

May 19, 1931.

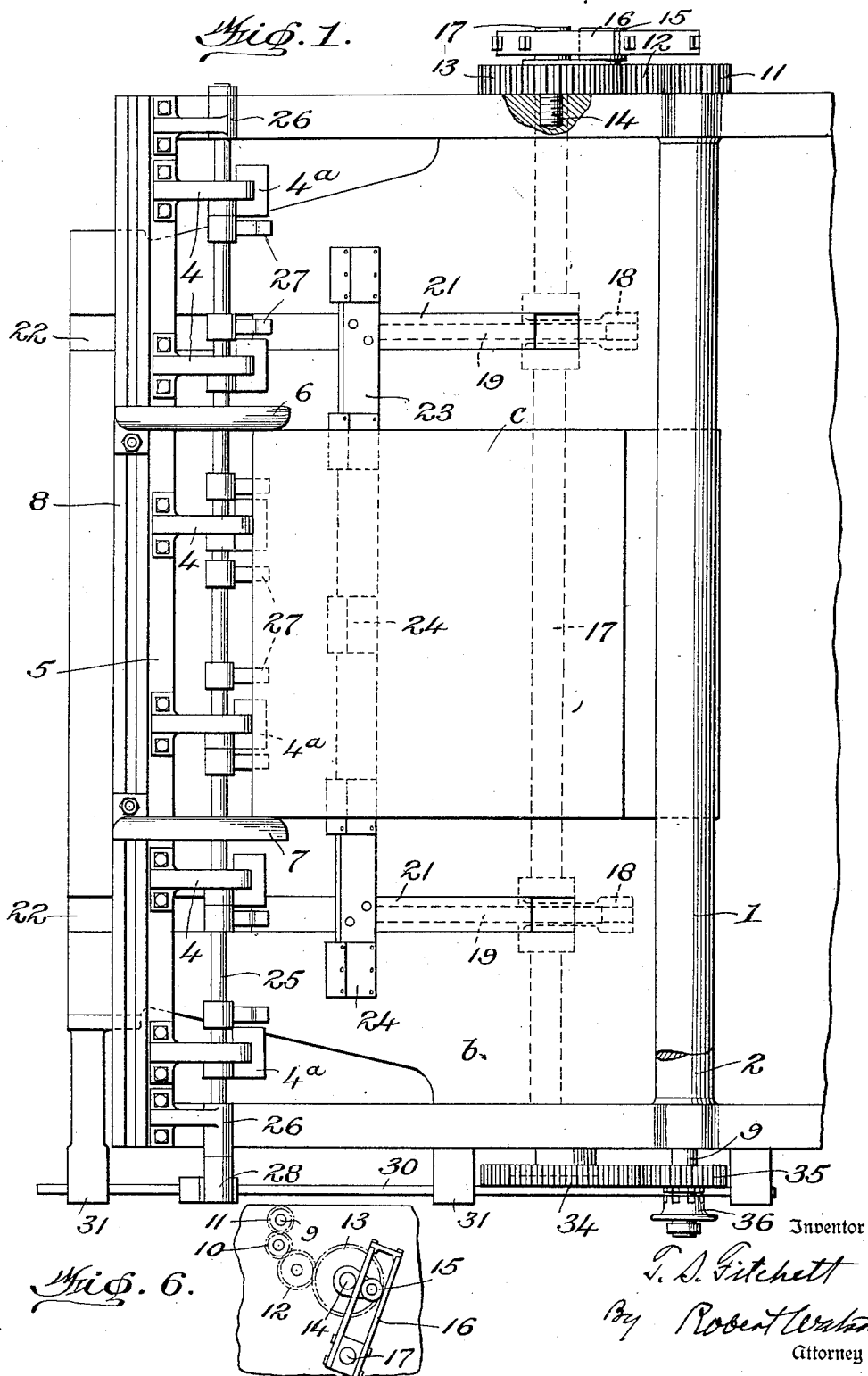
T. S. FITCHETT

1,806,391

SKIP FEED ATTACHMENT FOR SLOTTING AND CREASING MACHINES

Filed May 6, 1929

3 Sheets-Sheet 1



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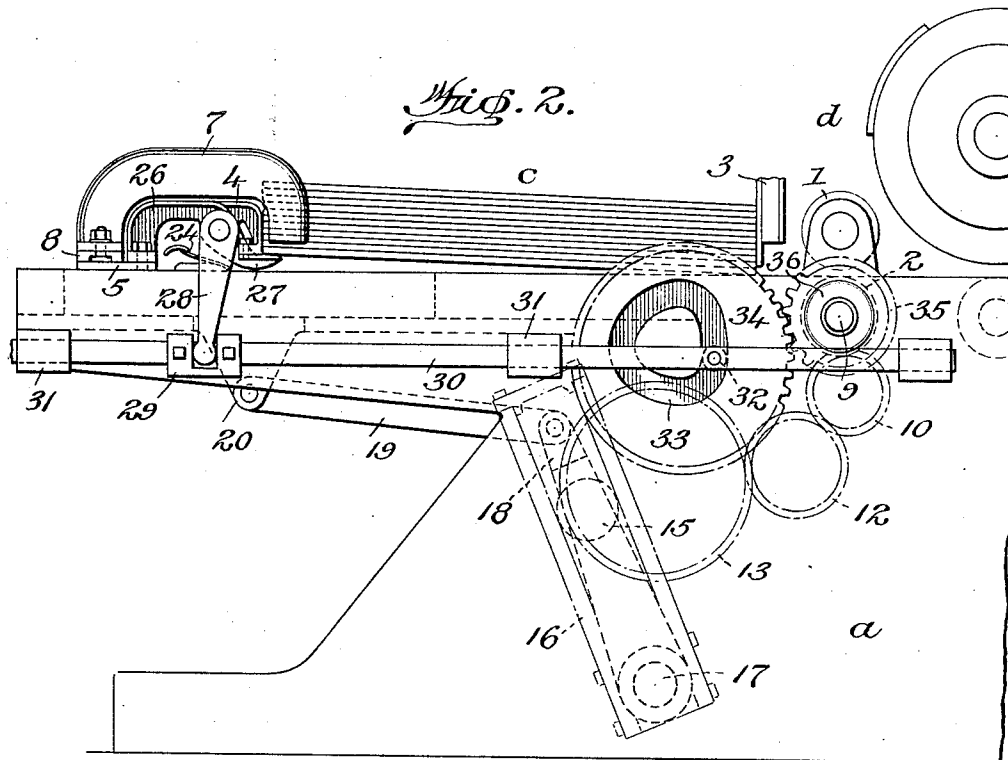
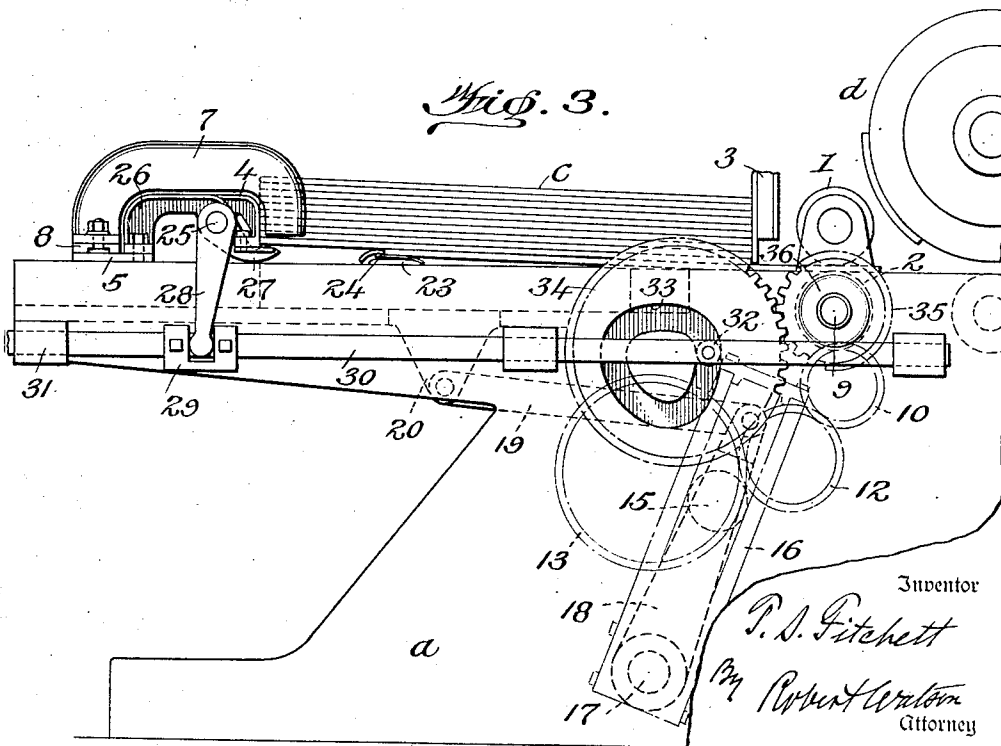
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3 Sheets-Sheet 2



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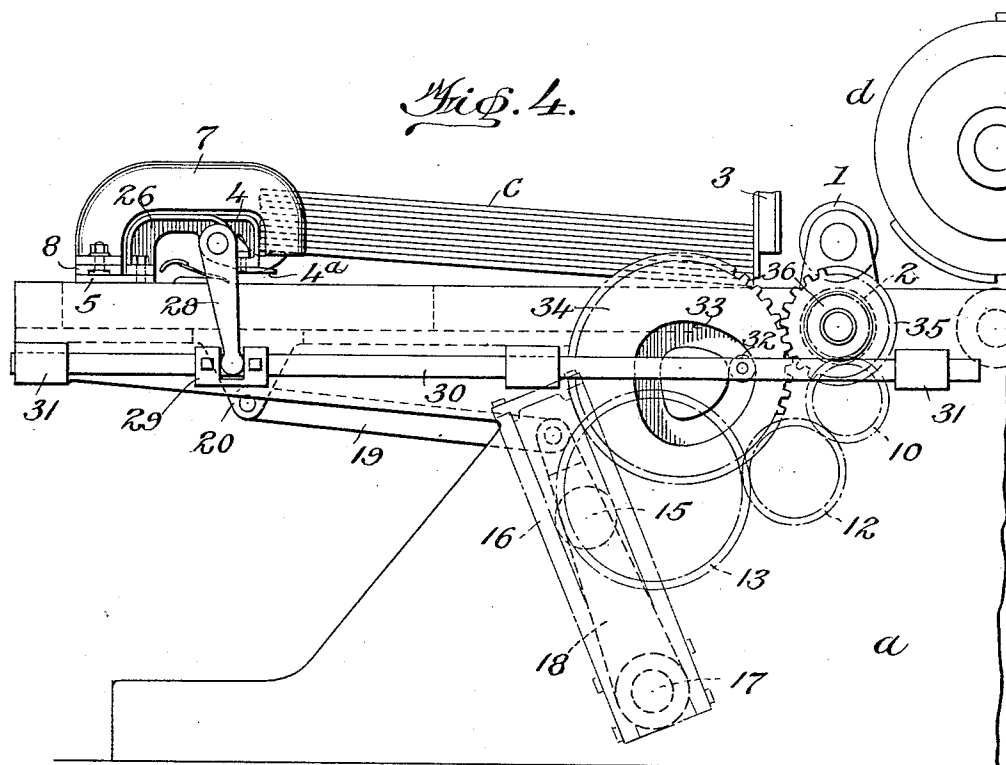
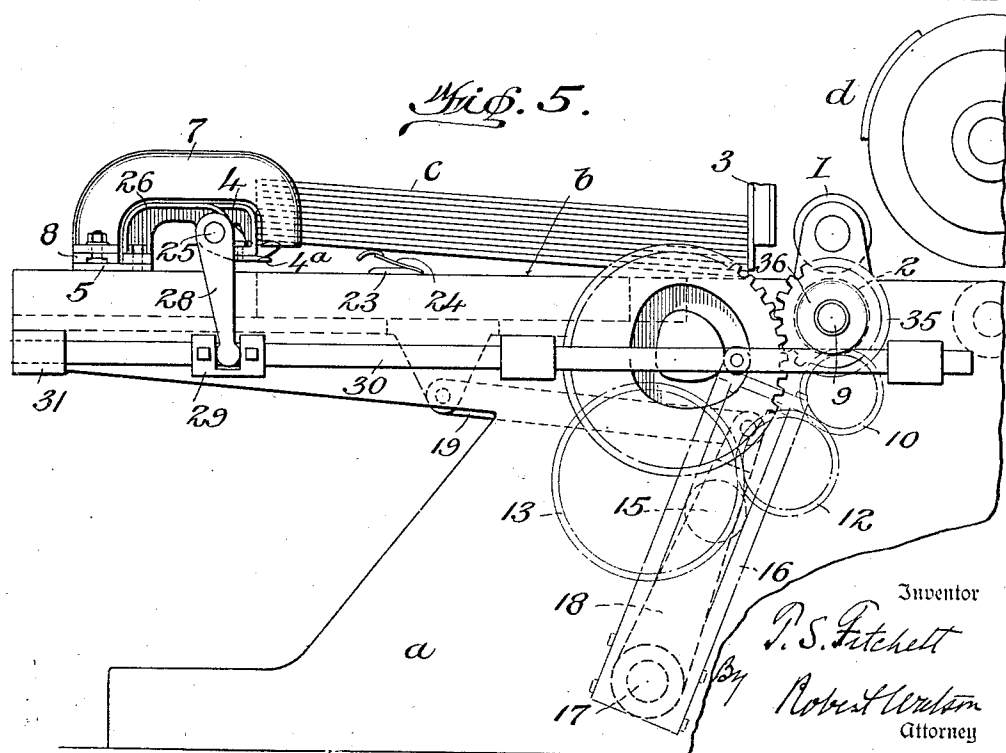
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SKIP FEED ATTACHMENT FOR SLOTTING AND CREASING MACHINES

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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SKIP-FEED ATTACHMENT FOR SLOTTING AND CREASING MACHINES

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In machines for slotting, creasing and printing upon cardboard box blanks, the blanks are usually fed from the bottom of a stack of blanks by feeding means moving in timed relation to the mechanisms which operate upon the blanks, and each blank must be entirely removed from the stack before a succeeding blank can be fed. Hence, the width of the blank longitudinally of the machine is a factor which enters into the design of the machine, and a feeding mechanism, operating at a constant speed, designed to feed relatively narrow blanks in close succession would not be suitable for feeding relatively wide blanks at successive operations of said mechanism.

The purpose of the present invention is to provide an attachment, applicable to machines of this character, for causing the feed mechanism to deliver blanks from the stack only on alternate feeding movements, whereby when the stack is composed of blanks of abnormal width, the interval between the deliveries of the succeeding blanks will be doubled, and each blank will be clear of the stack before a succeeding blank is engaged by the feeding mechanism. This attachment may be thrown into or out of action, as desired, and thus a machine designed for its most efficient operation on blanks of one size, may be used, when occasion requires, for operation on blanks of considerably larger size.

In carrying out the invention, I provide means whereby the feeding mechanism, operating at its usual speed and in timed relation to the slotting mechanism, or other devices which operate upon the blanks, is caused to engage the lowermost blank in the stack only on alternate feeding movements, and, in the embodiment of the invention shown in the drawings, this function is accomplished by mechanism which raises and lowers the rear end of the stack periodically in timed relation to the movements of the feeding devices, so that on the forward stroke of the feeding devices, the latter will engage and move the lowermost blank in the stack, while on the return stroke of said device the rear edge of the lowermost blank will be out of the path

of movement of the feeding device and the latter will not function to feed the blank.

In the accompanying drawings,

Fig. 1 is a top plan view of the feed table of a slotting and creasing machine, a stack of blanks being shown upon the table;

Fig. 2 is a side elevation of the same, showing the mechanism for rocking the shaft carrying the arms which raise and lower one end of the stack, and showing also one of the slotter heads, the stack being shown in its lowered position and the feed bar in its rearmost position;

Fig. 3 is a similar view, showing the feed bar in forward position.

Fig. 4 is a similar view, showing one end of the stack raised and the feed bar in its rearmost position;

Fig. 5 is a similar view, showing the feed bar in its forward position; and,

Fig. 6 is a side elevation, on a smaller scale, of the rocker and gearing for operating the feed bar.

Referring to the drawings, *a* indicates the bed of a machine for slotting and creasing box blanks, *b* indicates the feed table, *c* indicates a stack of cardboard blanks, and *d* indicates one of the slotting heads. Upper and lower pull rollers 1 and 2 are arranged in position to move each blank forward to the slotting mechanism, after it has been delivered to the rollers by a feeding device which feeds the blanks in succession from the bottom of the stack.

The stack of blanks is arranged with one end resting upon the table and against a vertical fixed stop 3, and the opposite end of the stack is supported above the table by supporting arms 4, secured to a cross-bar 5, which latter rests upon the opposite sides of the frame and is adjustable toward and from the fixed stop, by means not shown, to accommodate blanks of different widths. Each arm has a flat foot 4^a upon which the stack may rest and there may be any desired number of arms, to support blanks of different widths, six such arms being shown in the drawings. Guides 6 and 7 are adjustably mounted in a guide bar 8, extending transversely of the machine, and these guides are

adapted to engage the sides of the stack to hold the blanks in alinement.

The shaft 9 of the lower feed roller constitutes the driving shaft of the mechanism, and this shaft is driven in time with the slotting heads by gearing, not shown. The shaft 9 is geared to the upper pull roller shaft by gears 10 and 11, Fig. 6, and an idle gear 12, engaging the gear 10, also engages a gear 13, mounted upon a stub shaft 14, at one side of the machine. A roller 15, eccentrically mounted upon the gear 13, extends into a slot in the rocker arm 16, which arm is secured to a rock shaft 17, extending transversely of the machine below the bed *b*. Two crank arms 18 project upwardly from the rock shaft 17, and the upper ends of these arms are connected by links 19 to brackets 20 on the underside of guide bars 21, which are movable longitudinally of the bed in guide grooves 22. A feed bar 23 is secured to the guide bars 21 and upon this feed bar are a suitable number of yielding feeding devices 24, adapted to engage the rear edge of the lowermost blank in the stack, as shown in Fig. 3, to move the blank forward to the pull rollers. It will be seen from the description of the feeding mechanism that each time the gear 13 makes one revolution, the rocker arm 16 will be rocked back and forth and the rock shaft 17, through its connection to the feed bar 23, will cause the latter to move from the position shown in Fig. 2 to the position shown in Fig. 3, and then back to the position shown in Fig. 1, and normally, one blank will be moved forward far enough to be gripped between the pull rollers, at each forward movement of the feed bar, and the pull rollers will pull the blank from under the stack and pass it forward to the slotting and creasing heads.

It will be understood that in machines of this character, generally, the movements of the feed bar are timed to the movements of the slotting members by gearing, not shown in the present drawings, and a blank which is moved forward by the feed bar on one of its feeding movements must be pulled from under the stack by the pull rollers before the feed bar engages the next blank on its next feeding movement; otherwise a blank which is being moved from under the stack would prevent the blank above it from dropping down into position to be carried forward at the next forward movement of the feed bar. Machines are generally designed to feed blanks of a given maximum width, one for each revolution of the slotting members; but it is desirable at times to slot and crease blanks of a greater width (longitudinally of the machine), and in order to accomplish this without changing the time of the movements of the feeding mechanism, I provide means whereby this mechanism will feed a blank only during alternate feeding move-

ments. Thus, a wide blank which is moved forward by the feed bar will be carried from under the stack before the next blank is engaged by the feed bar. The mechanism for causing the feed bar to move a blank only during alternate feeding movements can be brought into action when extra wide blanks are used, and can be thrown out of action when blanks of ordinary width are used.

In order to cause the feed bar to feed blanks only on alternate feeding movements, I provide a rock shaft 25, which is journaled in bearings 26 at the sides of the bed, and this bar is provided with a plurality of arms 27 which are arranged adjacent the feet 4^a of the stationary stack supporting members 4, or they may be adjusted to any desired positions along the shaft 25. As shown in the drawing, certain of these arms project under the rear end of the stack and it will be evident that by rocking the shaft the arms may be caused to lift this end of the stack off of the stationary supports and also to lower the stack on to said supports.

A crank arm 28 is secured to one end of the shaft 25, and the free end of this arm fits into a yoke 29 which is adjustably secured to a rod 30, slidable longitudinally of the machine, in bearings 31. The rod 30 carries a roller 32, which projects within a cam groove 33 in the side of a gear wheel 34, which meshes with a gear 35, loosely mounted upon the shaft 9, which carries the lower pull roller 2. A clutch member 36, keyed to the shaft 9, may be moved to engage a clutch member on the gear 35, to thereby lock the gear 35 to the pull roller shaft and cause it to rotate therewith. When the gear 35 is thus driven it operates the cam gear 34 and the latter causes the sliding rod 30 to oscillate the crank 28 and thereby rock the shaft 25, and the arms 27 on said shaft will alternately raise and lower the rear end of the stack *c*. This mechanism operates in time with the movements of the feed bar 23 so that when the feed bar makes one forward movement, the end of the stack will be resting upon the stationary feet 4^a, as shown in Fig. 2, and the spring feeders on the bar will move a blank forward, as shown in Fig. 3; whereas, upon the return of the feed bar to its normal position the end of the stack will be raised, as shown in Fig. 4, and upon an ensuing forward movement of the feed bar, the spring fingers thereon will pass under the stack without engaging a blank, as illustrated in Fig. 5.

It is believed that the operation will be clear from the foregoing description. When blanks of the normal width are to be operated upon, the lifting mechanism will be disconnected from the driving shaft of the feed mechanism, and when wider blanks are to be operated upon, this mechanism will be clutched to said shaft. The blanks will then

be fed in time with the movements of the slotting heads, but only half the usual number of blanks will pass through the machine in a given time. The slotting heads will make an idle revolution for every second forward movement of the feeding device. The slotting heads on machines of this class are individually adjustable about the axis of the shaft on which they are carried, and they are adjustable collectively by disengaging the shaft from its driving mechanism, turning the shaft and reconnecting it to the driving mechanism through the medium of the clutch. The knives, also, are adjustable about the heads and longer or shorter knives may be used according to the desired lengths of the slots and the widths of the blanks. It will be understood that when the machine is adjusted to feed blanks of abnormal width on alternate forward movements of the feeding device, adjustments of the angular positions of the slotting heads and knives will be necessary to give them their proper timing with relation to the feed mechanism, and longer or shorter knives will be used, as required by the work.

In the drawings, I have shown a reciprocating feed bar for moving the blanks, but it will be evident that the mechanism for permitting blanks to be fed only on alternate forward movements of the bar will operate in the same way with the well known endless chain feeders, in which a feed bar is moved forward on the upper stretch of the chain and returned on the lower stretch.

What I claim is:

1. In a machine for operating upon cardboard box blanks, the combination with a feed table adapted to support a stack of blanks, a feeding device adapted to feed a blank from the bottom of the stack at each forward movement of said device, and means for operating said device, of means timed to the movements of the feeding device, for alternately changing the relative vertical positions of the rear end of the stack and said device, to cause said device to feed blanks only on its alternate forward movements.

2. In a machine for operating upon cardboard box blanks, the combination with a feed table adapted to support a stack of blanks, a feeding device adapted to feed a blank from the bottom of the stack at each forward movement of said device, and means for operating said device, of means, timed to the movements of the feeding device, for alternately raising and lowering the rear end of the stack to cause said device to feed blanks only on its alternate forward movements.

3. In a machine for operating on cardboard box blanks, the combination with a feed table, a feeding device, stationary means for supporting the rear end of a stack of blanks

with the lowermost blank in the path of movement of said device, gearing for operating said device and means for automatically lifting the rear end of the stack to raise the lowermost blank above the path of movement of said device during each alternate feeding movement of said device.

4. In a machine for operating upon cardboard box blanks, the combination with a feed table adapted to support a stack of blanks, a feeding device adapted to engage and feed the lowermost blank in the stack at each forward movement of said device, and driving means for said device, of a rock shaft having means thereon for raising and lowering the rear end of the stack, gearing for rocking said shaft, and means for connecting said gearing to said driving means when desired.

5. In a machine for operating upon cardboard box blanks, the combination with a feed table adapted to support a stack of blanks, pull rollers at the rear end of the table, and a reciprocating feed bar geared to the shaft of one of said rollers and adapted to feed the lowermost blank in the stack to the pull-rollers at each forward movement of said bar, of a rocking member adapted to raise and lower the rear end of the stack, gearing for actuating said member and a clutch for connecting said gearing to one of the pull-roller shafts.

6. In a machine for operating upon cardboard box blanks, a feed table adapted to support a stack of blanks, a feeding device adapted to feed blanks from the bottom of the stack, a drive shaft geared to said device, a rocking member for lifting the rear end of the stack, and gearing, including a clutch, connecting said member with the drive shaft.

In testimony whereof I affix my signature.

THOMAS S. FITCHETT.