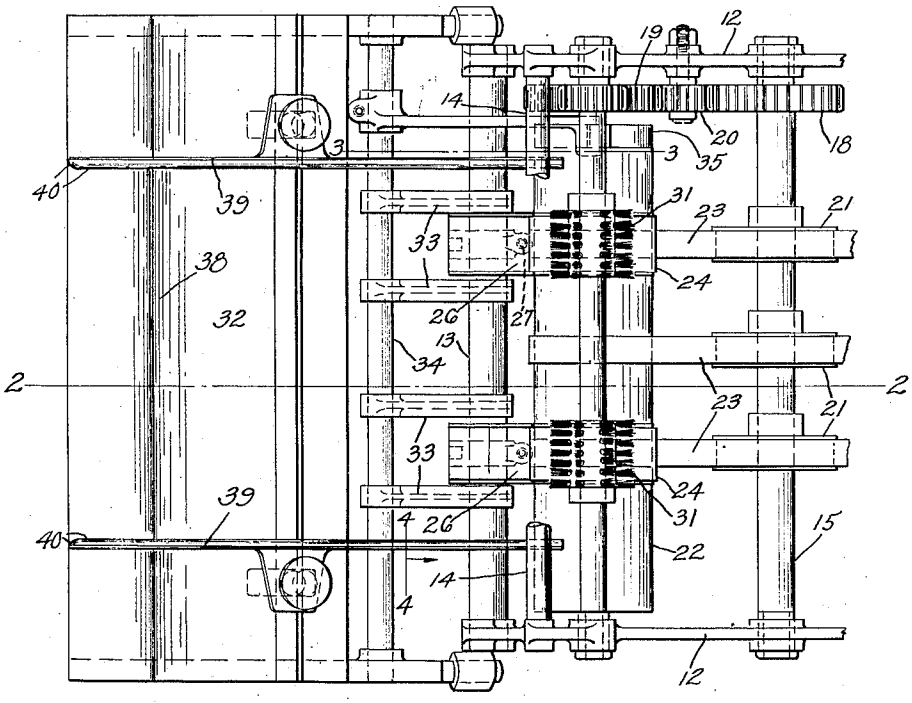
May 8, 1928. 1,668,967

H. S. LABOMBARDE

BLANK FEEDER

Filed April 3, 1923

FIG. 1.



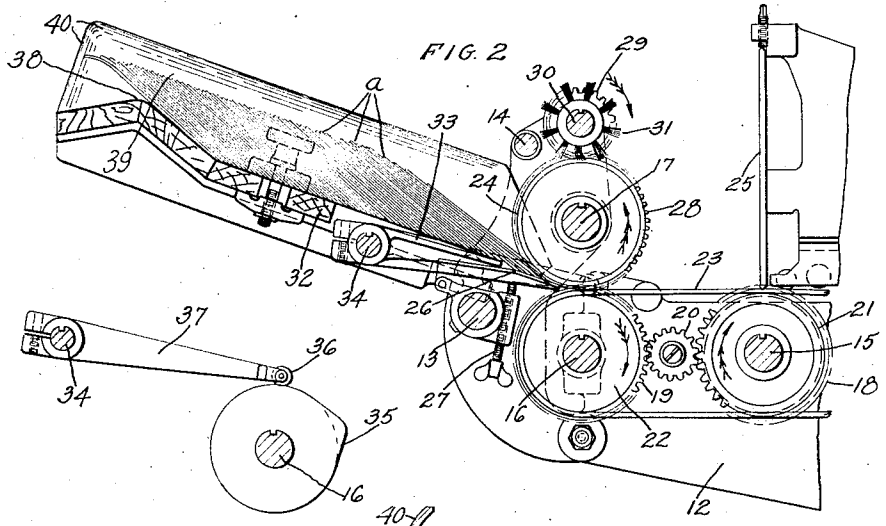


FIG. 2

FIG. 3

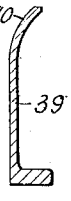


FIG. 4

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BLANK FEEDER.

Application filed April 3, 1923. Serial No. 629,543.

This invention relates to means for feeding blanks of paper or pasteboard, the blanks being taken singly from a supply on a table and forwarded to mechanism which folds or otherwise treats them.

In blank feeders of the type which employ a friction combing wheel or wheels to cause the blanks to advance singly, it often happens that said wheels acquire, on their peripheries, an accumulation of particles such as those of a fibrous nature which result from the cutting or dieing out of the blanks. Such particles interfere with the proper frictional effect of the combing wheels when feeding. Therefore one of the objects of the present invention is to provide an improved feeder of this type in which the combing wheel or wheels will be automatically kept clean and free from the accumulation of objectionable particles on their peripheries.

With this object in view, my invention includes the provision of a cleaning member in such proximity to the combing wheel as to remove from the periphery of the latter such fibers or other particles as may be temporarily attached thereto.

Another object of the invention is to provide a blank feeder of the combing wheel type with means for ensuring continuous automatic approach of the blanks on the table toward position for being acted upon successively by the combing wheel.

A further object is to provide an improved direct drive mechanism for the rotary elements of the feeding mechanism, the advantages of which will be explained hereinafter.

Of the accompanying drawings:

Figure 1 is a plan view of a blank feeder having my improvements, some of the adjuncts being omitted.

Figure 2 is a sectional elevation on line 2—2 of Figure 1.

Figure 3 is a sectional detail on line 3—3 of Figure 1.

Figure 4 represents a section on line 4—4 of Figure 1.

Mounted in the frame 12 connected by suitable tie rods such as indicated at 13, 14, are three shafts 15, 16, 17. Secured to the shafts 15, 16, are gears 18, 19, with both of which an intermediate pinion 20 meshes.

Carried by the shaft 15 so as to be rotated thereby are rolls 21 which, for a reason hereinafter explained, are referred to as gage rolls.

Passing around the drum 22 carried by shaft 16 are belts 23 onto which blanks *a* are fed successively by the action of the combing wheels 24 carried by shaft 17. Each blank so fed travels along on the belts 23 to the mechanism which is to fold or otherwise treat it, the passage of more than one blank at a time being prevented by a vertically adjustable gate or gage strip 25. Friction retards 26 are mounted on the tie rod 13 and are adjustable by means of screws 27. The operation of mechanism of this type is similar to that explained in Letters Patent 1,112,811 granted Oct. 6, 1914 to E. W. Labombarde, and needs no further explanation herein.

Referring now more particularly to the details of my present improvements, the shaft 17 carrying the combing wheels 24 has a gear 28 which is in direct mesh with the gear 19 of shaft 16 and is also in direct mesh with a gear 29 of a shaft 30 mounted in the frame above shaft 17. Above each combing wheel and carried by the shaft 30 is a brush 31 which may be of any suitable material for acting as hereinbefore described upon the combing wheel below it to positively remove therefrom all fibrous or other foreign particles and discharge such particles in a rearward direction so that such particles can not accumulate at the bottom of the gate strip 25 and interfere with the passage of blanks under said gate strip. The relative diameters of the combing wheels and the brushes are such, preferably, that the brush bristles move somewhat, but not greatly, faster than the speed of movement of the tops of the combing wheels, so that the brush bristles, after being somewhat bent or flexed as indicated in Figure 2, will quickly "snap" to straight condition and thereby forcibly remove in a rearward direction all foreign particles which may lodge on the peripheries of the wheels, which peripheries are usually of rubber. The gearing is such that the brushes and the combing wheels rotate in opposite directions and therefore their contacting peripheries are moving rearwardly, in operation. If the brushes were to rotate in the same direction as the combing wheels there would be such excessive friction be-

tween them as to unduly wear both the rubber and the bristles.

As is usual with this type of blank feeders, the table 32 is so supported by the frame as to be more or less inclined to cause the stock of blanks to gradually slide toward the combing wheels and retards. It is not always possible to have the angle of inclination so accurate, to suit the quality and quantity of blanks, that the forward blanks will be "squared up" as they reach the combing wheels. It often requires hand pressure or knocking on the upper portions of the forward blanks to cause them to slide down properly. To effect an automatic correct presentation of the forward blanks to the action of the combing wheels, I provide means for slightly agitating the forward blanks of the stock on the table. A convenient mechanism for effecting such agitation comprises vibrators consisting of arms 33 carried by a rock shaft 34 and extending part way along the sides of the retards so that the lower edges of the forward blanks (except a few close to the combing wheels) will be acted upon by said arms. The rock shaft and its blank-agitating arms are actuated by a cam 35 (Figs. 1 and 3) carried by shaft 16, said cam acting upon a roll 36 of an arm 37 of the rock shaft. This construction causes the vibrator arms 33 to impart a slight quick upward blow against the lower edges of some of the forward blanks during each rotation of the combing wheel, thereby ensuring continuous automatic approach of the blanks toward the combing wheels in accurately squared up position for the feeding action of said wheel.

As feeders of this type operate very rapidly, frequent additions of bunches of blanks must be made at the rear of those on the table. When the table is flat although inclined, as in the patent hereinbefore referred to and, so far as I am aware, in all others of such type, it is difficult for the attendant to insert the added supply under those at the rear of the blanks already on the table without quite seriously disarranging those under which the new ones are to be tucked. To facilitate the successive addition of bunches of blanks to position on the table, I provide the table with a transverse ridge as indicated at 38. Said ridge is located at such distance from the combing wheels as to admit what may be considered a normal supply of blanks *a* between it and the combing wheels, with the upper edge of the rearmost blank projecting over the ridge as indicated in Figure 2. Then, as the length of the row of blanks diminishes, due to their sliding down as the combing wheels remove the foremost ones, the attendant simply slides a fresh bunch of blanks under the rearmost one the projecting upper edge of which permits such insertion without necessitating any grasping of those on the table to lift them.

Preferably the forwardly-facing wall of the ridge is substantially parallel with the angle which the blanks have a natural tendency to assume when arranged for feeding. I do not limit myself to this shape however. Nor do I limit myself to forming the ridge as an integral part of the table, as illustrated, for it may consist of a separate bar suitably mounted on an otherwise flat inclined table.

By means of the ridge and the agitators or vibrators 33, no handling of the blanks once deposited on the table is required to ensure proper presentation to the combing wheels. The agitators ensure proper movement of the forward blanks, while the ridge enables more blanks to be added by sliding them under the one at the rear on the table without liability of laterally shifting any of those previously deposited.

The positive drive of the shaft 15 having the rolls 21, and the direct gear connections between the shafts 15, 16, 17, with no intermediate gearing other than the pinion 20, effect several advantages in operation. One is simplicity and durability of the parts, and another the certainty of uniformity of movement of the members which cooperate in feeding the blanks. An important advantage is that the space between the lower end of the gate strip 25 and the surface of the belt 23 below it, which space is relied upon to prevent the passage of more than one blank at a time, is more reliably uniform than when the roll 21 below such belt is not driven except as it may be rotated by the friction of the belt passing over it, as is the case in the machine illustrated in the Patent 1,112,811. The belts 23 are usually of resilient material, such as rubber, and therefore subject to variations in thickness. When the roll under the gate strip is rotated only by the friction of the belt pressed against it by a passing blank, the belt is subjected to constant variations of tension and therefore changes in thickness tending to effect a jam in the feed, or undue changes in the thickness of that portion of the belt extending from the roll 21 to the drum 22. By the direct drive as described, however, the peripheries of the roll 21 and drum 22 are caused to travel, always, at a uniform speed and therefore reduce the tendency of the belts 23 to vary in thickness.

The table 32 which supports the pile or row of blanks has side walls 39 which are adjustable toward and from each other, being provided with any suitable means for securing them in adjusted positions. The inner surfaces of the upper and rear edge portions of the side walls are flared outwardly as indicated by comparing Figure 4 with the shaded areas of the said walls in

Figures 1 and 2. The table with its side walls constitutes a hopper for the blanks. The object of the formation of the walls, with the flared portions 40, is to enable an attendant to introduce and properly locate the blanks without having to exercise special care to prevent any of the blanks from arriving in place more or less askew. The flared portions 40 provide a bell-mouth entrance to the hopper so that if any of the blanks which are being inserted from the rear or top of the hopper project somewhat laterally from the bunch, they will be pushed back into alinement with the rest of the bunch by the act of pushing the bunch to position. In other words, the bell-mouth entrance will straighten out any blanks that may be more or less askew in the bunch that is being manually supplied to the hopper.

Having now described my invention, I claim:

1. Blank feeding mechanism comprising a support for blanks, a friction combing wheel having means for driving it in a direction to feed blanks forward from said support, a rotary brush having resilient bristles in position to constantly contact with the top of the combing wheel and be flexed thereby, and means for positively rotating said brush continuously in a direction to cause it to remove particles backward from the combing wheel, the combing wheel and brush and the means for driving them being constructed to cause the periphery of the brush to move at a faster speed than that of the combing wheel, whereby the bristles are first flexed and then snap back to normal condition.

2. A blank feeder comprising a table for supporting the blanks edgewise, a combing wheel and cooperating members for feeding blanks singly and successively from the table, and means for automatically agitating the blanks as they approach position to be acted upon by the combing wheel.

3. A blank feeder comprising a table for the blanks, a combing wheel and cooperating members for feeding blanks singly and successively from the table, a rock shaft having arms extending toward the combing wheel, and means for rocking the shaft to cause its arms to agitate the blanks as they approach position to be acted upon by the combing wheel.

4. A blank feeder having a combing wheel, a drum below the wheel, a gage roll, a gate above the gage roll, a belt mounted on said drum and passing over the gage roll, and intermeshing gears for driving said wheel, drum and roll positively.

5. A blank feeder having a combing wheel, a drum below the wheel, a gage roll, a gate above the gage roll, a belt mounted on said drum and passing over the gage roll, and direct drive connections between the wheel, drum and roll to ensure positive and uniform movements thereof.

In testimony whereof I have affixed my signature.

HAROLD S. LABOMBARDE.