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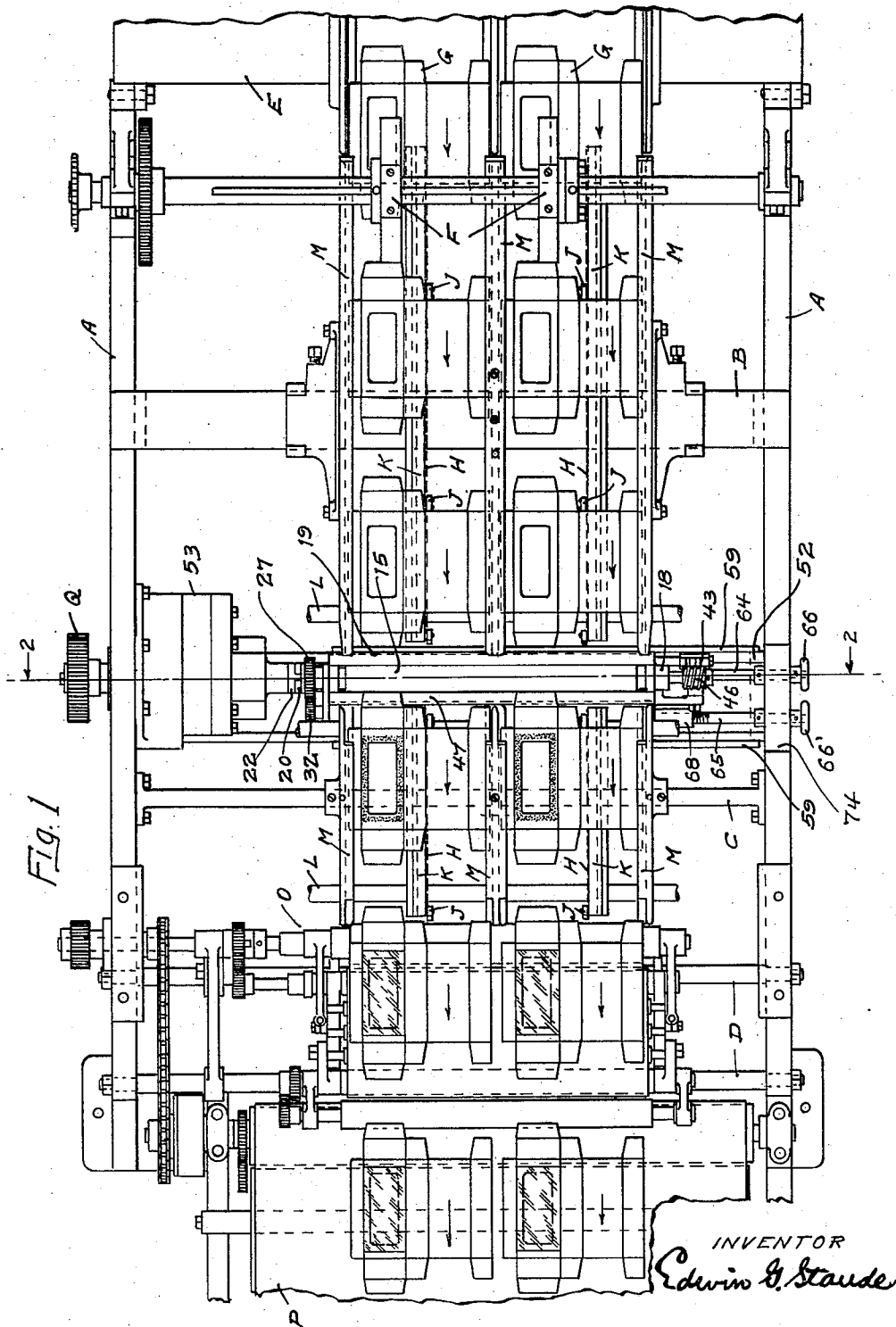
E. G. STAUDE

2,294,520

ADHESIVE APPLYING MECHANISM FOR PAPER FABRICATING MACHINES

Filed May 23, 1940

4 Sheets-Sheet 1



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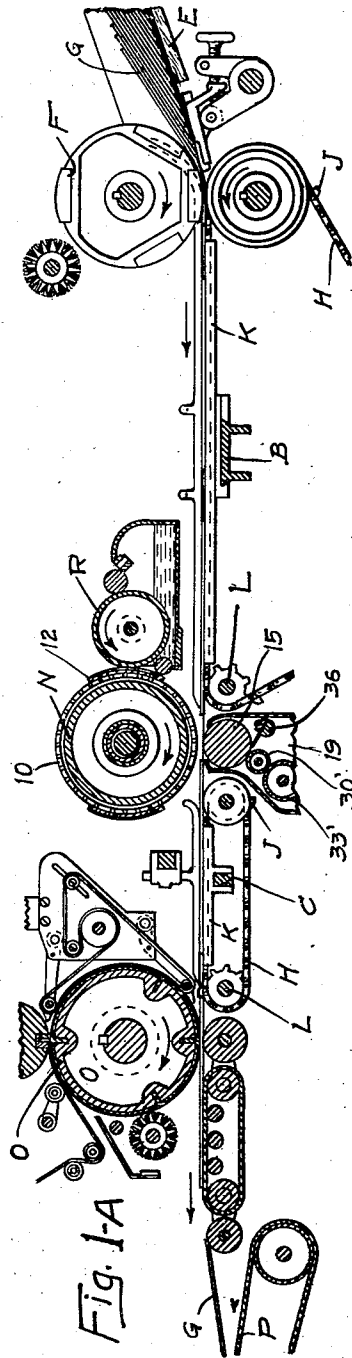
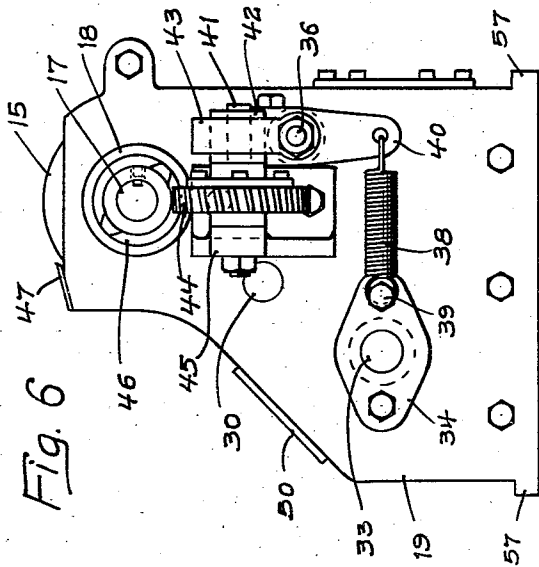
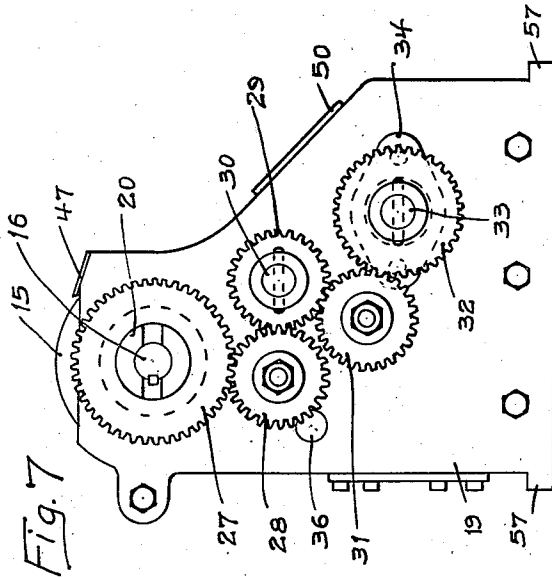
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4 Sheets-Sheet 2



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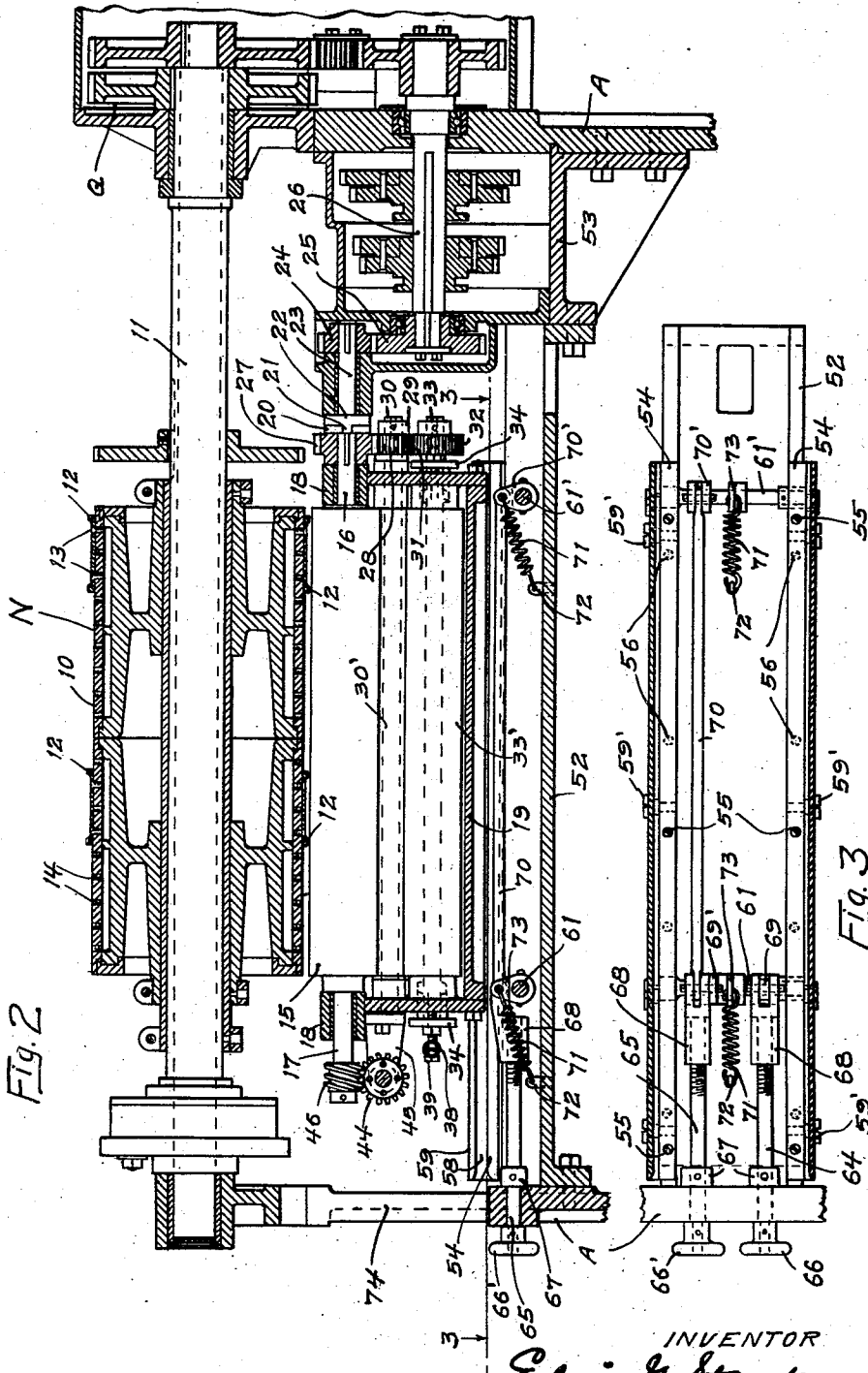
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4 Sheets-Sheet 3



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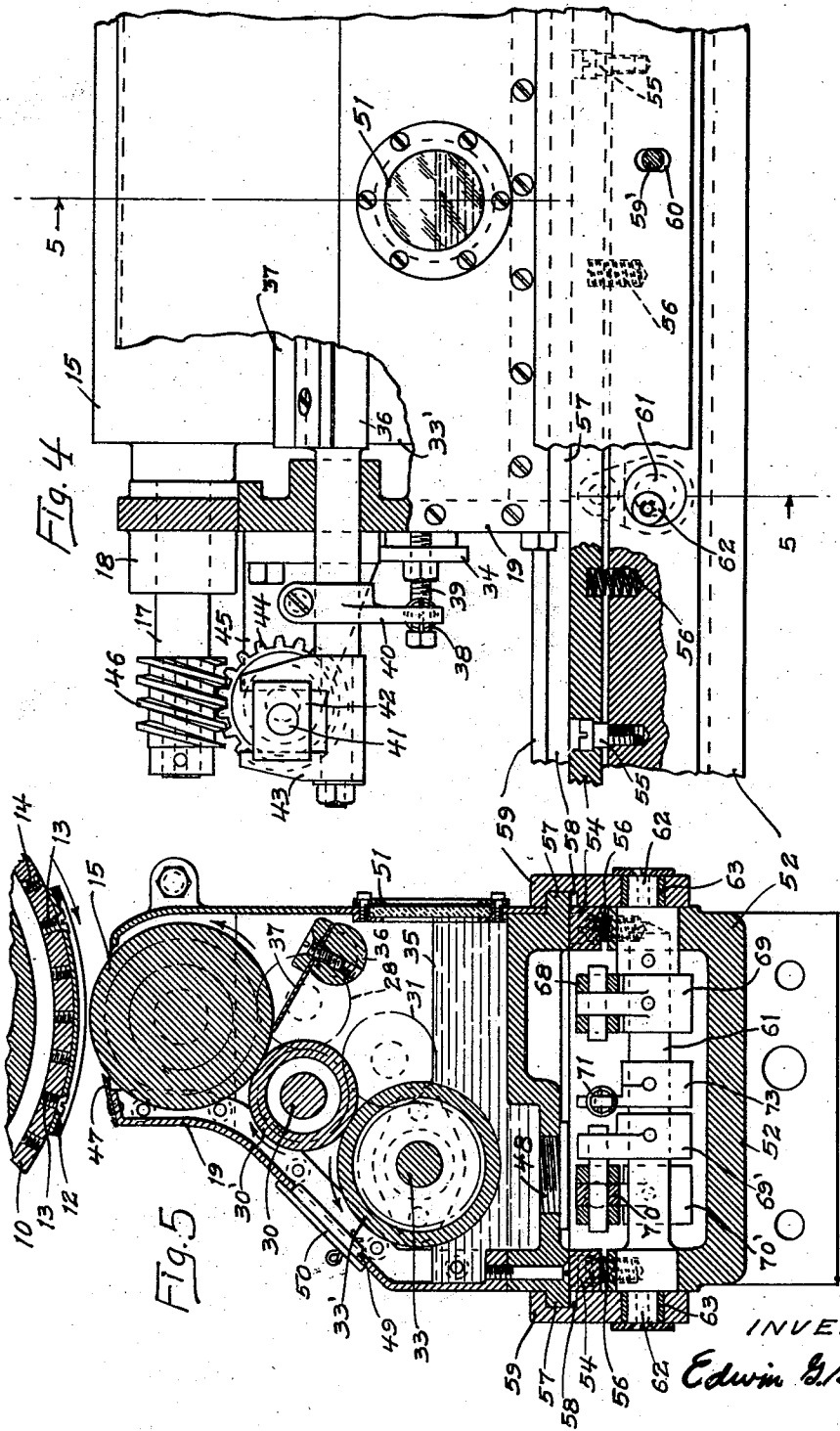
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ADHESIVE APPLYING MECHANISM FOR PAPER FABRICATING MACHINES

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,294,520

ADHESIVE APPLYING MECHANISM FOR
PAPER FABRICATING MACHINES

Edwin G. Staude, Minneapolis, Minn.

Application May 23, 1940, Serial No. 336,833

8 Claims. (Cl. 91—50)

This invention relates to improvements in machines of the type shown and described in the Patent No. 1,969,106 which was issued to me on August 7, 1934, and it particularly relates to improvements in the adhesive applying mechanism of such machines.

The object of this invention is to provide improved means for printing an adhesive boundary around openings, or windows in paper cartons, to which a transparent material is then applied. This improved mechanism may also be adapted for use in various other impression operations where exact and full control of the impression roll is essential, and where self-cleaning and quick and easy removal of the complete impression roll unit is desirable for efficient operation of the machine.

The primary object of my invention is to provide a self-cleaning impression roll for the gluing cylinder which is so constructed to immediately remove all "offset" of adhesive which may be transferred from the adhesive applying cylinder to the impression roll in event the machine runs idle or when the automatic feeder misses a blank or in event of a jam-up and for other reasons.

I am aware that self-cleaning impression rolls for holding blanks against glue dies are common even to the extent that they operate in a solvent for the adhesive. However, in every case the doctor blade or so-called glue scraper has the scraper pivoted behind the point of contact in direction of travel to prevent injury to the impression roll due to "digging in" or cutting the surface of the cylinder.

This construction has the disadvantage that heavy glue or partly dried glue will wedge in and cause the glue scraper or doctor blade to raise away from the impression roll and momentarily not accomplish the purpose for which it was intended.

Under my construction herein, I place the pivot for the doctor blade or glue scraper in advance of the point of contact and hold the doctor blade or glue scraper against the surface of the impression roll by a much lighter spring than would be possible under the conventional method, and I also obtain a new result because instead of scraping off the surface of the impression roll, I actually slice or "shave" the adhesive clean from the impression roll.

In order to get the best results I also harden the surface of the impression roll so as to avoid any "digging in" or cutting of the surface of the said roll by the doctor blade.

In practice I find the results even more gratifying that might appear from the drawings, and should the attendant overlook supplying the solvent fluid, the doctor blade when mounted as shown in the drawings will act to clean the impression roll in a very satisfactory manner by slicing, shaving or cutting the adhesive from the surface of the impression roll, even should the adhesive or glue be dried on the surface due to the machine standing idle during lunch hour or over night.

My present invention consists of improved means for quickly and conveniently adjusting a driven self-cleaning impression roll into perfect alignment with an adhesive applying cylinder, to insure an even, yielding contact of the carton blank with the adhesive coated pads on said cylinder, while my invention also consists of mounting said impression roll in a self-contained unit which is adapted to be easily and quickly removed from the machine for cleaning and other servicing.

Furthermore, my invention consists of improved means in said pressure roll unit for automatically cleaning the surface of said pressure roll to prevent accumulation of "offset" or dried adhesive and other foreign matter thereon, while a film of liquid solvent is continuously applied to said pressure roll to dissolve any trace of adhesive which may adhere thereto.

As a further object with certain adhesives or liquid material I may use the self-cleaning pressure roll without the solvent material by merely using the cleaning scraper made of thin spring steel and vibrated in the position shown in the drawings, which I believe to be new.

My invention consists, further, of the features and constructions described in the following specification, as shown in the accompanying drawings, and as specifically recited in the annexed claims.

In the drawings—

Figure 1 is a plan view of the lower part of a paper working machine embodying my invention, and in which is shown two rows of carton blanks passing through the several interconnected units of which said machine is composed.

Figure 1A is a vertical, longitudinal cross-section through the central portion of the machine shown in Figure 1, and showing the location of my improved adhesive applying unit therein.

Figure 2 is a vertical cross-sectional view, taken on line 2—2 of Figure 1, showing the relative parts of the adhesive printing unit of the ma-

chine in which my present invention is incorporated.

Figure 3 is a sectional plan view taken on line 3—3 of Figure 2.

Figure 4 is a sectional view of one end of the improved pressure roll unit, partially broken away to show its construction.

Figure 5 is a cross-sectional view of said pressure roll unit, taken on line 5—5 of Figure 4.

Figure 6 is an end view of a removable casing in which my self-cleaning pressure roll is mounted, and

Figure 7 is a view of the other end of said casing.

Figures 1 and 1A, show the location of my improved pressure roll unit in a machine which applies transparent windows to paper carton blanks, and in this figure a double row of carton blanks are shown passing in continuous procession through the several units of the machine which are mounted between frame members A—A, while B, C and D indicate some of the cross bars which connect said frame members and support some of said units.

A hopper E at one end of the machine holds a supply of carton blanks in position to be engaged by feed wheels F which project single carton blanks G successively on to conveyor chains H having projecting lugs J which engage the rear edge of the projected blanks to convey said blanks in equally spaced formation toward the rear end of said machine. The chains H run in guides K and are driven in timed relation with other parts of the machine by a transmission means (not shown) connected with shaft L, while the edges of said blanks slide freely in guideways M.

A single row of the larger size blanks or a double row of the smaller size blanks are thus conveyed through the machine past an adhesive applying unit N, and a window applying unit O, onto a receiving apron P where said blanks are counted and stacked preparatory to being removed by an attendant.

Figure 2 shows the adhesive applying cylinder or roll 10 mounted on a shaft 11, immediately above the path of the carton blanks G, and suitably shaped pads 12 are secured by screws 13 to the periphery of said cylinder which is provided with numerous threaded holes 14 to permit various sizes and shapes of pads to be secured in any desired position thereon. The pads 12 contact an adhesive supplying roll R to receive a film of liquid adhesive which, in turn, is transferred to the passing blanks, while the cylinder 10 is driven by a transmission gearing Q in synchronism with the conveyor chains H, so that the adhesive transfer pads will always register with the openings in the passing carton blanks.

Now, to insure perfect printing contact of the adhesive transfer pads on the passing carton blanks, I provide a smooth-faced impression roll 15, of smaller diameter, directly beneath the cylinder 10, and reduced diameter end shafts 16 and 17 support the roll 15 in bearings 18 which are mounted on the ends of a casing 19. The end shaft 16 terminates in a flange 20 having a recess to receive a projection 21 on an adjoining flange 22 which is integral with a stub shaft 23 on which a gear 24 is secured. The gear 24 meshes with a larger gear 25 on a driven transmission shaft 26, to revolve the stub shaft 23, the coupling flanges 20 and 22, and the roll 15. A gear 27 is secured to the end shaft 16 in position to engage an idler pinion 28 which, in turn, engages a gear 29 on

the outer end of an intermediate shaft 30, which has bearings in the ends of the casing 19 beneath the roll 15, and another idler pinion 31 connects the gear 29 with a gear 32 on a bottom shaft 33 which also has bearings in the ends of the casing 19, and packing glands 34 are provided to prevent escape of the solvent liquid 35 through the last mentioned bearings. A tubular roll 33' is secured to the shaft 33 so as to revolve in said solvent liquid, while a roll 30' is secured to the intermediate shaft 30 and arranged to contact the rolls 33' and 15 to carry a film of solvent liquid from the bottom of the casing 19 to the surface of the roll 15, for the purpose of dissolving any accumulation of "offset" adhesive on said roll.

To remove the film of solvent liquid from the roll 15, I prefer to arrange a reciprocating bar 36 beneath said roll in the casing 19 (see Figure 5), and a scraper or doctor blade 37 on said bar has a longitudinal edge held in yielding contact with the roll 15 by a spring 38 which extends from an adjustable arm 40 on said bar to a projecting bolt 39 on the packing gland 34. The bar 36 is reciprocated by a crank pin 41 which has a sliding block connection 42 with a yoke 43 on the extending end of the bar 36, while the crank pin 41 projects from a worm gear 44 which is supported by a bracket 45 in position to be actuated by a worm 46 on the end of the shaft 17 of the driven roll 15. A guard strip 47 is fastened to an upper edge of the casing 19 and extends over on to the roll 15 to keep lint and other waste matter from entering the casing, while a drain plug 48 is removably located in the bottom of said casing, and a filling hole 49 having a removable stopper 50 is disposed on one side and a glass covered opening 51 is provided on the other side of said casing.

The casing 19 is supported beneath the cylinder 10 by a channel shaped cross member 52, which extends from one frame member A to the transmission housing 53 on the other frame member A, and pressure bars 54 are yieldingly mounted on the vertical flanges of said cross member by a series of screws 55 that limit the vertical movement of said pressure bars which are forced upwardly by a series of compression springs 56. The casing 19 rests directly on the pressure bars 54 which act to force said casing upwardly so that the driven roll 15 is yieldingly pressed against the passing carton blanks with sufficient pressure to insure a firm printing contact of said blanks with the adhesive transfer pads. It is very important that the roll 15 can move upwardly far enough to press a very thin carton blank against the transfer pads, but it is also important that said roll does not move far enough to contact the transfer pads when a carton blank fails to be in position between said roll and pads, as the adhesive would then be transferred to the roll. It is therefore essential to provide means for quickly and accurately adjusting the upward movement of the casing 19 to suit blanks of various thickness, and to compensate for slight variations in the thickness of transfer pads.

For the purpose of accurately limiting the upward movement of the casing 19, I provide longitudinal flanges 57 at the bottom edges of said casing, and said flanges enter grooves 58 in side bars 59 which depend on each side of the cross member 52 where they are loosely held against said member by screws 59' which pass through

elongated holes 60 in said side bars. Small rock shafts 61 and 61' are arranged crosswise in the member 52 beneath each end of the casing 19, and a crank pin 62 is provided on each end of the shafts 61 and 61' and project through holes 63 in the side bars 59, so that when the shafts 61 and 61' are oscillated in their bearings the crank pins 62 will cause a slight vertical movement of the side bars 59 and the casing 19. As it is sometimes necessary to adjust each end of the casing 19 separately, in order to obtain correct printing contact at both ends of the adhesive applying cylinder 10, I provide independent adjusting means for the shafts 61 and 61', and said means consist of rods 64 and 65 which extend through holes in the frame member A and is provided with hand-wheels 66 and 66' on the outside and a collar 67 on the inside of said frame members. The inner end of the rods 64 and 65 are loosely threaded into hubs 68 which have a forked end pinned to the upper end of vertical arms 69 and 69' on the shaft 61, to which the arm 69 is secured, while a connecting rod 70 extends from the loosely mounted arm 69' to an arm 70' which is secured to the shaft 61'. When the rod 64 is rotated by the hand-wheel 66, the shaft 61 will be oscillated to move one end of the casing 19 up or down as desired, and when the rod 65 is rotated by its hand-wheel the shaft 61' will be oscillated to move the other end of the casing 19 as desired, while tension springs 71, which have one end attached to studs 72 and the other end attached to arms 73 on the shafts 61 and 61', serve to counter-act the upward pressure of the compression springs 56 so as to take up any lost motion and prevent rattling, and by friction of the parts hold the hand-wheels 66 and 66' in adjusted position.

From the foregoing description it will be apparent that the casing 19 is adjustably held in its upper position by the pressure bars 54 which force the flanges 57 against the upper edge of the grooves 58, and any "jam-up" or "double blanks" will cause the glue die 12 to force the impression roller 15 together with the casing 19 against the tension of the springs 56, thereby causing a yielding or cushion action. It is also possible to remove the casing 19 as an independent unit by simply turning the hand wheels 66 and 66' which will rock the shafts 61 and 61' and because of the eccentric mounting of such shaft (see Fig. 5) it will cause the side members 59 to raise, release or unclamp the guides 57 on the casing 19 and the casing 19 can then be removed by pulling it outwardly through an opening 74 which is provided in the frame member A for that purpose. I consider this construction an important feature of my invention, as it enables the operator to quickly remove the entire unit for cleaning or repair purposes without tools and without disturbing any other parts of the machine, the unit being uncoupled by the loose coupling connection 22.

I claim as my invention:

1. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a driven rotating impression roll arranged to press said blanks against said cylinder, a reservoir adapted to hold an adhesive solvent means for supplying a continuous film of adhesive solvent to the surface of said impression roll, a reciprocating wiping means in contact with the moistened surface of said impression roll and adapted to remove said film of liquid or offset

adhesive from said impression roll, said reciprocating wiping means being positioned beyond the line of contact of said impression roll and said supplying means in direction of travel of said impression roll whereby said impression roll will revolve towards said reciprocating wiping means.

2. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a spring mounted frame and a driven rotating impression roll mounted in said frame and arranged to yieldingly press said blanks against said cylinder, a reservoir containing an adhesive dissolving liquid disposed below said impression roll, means for transferring a film of said liquid to the surface of said impression roll, and a reciprocating wiping means in contact with the moistened surface of said pressure roll to remove said film of liquid or offset adhesive.

3. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a driven rotating impression roll mounted in a reservoir containing an adhesive dissolving liquid and located immediately below said cylinder, means in said reservoir for continuously supplying a film of said liquid to the surface of said impression roll, a wiping device contacting said impression roller means connected with said reservoir for reciprocating said wiping device in contact with the moistened surface of said impression roll to remove said film and return it to said reservoir, said reciprocating wiping device being anchored beyond the line of contact with said impression roll in direction of travel whereby said impression roll will revolve towards said wiping device, and clamping means for holding said reservoir securely in position.

4. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a rotating impression roll mounted in a reservoir containing an adhesive dissolving liquid and located immediately below said cylinder, means in said reservoir for continuously supplying a film of said liquid to the surface of said impression roll, and means connected with said reservoir for reciprocating a wiping device in contact with the moistened surface of said impression roll to remove said film and return it to said reservoir, and independent means for vertically adjusting either end of said reservoir to move said impression roll into suitable pressure contact with said blanks for perfect impressions of adhesive thereon.

5. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a rotating impression roll mounted in a reservoir containing an adhesive dissolving liquid and located immediately below said impression roll, means in said reservoir for continuously supplying a film of said liquid to the surface of said impression roll, and means connected with said reservoir for reciprocating a wiping device in contact with the moistened surface of said impression roll to remove said film and return it to said reservoir, and independent means for vertically adjusting either end of said reservoir to move said impression roll into suitable pressure contact with said blanks for perfect impressions of adhesive thereon, and resilient means arranged between said reservoir and said adjusting means for the purpose of forcing said

impression roll against said blanks with a yielding pressure which will allow the passage of an accidentally doubled blank.

6. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a rotating impression roll mounted in a reservoir containing an adhesive dissolving liquid and located immediately below said cylinder, means in said reservoir for continuously supplying a film of said liquid to the surface of said impression roll, and means connected with said reservoir for reciprocating a wiping device in contact with the moistened surface of said impression roll to remove said film and return it to said reservoir, and independent means for vertically adjusting said reservoir to move said impression roll into suitable pressure contact with said blanks for perfect impressions thereon and resilient means supporting said reservoir to force said impression roll against said blanks with yielding pressure.

7. A paper fabricating machine having means for conveying a series of paper blanks into con-

tact with a rotating adhesive applying cylinder, a driven spring-mounted impression roll located adjacent to said cylinder and arranged to yieldingly press said blanks against said cylinder, an impression roll cleaning member comprising a thin, flat, material, said cleaning member being anchored beyond the line of contact with said impression roll in direction of travel whereby said impression roll will revolve toward said cleaning member for the purpose specified.

8. A paper fabricating machine having means for conveying a series of paper blanks into contact with a rotating adhesive applying cylinder, a driven impression roll located adjacent to said cylinder and arranged to press said blanks against said cylinder, an impression roll cleaning member comprising a thin, flat metal spring, said cleaning member being anchored beyond the line of contact with said impression roll in direction of travel whereby said impression roll will revolve toward said cleaning member, and means for reciprocating said cleaning member.

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