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1,948,362

BLANK FEEDER

Filed July 5, 1932

2 Sheets-Sheet 1

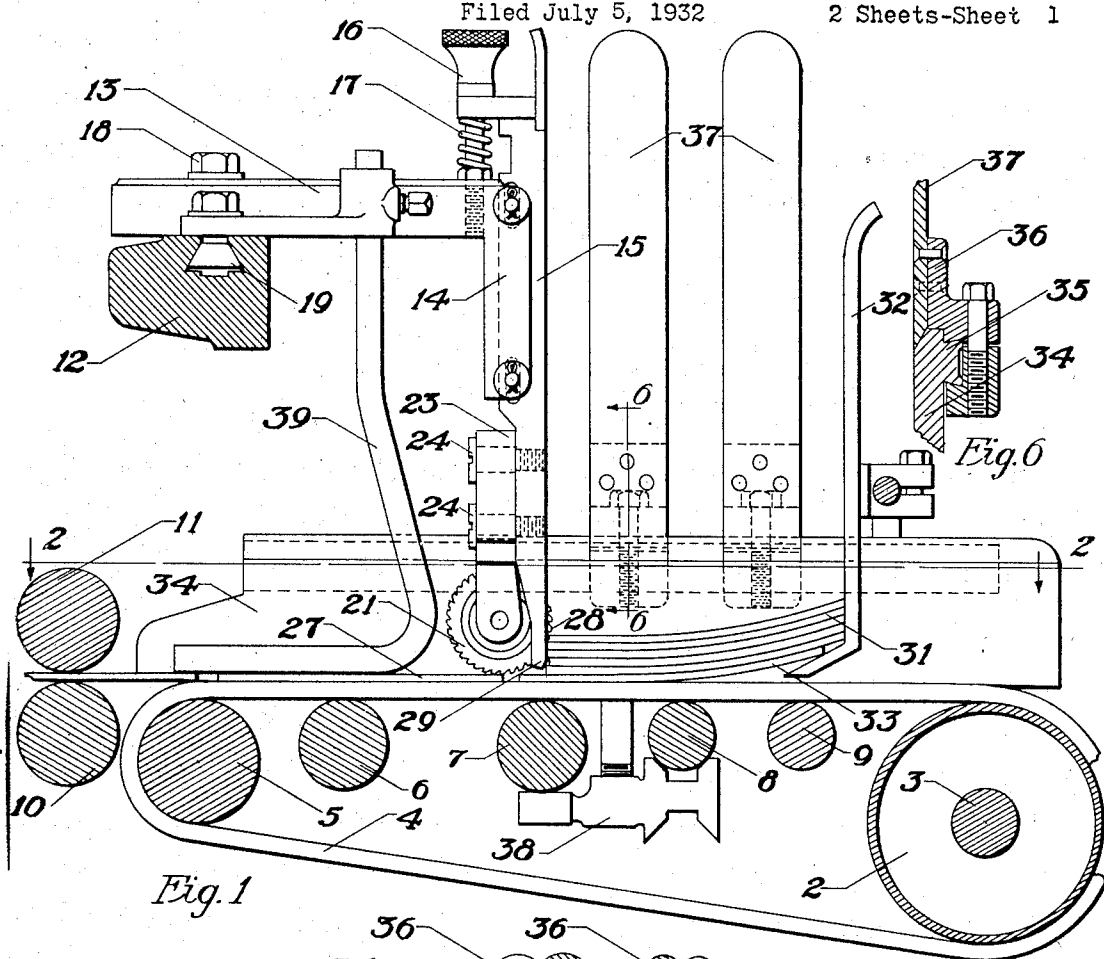


Fig. 1

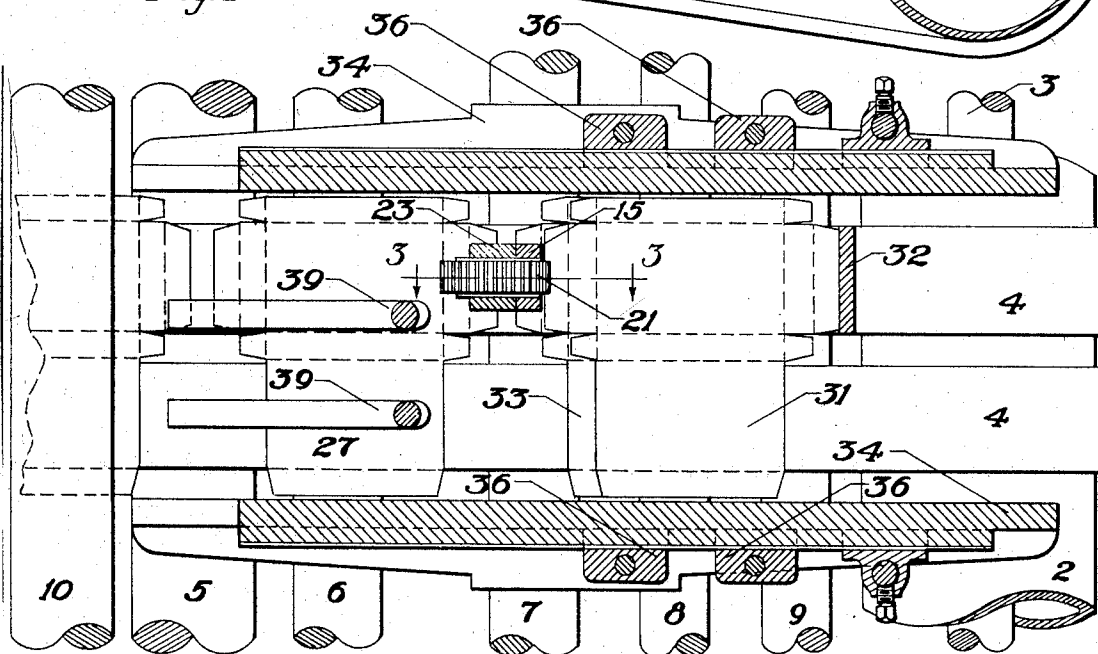


Fig. 2

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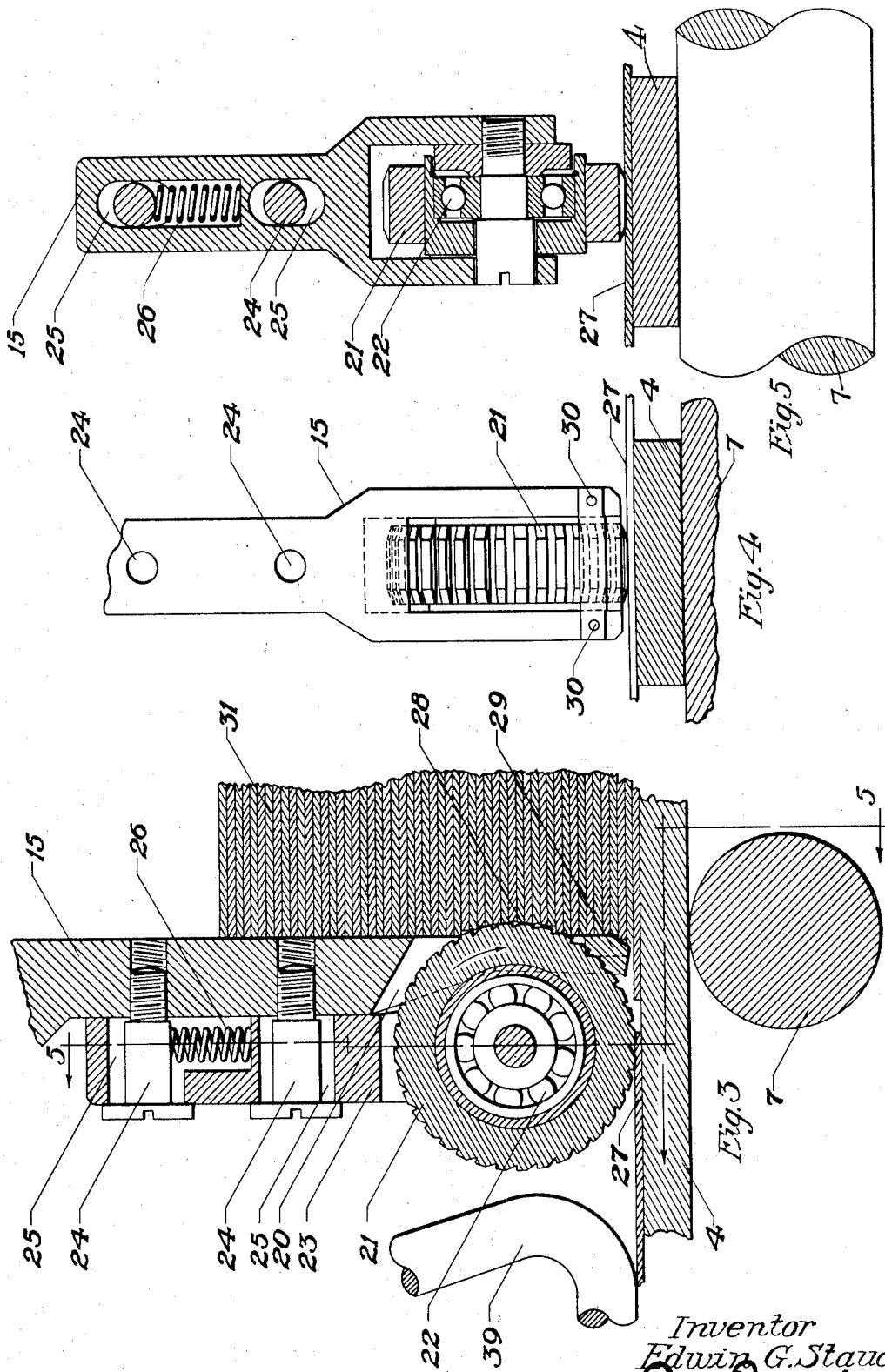
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,948,362

BLANK FEEDER

Edwin G. Staude, Minneapolis, Minn.

Application July 5, 1932. Serial No. 620,861

11 Claims. (Cl. 271—35)

This invention relates to improvements in paper feeding devices in which sheets or blanks of paper, of regular or irregular configuration cut and creased and ready to be glued and folded, are stacked upon one another in a pile (of a height often more than twelve inches) from which pile the bottom-most blanks are fed by friction past a gate and through a throat which permits passage of only one blank at a time.

Objects of the invention are: to provide a structure herein called a "gate" or "barrier", adjustable with respect to a friction feeding means, such as a belt, to form therewith a feed throat, which only permits the passage of a single and lowermost blank of the pile to the path; to provide pressure-applying means, such as a wheel adapted to engage the forward ends of the blanks before feeding and to press them downwardly and flatten them so that the bottom-most blank will always be so positioned as to be advanced through the feed throat without jamming; to operate the wheel for its blank-flattening function by friction from the blank-advancing means or belt; to mount said wheel upon the gate so that when the gate is adjusted, the wheel is also adjusted conformably to the gate adjustment; to mount the wheel movably with respect to the barrier so that the mount is automatically and constantly urged toward the feed belt, preferably by a spring so that the wheel may yield or be displaced by a blank, and thereafter be rotated by frictional contact with the blank; to so shape the working surface or face of the wheel that it is sufficiently rough to perform a blank-flattening operation by impingement action on the ends of the blanks, and yet to make this surface sufficiently smooth as not to mar the faces of the blanks when its peripheral speed becomes less than the speed of advance of the feed belt, or when its rotation momentarily ceases as the result of impinging engagement of its working surface with the ends of the blanks.

Other objects are: to provide a slot in the gate in opposition to the ends of the blank and to have the wheel operate in and through this slot to engage the ends; to provide a mechanism which can be quickly adjusted transversely of the machine, and which can be quickly set and is particularly adapted for handling small blanks having irregular outlines; and to provide an improved hopper structure including adjustable features.

Features include the broader ideas of means, along with all details of construction disclosed in the application.

Objects, features and advantages of the invention will be set forth in the description of the drawings forming a part of this application, and in said drawings

Figure 1 is a vertical section showing the invention applied to a box blank folding and gluing machine;

Figure 2 is a plan section on line 2—2 of Figure 1;

Figure 3 is an enlarged view of the feed gate and the means for urging the blanks downward against the moving surface to flatten, and thus prevent jamming of warped or curly stock, under the feed gate, or in the feed throat;

Figure 4 is a front view of the lower portion of the feed gate;

Figure 5 is a section on line 5—5 of Figure 3 looking in direction of the arrow; and

Figure 6 is a vertical detail section on line 6—6 of Figure 1, illustrating a feature relating to the hopper.

In the drawings, 2 represents a driving drum or series of pulleys mounted on a shaft 3. A rubber surface feed belt runs over the drum or pulley 2, and idler 5. Belt-supporting rolls 6, 7, 8 and 9 are used at points intermediately of elements 2 and 5. Numerals 10 and 11 indicate feed rolls which carry the individual blanks into the machine proper (which may perform any suitable operation on the blank) such as a gluing and folding or a printing machine. A cross member 12 is arranged above the belt to support a bar 13 having a depending portion 14. Held on member 14 is an adjustable feed gate 15. The feed gate 15 is adjusted by the thumb screw 16, against tension of the spring 17. The bar 13 is fastened to the member 12 by a cap screw 18, and is laterally adjustable in the dove-tail groove 19.

Referring to Figure 3, the feed gate and barrier 15 is slotted as at 20, at its lower portion, to receive a serrated or rubber-covered blank-flattening wheel 21, mounted on ball bearings 22. The use and construction of the ball bearings are features. The wheel 21 is mounted upon a member 23 which is secured to the feed gate 15 by screws 24, and is adapted for vertical movement by the use of slots 25 traversed by the screws 24. The mounting of the flattener 21 on the gate or barrier is a valuable feature.

A spring 26 is used to provide sufficient downward pressure on the wheel mount 23 to cause the wheel to have the proper degree of friction contact with either the carton blank 27 over which it rides, or with the belt 4.

It is to be noted that the blank-flattening wheel

21 and the feed gate 15 are a unitary structure and thus when the feed gate is adjusted the wheel moves therewith. It is further noted that by having the wheel so mounted that it is normally urged toward the belt either by gravity or by spring pressure, the wheel constantly engages the feed belt during adjustment of the gate 15. Therefore, no attention whatever need be paid to the position of the flattening wheel because it always automatically assumes the proper relation to the feed belt.

I am aware that devices of the general type herein have been used in which the flattening wheel is positively driven, as distinguished from the frictional drive herein. The present device has decided advantages because it is constantly frictionally operated by the belt, or by a blank on the belt, to perform its blank-flattening function, and it functions also to hold the blank against the feed belt after it passes through the throat.

The periphery of the wheel 21 is adapted to extend through a slot and beyond the edge of the feed gate 15, as shown at 28 in Figure 3, to engage the forward edges of the blanks and urge them downward. The lower end 29 of the feed gate, when properly adjusted relative to the belt 4, permits the passage of only one blank at a time.

The front and lower part of the feed gate member 29 is slightly beveled, as shown, which, in practice, has been found to be the most desirable angle. This is a feature. In order to obtain a sufficiently hard working surface for the member 29, this member is separately made and hardened and is then riveted to the feed gate as shown at 30, see Figure 4.

The blanks are stacked one above the other, as shown at 31 in Figure 3, against the adjustable feed gate or barrier 15. In order to provide means for adjustably varying the amount of friction between the bottom-most blank and belt, a support 32 (see Figure 1) is used, and may be adjusted universally to vary the area of contact between the lower blank 33 and the belt, and thus obtain just the proper amount of friction between the blank and belt 4 to feed the blank 33 under the feed gate member 29. This is a valuable feature.

Suitable side guides 34, see Figure 6, are provided with dovetail rails 35, with which clamps 36 cooperate. Each clamp carries a vertical side guide 37, which may be of any suitable height. By means of the rails and clamps, horizontal adjustment of the guides 37 in the direction of blank travel can be had. The guides 34, see Figure 1, are also secured by a bolt and clamp mechanism 38 to the bars 7 and 8, thus permitting lateral adjustment for blanks of different widths. Hold-down bars 39, see Figures 1 and 2, are provided to hold the blank down on the belt 4 and guide it directly into the feed rolls 10 and 11. These bars are adjustable on bar 12, in the same manner as element 13.

From the above description, it is clear that the feed gate 15 may be moved into the proper position and carries with it the wheel that is adapted to operate through a slot in the face of the feed gate, and either by its own weight or through the tension of the spring 26, permit it to rest on the belt 4 or the blank as it passes under the feed wheel 21, with just enough pressure to get the desired depressing friction against the edge of the blanks at the point 28. This may be accomplished by the proper tension of the spring

26 or, of course, the spring 26 may be removed entirely relying upon the weight of the metal member 23.

The feed gate described provides an exceedingly simple and compact mechanism and is found to be very satisfactory in the feeding of practically all types of blanks within its range.

The serrations in the periphery of the wheel 21 are adapted to engage the edge of the blanks at 28 and at the same time will not interfere with the continuous passage of the blanks as they pass underneath the wheel 21, between the wheels 21 and the belt 4.

I claim as my invention:

1. A blank feeding mechanism comprising, feeding means, a feed gate, and blank-flattening means mounted on the gate, to be operated by the feeding means.

2. A blank feeding mechanism comprising feeding means, a feed gate, and blank-flattening means mounted on the gate and yieldably urged toward the feeding means to be operated by the feeding means.

3. A blank feeding mechanism comprising feeding means, a feed gate cooperative with the feeding means to form a feed throat, and blank-flattening means mounted on the gate and yieldably urged toward the feeding means to be operated by the feeding means.

4. A device of the class described including means for feeding blanks, a feed gate adjustable with respect to the feeding means to form a feed throat, said gate having a slot adjacent its throat-forming end, a wheel mounted on the gate and extending into and through the slot and therebeyond to contact the forward ends of the blank which also engage the gate, to press the blanks downwardly toward the feeding means, said wheel being yieldably mounted and normally resting upon the feeding means.

5. A blank feeding mechanism comprising a feeding means, a feed gate, means on the gate for urging the forward ends of the blanks downwardly against the feeding means, and frictionally operated by the feeding means.

6. A blank feeding mechanism having a blank feeding belt, a gate forming with the belt a feed throat, and a blank-flattening member characterized by the fact that it is automatically moved toward the feed belt to be yieldably engaged therewith or with a blank fed thereby and is moved away from the feed belt as a blank issues through the throat, and being further characterized by the fact that it is attached to and is adjustable with the gate.

7. A device of the class described including a feed belt, a feed gate adjustable relative to the belt to form therewith a feed throat, a blank-flattening wheel and means yieldably urging the flattening wheel into contact with the feed belt, said wheel having serrations which act to abut the ends of the blanks and flatten them, the serrations being transversely and circumferentially flattened so as not to mar the faces of the blanks as they are passed beneath the wheel by the feed belt.

8. A machine of the class described having a belt for moving the blanks, means for feeding the blanks including a feed gate, a feed wheel having teeth adapted to engage the forward edges of certain of the blanks and press them downwardly toward the feed belt, said wheel being frictionally operated by the belt or by a blank fed by the belt, the working surface of said wheel being provided with ratchet teeth the points of which

move downwardly at that point where they perform their blank-depressing function, said teeth having flattened portions aligned in the plane of the periphery of the wheel to provide a relatively smooth surface for contacting the face of the blank without marring it, in case rotation of the wheel ceases or its working surface speed becomes less than that of the belt.

9. A blank feeding mechanism comprising in combination, feeding means, a feed gate, and means for urging the blanks toward the feeding means, the combination being characterized by the fact that the means for urging the blank toward the feeding means is mounted upon the gate and is driven by the feeding means.

10. A blank feeding mechanism comprising in combination, feeding means, a feed gate, and a

roll for urging the blanks toward the feeding means, the combination being characterized by the fact that the roll is mounted upon the gate and is rotated by frictional contact with the feeding means.

11. A device of the class described including means for feeding blanks, a feed gate adjustable with respect to the feeding means to form a feed throat, a blank-separating wheel arranged forwardly beyond the feed throat in direction of feed, said gate having a slot, and said wheel extending through the slot to contact the forward ends of blanks which also normally engage the gate to press the blanks downwardly toward the feeding means, said wheel being operated by frictional contact with the feeding means.

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20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150