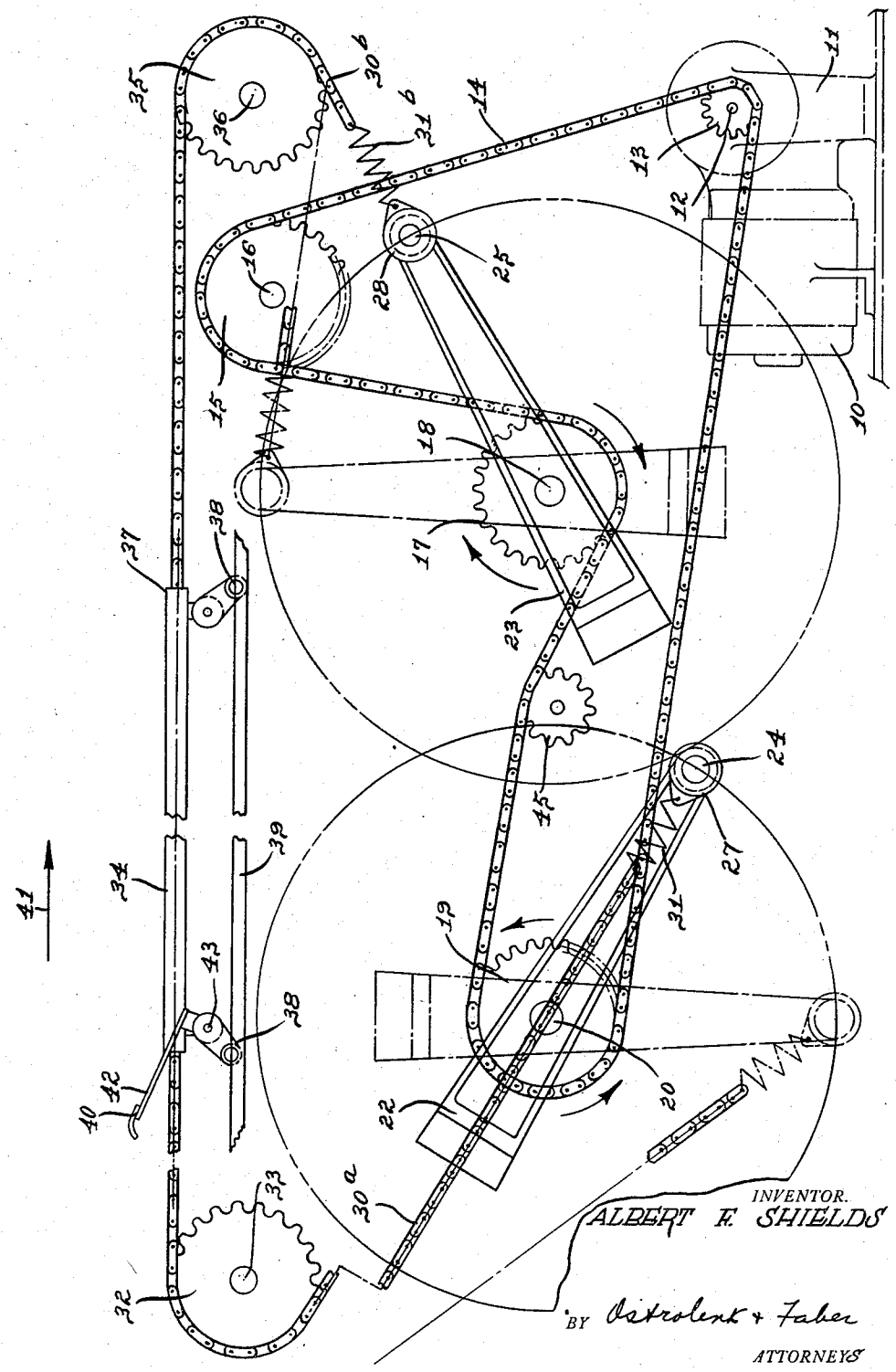
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BLANK FEEDING MECHANISM

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BLANK FEEDING MECHANISM

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My present invention relates to blank feeding units of the type particularly adapted for use in paper box machines, and more specifically adaptable for use in connection with machines of the type shown in Patent 2,336,507.

The folding machine in the aforesaid patent illustrates two types of blank feeding apparatus, the first a short stroke kicker adapted to remove blanks successively from the bottom of a stack, and the second a chain carried slat adapted to move a blank over an extended path.

The first type of oscillating kicker is generally adapted only to relatively short strokes where the blank is fed from a first position to a second position where feed rollers or other elements of the machine take over the movement of the blank.

The second type of feeding device is adapted to move a blank over an extended path.

My present invention relates primarily to an oscillating type of apparatus adapted to move a blank over a substantial path much greater than the distance over which oscillating kickers of the prior art have been able to operate.

Thus a primary object of my invention is the provision of an improved long stroke oscillating feeding or blank kicker device.

One of the inherent difficulties encountered in prior art oscillating type blank feeders or kickers is that the oscillating movement of the kicker was usually thought to require the utilization of oscillating actuating apparatus; and this type of oscillating actuating apparatus, owing to the fact that it was required to come to rest and reverse its operation twice for each blank that was fed, had a definite limit to its upper speed.

Another and equally important object of my invention is the provision of a simplified continuously operating apparatus of the non-oscillating type in order to actuate a long stroke oscillating kicker for a blank feeding unit.

The foregoing and many other objects of my invention will become apparent in the following detailed description taken in connection with the figure in which a diagrammatic illustration of the operating principle is shown in schematic form.

Referring to the figure, the feeding mechanism therein shown is illustrated in the general form it would take if applied to a folding machine of the general type shown in Patent 2,336,507, with the kicker unit having a stroke of such distance that it may feed the blank from the stack up to the taping or stitching head at the opposite end of the folding machine.

The drive motor 10 of the folding machine through the gear box 11 drives shaft 12 carrying sprocket 13. Sprocket 13 operating from chain 14 drives sprocket 15 on shaft 16, sprocket 17 on shaft 18, sprocket 19 on shaft 20. Sprocket 15

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on shaft 16 may drive any suitable apparatus on which the kicking mechanism is mounted.

Where the apparatus is a folding machine of the type of the aforesaid patent, then shaft 16 will drive the folding plates through appropriate gear or cam connections. Sprockets 17 and 19 drive the kicking or feeding mechanism. Since sprockets 17, 19 and 15 are all driven by the same chain 14, it is obvious that exact synchronism between the kicking or feeding mechanism and the remaining elements of the machine driven from shaft 16 will always be maintained.

Shafts 18 and 20 carry keyed thereto the counterbalanced crank arm 22 and 23. The outer end of each crank arm 22 and 23 has a laterally directed pin 24, 25 directed toward the side of the crank arm opposite the associated sprockets 17 and 19 respectively.

Consequently no interference will occur between shafts 20 and 18 and the chain 30 as the operations hereinafter described take place.

Pins 24 and 25 each carry the rotatable lug 27, 28 respectively. Chain 30*a* is connected at one end to the self-adjusting spring 31, the opposite end of which is connected to lug 27. Chain 30*b* is connected at one end to the self-adjusting spring 31*b*, the opposite end of which is connected to lug 28. There is a variation in length of chain path for different crank positions due to angularity. Springs 31 and 31*b* take up this difference. Also and preferably, idlers 36 or 33 may be spring loaded and biased outwardly to take up this length variation.

Chain 30*a* is laid over idling sprocket 32 on shaft 33 and is connected to the trailing end of the feeder carriage 34.

Chain 30*b* is laid over idling sprocket 35 on shaft 36 and is connected to the leading end 37 of the feeder carriage 34. The feeder carriage 34 carries on its underside any appropriate means such as the rollers 38, 38 riding in tracks 39 to support the same in a friction reducing manner for longitudinal oscillating movement.

Feeder carriage 34 carries the feed slat 40 at its trailing end. Feed slat 40 may have any appropriate arrangement enabling it to move a blank in the direction indicated by arrow 41. The feed slat 40 may be flexibly or resiliently mounted either on a resilient member 42 or pivotally on a cross-bar 43 to enable it appropriately to grasp the trailing portion of a blank.

Sprocket 45 is an idling sprocket arranged so that a drive chain 14 obtains an appropriate wrap around the sprockets 17 and 19. It will be seen that owing to the manner in which chain 14 is wrapped around sprockets 17 and 19, these sprockets are driven in an opposite direction.

The crank arms 22 and 23 are so mounted on the oppositely driven shafts 18 and 20 that as the end 25 of crank arm 23 approaches towards

sprocket 35, the end 24 of crank arm 22 moves away from sprocket 32 and as the end 24 of crank arm 22 moves toward sprocket 32, the end 25 of crank arm 23 moves away from sprocket 35. Consequently the continuous rotating motion of crank arms 22 and 23 is translated into continuous reciprocating motion of the composite chain 30 and hence of the carriage 34.

It will also be seen that as the end of each stroke is approached, as shown in solid lines in the figure, the relative motion of the ends of the crank arms toward and away from the respective sprockets 32 and 35 is decreased owing to the arrangement of the orbits of the ends of the crank arms 22 and 23. This results in a gradual stop and a gradual start of the feeder carriage 34 at the end and beginning of each stroke. The maximum speed of the feeder carriage 34 is attained at about the middle of the stroke and again there is a gradual slowing down through zero and a gradual speeding up once more.

By this means therefore the blank is first engaged at relatively low speed, is then moved at high speed, and the forward motion of the feeder carriage is decelerated gradually rather than suddenly.

The same type of operation during the return stroke also serves to decrease the mechanical shock on the mechanism thereby prolonging the life of the mechanism.

By this means therefore I provide a simplified kicker or feeding mechanism which may have as long a stroke as desired which engages the blank slowly, feeds it rapidly, and then decelerates gradually, and which operates entirely in response to a continuously constant speed rotating member.

In the foregoing I have described my invention solely in connection with the specific illustrative embodiment thereof. Since many variations and modifications of my invention will now be obvious to those skilled in the art, I prefer to be bound not by the specific disclosures herein contained, but only by the appended claims.

I claim:

1. A machine for operating on box blanks; said machine comprising a blank feeding carriage; a feed slat secured to said carriage; said carriage being movable along a line transverse to the main axis of the feed slat; a flexible longitudinal member connected at each end of the carriage and extending along the line of the path of travel of the carriage beyond each end of the carriage; a first rotatable crank member operating in an orbit which is included in the plane of movement of said flexible longitudinal member and connected to a free end of said flexible longitudinal member; a second rotatable crank member operating in an orbit coplanar with the orbit of the first crank member but in an opposite direction and connected to the other free end of said flexible longitudinal member; said cranks during rotation each going through a half cycle in which it pulls on its end of the flexible longitudinal member and a half cycle in which it permits its end of the flexible longitudinal member to be pulled; said pulling half cycles being alternated for each crank; and guide means for said flexible longitudinal member at each end of the path of travel of the carriage confining the portion of the flexible longitudinal member between said guide means in a straight line.

2. A machine for operating on box blanks; said machine comprising a blank feeding carriage; a feed slat secured to said carriage; said carriage being movable along a line transverse to the main axis of the feed slat; a flexible longitudinal member connected at each end of the carriage and extending along the line of the path of travel of the carriage beyond each end of the carriage; a first rotatable crank member operating in an orbit which is included in the plane of movement of said flexible longitudinal member and connected to a free end of said flexible longitudinal member; a second rotatable crank member operating in an orbit coplanar with the orbit of the first crank member but in an opposite direction and connected to the other free end of said flexible longitudinal member; said cranks during rotation each going through a half cycle in which it pulls on its end of the flexible longitudinal member and a half cycle in which it permits its end of the flexible longitudinal member to be pulled; said pulling half cycles being alternated for each crank; and guide means for said flexible longitudinal member at each end of the path of travel of the carriage confining the portion of the flexible longitudinal member between said guide means in a straight line; said crank members being located below said carriage; said guide means at each end of the machine guiding the flexible longitudinal member to the crank adjacent said end.

3. A machine for operating on box blanks; said machine comprising a blank feeding carriage; a feed slat secured to said carriage; said carriage being movable along a line transverse to the main axis of the feed slat; a flexible longitudinal member connected at each end of the carriage and extending along the line of the path of travel of the carriage beyond each end of the carriage; a first rotatable crank member operating in an orbit which is included in the plane of movement of said flexible longitudinal member and connected to a free end of said flexible longitudinal member; a second rotatable crank member operating in an orbit coplanar with the orbit of the first crank member but in an opposite direction and connected to the other free end of said flexible longitudinal member; said cranks during rotation each going through a half cycle in which it pulls on its end of the flexible longitudinal member and a half cycle in which it permits its end of the flexible longitudinal member to be pulled; said pulling half cycles being alternated for each crank; and guide means for said flexible longitudinal member at each end of the path of travel of the carriage confining the portion of the flexible longitudinal member between said guide means in a straight line; said crank members being located below said carriage; said guide means at each end of the machine guiding the flexible longitudinal member to the crank adjacent said end; said connection at each crank between the flexible longitudinal member and the crank including a resilient member.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,218,778	Johnson	Mar. 13, 1917
1,506,276	Stolp	Aug. 26, 1924
1,774,113	Swift, Jr.	Aug. 26, 1930
2,289,010	Greenwood	July 7, 1942

FOREIGN PATENTS

Number	Country	Date
177,232	Switzerland	May 31, 1935
269,051	Germany	Oct. 10, 1912