Aug. 6, 1935. A. NOVOTNY 2,010,410

PACKING MECHANISM

Filed June 18, 1934 4 Sheets-Sheet 1

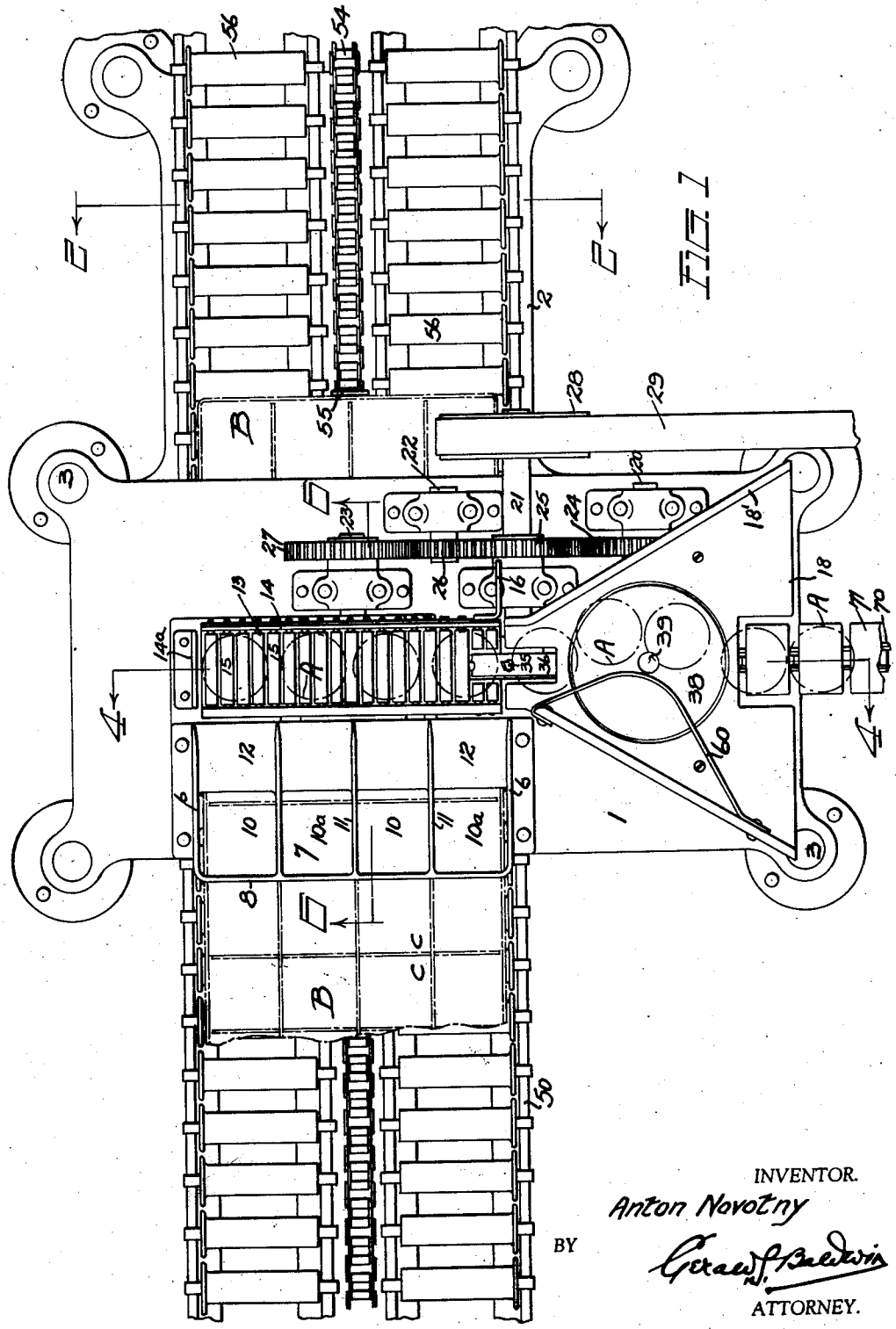


FIG. 1

INVENTOR.
Anton Novotny
BY Gerard S. Baldwin
ATTORNEY.

Aug. 6, 1935. A. NOVOTNY 2,010,410

PACKING MECHANISM

Filed June 18, 1934 4 Sheets-Sheet 2

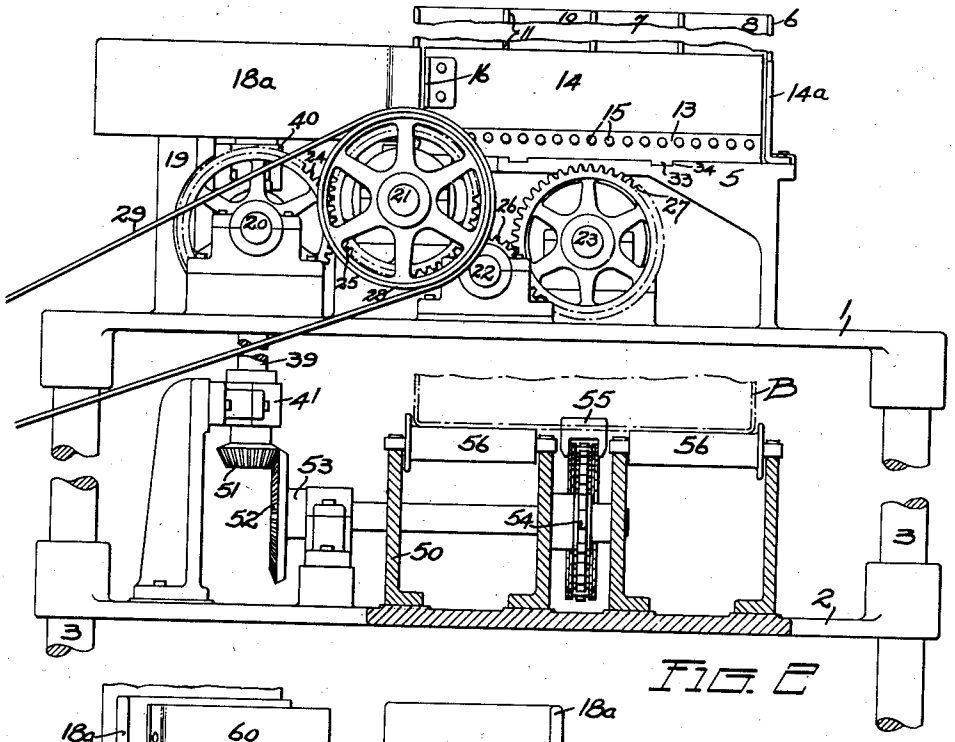


FIG. 2

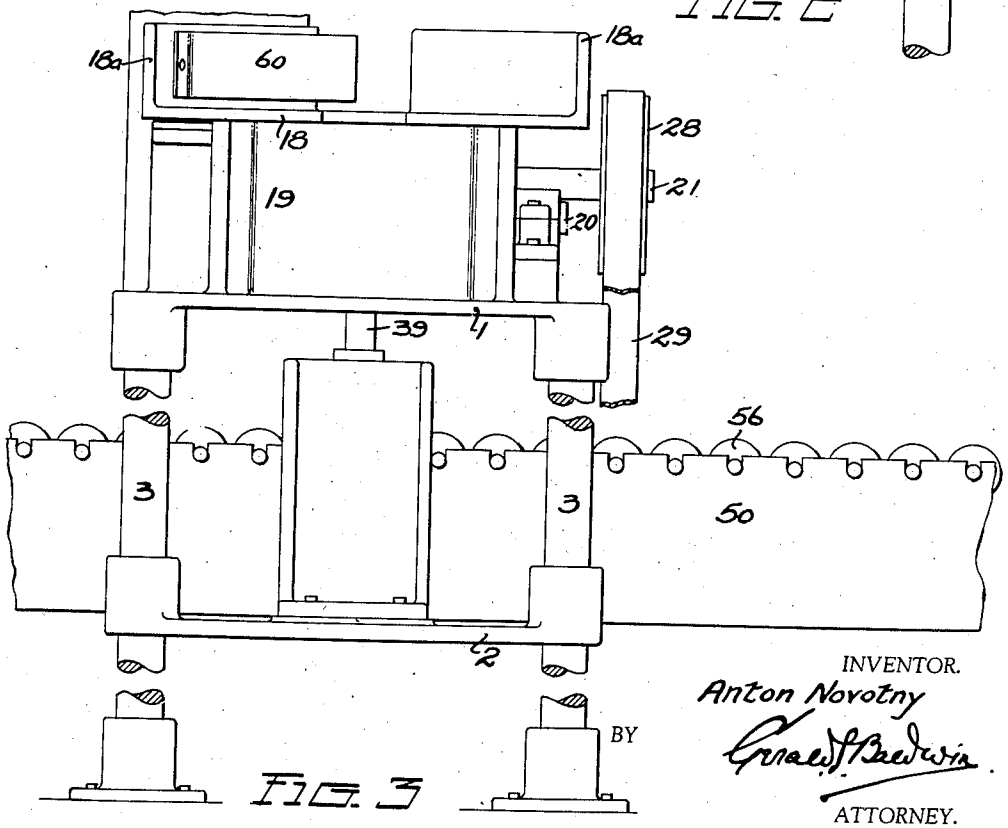


FIG. 3

INVENTOR.
Anton Novotny
BY
Grace S. Baldwin
ATTORNEY.

Aug. 6, 1935. A. NOVOTNY 2,010,410

PACKING MECHANISM

Filed June 18, 1934 4 Sheets-Sheet 3

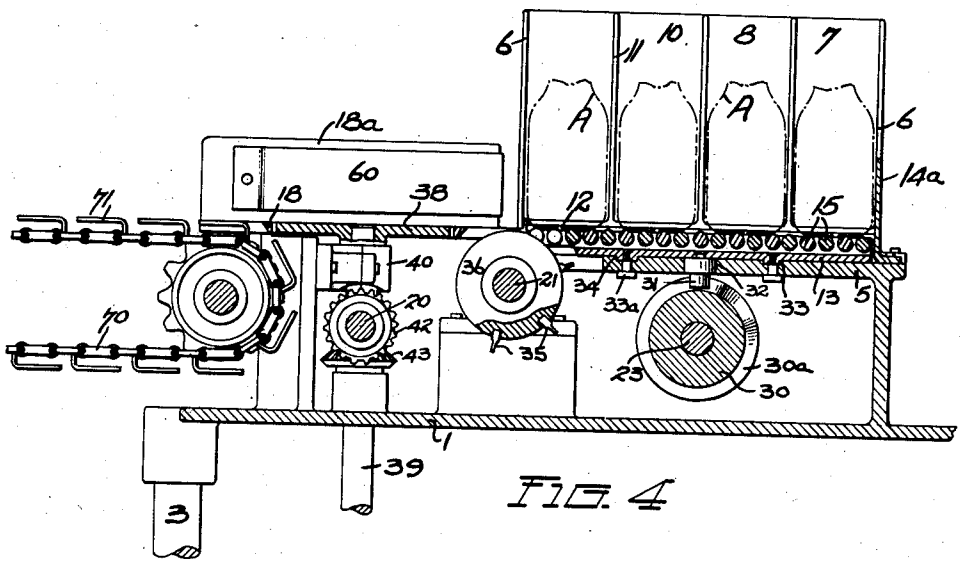


FIG. 4

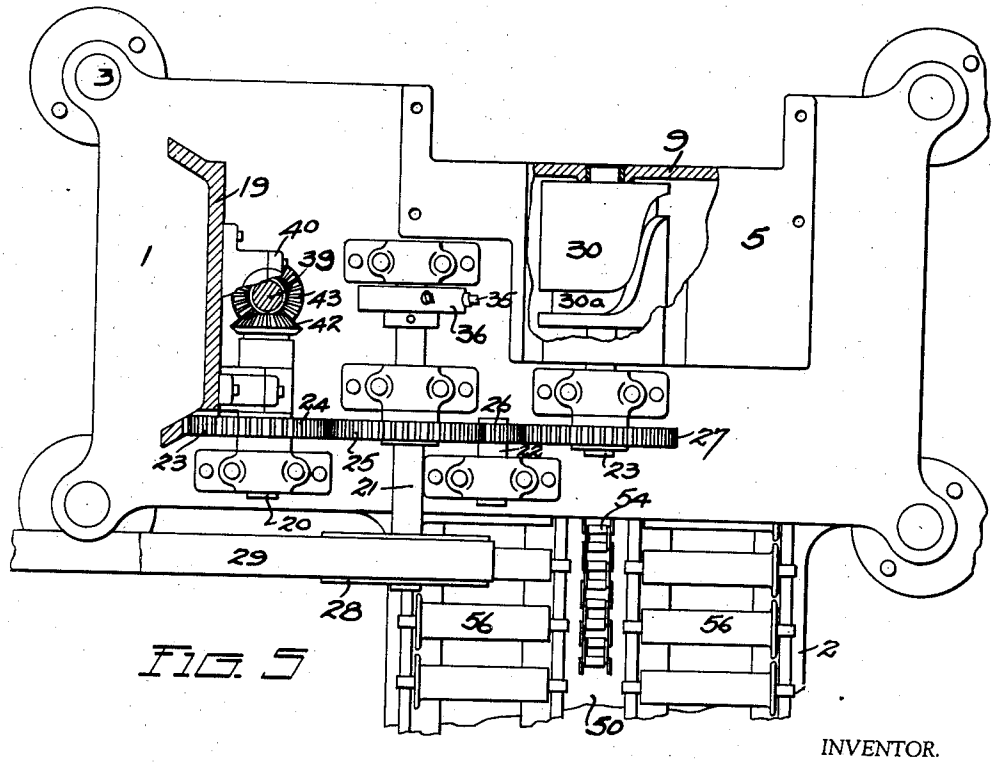


FIG. 5

INVENTOR.

Anton Novotny

BY

Gerald J. Baldwin

ATTORNEY.

Aug. 6, 1935. A. NOVOTNY 2,010,410

PACKING MECHANISM

Filed June 18, 1934 4 Sheets-Sheet 4

FIG. 6

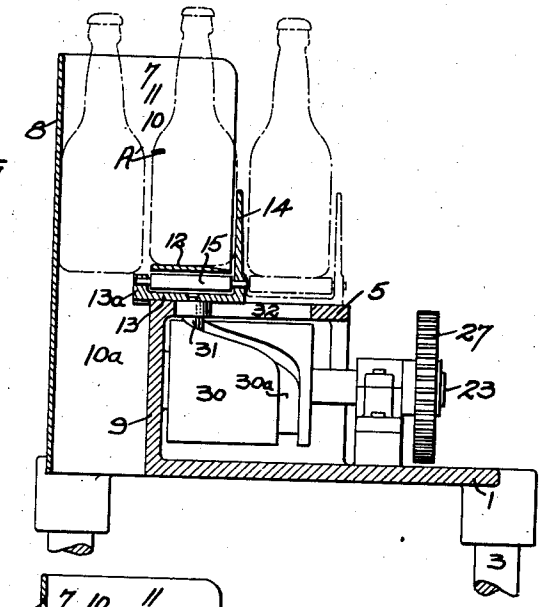
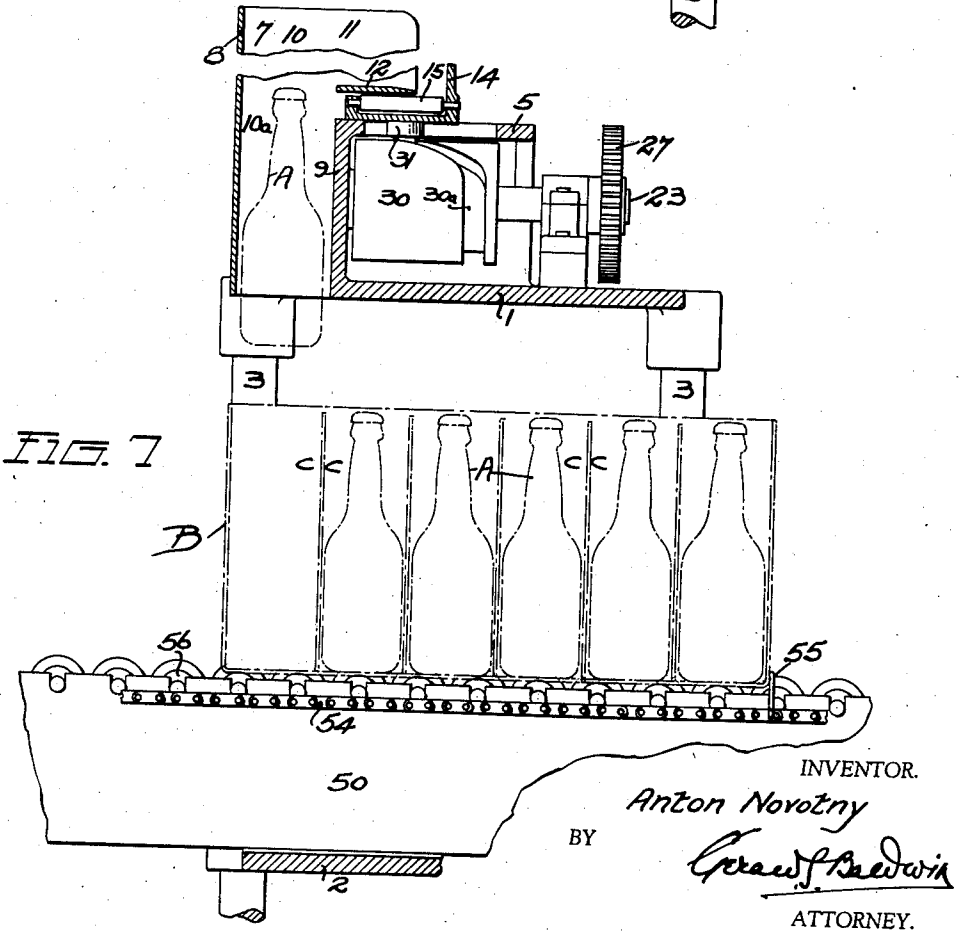


FIG. 7



INVENTOR.

Anton Novotny

BY

Grace J. Baldwin

ATTORNEY.

Patented Aug. 6, 1935 2,010,410

UNITED STATES PATENT OFFICE

2,010,410

PACKING MECHANISM

Anton Novotny, Detroit, Mich., assignor to Detroit Gray Iron Foundry Company, Detroit, Mich., a corporation of Michigan

Application June 18, 1934, Serial No. 731,102

21 Claims. (Cl. 226—14)

This invention relates to improvements in packing mechanisms, and refers more particularly to such a mechanism for depositing containers, such as bottles, one row at a time, into shipping cases.

It is an object of the invention to provide a packing mechanism comprising a packing machine which is relatively cheap and simple to manufacture and automatic in operation; and wherein means are provided for actuating a conveyor, to carry shipping cases into which the containers are delivered by the machine, in synchronism with the latter.

Another object of the invention is to provide a packing mechanism for handling containers, such as glass bottles, and dropping them down chutes into shipping cases which travel upon a conveyor extending beneath the chutes; and wherein means are provided for handling glass bottles in such a manner that they may be safely dropped through the chutes into the cases.

A further object of the invention is to provide a packing mechanism comprising a packing machine having a transversely movable carriage thereon to receive a plurality of containers in a row, a pen divided into compartments each having a platform at the front and a chute at the rear, and means for alternately loading containers upon the carriage and moving the latter to plow off the load thereon upon the platforms; utilizing the second load of containers upon the carriage for moving the containers already upon the platforms over the chutes; and providing means for supporting the containers as they are moved over the chutes until they have finally come to rest squarely over the latter.

Having thus broadly and briefly stated some of the major objects and advantages of the invention I will now proceed to describe a preferred embodiment thereof, with the aid of the accompanying drawings, in which:

Figure 1 illustrates a plan view of the invention.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is an end elevation omitting the feed conveyor.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a horizontal sectional view showing the base of the machine with the guide thereover partly broken away to show the cam, and the bracket upon the base which supports the apron.

Figure 6 is a section on the line 6—6 of Figure 1, and

Figure 7 is a sectional view similar to Figure 6 but showing a container dropping down a chute after the carriage has commenced to move towards its forward position.

A base 1 and a subbase 2 are suitably supported one above the other as by standards 3. A guide 5 is provided upon the base 1, and projecting upwardly from the rear portions of the sides of the guide and extending rearwardly thereof are side walls 6 of a pen 7. The rear wall 8 of the pen which may be integral with the sides 6 is spaced behind the rear of the guide 5, and the lower margin of the said rear wall is in substantial horizontal alignment with the base 1. 9 denotes a vertical front wall, spaced from the rear wall 8, which extends upwardly from the rear margin of the base 1 to the rear margin of the guide 5. The pen 7 is divided into a plurality of compartments 10 by vertical partitions 11 which extend forwardly from the rear wall 8; and extending the full length of the pen 7, and along the front portion thereof, is a platform 12. Rearwardly of the latter vertical chutes 10a are formed between the vertical walls 8 and 9 which are divided from one another by the partitions 11 the lower margins of which preferably terminate flush with the lower margins of the said walls 8 and 9.

Transversely slidable upon the guide 5, and extending substantially the full length of the latter is a carriage 13 which is normally supported upon the front portion of the said guide. Along the front margin of the carriage 13 and integral therewith an upwardly projecting shifter plate 14 is provided, and 14a denotes a buffer mounted, in the present instance, upon the guide 5 adjacent the outer extremity of the carriage when the latter is in its forward position. Mounted transversely of the carriage and in axial alignment with its direction of movement are a plurality of rollers 15 which extend slightly above the upper face of the said carriage; and extending forwardly from the carriage at one extremity thereof and above the carriage is a stop 16. The carriage 13 and its rollers 15 are so positioned relative to the platform 12 as to just slide freely beneath the latter.

Rotatably supported above the base 1 in suitable bearings are a plurality of horizontal shafts 20, 21, 22 and 23 having spur gears 24, 25, 26 and 27 respectively fixed thereon so that they mesh with one another. The shaft 21 is provided with suitable driving means such as a pulley 28 and a belt 29. The gear 26 is merely an idler to furnish driving means between the gears 25 and 27. Upon the shaft 23 a cam 30, having a cam slot 30a formed around its periphery, is secured. This cam slot receives a pin 31 which extends down-

wardly from the underside of the carriage 13 through a transverse slot 32 formed through the guide 5. The cam slot 30a is so shaped as to impart a reciprocating motion to the carriage 13; on the underside of the latter are downwardly projecting tongues 33 slidable in grooves or ways 34 formed in the upper face of the guide 5. These tongues 33 are held in place in the ways 34 as by screws 33a which extend through vertical slots formed in the guide 5 parallel with the slot 32. It will be noted that the carriage 13 and platform 12, immediately beneath which it travels, are so proportioned that when the carriage reaches its rearmost position a sufficient portion thereof projects behind the said platform to form a longitudinal supporting ledge 13a shown in Figure 6.

A receiving apron 18, supported as by a bracket 19 resting on the base 1, is arranged adjacent one extremity of the carriage 13 so that its upper surface is substantially in a plane with the upper faces of the rollers 15. The apron is provided with upstanding sides 18a which converge towards the carriage 13. A circular aperture is formed in the apron to receive a rotary feed plate 38 the upper face of which is in a plane with the upper face of the said apron. This feed plate is secured to the upper extremity of a vertical spindle 39 rotatably supported by a bearing 40 secured to the bracket 19, and also by a second bearing 41 mounted upon the subbase 2. 42 and 43 denote bevel gears secured around the shaft 20 and spindle 39 respectively for rotating the latter. In order to prevent packages or bottles A passing over the apron 18 from riding upon that portion of the feed plate 38 which is turning away from the carriage 13, and also to assist in directing the packages towards the latter, a spring guide 60 is so mounted upon one of the apron walls 18a as to project partly over the said feed plate.

Both the extremity of the carriage 13 adjacent the apron 18 and the adjacent portion of the said apron, are longitudinally and substantially centrally slotted to provide clearance for feed fingers 35 radially mounted on a rotary feed member 36 fixed upon the shaft 21. As will be seen from Figure 4 these fingers 35 are uniformly spaced around a portion of the feed member periphery while no fingers project from the remainder of the feed member circumference.

During a portion of each revolution of the feed member 36 a plurality of packages or bottles A are moved in rapid succession onto the carriage 13 by the fingers 35, one by each of said fingers; and then an interval occurs during which time that portion of the feed member 36 having no fingers extending from it is uppermost. The cam slot 30a is so formed that after each reciprocating movement of the carriage 13 the latter remains stationary for an appreciable period of time. The rotation of the feed member 36 and the cam 30 are so synchronized that immediately a package or bottle A has been moved onto the carriage 13 opposite each of the compartments 10 by the fingers 35, the carriage is moved rearwardly by the cam 30 so that the packages are plowed off onto the platform 12 by the forwardly and downwardly inclined margin of the latter. The cam then returns the carriage to its forward position in time for the rollers 15 to receive a package or bottle A moved thereonto by the leading finger 35 upon the next revolution of the feed member 36. During the rearward movement of the carriage 13 the stop 16 positively prevents a package from leaving the apron 18.

When one row of packages has been lodged upon the platform 12 the next rearward movement of the carriage 13 with packages thereon causes the new row of packages to move the packages already upon the platform over the chutes 10a. The rear margin of the carriage 13 projecting as it does behind the platform 12 when in its rearmost position, forms a ledge 13a to prevent the back row of packages dropping down the chutes 10a until after the carriage commences to move forward again, and therefore after the said packages have come to rest squarely over the chutes 10a.

While the arrangement of four chutes 10a and four feed fingers 35 is herein employed, it is of course understood that the machine may be built to accommodate any desired number of packages in a row to be dropped simultaneously down chutes, and to provide means for moving any desired number of packages one after the other onto the carriage before the latter is moved by the cam.

In order to provide proper operation of the packing mechanism, it is obviously necessary to provide means for carrying shipping boxes B beneath the chutes so that each row of packages A drops in predetermined relation to, and usually adjacent, the row last packed. I therefore arrange upon the subbase 2 a conveyor mechanism 50 operated in synchronism with the mechanism already described. In the present instance a bevel gear 51 upon the spindle 39 meshes with a gear 52 upon a head shaft 53 which operates a carrier chain 54 having spaced, upwardly projecting lugs 55 thereon in connection with which rollers 56 are provided on both sides of the said chain. The lugs 55 contact the ends of shipping cases B and advance them at such speed over the rollers 56 that rows of packages A are delivered into the cases adjacent one another. The shipping cases may be sub-divided by dividing walls or partitions into compartments C, each of which is intended to receive one package or bottle A.

Further in order to render the entire mechanism fully automatic and to prevent delivery of packages or bottles A to the apron 18 when the feed member 36 and carriage 13 are not operating, I prefer to utilize a second conveying mechanism to deliver packages onto the apron 18 as shown at 70, and to utilize a common driving means—not shown—for this conveyor and for the pulley 28. In the arrangement diagrammatically shown in the drawings the conveyor 70 is provided with carrier plates 71 each of which delivers one package or bottle A onto the apron 18.

Relative to the loading of the packages A upon the carriage 13; each package is moved onto the carriage rollers 15 by one of the fingers 35, and each package behind the first one, when advanced, moves the packages in front of it onto the rollers until the last package advances the leading package until it strikes the buffer 14a. Then the four packages upon the carriage are opposite the four compartments 10. It may also be remarked that the front vertical edges of the partitions 11 are thin in order to insure each package being moved into the compartment opposite to it. To facilitate the delivery of the packages from the rollers 15 onto the platform 12 by the shifter plate 14, which is integral with the carriage 13, the front portion of the upper face of the platform is downwardly and forwardly inclined so that the front margin thereof, which is positioned just above the top of the rollers, is relatively thin.

While in the foregoing the preferred embodiment of the invention has been described and

shown, it is understood that alterations and modifications may be made thereto provided the said alterations and modifications fall within the scope of the appended claims.

What I claim is:

1. A packing mechanism comprising a guide, a carriage thereon, means for intermittently moving packages onto the carriage, a pen opposite the carriage, a platform extending across the front of the pen, a chute at the rear of the pen behind the platform, and means reciprocating the carriage intermittently upon the guide and delivering the packages thereon upon the platform, the movement of said packages onto the platform forcing other packages already thereon over the chute.

2. A packing mechanism comprising a guide, a carriage thereon, means for intermittently moving packages onto the carriage, a pen opposite the carriage, a platform extending across the front of the pen, a chute at the rear of the pen behind the platform, means reciprocating the carriage intermittently and delivering the packages thereon upon the platform, the movement of said packages onto the platform forcing other packages already thereon rearwardly over the chute, and means preventing the packages over the chute from falling therethrough until they have come to rest squarely thereover.

3. A packing mechanism comprising a guide, a carriage thereon, means for intermittently moving packages onto the carriage, a pen opposite the carriage, a platform extending across the front of the pen, a chute behind the platform at the rear of the pen, and means reciprocating the carriage intermittently immediately beneath the platform and delivering the packages upon the carriage onto the platform, the movement of said packages onto the platform forcing other packages already thereon over the chute, and the rear margin of the carriage at its rearmost limit of travel projecting beyond the platform into the chute and forming a supporting ledge to prevent packages over the chute from falling therethrough until the carriage has commenced to move forward again.

4. A packing mechanism comprising a guide, a carriage mounted thereon for intermittent reciprocation, means for moving the carriage, means for intermittently moving packages onto the carriage when in its forward position, a stop carried by the carriage preventing movement of packages thereonto during the reciprocation of the carriage, a pen rearwardly into which the carriage is reciprocated, a platform across the front of the pen onto which the packages are delivered upon rearward movement of the carriage, and a chute across the rear of the pen behind the platform, the movement of the packages onto the platform forcing other packages already thereon rearwardly over the chute.

5. A packing mechanism comprising a guide, a carriage thereon, means for moving packages onto said carriage, means intermittently reciprocating the carriage, a pen adjacent the guide into which the carriage is reciprocated, the pen being divided into a plurality of vertical compartments, a platform across the front of each compartment onto each of which one of the packages is delivered from the carriage upon rearward movement of the latter, and a chute at the rear of each compartment into which a package already upon the platform in front of it is forced by the delivery of one of said packages onto said platform from the carriage.

6. A packing mechanism comprising a guide, a carriage thereon, means for moving packages onto said carriage, means intermittently reciprocating the carriage, a pen behind the guide into which the carriage is reciprocated, the pen being divided into a plurality of vertical compartments, a platform across the front of each compartment immediately beneath which the carriage moves, and onto each of which one of the packages is delivered from the carriage upon rearward movement of the latter, a chute at the rear of each compartment into which a package already upon the platform in front of it is forced by the delivery of one of said packages onto said platform from the carriage, and means restricting the opening at the top of the chutes upon rearward movement of the carriage so that the packages cannot then drop therethrough.

7. A packing mechanism comprising a guide, a carriage thereon, means for intermittently moving packages onto the carriage, a pen, a platform across the front thereof beneath which the carriage is reciprocated, to deliver packages thereon onto the platform, a chute at the rear of the pen over which the packages are moved by the delivery of a second set of packages onto the platform, in combination with a conveyor mechanism travelling beneath the chute adapted to carry packing cases into which the packages fall, and means for synchronizing the conveyor and carriage movement so that the former travels a predetermined distance between the discharge of each set of packages down the chute.

8. A packing mechanism comprising an apron, a rotary feed member having a plurality of radial feed fingers uniformly spaced around a portion of its periphery, a carriage normally in radial alignment with the feed member onto which packages are adapted to be moved from the apron by the feed fingers, means intermittently reciprocating the carriage parallel with the feed member axis, a pen opposite the carriage, a platform across the front of the pen, immediately beneath which the carriage is reciprocated to deliver packages thereon onto the platform, a chute behind the platform in the pen over which packages already upon the platform are moved by the packages being delivered thereonto from the carriage, and a common driving means for the feed member rotation and the intermittent carriage reciprocation so that the feed fingers only move packages towards the carriage when the latter is in radial alignment with the feed member.

9. A packing mechanism comprising an apron, a guide, a carriage mounted thereon for intermittent reciporcation, a rotary feed member having its axis parallel with the direction of movement of the carriage, feed fingers carried by the member adapted intermittently to move a plurality of packages from the apron onto the carriage, a pen into which the carriage moves, a platform across the front of the pen onto which the packages are delivered by the carriage, and a chute at the rear of the pen over which other packages already upon the platform are moved by the first named packages as the latter are delivered onto the platform.

10. A packing mechanism comprising an apron, means delivering packages thereonto, a guide adjacent the apron, a carriage mounted thereon for transverse reciprocation, means intermittently moving the carriage, means intermittently delivering a plurality of packages from the apron onto the carriage, a stop preventing the delivery of packages from the apron during reciprocation of

the carriage, a pen, a platform extending across the front thereof beneath which the carriage is reciprocated, a chute at the rear of the pen, the carriage delivering packages thereon upon the platform and forcing other packages already on the platform over the chute, and a conveyor travelling beneath the chute adapted to carry packing cases to receive the packages which fall through the chute.

11. A packing mechanism comprising an apron, a guide adjacent thereto, a carriage mounted for transverse reciprocation upon the guide, means intermittently moving the carriage, other means intermittently delivering a plurality of packages from the apron onto the carriage, a pen divided into a plurality of compartments, a platform across the front of each compartment, a chute at the rear of each compartment, the carriage delivering the packages thereon onto the platforms during its movement and forcing other packages already upon the platforms over the chutes, a stop preventing the delivery of packages from the apron during reciprocation of the carriage, means preventing the packages being moved over the chutes from falling therethrough until they have come to rest thereover, each chute being adapted to support a package in a substantially vertical position during its movement therethrough, and a conveyor moving beneath the chutes adapted to carry packing cases to receive the packages as they fall through the chutes.

12. A packing machine including a reciprocating carriage, means for moving a plurality of bottles thereonto when the carriage is in one position, a chute adjacent which the carriage is adapted to be moved, and down which the bottles drop, and means plowing the bottles off the carriage as the latter approaches the chute.

13. A packing machine including a reciprocating carriage, means for feeding a plurality of packages onto the carriage when the latter is in one position, means plowing all the packages off the carriage as the latter approaches a second position, and a chute partly over which the carriage moves and down which the packages drop.

14. A packing machine including a reciprocating carriage, means for moving a plurality of bottles thereonto when the carriage is at one end of its travel, a chute adjacent which the carriage is positioned at the opposite end of its travel and down which the bottles drop, and means plowing the bottles off the carriage as the latter approaches the opposite end of its travel.

15. A packing machine including a reciprocating carriage, means for moving a plurality of bottles thereonto when the carriage is at one end of its travel, a chute adjacent which the carriage is positioned at the opposite end of its travel and down which the bottles drop, means obstructing the chute to prevent the passage of bottles therethrough when the carriage is at said opposite end of its travel, and means for plowing the bottles off the carriage as the latter approaches said opposite end of its travel.

16. A packing machine including a reciprocating carriage, means for moving a plurality of bottles thereonto when the carriage is at one end of its travel, a chute adjacent which the carriage is positioned at the opposite end of its travel and down which the bottles drop, and means for plowing the bottles off the carriage as the latter approaches the opposite end of its travel, in combination with a conveyor extending beneath the chute adapted to carry packing cases to receive the dropped bottles, and means operating the conveyor in synchronism with the carriage.

17. A packing mechanism including a reciprocating carriage, means for feeding a row of bottles thereon when said carriage is in one position, means plowing the bottles off the carriage as the latter approaches a second position, a chute partly over which the carriage moves and down which the bottles drop, in combination with a conveyor extending beneath the chute to carry packing cases to receive the dropped bottles, and means operating the conveyor continuously and in synchronism with the carriage so that each row of bottles dropped alights in the packing cases adjacent the previously dropped row.

18. A packing machine including a carriage, means for reciprocating the carriage, means for moving a plurality of bottles thereonto, a platform onto which the bottles are transferred by movement of the carriage, and a chute over which said bottles are moved by other bottles upon the carriage upon the next reciprocating movement of the latter.

19. A packing machine including a carriage, means for reciprocating the carriage, means for moving a plurality of bottles thereonto, a platform onto which the bottles are transferred by movement of the carriage, a chute over which said bottles are moved by other bottles upon the carriage upon the next reciprocating movement of the latter, and means preventing the bottles from dropping through the chute until after they have been squarely positioned thereover.

20. A packing machine including a carriage, means for reciprocating the carriage intermittently, means for feeding a plurality of bottles thereonto, a platform onto which the bottles are transferred by movement of the carriage, a chute over which said bottles are moved by other bottles upon the carriage upon the next reciprocation of the latter, and means obstructing the feeding of bottles onto the carriage when the latter is in motion.

21. A packing machine including a carriage, means reciprocating the carriage, means for feeding a plurality of bottles thereonto, a platform onto which the bottles are transferred by movement of the carriage, and a chute over which said bottles are moved by other bottles upon the carriage upon the next reciprocating movement of the latter, in combination with a conveyor extending beneath the chute adapted to carry packing cases to receive the dropped bottles, and means operating the conveyor in synchronism with the carriage.

ANTON NOVOTNY.