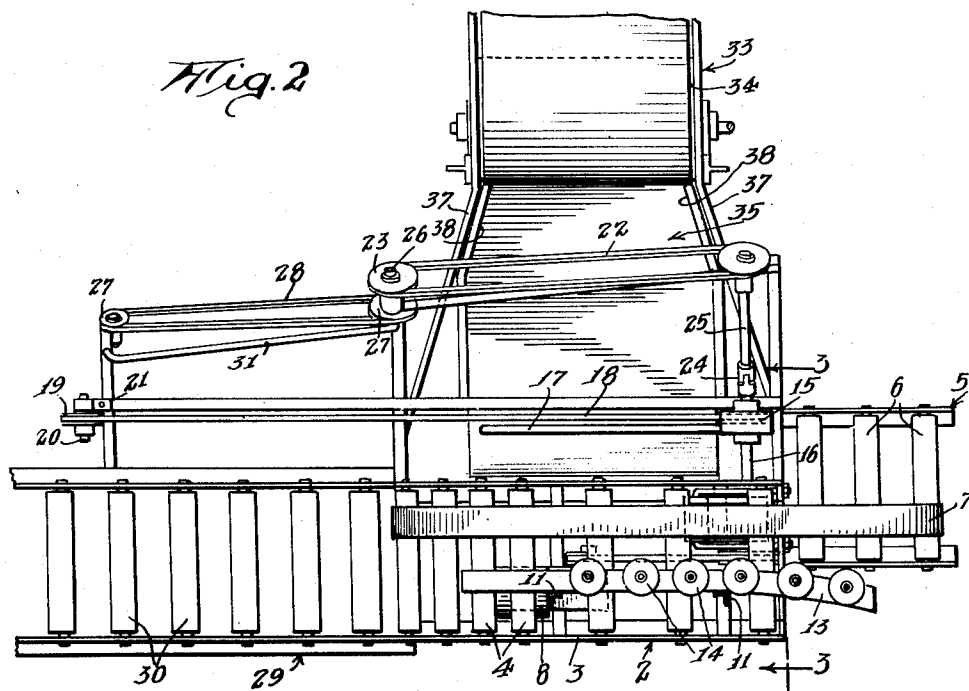
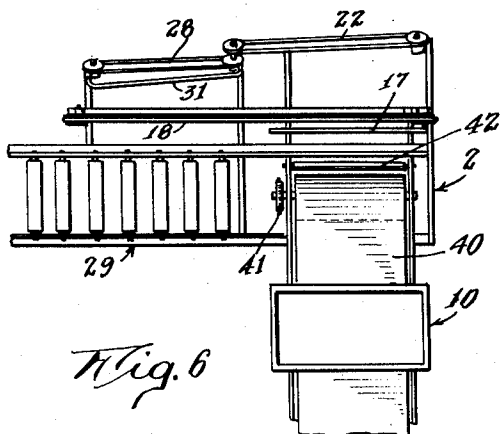
July 18, 1950

A. J. KRONER
BOX DUMPING MACHINE

2,515,718

Filed June 25, 1945

2 Sheets-Sheet 1



Inventor
Albert J. Kroner
By
Lyon & Lyon
Attorneys

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2 Sheets-Sheet 2

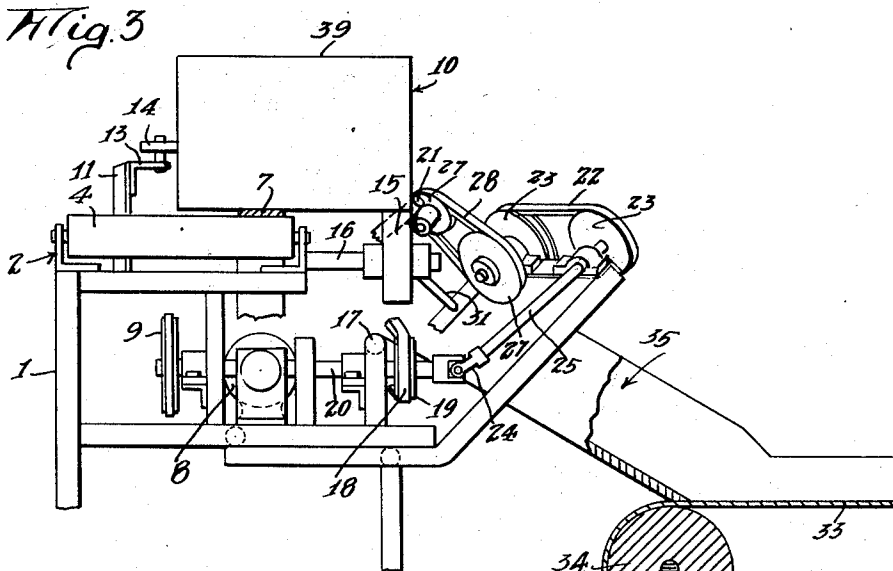
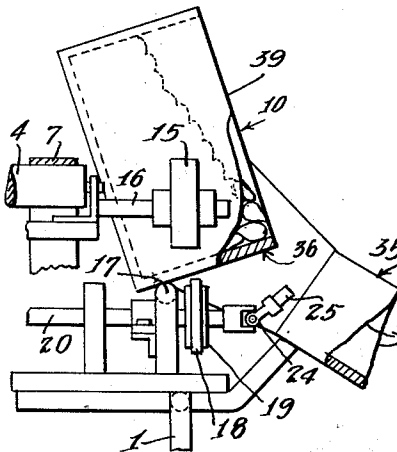


Fig. 4

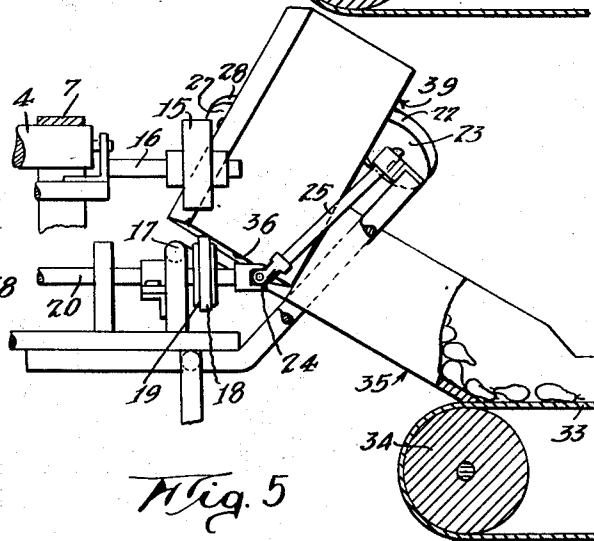


Fig. 5

Inventor
Albert J. Kroner
By *Lyon & Lyon* Attorneys

UNITED STATES PATENT OFFICE

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BOX DUMPING MACHINE

Albert J. Kroner, Vancouver, Wash., assignor to
California Packing Corporation, San Francisco,
Calif., a corporation of New York

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11 Claims. (Cl. 214—1.1)

1

My invention relates to the art of mechanically removing the contents of receptacles, and more particularly to a means of mechanically dumping said receptacles.

The advantages of mechanical dumping are apparent, and a number of devices have been constructed for this purpose. These devices, however, are unsatisfactory in that heretofore it has been thought necessary to provide means for mechanically grasping the receptacles, holding said receptacles fixed by mechanical means while said receptacles are overturned. This, of course, requires a complexity of parts and an expensiveness of construction with which I propose to do away.

It is the object of my invention to provide a simple, compact, and inexpensive means for dumping boxes. This I do by a method I have devised for utilizing the forces of gravity in the dumping operation, rendering unnecessary the use of expensive and complicated machinery.

The mechanical dumping of receptacles is often of use where the contents of such receptacles are perishable fruits and the like, having thin and easily bruised skins, and a satisfactory dumping means must avoid the injury to such fruit occasioned by sudden contacts with hard or sharp surfaces, corners and the like. It is, therefore, another of my objects to provide means preventing any such injurious contacts to the objects being dumped during the operation of my invention.

Other objects and advantages of this invention, it is believed, will be apparent from the following detailed description of a preferred embodiment thereof, as illustrated in the accompanying drawings:

Figure 1 shows a side elevational view of my dumping apparatus.

Figure 2 illustrates a top plan view of my dumping apparatus.

Figures 3, 4 and 5 are diagrammatical end views of my dumping apparatus taken on a section along the line 3—3 in Figure 2, showing the steps of the dumping operation.

Figure 6 shows diagrammatically a modification of my dumping apparatus.

In my device the frame members 1 support dumping platform 2. Said platform is comprised of longitudinal frame members 3 and rollers 4 revolvably mounted transversely thereon. Leading to said platform is a standard conveyor track 5, having rollers 6. It is to be noted that said conveyor track 5 does not lead to said platform 2 in longitudinal alignment, but is substantially out

2

of alignment therewith. Moving belt 7 driven by motor 8 by virtue of pulleys 9 rides on rollers 6 and on rollers 4 of platform 2. It is the purpose of this belt to urge receptacles 10 entering from conveyor track 5 onto and over platform 2. Supported on hanger 11 connected to transverse members 12 of platform 2 is guide bar 13, having roller discs 14 thereon. It is the function of said guide bar 13 and said roller disc 14 to align entering receptacles 10 on platform 2 in such manner that the center of gravity of such receptacles projects slightly over the belt 7 and then beyond the ends of rollers 4, thus rendering the position of said receptacles unstable. I have provided a stabilizing wheel 15, revolving upon shaft 16, which projects from platform 2 at the entering end of said platform, whereby said receptacles 10 are prevented from tipping or falling as they enter the platform 2, thus being maintained stably until completely on said platform and in position for dumping.

Part of my frame structure comprises the landing bar 17, which is adapted to provide momentary support for a dumped receptacle during the first stage of the dumping operation, and is, of course, below and to the side of platform 2. Adjacent said landing bar 17 is V-belt 18, which is adapted to support the side of the dumped receptacle and carry the same forward. V-belt 18 is mounted on pulleys 19 supported on shaft 20 and supporting member 21, and is driven through said shaft 20 by motor 8. Situated above and to the side of said V-belt 18 is V-belt 22 mounted on pulleys 23, which are rotatively supported by the frame 1, and driven through universal joint 24, which transmits power from shaft 20 to shaft 25. V-belt 22 is adapted to support the top of dumped receptacles 10 and said V-belt 18 carries the same forward. The forward pulley 23 carrying V-belt 22 is keyed to shaft 26, which is rotatively supported by frame member 1 and to which is also keyed pulley 27. Mounted on pulley 27 is V-belt 28, which supports the top of receptacles 10 and urges the same forward while gradually encouraging said receptacles back to an upright position upon departing conveyor track 29. Conveyor track 29 has thereon rollers 30, and in fact, comprises a continuation of conveyor track 5 and is adapted to carry off empty receptacles. To aid in the returning of said receptacles to conveyor track 29, I have provided guide rod 31, which is mounted upon frame 1 and supporting member 21 in proximity to V-belt 28, and which urges the tip-

3

ping back of the dumped boxes upon the conveyor track 29.

For the purpose of carrying off dumped fruit, I have provided a standard conveyor belt 33, mounted on roller pulleys 34 in a well-known manner. Leading to said conveyor belt 33 is a chute 35, the plane of which is substantially coplanar with the side 36 of dumped box 10, as shown in Figure 5. Rigidity is given the entire structure by frame members 37 and flanges 38 provide sides whereby the fruit is prevented from spilling out of the chute.

In the operation of my dumping device receptacles 10 enter said device by conveyor track 5 upon rollers 6 and are carried on to dumping platform 2 by the belt 7. Entering dumping platform 2, said receptacles are guided by rollers 14 on guide bar 13 to an unstable position, being supported, however, from tipping by stabilizing wheel 15, as shown in Figure 3. The receptacles are urged further forward and when the rearward ends thereof pass over and beyond stabilizing wheel 15, said receptacles tip and slide to the position shown in Figure 4, being supported by landing bar 17 at side 36. In this position, the contents of receptacles 10, shown here as pears, tumble over one another gravitationally toward side 36. This brings the now center of gravity of the receptacle and its contents beyond and over the said landing bar 17 and causes the receptacle 10 to rotate about landing bar 17. As shown in Figure 5, the receptacle 10 assumes a position whereby the side 36 is supported by V-belt 18 and the top 39 is supported by V-belt 22. This brings the side 36 substantially into coplanar alignment with the chute 35, and allows the contents to roll onto said chute avoiding sudden bruising of contents. The empty receptacle 10 is then urged by said V-belts 18 and 22 forward and out of the way of the following receptacles. The carrying forward of said V-belts continues until V-belt 28 takes the place of V-belt 22 in supporting the top 39 of the receptacle 10, and urges the receptacle forward and back to an upright position. At this point, guide rod 31 co-acts with the top 39 of the receptacle, urging it further into an upright position as it is carried forward, until finally the center of gravity of the dumped receptacle passes over the V-belt 18 and said receptacle falls back into an upright position upon the departing conveyor track 29.

Of course, my invention is not limited to the particular means described above for conveying the receptacles 10 to the dumping platform. Figure 6 shows diagrammatically a modification of my box dumper whereby a frontal approach is used. In this case, the dumping platform 2 comprises the ordinary frame members and an extension of power belt conveyor 40 driven through sprocket 41 in well-known manner. In this adaptation I have chosen a free roller 42 on a level with and adjacent the end of belt 40, to prevent a too-early dumping of the box which might result in its failure to carry on over the landing bar 17 to the ordinary dumped position on the V-belts 18 and 22. It should be noted that conveyor track 29 permits of modification to a powered belt for conveying purposes, and that powered belt 40, if desired, might be approached from a conveyor track similar to the conveyor track 5 shown in Figures 1 and 2.

Having described a preferred embodiment of my invention, it is to be understood that I do not wish to be limited to the details set forth in

4

said description, but that my invention is to be of the full scope of the following claims.

I claim:

1. In a device of the class described: a frame; a platform mounted thereon; an entering receptacle conveyor leading to said platform; a moving belt riding over said platform; a guide bar on said frame whereby said receptacles are caused to ride on said platform and belt unstably; a stabilizing member on said frame at the entering end of said platform and level therewith; a landing bar on said frame below and to the side of said platform; a driven V-belt adapted to co-act with the top of a dumped receptacle falling from said platform and landing on said landing bar; a second V-belt adapted to co-act with the side of said receptacle in a similar manner; a third V-belt whereby said receptacle is removed from a dumped position; a second guide bar adapted to tip said receptacle back to an upright position as it is carried forward by said third V-belt; and a leaving conveyor in proximity to said V-belts and guide bar for removing empty receptacles.

2. In a device of the class described: a frame; a platform mounted thereon; means for conveying receptacles to said platform; means for conveying receptacles along said platform; a guide bar for maintaining said receptacles unstably on said platform; a stabilizing member on said frame at the entering end of said platform and level therewith; a landing bar on said frame below and to the side of said platform; means for catching said receptacles in dumped position; and means for conveying said receptacles from said dumped position.

3. In a device of the class described: a frame; a platform mounted thereon; means for conveying receptacles to said platform; means for conveying receptacles along said platform; a guide bar for maintaining said receptacles unstably on said platform; a stabilizing member on said frame at the entering end of said platform and level therewith; a landing bar on said frame below and to the side of said platform; and means for catching said receptacles in dumped position.

4. In a device of the class described: a frame; a platform mounted thereon; conveying means for introducing receptacles to said platform; means for conveying said receptacles along said platform; guiding means along said platform whereby said receptacles are caused to ride on said platform unstably with their respective centers of gravity disposed beyond the edge of said platform; a stabilizing member adjacent said platform cooperating with said platform in supporting said receptacles as said receptacles progress part way along said platform; means adjacent and on the opposite side of said centers of gravity from said platform adapted to receive dumped receptacles; and means for carrying away said dumped boxes.

5. In a device of the class described: a frame; a platform mounted thereon; conveying means for introducing receptacles to said platform; means for conveying said receptacles along said platform; guiding means along said platform whereby said receptacles are caused to ride on said platform unstably with their respective centers of gravity disposed beyond the edge of said platform; a stabilizing member adjacent and on the opposite side of said centers of gravity from said platform cooperating with said platform in supporting said receptacles as said receptacles progress part way along said platform; and means

5

adjacent said platform adapted to receive dumped receptacles.

6. In a device of the class described: a frame; a platform mounted thereon; means for conveying receptacles to said platform; means for conveying receptacles along said platform; a guide bar for maintaining such receptacles unstably on said platform with their respective centers of gravity disposed beyond the edge of said platform; a stabilizing member on the opposite side of said centers of gravity from said platform and adjacent said platform substantially on a level therewith; V-belts adjacent said platform adapted to receive said receptacles; receiving means adjacent said V-belts; and a chute leading to said receiving means from one of said receptacles when said receptacle is in dumped position supported by said V-belts, the surface of said chute being substantially co-planar with the side of said receptacle from which the contents thereof spill.

7. In a device of the class described: a frame; a platform mounted thereon; conveying means for introducing receptacles to said platform; means for conveying said receptacles along said platform; guiding means along said platform whereby said receptacles are caused to ride on said platform with their respective centers of gravity disposed beyond the edge of said platform; a stabilizing member adjacent and on the opposite side of said centers of gravity from said platform; supporting means adjacent said platform adapted to receive dumped receptacles; receiving means adjacent said supporting means; and a chute leading to said receiving means from one of said receptacles when said receptacle is in dumped position supported by said V-belts, the surface of said chute being substantially coplanar with the side of said receptacle from which the contents thereof spill.

8. In a device of the class described: a frame; a platform mounted thereon; means for conveying receptacles to said platform; means for conveying receptacles along said platform; means for rendering said receptacles unstable on said platform; a landing bar adjacent and below said platform adapted to catch said receptacles; V-belts adjacent said landing bar adapted to receive said receptacles; receiving means adjacent said V-belts; and a chute leading to said receiving means from one of said receptacles when said receptacle is in dumped position supported by said V-belts, the surface of said chute being substantially co-planar with the side of said receptacle from which the contents thereof spill.

9. In a device of the class described: a frame;

6

a dumping platform on said frame; means for conveying receptacles to said dumping platform; a roller member adjacent said dumping platform and substantially level therewith; a landing bar below said platform adapted to catch said receptacles during dumping; driven V-belts adapted to coact with the sides and tops of said receptacles and carrying said receptacles forward; guiding means adapted to tilt back said receptacles to upright position; and means for carrying away said receptacles.

10. A receptacle handling apparatus comprising: a platform; a conveyor leading to said platform; a guide member for positioning receptacles on said platform with their respective centers of gravity positioned beyond the edge of said platform; a stabilizing member adjacent and on the opposite side of said centers of gravity from said platform and extending only partially along said platform, whereby said receptacles are stabilized temporarily and then allowed to dump; a landing bar below said platform; driven belt members positioned to engage the side and top of receptacles dumping and pivoting about said landing bar; and a second guide member adapted to tip said receptacles back to upright position.

11. A receptacle handling apparatus comprising: a platform; a conveyor leading to said platform; a guide member for positioning receptacles on said platform with their respective centers of gravity positioned beyond the edge of said platform; a stabilizing member adjacent and on the opposite side of said centers of gravity from said platform and extending only partially along said platform, whereby said receptacles are stabilized temporarily and then allowed to dump; a landing bar below said platform; driven belt members positioned to engage the side and top of receptacles dumping and pivoting about said landing bar; and a second guide member adapted to tip said receptacles back to upright position, said belt members being adapted to carry receptacles to said second guide member.

ALBERT J. KRONER.

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