May 29, 1928. 1,671,687

E. G. STAUDE

FEED WHEEL MOISTENER FOR AUTOMATIC PAPER SHEET FEEDERS

Filed June 7, 1926 5 Sheets-Sheet 1

FIG. 1

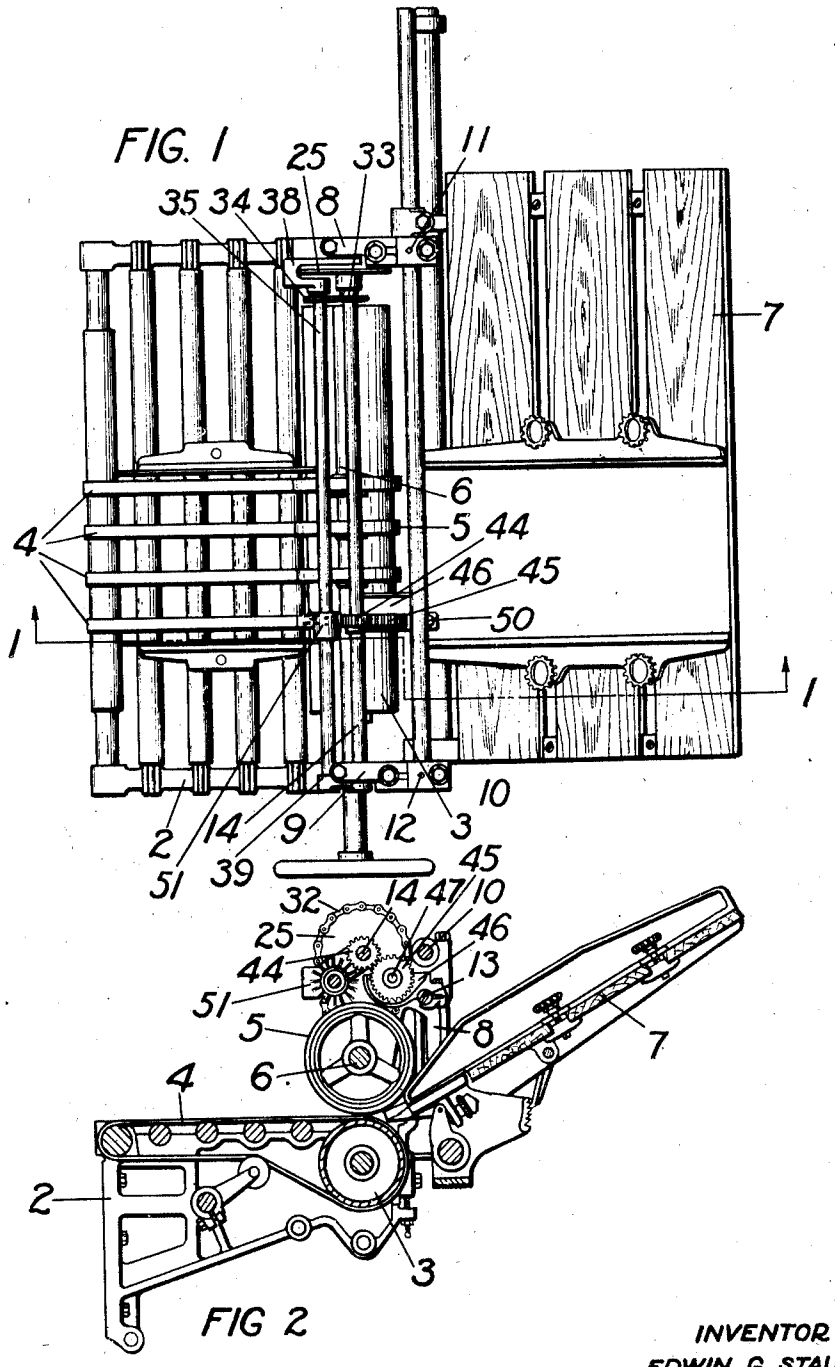

FIG 2

INVENTOR
EDWIN G STAUDE
BY Paul, Paul & Woodard
ATTORNEYS

May 29, 1928. 1,671,687

E. G. STAUDE

FEED WHEEL MOISTENER FOR AUTOMATIC PAPER SHEET FEEDERS

Filed June 7, 1926 5 Sheets-Sheet 2

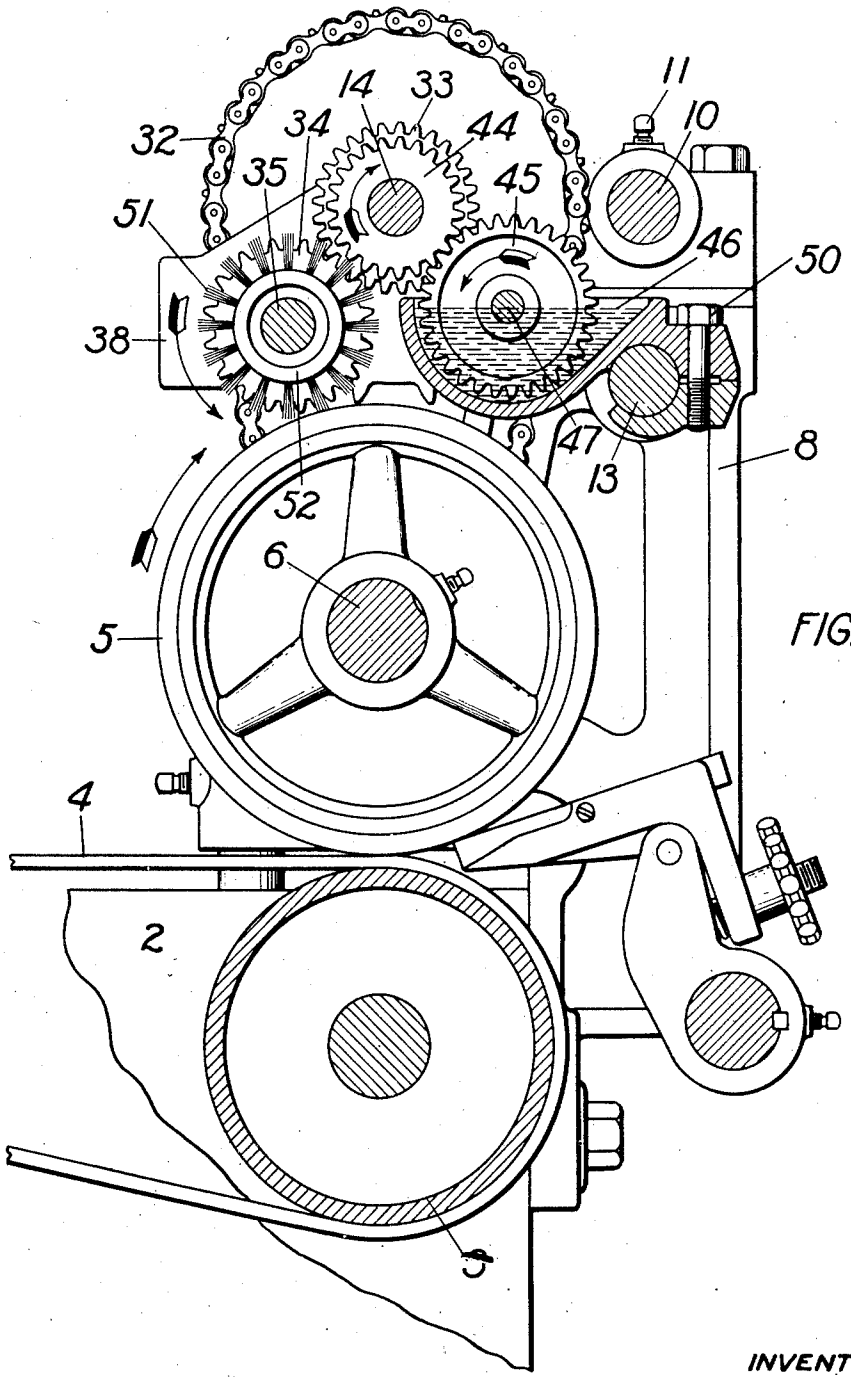

FIG. 3

INVENTOR
EDWIN G STAUDE
BY Pavel, Pavel & Moore
ATTORNEYS

May 29, 1928. 1,671,687

E. G. STAUDE

FEED WHEEL MOISTENER FOR AUTOMATIC PAPER SHEET FEEDERS

Filed June 7, 1926 5 Sheets-Sheet 3

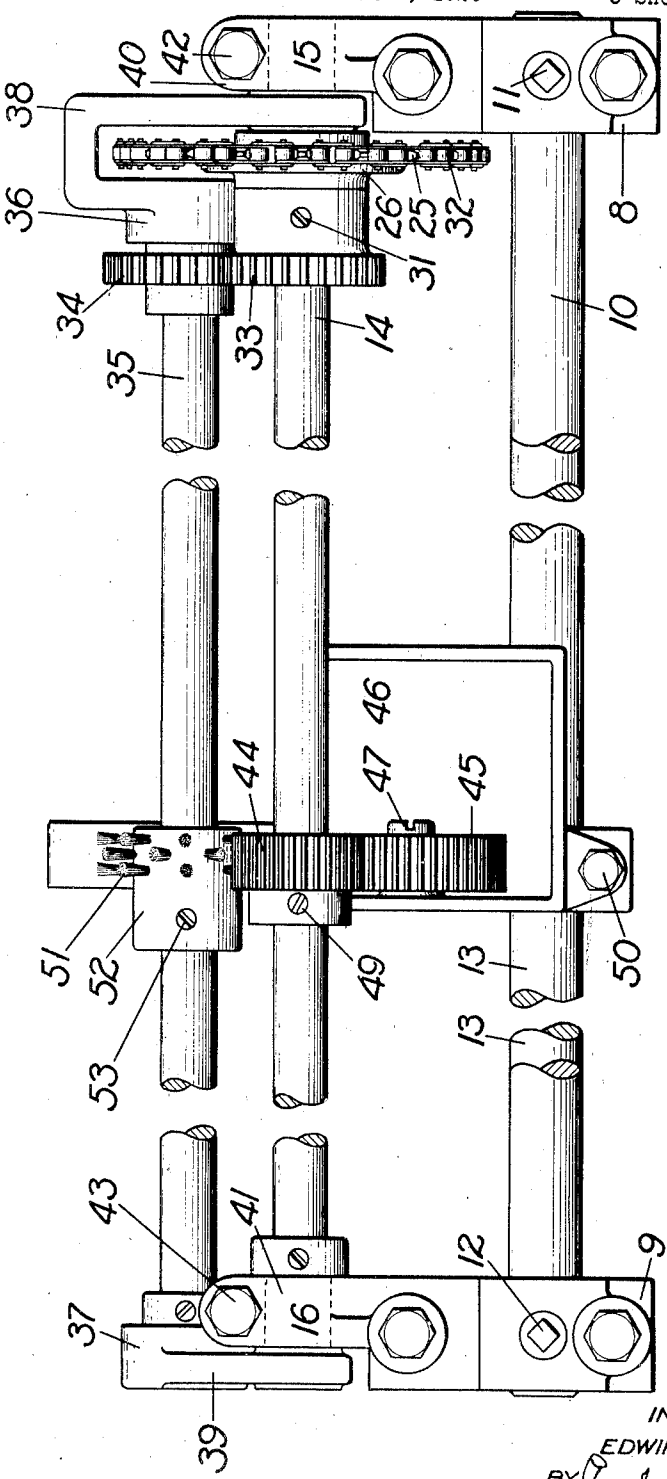

FIG. 4

INVENTOR
EDWIN G STAUDE
BY Paul, Paul & Woodcock
ATTORNEYS

May 29, 1928. 1,671,687

E. G. STAUDE

FEED WHEEL MOISTENER FOR AUTOMATIC PAPER SHEET FEEDERS

Filed June 7, 1926 5 Sheets-Sheet 4

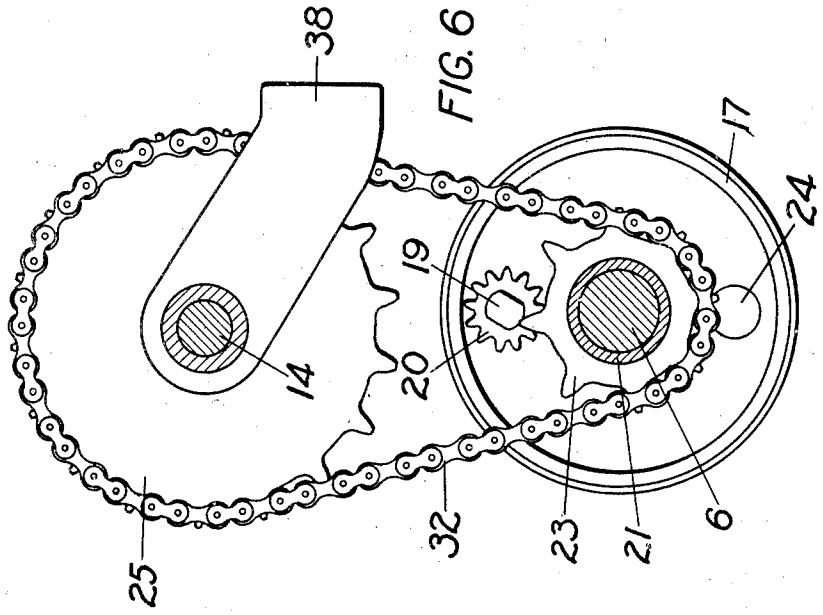

FIG. 6

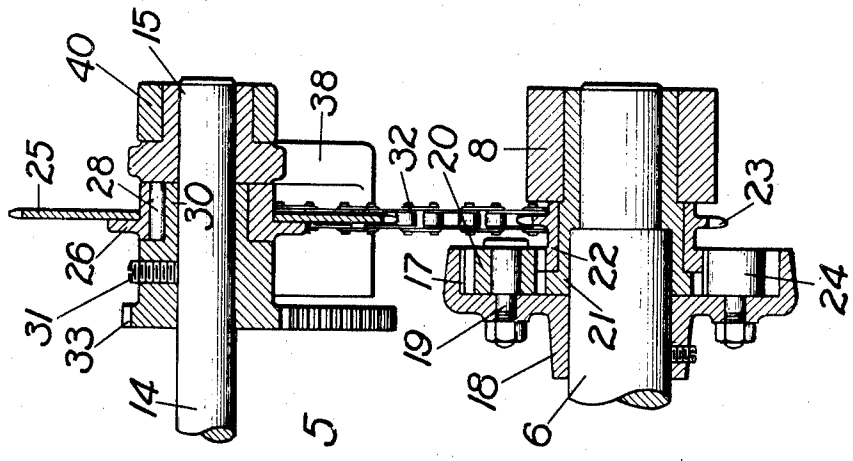

FIG 5

INVENTOR
EDWIN G STAUDE
BY Paul, Paul & Woodcock
ATTORNEYS

May 29, 1928. 1,671,687

E. G. STAUDE

FEED WHEEL MOISTENER FOR AUTOMATIC PAPER SHEET FEEDERS

Filed June 7, 1926 5 Sheets-Sheet 5

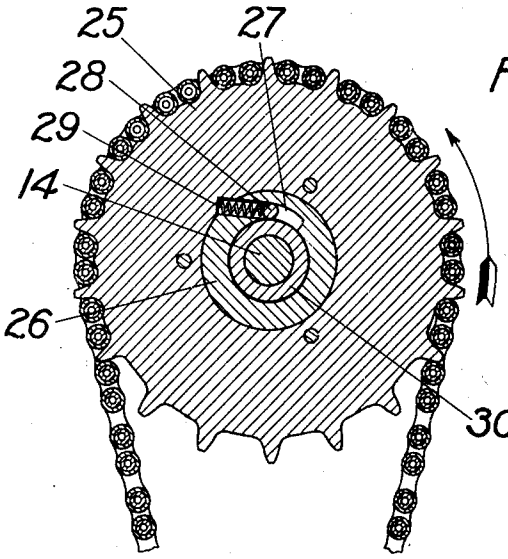

FIG. 7

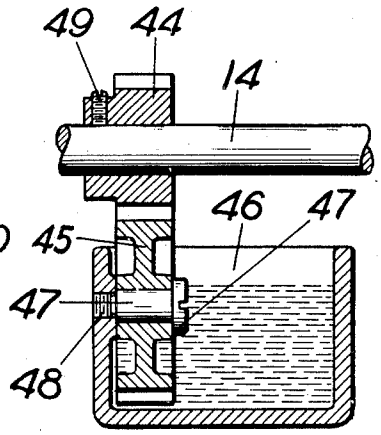

FIG. 9

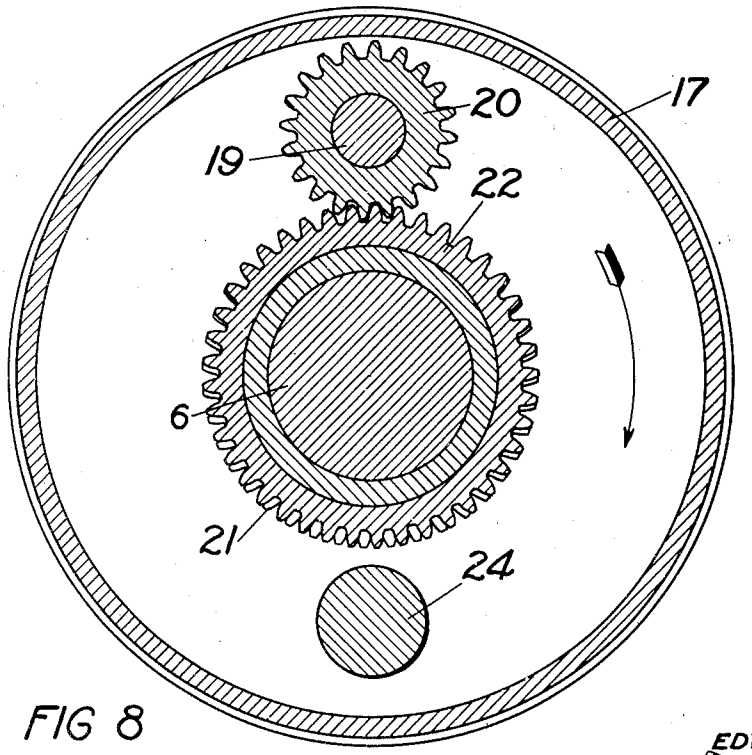

FIG 8

INVENTOR
EDWIN G STAUDE
BY Pearl, Paul & Moore
ATTORNEYS

Patented May 29, 1928. 1,671,687

UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

FEED-WHEEL MOISTENER FOR AUTOMATIC PAPER-SHEET FEEDERS.

Application filed June 7, 1926. Serial No. 114,815.

My invention relates to improvements in automatic paper sheet feeders ordinarily used for folding paper box gluing machines, open end envelope machines, paraffining machines, and those of similar nature, and is designed as an improvement of the machine shown and described in Letters Patent of the United States #1,033,040, issued to me July 16, 1912.

The object of my invention is to provide means for keeping the surface of the feed wheel moist during the feeding operation to insure the greatest efficiency of the feed wheel and dispense with the usual practice of moistening the surface of the feed wheel with a wet cloth, a manual operation requiring considerable time and labor to keep the cloth properly saturated and cleaned.

A further object is to provide a moistening device which can be easily and quickly adjusted transversely of the machine to position it for contact with any particular feed wheel.

A further object is to provide a moistening device having means for manual operation for starting the flow of the moistening fluid with provision for operating the moistening device mechanically at the desired speed.

A further object is to provide means for keeping the surface of the feed wheel clear of lint or other foreign material which has a tendency to accumulate on the rubber surface of the wheel and destroy its feeding efficiency.

A further object is to provide a feed wheel moistening and cleaning device of simple inexpensive construction, and at the same time, strong and durable.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming a part of this specification,

Figure 1 is a plan view of an automatic paper sheet feeder to which my invention has been applied;

Figure 2 is a vertical section on the line 1—1 of Figure 1, looking in the direction of the arrow;

Figure 3 is an enlarged view of a portion of Figure 2;

Figure 4 is a plan view of the lint brush and moistening device, and the driving connections;

Figure 5 is a detail section of the gear-reducing mechanism for driving the moistener device;

Figure 6 is an end view of Figure 5;

Figure 7 is a detail of the sprocket which drives the moistener device, showing the clutch arrangement which releases the shaft for driving the moistener device when said shaft is turned in the same direction by hand;

Figure 8 is a detail section of the gear-reducing mechanism;

Figure 9 is a detail section through the gears and water pot device which serves to transfer the water from the water pot to the brush.

In the drawings, 2 represents the frame of an automatic feeder corresponding to that used in the conventional type of folding paper box gluing machine, provided with the usual lower feed drum 3, the carrier belts 4 driven in the usual manner and a feed wheel 5 mounted on a shaft 6 driven through frictional contact of the wheel 5 with the belt 4, preferably of rubber. 7 represents a feed table or hopper. A shaft 6 has bearings in brackets 8 and 9 provided on each side of the machine frame. Above the shaft 6, is a shaft 10 also having bearings in the brackets 8 and 9. This shaft 10 has the function of tying the brackets 8 and 9 together and is secured in the brackets by suitable setscrews 11 and 12. Below the shaft 10, I provide a shaft 13 having its end portion secured in a similar manner to the brackets 8 and 9. I also provide another shaft 14 having bearings 15 and 16 in the brackets 8 and 9 and adapted to revolve freely therein. For driving the shaft 14, I provide a flange 17 having a hub 18 secured on the shaft 6. A stud 19 is mounted in the flange 17 and carries a pinion 20 that is adapted to mesh with spur gears 21 and 22, (see Figure 5). The gear 21 is held in the bracket 8 against rotation and its hub forms a bearing for the shaft 6. The gear 22 is free to revolve and has a sprocket 23 thereon. The gears 21 and 22 are of the same diameter but the gear 21 has one more tooth than the gear 22 (see Figure 8). It follows, therefore, that as the flange 17 revolves in the direction of the arrow, (see Figure 8), it will carry the pinion 20 around with it, causing the pinion to roll over the teeth in the gears 21

and 22 and keeping the teeth in line at the point of contact. As the number of teeth in the gears is different, it follows that with the engagement of the driving pinion with both gears, and as one of the gears is fixed, the other or the gear 22 must advance to compensate for the difference in the number of teeth. I thus provide a speed-reducing mechanism for the sprocket wheel 23 from the rather high speed of the shaft 6 without the necessity of providing a complicated expensive speed-reducing mechanism.

To counterbalance the weight of the stud in the pinion 20, I prefer to provide a plug 24 in the flange 17 on the other side of the shaft 6. Mounted on the shaft 14 above the speed-reducing mechanism just described, I provide a sprocket wheel 25 secured by suitable means to a hub 26. In this hub, I provide a recess 27 having a roller 28 and spring 29 forming the conventional roller clutch device for driving the shaft 14 when the sprocket is revolved in the direction of the arrow, but releasing the shaft 14 when the operator wishes to turn it by hand in the same direction for the purpose of adjustment to allow access to the adjusting screws of the brushes and transfer gears as will be hereinafter described. The roller 28 operates to clamp the hub 26 against the hub 30 that is secured to the shaft 14 by suitable means such as a setscrew 31. The sprocket wheel 25 is driven through a sprocket chain 32 connecting the wheel 25 with the sprocket 23. The sprocket 23 is somewhat smaller than the sprocket wheel 25 and, therefore, serves to effect a further reduction in speed. The hub 30 is provided with a gear 33 adapted to mesh with a gear 34 on the shaft 35. The gears 33 and 34 are of substantially the same diameter so that the speed of the shaft 35 is practically the same as that of the shaft 14.

The shaft 35 has bearings 36 and 37 in the arms 38 and 39 which are clamped in position concentric with the bearing of the shaft 14 by suitable clamps 40 and 41 formed on the brackets 8 and 9 and provided with cap screws 42 and 43. The purpose of this mechanism is to provide for an adjustment of the shaft 35 with respect to the feed wheels as will appear from the following description.

Upon the shaft 14, I provide a gear 44 adapted to mesh with a gear 45 that is mounted to revolve in a fluid receptacle 46 on a stud 47 having a threaded portion 48 that is screwed into the side wall of the fluid receptacle 46. A setscrew 49 adjustably secures the gear 44 to the shaft 14. The fluid receptacle 46 is held in place on the shaft 13 by suitable means such as a cap screw 50.

On the shaft 35 opposite and adjacent the gear 44 and in contact therewith, is a brush 51 mounted in a hub 52 that is secured on the shaft 35 by a setscrew 53. The brush 51 is also adapted to contact with the rubber surface of the feed wheel 5 (see Figure 3).

From the foregoing description and the illustration in Figure 4, it is clear that the entire moistening mechanism may be adjusted laterally across the machine at any point wherever it is desirable to locate the feed wheel 5. As shown in Figure 3, the brush 51 will travel in the direction of the arrow and contact with the rubber surface of the feed wheel 5 but will operate at a much slower speed and will, therefore, drag on the surface of the wheel and wipe off lint, dust, or any other foreign material which may accumulate on the surface of the wheel. As the brush revolves, it will also come in contact with the gear 44 and as this gear is in mesh with the gear 45 revolving in the fluid chamber 46, (see Figure 3), it follows that the teeth of the gear 46 will carry up such fluid as water, glycerine, or other liquid that may be contained in the fluid chamber and transfer it to the teeth of the gear 44 from whence the liquid will be picked up in sufficient quantity to keep the bristles of the brush 51 moist but not too moist or wet, to such an extent that an excess of moisture will be deposited on the surface of the wheel, but on the contrary the slightly moist bristles as they slowly revolve will deposit just enough moisture on the surface of the wheel to insure the perfect feeding efficiency of the wheel.

The gears 45 and the brush 51 move very slowly and in changing the machine for stock of different sizes and moving the feed wheel 5, it is of course necessary to adjust the gears and the brush and to make the setscrews 49 and 53 easily accessible. I provide the clutch mechanism on the shaft 25 as heretofore described which will enable the operator to grasp and turn the shaft 14 by hand until the screws 49 and 53 are in position to be easily reached and loosened for the desired adjustment of the mechanism.

I claim as my invention:

1. In a machine of the class described, means for engaging and feeding the blanks one at a time, and means for automatically moistening the surface of said feeding means, and cleaning the same.

2. In a machine of the class described, feed wheels between which the blanks are fed one at a time, means for driving said wheels, and means for automatically moistening the surface of said wheels, and cleaning the same.

3. In a machine of the class described, means for feeding blanks or sheets one at a time, and a brush device for applying moisture to the peripheral surface of said feeding means, and cleaning the same.

4. In a machine of the class described, feed wheels between which the blanks are fed, means for revolving said feed wheels, and a brush mounted to revolve at a slower speed than said feed wheels and contact with the peripheral surface of a wheel to apply moisture thereto.

5. In a machine of the class described, means for feeding the blanks, a fluid reservoir and a member mounted to revolve therein and adapted to pick up the fluid from said reservoir, and a revolving brush positioned to receive the moisture from said revolving member and apply it to the surface of a feed wheel, said reservoir, member mounted to revolve therein, and said brush, being adjustable in a direction transversely of the line of feed.

6. In a machine of the class described, feed wheels adapted to feed blanks or sheets one at a time, a brush mounted to contact with the peripheral surface of a wheel, a fluid reservoir and means for transferring the liquid from said reservoir to the bristles of said brush, said brushes acting to clean the liquid transfer means.

7. In a machine of the class described, feed wheels between which the blanks or sheets are fed, a fluid reservoir, a member revolving in said reservoir to slowly gather up the fluid, and revolving means adapted to receive the fluid from said member and deposit it upon the surface of a feed wheel, and means for causing said revolving means to have a peripheral speed less than the feed wheels.

8. In a machine of the class described, feed wheels between which the blanks or sheets are fed one at a time, a fluid reservoir, a gear mounted to revolve therein, a second gear mounted to mesh with the teeth of said first named gear and receive the moisture therefrom, and a brush mounted to contact with the surface of a feed wheel and said second named gear.

9. In a machine of the class described, feed wheels between which the blank is fed, means for driving said wheels, and means for cleaning the lint and other foreign matter from the surface of a feed wheel and applying a limited amount of moisture thereto.

10. In a machine of the class described, means for feeding the blanks or sheets one at a time, a fluid reservoir, a revolving brush for contact with the surface of said feeding means, fluid transfer means for lifting the moisture from said reservoir and delivering it to said brush, and said reservoir, brush and transfer means being adapted for adjustment across the machine.

11. In a machine of the class described, means for feeding the blanks or sheets one at a time, a shaft adjacent said feeding means, a brush on said shaft adapted to contact with said feeding means, a second shaft and gear thereon having its teeth positioned to contact with the bristles of said brush, a speed-reducing device for driving said shafts and gear and brush at a slower speed than that of said feeding means, and a fluid receptacle having means therein for transferring the liquid to the teeth of said gear.

In witness whereof, I have hereunto set my hand this 4th day of June, 1926.

EDWIN G. STAUDE.