

1,352,284.

Fig. 1.

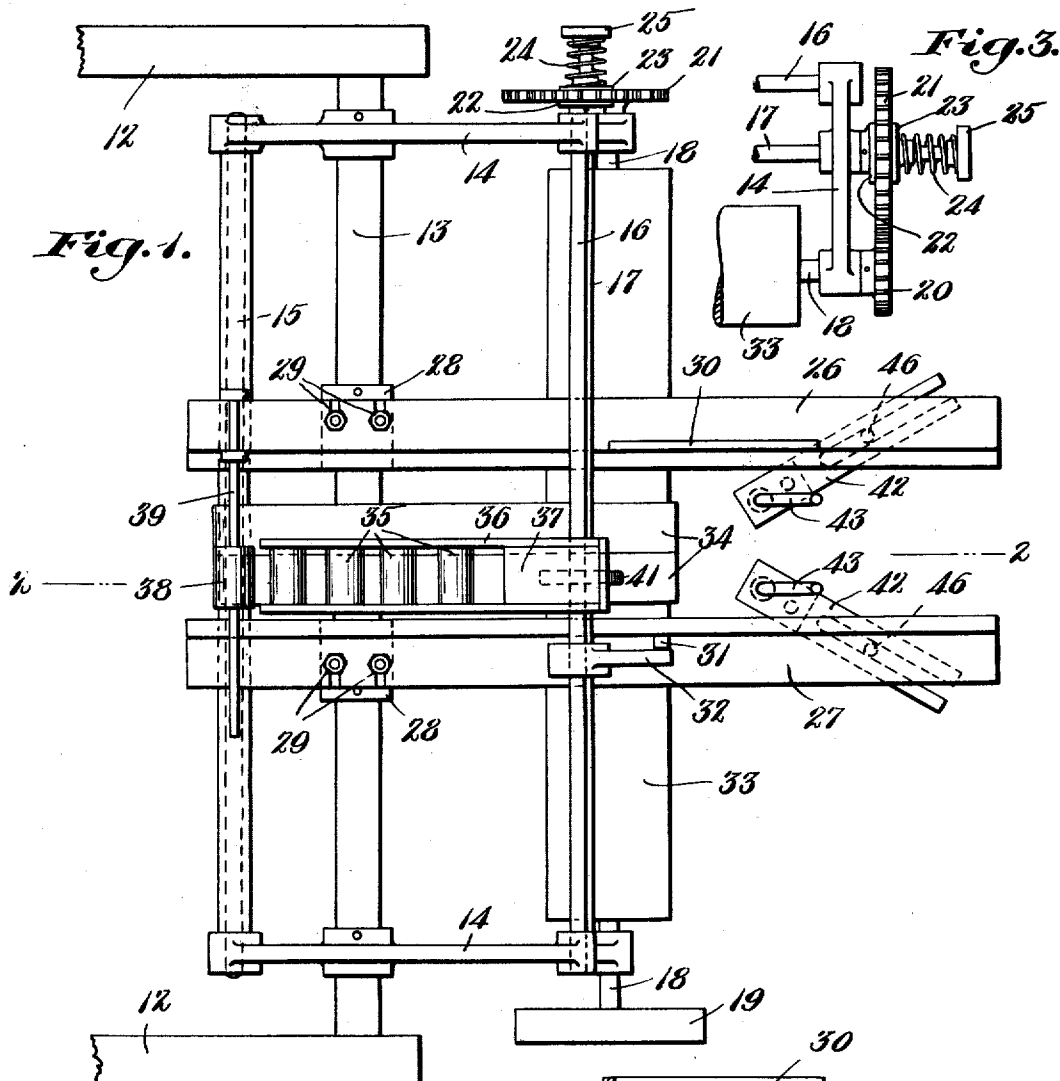
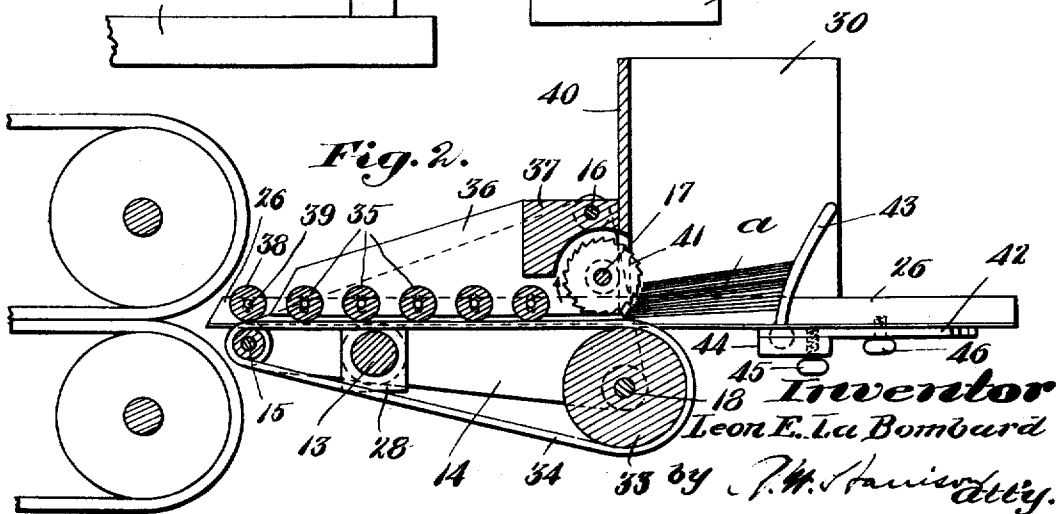


Fig. 2.



UNITED STATES PATENT OFFICE.

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BLANK-FEEDER.

1,352,284.

Specification of Letters Patent.

Patented Sept. 7, 1920.

Application filed April 12, 1917. Serial No. 161,432.

To all whom it may concern:

Be it known that I, LEON E. LA BOMBARD, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Blank-Feeders, of which the following is a specification.

This invention relates to feeding mechanisms such as are employed in connection with machines for folding paper blanks to make boxes or envelopes, or in connection with printing presses, and my invention refers particularly to such feeding mechanisms as detach the blanks or sheets singly from the bottom of a pile.

In feeders of this type, there is a liability of a let up in the regularity of the feed as the height of the pile in the supply hopper decreases, this resulting from the reduction of pressure due to the gradual diminution of weight of the superposed blanks, and the consequent reduction of feed-effect of the friction device operating against the under surface of the lowermost blank.

The chief object of my invention is to provide a feeder of the character stated which will increase the certainty of the blanks following each other regularly spaced, without liability of skipping any blanks, so long as there are any blanks at all to be fed from the supply hopper.

With this and other objects in view, my invention consists in the improvements substantially as hereinafter described and claimed.

Of the accompanying drawings:

Figure 1 is a plan view illustrating my improvements in one embodiment thereof.

Fig. 2 represents a section on line 2—2 of Fig. 1, and showing also portions of carrier belts for delivering the blanks from the feeder to whatever machine is to operate on said blanks.

Fig. 3 is a detail elevation looking from the right of the upper part of Fig. 1.

Similar reference characters indicate similar parts in all of the views.

Portions of the frame of the machine to which my improved feed mechanism is attached are indicated at 12, said portions being connected by a cross bar or tie rod 13. Two frame brackets 14 are secured to the tie rod 13, and may be additionally held in fixed position by any suitable means. Two tie

rods 15, 16, connect the brackets 14, and two shafts 17, 18, are mounted in said brackets. The shaft 18 has a pulley 19 at one end for a driving belt, and at the other end carries a pinion 20 (Fig. 3) meshing with a gear 21 loosely mounted on shaft 17 between a collar 22 fixed to the shaft and a friction disk 23 splined on said shaft. A spring 24 coiled on the shaft 17 is confined between the hub of friction disk 23 and a collar 25 adjustably secured to the shaft. Any equivalent connections that will cause shaft 18 to frictionally drive shaft 17 may be substituted for those just described.

Two horizontal bars 26, 27, are suitably supported, as by blocks 28 mounted on tie rod 13 and adapted to be secured in adjusted position thereon, according to the width of the blanks, by screws 29. The bar 26 carries an upright plate 30 as a guide for one side of the pile of blanks, the other side being guided by a vertical rod 31 (shown only in Fig. 1) secured to an arm 32 having its hub laterally adjustable on tie rod 16.

Secured to shaft 18 is a drum 33. Mounted on said drum and on tie rod 15 or on small pulleys carried by the tie rod are one or more feed belts 34 of rubber or other suitable material to frictionally engage and carry the blanks. To hold the blanks in operative contact with said belt or belts, a series of gravity rolls 35 are loosely mounted in a frame comprising side plates 36 and a block 37, said plates and block being mounted on tie rod 16. A supplemental roll 38, above the delivery end of feed belt 34, is carried by a small shaft 39 supported by the bars 26, 27.

Secured to block 37, either rigidly or so that it may be vertically adjusted, is a plate or gage strip 40 to cooperate with the plate 30, rod 31, and the rear pins presently described, in holding the stack or pile of blanks in position, said parts constituting a hopper for a pile of blanks *a* (Fig. 2). It is not necessary to illustrate the member 40 as adjustable, because such adjustable devices are well known in this art, the blanks being fed one by one through a narrow space between the lower edge of the member 40 and the friction feeder, the latter being in this case, the belt or belts 34.

Secured to shaft 17, and accommodated in a recess in the lower portion of strip or plate 40 and block 37, is a presser 41 for

the front edges of the blanks, the presser illustrated consisting of a toothed or milled wheel. I do not limit myself to a wheel having teeth. A wheel having any kind of

5 periphery that will exert a constant downward action on the front edges of the blanks may serve.

Adjustably secured to each of the bars 26, 27, is a strip 42 to support a pin 43 having a ball-shaped lower end mounted in a socket formed in the inner end of said supporting strip and in a cooperating clamp piece 44. By means of clamp screws 45 and set screws 46, I provide for universal

10 movement of the pins 43 to any position to engage the rear edges of the blanks of any shape, in a pile, and the then setting of said pins fixedly in such position, so that the weight of the blanks will cause their rear

15 edges to engage inclined portions of the pins and result in the blanks, as they reach lowermost positions, being directed or shifted forward. This renders it certain that their front edges will be engaged by the

20 presser 41.

In operation blanks *a* are placed in the hopper and the pins 43, when properly adjusted and set, cause the lowermost blanks to be pushed slightly forward as indicated

30 in Fig. 2, the front edge of the bottom blank resting on the feed belt or belts 34 and in line with the narrow opening or passageway below gage strip 40. The shaft 17 is frictionally driven to cause the presser

35 41 to rotate, or tend to rotate, in the direction of the arrow in Fig. 2. The force exerted by the presser on the front edges of the blanks is readily adjustable by varying the pressure of the friction-clutch-spring

40 24. When the wheel presser 41 is toothed, as shown, it is preferable to so adjust spring 24 as to permit an intermittent slipping of gear 21 relatively to friction disk 23. It would be objectionable to permit a sawing

45 of the presser into the blanks. The slipping just referred to results in the blanks holding the presser stationary until each bottom one is fed out and the pile is free to descend a distance equal to the thickness

50 of one blank. Such descent is instantly effected, with little or no liability of delay or hesitation in the feed, because gravity is aided by the presser, the inclined pins 43 rendering it certain that the blanks will be

55 in position to be acted upon by the presser. It will now be understood that while the toothed member 41 rotates intermittently it is constantly acting as a presser. Said presser not only insures the same regularity or uniformity of feed when the pile of

60 blanks is small and of light weight as when the hopper is full and the pile heavy, but it also insures proper feed when the front edges of the blanks are curled up as is frequently the case. The dieing out of blanks

from a pile of sheets often causes the blanks, or some of them, to be more or less curved instead of flat. And sometimes the dies are dull and the edges of the blanks are rough or curled. My improved feeder treats all

70 such blanks perfectly because the presser renders it certain that their front edges will be forced, in regular succession, into proper position to be fed by the belt or belts 34, under rolls 35, from which they will pass to

75 the machine which is to fold or otherwise treat them.

The lateral adjustment of the bars 26, 27, and the adjustable mounting of the pins 43, enables the feeder to operate properly

80 on blanks of widely different sizes, shapes and qualities. The blanks are mainly supported only at their front and rear edges, the front edges being supported by the belt or belts 34 on drum 33, the pins 43 being so

85 adjusted as to hold the blanks inclined upwardly toward the rear and therefore cause the blanks to have a constant tendency to move forwardly to position to be properly acted upon by the presser 41. Preferably the

90 pins 43 are not straight but are curved slightly so that the tendency of the blanks to be crowded forward will be gradually lessened as they move down.

Another advantage resulting from the structure shown is that the blanks nearest the bottom automatically separate as indicated in Fig. 2 and admit air between them. The result is that there is little or no adhesion between the lower blanks, and consequently the bottom blank is freer to be fed

95 than is the case where the lower blanks are in contact throughout their areas.

Having now described my invention, what I claim is:

1. A blank feeding mechanism comprising side guides for a pile of blanks, a friction feeder to act successively on the lower blanks of the pile, pressing means to engage edge portions of blanks in the pile and means

100 having a constant tendency to actuate the pressing means to urge the blanks toward said feeder.

2. In a blank feeding mechanism having a hopper for a pile of blanks and a friction

115 feeder for removing the blanks singly therefrom, a wheel opposite the front edges of the blanks, and means having a constant tendency to rotate the wheel in a direction to urge said edge portions toward the feeder.

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3. In apparatus of the character described, a feeder, a movable member above the feeder, means for supporting a pile of blanks with the front edge portions of the lower blanks of the pile contacting with

125 said movable member, and means for actuating the said movable member to urge said edge portions toward the feeder.

4. In apparatus of the character described, a hopper for a pile of blanks, means

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for feeding out the lower blank of such pile, and means for pressing front edge portions of the lower blanks of the pile toward the feeding out means, said means comprising
5 a wheel and frictional driving mechanism for constantly urging said wheel in its operative direction.

5. In apparatus of the character described, a hopper for a pile of blanks, means
10 for feeding out the lower blank of such pile, and means for uniformly pressing the front edge portions of the lower blanks of the pile toward the feeding out means, said means comprising a toothed disk, a shaft therefor,
15 and frictional driving mechanism for said shaft.

6. A blank feeding mechanism having front and rear supports for a pile of blanks, the front support being movable to feed
20 the lower blank of the pile, a wheel above said front support, and means for continuously actuating the wheel to cause it to press front edge portions of the lower blanks toward said movable front support.

25 7. A blank feeding mechanism having front and rear supports for a pile of blanks, the front support being movable to feed

the lower blank of the pile, a wheel above said front support, and means for actuating the wheel to cause it to press front edge portions of the lower blanks toward said movable front support, the rear support comprising a pair of independently adjustable
30 pins.

8. A blank feeding mechanism having
35 front and rear supports for a pile of blanks, the front support being movable to feed the lower blank of the pile, and means for pressing front edge portions of the lower blanks toward said movable front support,
40 the rear support comprising a pair of universally mounted and independently adjustable pins.

9. In apparatus of the character described, a constantly movable feeder, means
45 for holding a pile of blanks in position for them to be taken singly from the pile, and a constantly movable member engaging front edge portions of blanks in the pile to exert a uniform tendency to press said front
50 edge portions toward the feeder.

In testimony whereof I have affixed my signature.

LEON E. LA BOMBARD.