May 1, 1923. 1,453,720

C. H. NITSCH ET AL

PACKAGE FEED MECHANISM

Filed March 1, 1922 3 Sheets-Sheet 1

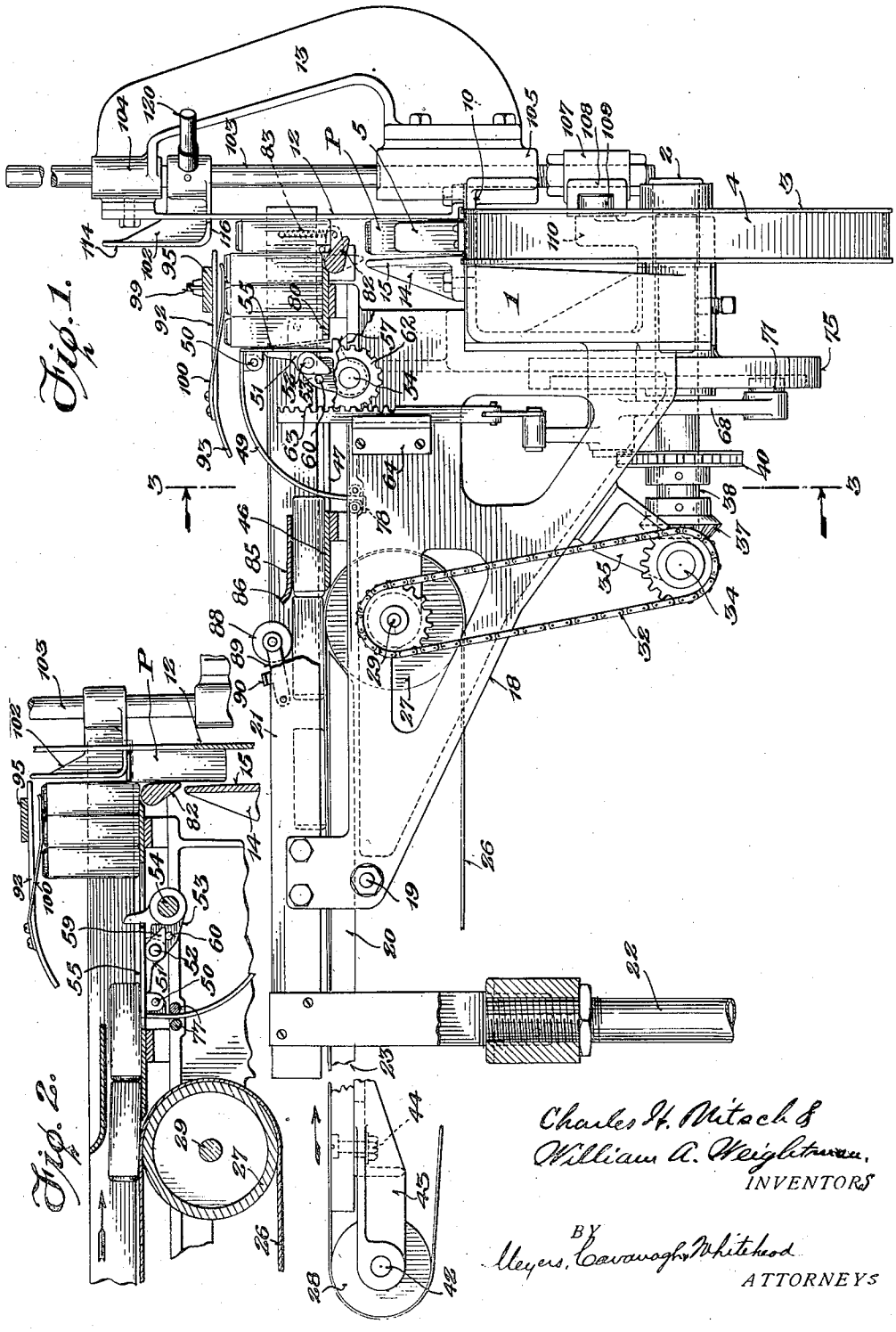

Fig. 1.

Fig. 2.

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PACKAGE FEED MECHANISM

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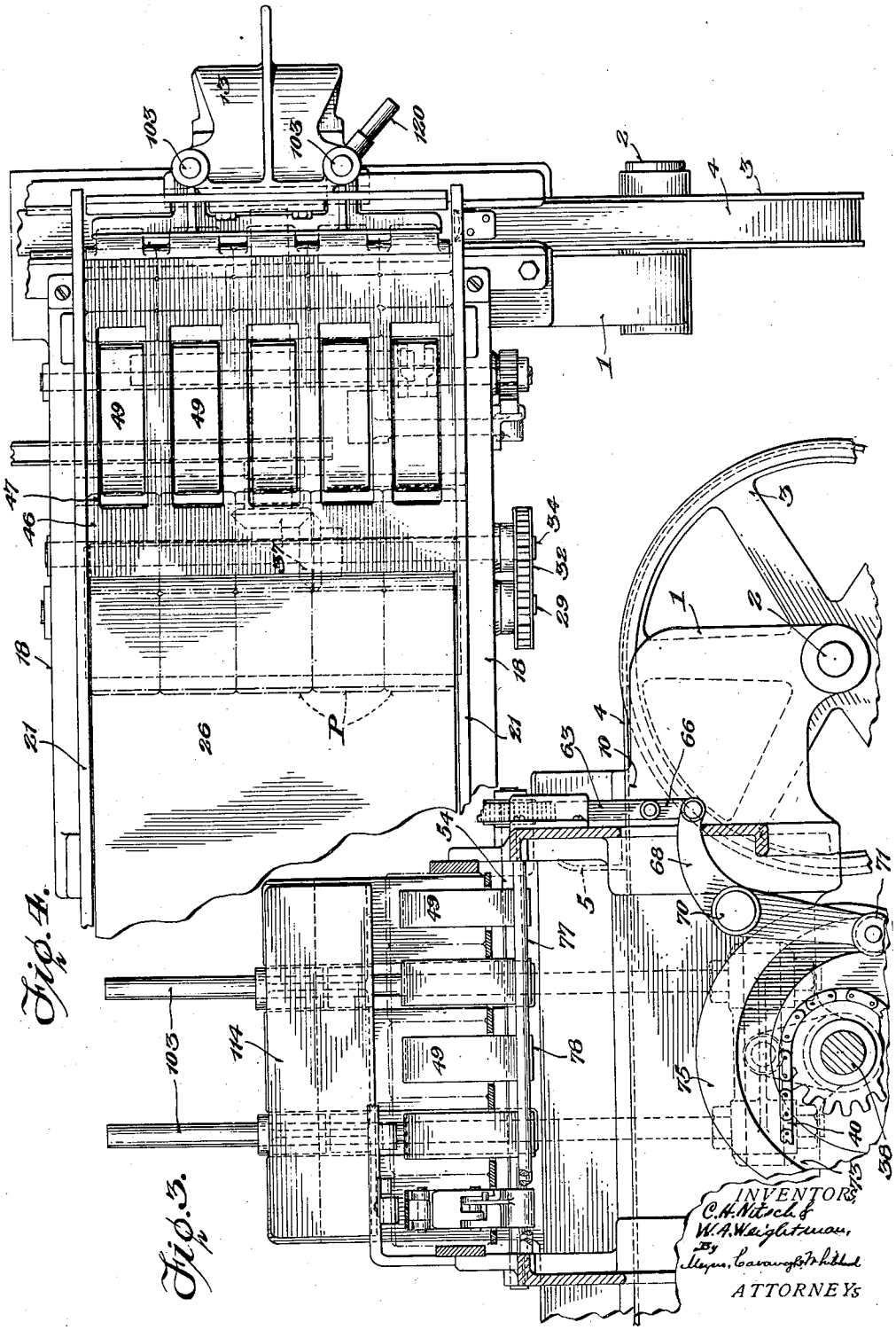

Fig. 4.

Fig. 5.

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PACKAGE FEED MECHANISM

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Fig. 5.

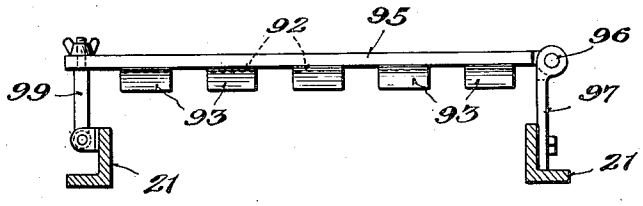
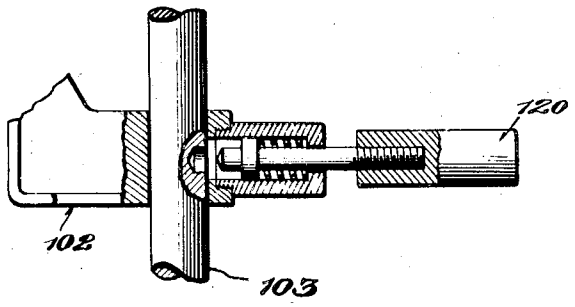


Fig. 6.



Inventors

Charles H. Nitsch &
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By Meyers, Cavanagh & Whitehead, Attorneys

Patented May 1, 1923. 1,453,720

UNITED STATES PATENT OFFICE.

CHARLES H. NITSCH AND WILLIAM A. WEIGHTMAN, OF LOGAN, PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO STOKES & SMITH COMPANY, OF SUMMERDALE, PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PACKAGE-FEED MECHANISM.

Application filed March 1, 1922. Serial No. 540,289.

To all whom it may concern:

Be it known that we, CHARLES H. NITSCH and WILLIAM A. WEIGHTMAN, citizens of the United States, and residents of Logan, Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Package-Feed Mechanism, of which the following is a specification.

The object of this invention is to provide mechanism for feeding packages or articles to machines, such as cigarette package stamping machines, which require a great volume of packages to be supplied in a stated time, and in a certain way.

The invention will be herein exemplified and described as especially adapted for feeding cigarette packages to stamping machines of the general class disclosed in United States patent to Fogde and Southwick, No. 1,244,438, Oct. 23, 1917, in which the packages are advanced in a row on a belt conveyor, the packages being separated into groups, usually five or ten in each group, with a positive pusher or blade engaging the rear package of each group. The conveyor is moved intermittently and each group is brought to rest at a station where stamps are applied, and then moved away and discharged, or additionally operated upon. Machines of this class at the present time are operated rapidly, and require the supply of a large volume of packages, which must be grouped and positioned in substantial accordance with the arrangement above described, and placed upon the stamping machine feed belt in advance of stamping position, and between two of the feed blades. Our invention, as will appear hereafter, meets the described conditions; but it is not intended to limit the invention to this specific use or construction, and evidently structural features may be varied considerably, and the invention may be adapted to other uses where some or all of the conditions are similar.

In the accompanying drawings:

Fig. 1 is a side elevation of package feed mechanism embodying the invention, shown in association with a cigarette package stamping machine of the class above mentioned.

Fig. 2 is a detail from the same view point, showing a different operative position.

Fig. 3 is an enlarged detail, at 3—3, Fig. 1.

Fig. 4 is a top plan, enlarged, of the right-hand end of the mechanism of Fig. 1.

Fig. 5 is a detail, in elevation, of package guiding and retaining devices, and their movable frame.

Fig. 6 is a detail, in section, of the releasable discharge plunger connection.

The feed mechanism of this invention is associated in the present exemplifying embodiment, with the package conveyor of a machine for applying revenue stamps to cigarette packages, of the general type disclosed in the patent to Fogde and Southwick, above mentioned. A horizontal frame member 1, forming a part or an extension of the frame of such a stamping machine is shown in the present drawings. This frame member supports a shaft 2 carrying a channeled belt pulley 3, over which runs the stamping machine package feed belt 4. This belt is provided with equally spaced blades or package pushers 5. It is necessary to supply to the feed belt, 4, groups of packages of equal number, these packages being in the present instance cigarette packages P of the pouch type, and they are to be placed on the belt 4 in upright position and in edgewise contact, with five packages, in the present instance, arranged between each pair of pushers 5. Of course, the number of packages can be varied within reasonable limits. The feed belt 4 is driven intermittently by suitable mechanism, (not here shown), and the successive groups of packages are thus located at a stamping position and stamped and then moved onward for discharge or for further operations. Stamping machines of the general type indicated, operate at a relatively high speed and a large number of packages must be supplied to them per minute in order to run them at their maximum capacity, and it has heretofore been a difficult problem to supply the packages in the proper way, rapidly enough to satisfy the requirements.

The cigarette packages P of the pouch form here shown, or of other suitable form, are produced by packaging and wrapping machines of various types, and the present invention, consisting of feed mechanism for supplying the packages to the stamping machine, is devised so as to receive packages in an advantageous way from one or a number

of such packaging or wrapping machines, and is also devised so that at the same time it can be supplied with packages in other ways, for instance, from trays, in which the packages are arranged in definite manner and which can be rapidly handled and placed upon the conveyor belt of the present invention for the discharge of their contents, and the packages can be otherwise supplied to the feed mechanism, as sufficiently further explained hereafter. The invention further includes means for advancing the packages which are placed upon the feed belt in any of the ways mentioned, in orderly row-arrangement, corresponding to the package group arrangement required by the stamping machine, as above described, and for discharging these packages row by row in proper position upon the stamping machine feed belt with each row or group properly located between two of the pusher blades 5, while the feed belt 4 pauses at the package receiving position.

Feed belt 4 runs over a plate or table 10, formed as a part or extension of frame member 1, and a row of packages P is supported and guided in relation to the belt by a vertical back plate 12, the upper end of which is secured to a frame yoke 13 and a front wall or guide plate 14 secured to frame member 1 and having an upwardly divergent package guiding face 15.

The feed mechanism of the present invenaion is built on and around a frame comprising side plates 18, secured to frame member 1 and properly connected and spaced apart by suitable means including a cross rod 19. The side plates 18 support a table 20 and vertical guide rails 21, located near the sides of the table. The outer end of the feed mechanism frame may be supported by adjustable legs 22 secured to the table or to the guide rails 21, and the table may extend to a point more or less remote from the stamping machine, in accordance with the manner in which the packages are to be supplied. The variable length of the table is sufficiently indicated by a portion broken away at 23. The conveyor of the present feed mechanism is in the form of a continuous belt 26, the upper stretch of which runs over the table 20. The belt is supported by a drive pulley 27 at its delivery end and an idler pulley 28 at its outer end. Pulley 27 is carried by a shaft 29, mounted in bearings in side plates 18, and is driven by sprockets and a chain 32 from a shaft 34 supported in frame brackets 35. Shaft 34 is continuously driven by bevel gears 37 from a shaft 38, which is in the present instance a part of the stamping machine, and is driven by sprockets and a chain 40, or some other operative part of the stamping machine, not here shown. The idler pulley or belt roll 28 is carried by shaft 42 mounted in bearing arms 43 secured to the outer end of the table, and these arms may be made adjustable by a slot and bolt connection, as at 44, for the proper tightening of the belt.

The table 20 is interrupted above the belt pulley 27 and a portion 46 of the table extends beyond the belt toward package discharge position and is provided with slots 47 accommodating curved package stop blades 49. One end of each of these blades is pivotally connected at 50 to a tilting frame 51, pivotally connected at 52 to arms 53, fixed on a rock shaft 54. The tilting frame carries a plate 55, the lower end of which is movable adjacent to a package supporting flange or ledge 57 operatively integral with arms 53. The tilting frame 51 is provided with a lug 59 engaging a stop pin 60 on one of the arms 53 to limit the tilting movement in one direction.

To oscillate the package handling unit, comprising blades 49, tilting frames 51, arms 53 and the package flange 57, rock shaft 54 is provided with a pinion 62 engaged by a vertically movable rack 63, supported by suitable guides 64, and the rack bar is connected by a link 66 to one arm of a lever 68, fulcrumed at 70, and provided with a cam roller 71 engaging a cam groove 73 in a circular cam body 75, fixed on shaft 38. The cam groove 73 is contoured, and shaft 38 is driven, so that the rock shaft 54 is oscillated to and fro during each cycle of the stamping machine conveyor 4.

The curved blades 49 pass between guide bars or rollers 77, and the blades are provided with hooked ends 78 to engage one of the bars, to control the tilting of frames 51.

A portion 80 of table 20 extends beyond the package tilting position, indicated approximately by the position of shaft 54, and at the inward end of table portion 80 is a tilting package shelf 82 urged normally to upper horizontal position by a spring 83.

Anterior to the package tilting position, the rows of packages pass beneath a transverse guide plate 85, having an upwardly curved edge 86, and in advance of this guide plate is a package engaging roll 88 carried by arms 89 pivotally connected to guide rails 21. The downward movement of the roll 88 is limited by stops 90 connected to arms 89 and arranged to engage the upper edges of guide rails 21.

Adjacent to the package turning or tilting position package guide strips 92 are located, having downwardly curved or arcuate ends 93. These strips are connected to a cross piece 95, which is pivotally connected at 96 to a bracket 97, on one of the guide rails 21, and the other end of the cross piece is secured detachably, for instance, by a swing bolt 99, to the other guide rail 21, so that the cross piece 95, with the connected guide strips 92, may be disconnected and swung away to give access to the packages

between the tilting posititon and the discharge position. Connected to guide strips 92 are spring clips 100 arranged to bear upon the upper ends of the packages and retain them in position and at the same time to properly retain flaps which are sometimes formed at the upper ends of the packages, notably in the case of pouch packages.

A feed plunger 102 is arranged at the package discharge position. This plunger is carried by vertical rods 103 arranged to slide in sleeve 104 and 105 in frame yoke 13. The lower ends of the sleeves are adjustably connected to a cross piece 107, provided with a horizontal channel 108, in which engages a roller 109 carried by a crank arm 110, connected to the rearward end of shaft 38. In this way the discharge plunger is moved down and then returned at each rotation of shaft 38, that is, in each cycle of the machine. The rear plate 12, previously mentioned, is vertically slotted to provide for the connection of the plunger 102 to rods 103. The plunger has an outer vertical or package confronting face 114 and a horizontal package top engaging face 116. It is desirable to provide means for moving the plunger 102 independent of the movement of its driving rods 103. For this purpose the plunger may be connected to one of the rods by a handle 120, which acts at the same time as a spring operated plunger, urged into engagement with a notch or socket provided in the adjacent rod 103. Normally the inward end of the handle plunger is in engagement with the socket, and the discharge plunger 102 is thus connected to move properly in the normal cycle of operations. But by pulling out the handle the plunger or head 102 may be released and moved down independently to eject a row of packages or it may be similarly released and held up while the machine is in operation to prevent package feed to the stamping machine conveyor belt. Also when the plunger is depressed it may in this manner be released and raised to give access to a row of packages for the purpose of removing packages which may have become displaced or damaged.

The package supply conveyor 26, as previously indicated, may be of considerable length, and in fact, may, when necessary, extend twenty or thirty feet or more away from the stamping machine, and in such a case will usually extend past the discharge points of a plurality of packaging or wrapping machine from which the packages are discharged upon the conveyor, either in orderly rows or columns, by mechanism which does not form a part of the present invention, or they may be arranged to a greater or less extent by hand operations. In other cases, the supply conveyor 26 may be considerably shorter and packages may be placed upon it by the use of trays, or a vertical package hopper may be placed over the conveyor, and the packages discharged from this wrapper automatically in rows. By whatever means the packages are supplied to the conveyor, at some point considerably in advance of the package stop and the guide strips 49, the upper stretch of the conveyor carries a plurality of rows of packages P, as sufficiently indicated in Figs. 1 and 4. In the present case there are five packages in each row, arranged horizontally or with one broad side down upon the belt, and the open ends of the pouch packages are arranged toward the rear. This grouping of packages agrees with the design of this particular stamping machine in which a group or row of five packages is to be positioned and stamped simultaneously. Evidently other numbers of packages may be provided for in each row, as may be necessary or desirable within reasonable limits. Several rows of packages are consolidated or brought together by the movement of the belt and in the position of parts shown in Fig. 1, the foremost package row is in contact with the stop strips 49. Package advance is thus prevented and the feed belt slides frictionally below the packages. Any humping or dislocation of the packages adjacent to the foremost row is prevented by the guard or guide plate 85 and also by the guide roller 88. The arms 53 are now oscillated by movement of rock shaft 54, impelled by the rack 63. Package stop strips 49 move toward the left and downward between the guide rods 77 and presently the plate 55 is brought to horizontal position, as shown in Fig. 2, flush with the package table surface. The frictional impulse of the feed belt now moves the package rows forward until the forward ends of the foremost row encounter ledge 57, which is now in vertical position. Further package advance is then prevented, and the rock shaft 54 is soon oscillated in a clockwise direction and the package row lying on plate 55 is moved in an arcuate path until the packages stand upright, and at about this time the hooked ends 78 of strips 49 engage one of the guide rods 77; further movement of the upper end of the tilting frame 51 is prevented and the lower end of plate 55 is moved to the rear, pressing the bases of the packages forward so that the package row is located in the rearmost position of the several rows resting on table portion 80, Fig. 1. In their turning or tilting movement the packages are guided by the strips 92 and in final position on table surface 80 the package ends are engaged by the spring clips 100, as previously described. Each operation of the package tilting mechanism advances a row of packages onto the tilting shelf 82, with

their upper ends below the plunger 102, which is at this moment in elevated position. The plunger is then depressed and forces the foremost row of packages down along the surface of guide plate 12, the shelf 82 tilting downward to permit the packages to descend. The row of packages is thus placed upon conveyor belt 4, just ahead of one of the pushers blades 5, the belt 4 being at this time stationary. During its descending movement the vertical face 114 of the plunger slides along in contact with the vertical broad faces of the advance row of packages, remaining on table surface 80. The head is then again elevated, conveyor 4 moves forward, and the operations are repeated indefinitely.

What we claim is:—

1. Package or article feed mechanism, comprising a conveyor belt adapted to frictionally advance a row of packages, means for stopping a package row, means for repositioning a package row, and means for discharging a repositioned package row.

2. Package or article feed mechanism, comprising a conveyor belt adapted to frictionally advance a series of rows of packages, means for stopping the packages, means for tilting successive package rows, and means for discharging successive foremost repositioned package rows.

3. Package or article feed mechanism, comprising a feed belt adapted to hold and frictionally advance a plurality of rows of packages, means for checking package advance, means for receiving and turning packages one row at a time to a new position, and means for discharging packages one row at a time in their repositioned relation.

4. Package or article feed mechanism, comprising a feed belt adapted to hold and frictionally advance a plurality of rows of packages, means for checking package advance, means for receiving and turning packages one row at a time to a new position, means for supporting one or more rows of repositioned packages, and means for discharging packages one row at a time in their repositioned relation.

5. Package or article feed mechanism, comprising a feed belt adapted to support and frictionally advance packages arranged horizontally in a plurality of contacting rows, tilting mechanism adapted to receive an advanced row of packages and move it to substantially vertical position, means for receiving and retaining a vertically positioned package row, and means for discharging a package row substantially in package length direction.

6. Package or article feed mechanism, comprising a feed belt adapted to support and frictionally advance packages arranged horizontally in a plurality of contact rows, tilting mechanism adapted to receive an advanced row of packages and rotate it to substantially vertical position, means for receiving and retaining one or more vertically positioned package rows, means for retarding the package rows upon the conveyor during the row turning operation, means for yieldably supporting the foremost vertically positioned package row, and means for discharging the foremost row substantially in package length direction.

7. Package or article feed mechanism, comprising a feed belt adapted to support and frictionally advance packages arranged horizontally in a plurality of contacting rows, tilting mechanism adapted to receive an advanced row of packages and move it to substantially vertical position, means for receiving and retaining a vertically positioned package row, a discharge plunger arranged to engage the upper ends of packages of the foremost vertically positioned row, and means for moving the plunger to eject said row in substantially package-endwise direction.

8. Package or article feed mechanism, comprising a feed belt adapted to support and frictionally advance packages arranged horizontally in a plurality of contacting rows, tilting mechanism adapted to receive an advanced row of packages and rotate it to substantially vertical position, means for receiving and retaining one or more vertically positioned package rows, means for retarding the package rows upon the conveyor during the row turning operation, means for yieldably supporting the foremost vertically positioned package row, a discharge plunger arranged to engage the upper ends of packages of the foremost vertically positioned row, and means for moving the plunger to eject said row in substantially package-endwise direction.

9. In package and article feed mechanism, the combination with a feed belt, a table, and package discharge means, of package turning mechanism comprising an oscillating member, a package carrying plate thereon, a package supporting ledge, and a package stop member.

10. In package and article feed mechanism, the combination with a feed belt adapted to advance a plurality of rows of horizontally arranged packages, a table, and package-row discharge means, of package turning mechanism comprising an oscillating member, a package carrying plate, and a package supporting ledge thereon adapted to receive a row of packages and move it to substantially upright or vertical position.

11. In package and article feed mechanism, the combination with a feed belt, a table, and package discharge means, of an oscillating frame, means for oscillating the frame, and a tilting frame connected to the

oscillating frame and comprising a package receiving plate, a substantially arcuate package stop strip, and means cooperating with the guide strip to tilt the tilting frame toward the end of the movement of the oscillating frame.

12. In package and article feed mechanism, the combination with a feed belt, a table, and package discharge means, of an oscillating frame, a package-supporting ledge thereon, means for oscillating the frame, and a tilting frame connected to the oscillating frame and comprising a package receiving plate, a substantially arcuate package stop strip, and means cooperating with the guide strip to tilt the tilting frame toward the end of the movement of the oscillating frame.

13. Package feed mechanism comprising a feed belt for advancing packages in substantially horizontal position, a table to receive packages in substantially vertical position, means for moving packages advanced horizontally and delivering them to the table in vertical position, and means for guiding packages in their approach to vertical position.

14. Package feed mechanism comprising a feed belt for advancing rows of packages in substantially horizontal position, a table to receive package rows in substantially vertical position, means for moving package rows advanced horizontally and delivering them to the table in vertical position, and means for guiding package rows in their approach to vertical position.

15. Package feed mechanism comprising a feed belt for advancing packages in substantially horizontal position, a table to receive packages in substantially vertical position, means for moving packages advanced horizontally and delivering them to the table in vertical position, means for guiding packages in their approach to vertical position, and means for yieldably engaging and retaining packages in vertical position on the table.

16. Package feed mechanism comprising a feed belt for advancing rows of packages in substantially horizontal position, a table to receive package rows in substantially vertical position, means for moving package rows advanced horizontally and delivering them to the table in vertical position, means for guiding package rows in their approach to vertical position, and means for yieldably engaging and retaining package rows.

17. Package feed mechanism comprising a feed belt for advancing packages in substantially horizontal position, a table to receive packages in substantially vertical position, means for moving packages advanced horizontally and delivering them to the table in vertical position, means at the discharge end of the table for yieldably supporting packages, and a discharge plunger arranged to engage packages in position on said yielding support and discharge them with accompanying yielding movement of the support.

18. Package feed mechanism comprising a feed belt for advancing rows of packages in substantially horizontal position, a table to receive package rows in substantially vertical position, means for moving package rows advanced horizontally and delivering them to the table in vertical position, means at the discharge end of the table for yieldably supporting a package row, a discharge plunger arranged to engage packages in position on said yielding support and discharge them with accompanying yielding movement of the support.

19. Package feed mechanism comprising means for advancing packages, a package discharge plunger, means for reciprocating the plunger, and means for releasably connecting the plunger to the reciprocating means.

20. Package feed mechanism comprising means for advancing rows of packages, a package row discharge plunger, means for reciprocating the plunger, and spring-retained means for releasably connecting the plunger to the reciprocating means.

21. Package feed mechanism comprising a conveyor advancing a succession of packages in contact, means for checking the packages, and means adjacent to the checking means for preventing buckling or displacement of packages on the conveyor.

22. In package and article handling mechanism, the combination with a machine in which packages are advanced on a conveyor in groups, each group consisting of a row of upright packages, of means for supplying packages to said conveyor in proper arrangement, comprising means for advancing packages in substantially horizontal position and in rows, each row containing a number of packages corresponding to one of the conveyor groups, means for moving the package rows successively to upright position, and means for placing successive upright package rows upon the machine conveyor.

23. In package and article handling mechanism, the combination with a machine in which packages are advanced on an intermittently moving conveyor in groups, each group consisting of a row of upright packages, of means for supplying packages to said conveyor in proper arrangement and at proper intervals comprising means for advancing packages in substantially horizontal position and in a plurality of contacting rows, each row containing a number of packages corresponding to one of the conveyor groups, means for moving the package rows successively to upright position, and means

for placing successive upright package rows upon the machine conveyor.

24. The combination with a package labeling machine of the class described including a package conveyor, of a feed belt extending a distance from said conveyor and adapted to frictionally support and advance a plurality of rows of packages in substantially horizontal position, means for rotating single package rows successively to substantially upright position, means for retaining one or more package rows in upright position and advancing them by the positioning of successive rows, and means for delivering the successive foremost rows upon the labeling machine conveyor.

25. The combination with a package labeling machine of the class described including an intermittently movable package conveyor, of a feed belt extending a greater or less distance from said conveyor and adapted to frictionally support and advance a plurality of rows of packages in substantially horizontal position, means for retarding the packages and rotating single rows successively to substantially upright position, means for retaining a plurality of package rows in upright position and advancing them by the positioning of sucres sive rows, means for yieldably supporting the foremost upright row, and means for discharging the successive foremost rows downward upon the labeling machine conveyor during its periods of rest.

26. Package supply mechanism devised as an attachment for a package labeling machine in which successive groups of packages are placed upon a carrier and advanced for labeling, the packages being arranged in a row in groups in substantially upright position with an equal number of packages in each group, said supply mechanism comprising a frame adapted for connection to said labeling machine, a feed belt arranged to advance continuously toward the labeling machine conveyor and adapted to support a plurality of rows of packages in horizontal position, each package row corresponding to the package grouping of said labeling machine, means for turning package rows advanced successively by said belt to substantially upright position, and means for discharging the rows successively in upright position to the labeling machine conveyor.

27. Package supply mechanism devised as an attachment for a package labeling machine in which successive groups of packages are placed upon a carrier and intermittently advanced for labeling, the packages being arranged in a row and groups in substantially upright position with an equal number of packages in each group, said supply mechanism comprising a frame adapted for connection to said labeling machine, a feed belt arranged to advance continuously toward the labeling machine conveyor and adapted to support a plurality of rows of packages in horizontal position, each package row corresponding to the package grouping of said labeling machine, means for turning package rows advanced successively by said belt to substantially upright position, means for further advancing the package rows, and means for discharging the rows successively in upright position to the labeling machine conveyor during its periods of rest.

Signed at Philiadelphia in the county of Philadelphia and State of Pennsylvania this 25th day of Feb. A. D., 1922.

CHARLES H. NITSCH.
WILLIAM A. WEIGHTMAN.