This invention relates to improvements in packer box deliveries for printing machines. The general object of the invention is to provide a packer box delivery which minimizes tendency of the products to rise up or become otherwise disarranged as they progressively move along the packer box. Another object of the invention is to provide means for positively holding the products in vertical position, while also preventing undesired movement thereof horizontally.

A packer box delivery embodying the invention in a preferred form will now first be described with reference to the accompanying drawings, and the features forming the invention will then be pointed out in the appended claims.

In the drawings:

FIG. 1 is a view partly in side elevation and partly in section of the packer box delivery of the invention;

FIG. 2 is a front elevation view of the pusher element of the delivery;

FIG. 3 is a plan view of this element and associated parts; and

FIG. 4 is an enlarged side elevation view with parts broken away, showing the drive mechanism for the various elements involved in the moving of the successive products as received.

In FIG. 1 there is indicated schematically at 10 a delivery cylinder, together with belts 11 from which the products are discharged downwardly along the path 12 into the packer box. The box comprises a rigid floor 13 and side walls 14 secured thereto, with which are associated a yielable back-up member 15, against which a stack of products P is periodically pushed by a pusher indicated generally at 16. The pusher face 17 is convexitly arched as shown in FIG. 3, and is perforated to prevent trapping of air, as indicated at 18 in FIG. 2. Each of the side walls 14 carries a knife 20 past which the products are pushed by the pusher face 17, thus slitting the lower portion of their side edges, and holding them down as they move along the box. The pusher face 17 is formed with projections 21 above and below the knives 20, for backing up the edges of the products to slit them as they are pushed past the knives. Rollers 19 support the pusher.

A set of holding fingers 22 are provided with pins 50 for holding the products in arched shape during the return stroke of the pusher, and the lower edge of the pusher face 17 is recessed as at 23 to permit it to pass these pins. The cooperative action of the elements will be best understood from FIG. 4, in which there is indicated the pusher 16, to which tubular members 25 are secured. These cooperate with guiding bars 26 for movement of the pusher back and forth over the floor 13, between the full line and phantom line positions of the figure. This movement is imparted to the pusher by means of a link or pitman 27 pivoted to a yielable supporting member 28 to 29 and to a bell crank arm 29 at 30. The bell crank is rotatably carried by shaft 31 and has a second arm 32 which is pivotally connected at 33 to a pitman 34, which, in turn, is pivotally connected at 35 to a crank 36, which may conveniently be carried by a shaft 37 of the delivery cylinder 10 itself. On this same shaft, there is a gear 38 which through gearing 39, 40, 41 drives a cam 42. The cam 42 periodically rocks shaft 43 through arm 44 and follower roller 45 carried thereby, thus rocking a series of stop fingers 22 previously referred to and which are carried by this shaft, between a position just below the level of the box bottom and a position where they extend upwardly therefrom, as indicated.

Each operating cycle of the mechanism, starting in the full line position of FIG. 4, involves the dropping of a product in front of the pusher 16, which is then in the retracted position of FIG. 4, and movement of this pusher toward to, and to the phantom line position of that figure, during the course of which the edges of the product are slit on the knives 20 and the product is curved to conform to the arch of the pusher surface 17. Just before the pusher reaches the projection of the path of the stop fingers 22, the roller 45 comes opposite the low point of cam 42, momentarily dropping these fingers out of the way. They then immediately rise, holding the stack together as the pusher 16 is withdrawn. Stop pins 50 are arranged in an arc parallel to the pusher convex face, holding the sheets of the stack in arched position while the pusher is retracted.

What is claimed is:

1. A packer box delivery comprising a horizontal packer box, delivery means for successively dropping products on edge into the box, a horizontally moveable pusher for moving products along the box, a pair of horizontal opposed knife edges mounted in the box in position for engagement by and slitting the edges of a product as the same is pushed by the pusher, whereby the products are held down by the said knife edges and confined to a path of movement parallel to said knife edges, the pusher having a perforated face, convexly curved in a horizontal plane, for engaging the products and pushing the central part thereof ahead of the edges engaged by said knife edges, a plurality of stops, means mounting the stops for movement between an upper position engaging and holding the products and a lower position clear of the path of movement of products, the pusher having notches accommodating the knife edges and stops to permit movement of the pusher past the stops, and means for operating the pusher and stops in timed relation to the delivery means.

2. A packer box delivery comprising a horizontal packer box, delivery means for successively dropping products on edge into the box, a horizontally moveable pusher for moving products along the box, a pair of horizontal opposed knife edges mounted in the box in position for engagement by and slitting the edges of a product as the same is pushed by the pusher, whereby the products are held down by the said knife edges and confined to a path of movement parallel to said knife edges, the pusher having a perforated face, convexly curved in a horizontal plane, for engaging the products and pushing the central part thereof ahead of the edges engaged by said knife edges, a plurality of stops, means mounting the stops for movement between an upper position engaging and holding the products and a lower position clear of the path of movement of products, the pusher having notches accommodating the knife edges and stops to permit movement of the pusher past the stops, and means for operating the pusher and stops in timed relation to the delivery means.

3. A packer box delivery comprising a horizontal packer box, delivery means for successively dropping products on edge into the box, a horizontally moveable pusher for moving products along the box, a pair of horizontal opposed knife edges mounted in the box in pos-
tion for engagement by and slitting the edges of a product as the same is pushed by the pusher, whereby the products are held down by the said knife edges and confined to a path of movement parallel to said knife edges, the pusher having a perforated face, convexly curved in a horizontal plane, for engaging the products and pushing the central part thereof ahead of the edges engaged by said knife edges, a plurality of stops, means mounting the stops for movement between an upper position engaging and holding the products and a lower position clear of the path of movement of products, the pusher having notches accommodating the stops to permit movement of the pusher past the stops and projections above and below the knife edges for backing up a sheet as slit thereby.

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