Dec. 24, 1935. J. E. MEYER 2,025,119

DELIVERY MECHANISM FOR PRINTING MACHINES

Filed July 14, 1933 3 Sheets-Sheet 1

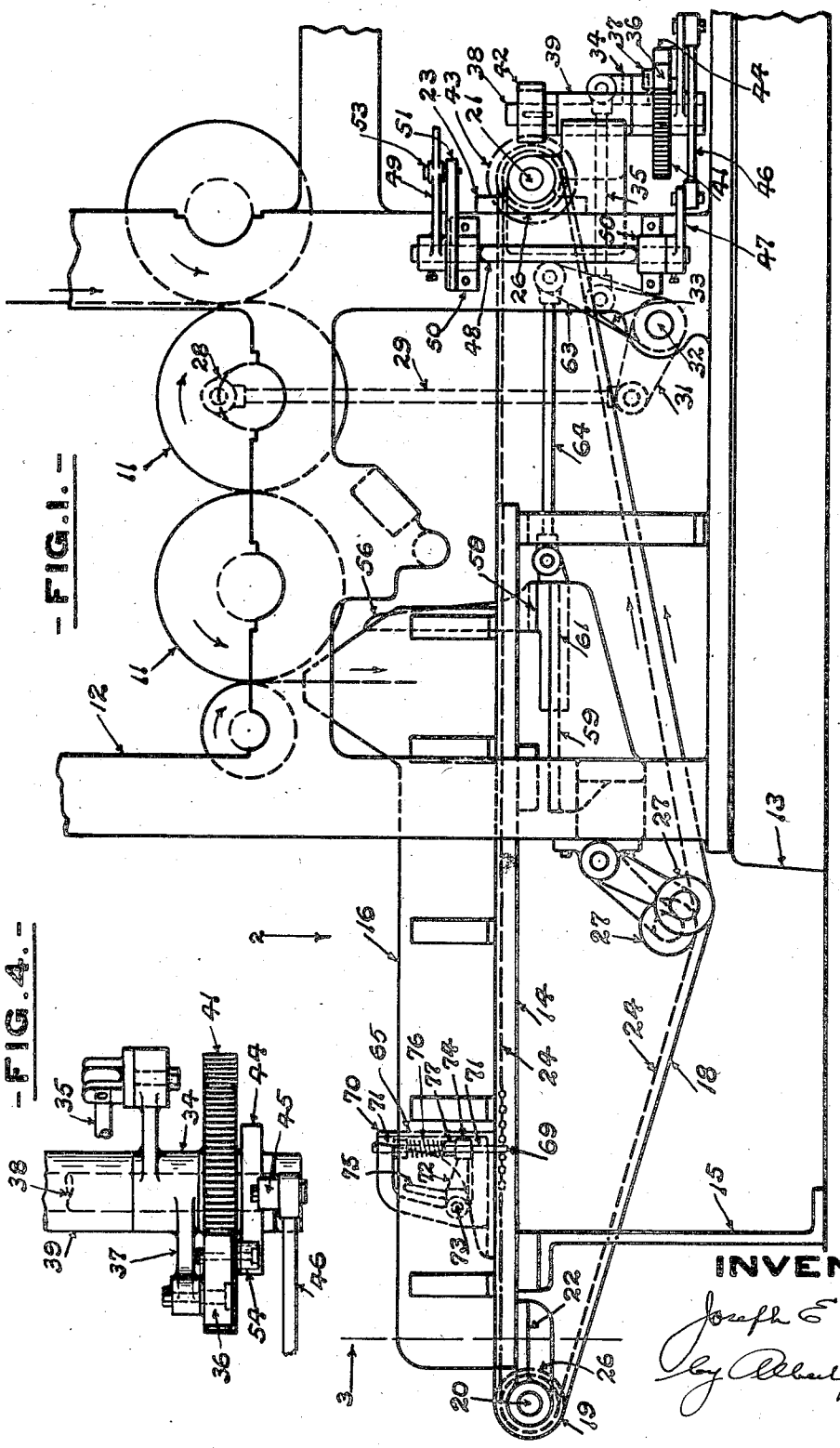


FIG. 1.

FIG. 4.

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DELIVERY MECHANISM FOR PRINTING MACHINES

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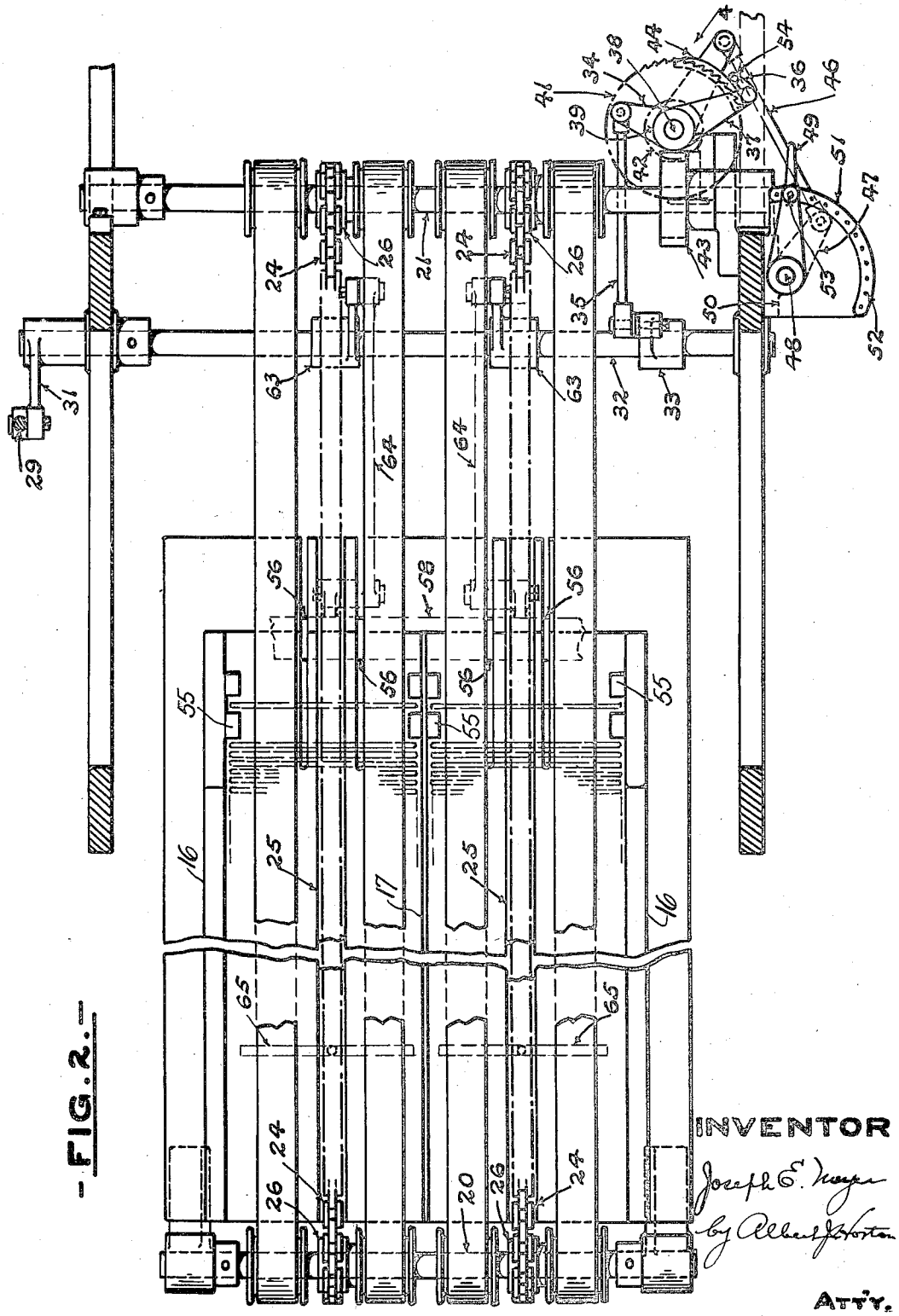


FIG. 2.

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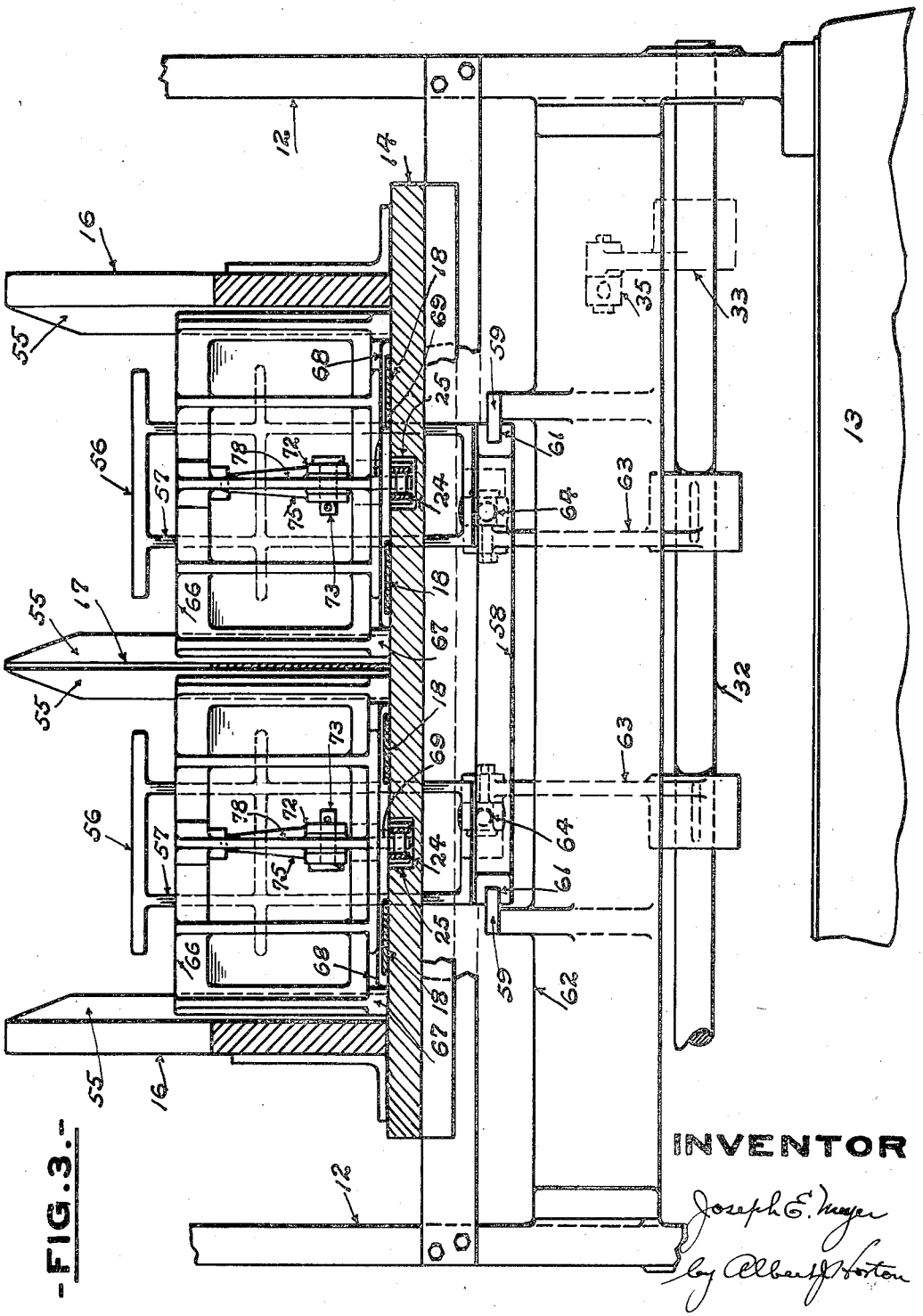


FIG. 3.

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DELIVERY MECHANISM FOR PRINTING MACHINES

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Application July 14, 1933, Serial No. 680,395

10 Claims. (Cl. 271—87)

This invention relates to a packer box delivery mechanism for printing machines and particularly to a power driven back stop which is movable with the product carrying conveyor, and to an improved means for actuating said conveyor.

According to former methods of actuating the delivery mechanism under conditions similar to those of this invention, the practice has been to advance the products released from a printing machine folder by means of a pusher and, by this same force, advance a back stop, against which the products abut. This meant that the load on the pusher would be increased as the number of products increased.

It is therefore one object of this invention to provide means whereby the back stop is driven with a product carrying conveyor and to permit said back stop to be removed and adjusted to any desired position with respect to the conveyor.

A further object is to provide an improved mechanism whereby the product carrying conveyor is moved intermittently and is also adapted to be adjusted to move any desirable distance within the limits of the adjustment.

According to the structure of this invention, the back stop is adapted to engage a driven chain and to be moved along thereby, which chain is also used to drive the product carrying conveyor. By means of a manually operated releasing member, the said back stop is also adapted to be positioned at any desirable location along said chain. The chain and conveyor are moved intermittently, and a pusher member for initially advancing each product is given a reciprocating motion. The stroke of said pusher is preferably fixed, while the movement of the chain is adapted to be varied.

It is thus possible, by means of this arrangement, to advance each product a certain fixed distance by the pusher member, such that each product is forced into engagement with its preceding product and the whole forced against the back stop. The back stop will take the thrust of said pusher through the products but since it is adapted to be moved with the conveyor the force will always remain the same for each stroke of the pusher.

With the above and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be fully described in connection with the accompanying drawings and the novel parts pointed out in the claims hereunto annexed.

In the drawings which show a preferred embodiment of the invention:

Figure 1 is a side elevation, with parts broken away, of the structure relating to the delivery mechanism;

Figure 2 is a plan view of the structure shown in Figure 1, taken in the direction of the arrow 2, with parts broken away and parts in section;

Figure 3 is an enlarged view, partly in section, taken along the line indicated by the arrow 3 of Figure 1, with parts broken away; and

Figure 4 is an enlarged detail in elevation, taken in the direction of the arrow indicated at 4, in Figure 2, showing the pawl and ratchet mechanism.

In the construction illustrated in Figure 1, a portion of the folding mechanism of a printing machine is shown, which comprises folding cylinders 11 mounted in frames 12, said frames being supported on a base 13.

A bed plate 14, located below said cylinders 11, is suitably supported on legs 15 and has side walls 16 and a central partition 17 thereon. Conveyor belts 18 ride over the surface of the bed plate 14 and over pulleys 19 mounted on the driven shaft 20 and the drive shaft 21, said shafts are supported by brackets 22, secured to one end of the bed plate 14 and brackets 23 secured to the frames 12 respectively. Sprocket chains 24 move in grooves 25 in the bed plate 14, between the belts 18, and over sprockets 26 mounted on the shafts 20, 21. Suitable means is provided to take up the slack in both the conveyor belts and the sprocket chains, such as rollers on swinging arms indicated at 27 in Figure 1. The pulleys 19 and sprockets 26 on the driven shaft 20 are fixed thereto, while on the drive shaft 21, the pulleys run freely and the sprockets are fixed thereon.

The drive for the conveyors and chains is provided through a crank movement taken off one of the folding cylinder shafts by means of a crank 28 and a connecting rod 29, which connects said crank 28 with a rocker lever 31, fixed to a rock shaft 32.

The rock shaft 32 has a lever 33 secured thereto, which is connected with a bell crank lever 34, by means of a link 35. Said bell crank 34 is freely mounted on a vertical shaft 38, suitably supported by means of a bearing 39, and has a pawl 36 mounted on another arm 37 extending therefrom. A ratchet wheel 41 is keyed to the shaft 38 and is adapted to be rotated when engaged by the pawl 36, on the forward movement of the arm 37. Also keyed to said shaft 38 is a worm

42, which meshes with a worm gear 43, keyed to the chain drive shaft 21.

Each rocking movement of the levers 31, actuated by the movement of crank levers 28, will rock the bell crank 34 and pawl 36 thereon. Said pawl will engage the ratchet to give same and the shaft 38, a partial rotation and thereby drive the shaft 21, through the worm 42 and worm gear 43, thus providing an intermittent motion for the conveyor belts 18 and the chain 24.

Means has also been provided to vary the movement of the conveyor belts and chain, which comprises a cam shoe 44, mounted below the ratchet 41 on a lever 45, which lever is freely movable on the shaft and is connected by means of a link 46 to an adjusting lever 47. Said adjusting lever 47 is fixed to the lower end of a shaft 48 mounted in bearings 50, on one of the frames 12. A plate 51 has radially spaced holes 52 within same and the hand lever 49 fixed to the upper end of the shaft 48, has a pin 53 projecting therefrom, which pin is adapted to engage one of the holes 52 to determine the position of the cam shoe 44.

Said cam shoe 44 projects beyond the end of the ratchet wheel 41 and is adapted to be engaged by a roller 54 on the pawl 36 during a portion of the forward stroke of said pawl to hold same clear of the ratchet teeth. When said cam shoe 44 is positioned as shown in Figure 2, the pawl will not engage the ratchet teeth until the roller moves off the cam which, as shown, will only become engaged with the teeth at a short distance from the end. The ratchet wheel and the parts cooperating therewith are thus moved a relatively short distance during each forward movement of the pawl which movement is repeated for each revolution of the crank 28, thereby causing the conveyor and chain to be moved intermittently.

As each product is released from the folding cylinders it drops between side guides 55 secured to the walls 16 and partition 17, the said guides forming a groove or pocket for same, and although said products actually rest upon the moving conveyor belts, they are not moved thereby until released from their position between the said guides 55.

A pusher member 56 is used to force each product from its position between the guides 55 and also to advance same until each engages the preceding product.

The pusher comprises a ribbed structure 57, having a base 58 extending therefrom and is adapted to slide over ways 59, which engage grooves 61 in the base 58. Said ways 59 are secured to a bracket 62, which is mounted between the frames 12. Two pusher actuating levers 63—63 are secured to the rock shaft 32, and are connected to the pusher by means of connecting links 64.

Upon each movement of the rock shaft 32, the levers 63 will be rocked and cause the pusher 56 to be reciprocated a fixed distance over the ways 59. In its forward movement it will engage the products which were deposited between the guides 55 and will release and advance same to a position directly behind the previously advanced products, or if they happen to be the first of the products, the same will be advanced to a position directly behind the back stops 65 which will now be described.

Said back stops 65 comprise, a support or frame structure 66, having a base 67 which is adapted to slide freely upon the bed plate 14, and also having a recess 68 in said base, which will clear the conveyor belts 18. A flat facing 70 secured to the support 66, provides an abutment for the products to be forced against.

Means is also provided to connect said back stop with the chain 24, to permit same to be driven therby. Said means comprises a plunger pin 69, slidably mounted in bearings 71, in the support 66, which pin projects below the support and is adapted to engage the chain 24. A manually operated lever 72 is pivotally mounted on said support at 73 one end of which engages the plunger at 74, and another upwardly projecting end provides an operating handle 75. A spring 76 is placed over the plunger pin 69 and is compressed between the upper bearing 71 and a collar 77 secured to the plunger directly above the end 74 of the lever 72.

According to this construction, the said back stop 65 is normally set in driving relation with its chain 24, through the engagement of the plunger pin 69 with said chain, and is adapted to be adjusted to any desired position along said chain by grasping the handle 75 of the lever 72 and moving same backward, to cause the collar 77, on the plunger pin 69, to be raised against the pressure of the spring 76, and thereby disengage the plunger from the chain. It is also possible to lift the back stop 65 from the bed plate 14 at the same time the plunger pin is actuated, due to the position of the handle 75 which is directly in front of one rib 78 on the support 66.

It will thus be observed that with the combined motions of the pusher and the chain, the products, upon release from the folding cylinders, will first be advanced from their position between the guides 55, to a position directly behind the back stop 65 and that this movement is still in progress while the conveyor 18 and back stops are in motion. The movement of the pusher at the time the back stops are moved by the chains is at substantially the same speed as that of the back stops, therefore, there is no additional load on the pusher.

With the above said feature and the means of adjustment and drive for the chains and conveyors, it will be seen that the operation of delivery mechanisms of this character has been considerably improved without involving any complicated mechanism.

While the invention has been shown and described in its preferred form, it will be understood that certain changes and variations may be made in the specific structure provided for carrying out the invention without however departing from the spirit thereof as defined in the appended claims.

What I claim is:

1. In a packer box delivery mechanism for a printing machine, a conveyor adapted to support delivered products, a stop means arranged to engage one face of each product to prevent the movement of each product momentarily, means adapted to press the opposite face of each product to advance the product beyond the stop means, and abutment means for said products movable with the conveyor, said abutment means having a manually operable locking mechanism, whereby it may be secured to the conveyor.

2. In a packer box delivery mechanism for a printing machine, a conveyor adapted to support delivered products, a sprocket chain connected in driving relaton with said conveyor and a back stop adjustably connected to said chain, a pusher

plate, means for reciprocating said pusher plate to initially advance each delivered product, means for intermittently driving said chain, and locking mechanism movable relatively to said back stop whereby it may be operatively connected to the conveyor.

3. A back stop for use with a conveyor drive of a packer box delivery mechanism for a printing machine, comprising a support, a plunger pin normally projecting from said support and adapted to engage the conveyor drive, and means for retracting said pin, whereby said support is made movable with the conveyor and is adapted to be disposed in any desired position on the conveyor drive.

4. A back stop for use with a conveyor drive of a packer box delivery mechanism for a printing machine, comprising a support slidable upon a conveyor bed plate, a spring pressed plunger pin projecting from said support and engaging the conveyor drive, and a lever adapted to be grasped to retract said plunger and remove the support from said conveyor drive.

5. The combination with a belt conveyor and a chain drive for said conveyor, of a back stop mounted in driving relation with said chain to provide an abutment for products carried on the conveyor, and means on said back stop for adjusting the position thereof on said chain.

6. The combination with a belt conveyor and a chain drive for said conveyor, of a back stop mounted above said chain, a spring pressed plunger projecting from said back stop and engaging said chain, and means for retracting said plunger to adjust said back stop along said chain.

7. The combination with a belt conveyor and chain drive for said conveyor, of a back stop mounted in driving relation with said chain and adapted to provide an abutment for products carried on the conveyor, said back stop having a handle and a latch mechanism, whereby the back stop may be adjustably connected to the conveyor.

8. The combination with a belt conveyor and chain drive for said conveyor, of a back stop mounted on said chain, said back stop having a handle and a manully operable spring pressed latch, whereby the back stop may be freed from the chain and adjusted relatively thereto.

9. In a delivery mechanism for a printing machine, a conveyor adapted to support delivered products, a stop adapted to engage each product as delivered and prevent movement thereof momentarily, means to engage the product and advance it toward and past said stop, abutment means movable with said conveyor, and manually operable locking mechanism on said abutment means to releasably connect it to said conveyor.

10. In a delivery mechanism for a printing machine, a conveyor adapted to support and move delivered products, a chain connected to said conveyor to drive the same, a back stop driven by said chain to move with said conveyor, a product advancing member, means to drive said member to initially advance each delivered product, means to drive said chain, and releasable means on said back stop operable to adjust the same relatively to and along said conveyor.

JOSEPH E. MEYER.