May 7, 1935. G. F. FORD ET AL 2,000,325

GLUING MACHINE

Filed July 15, 1932 3 Sheets-Sheet 1

Fig. 1

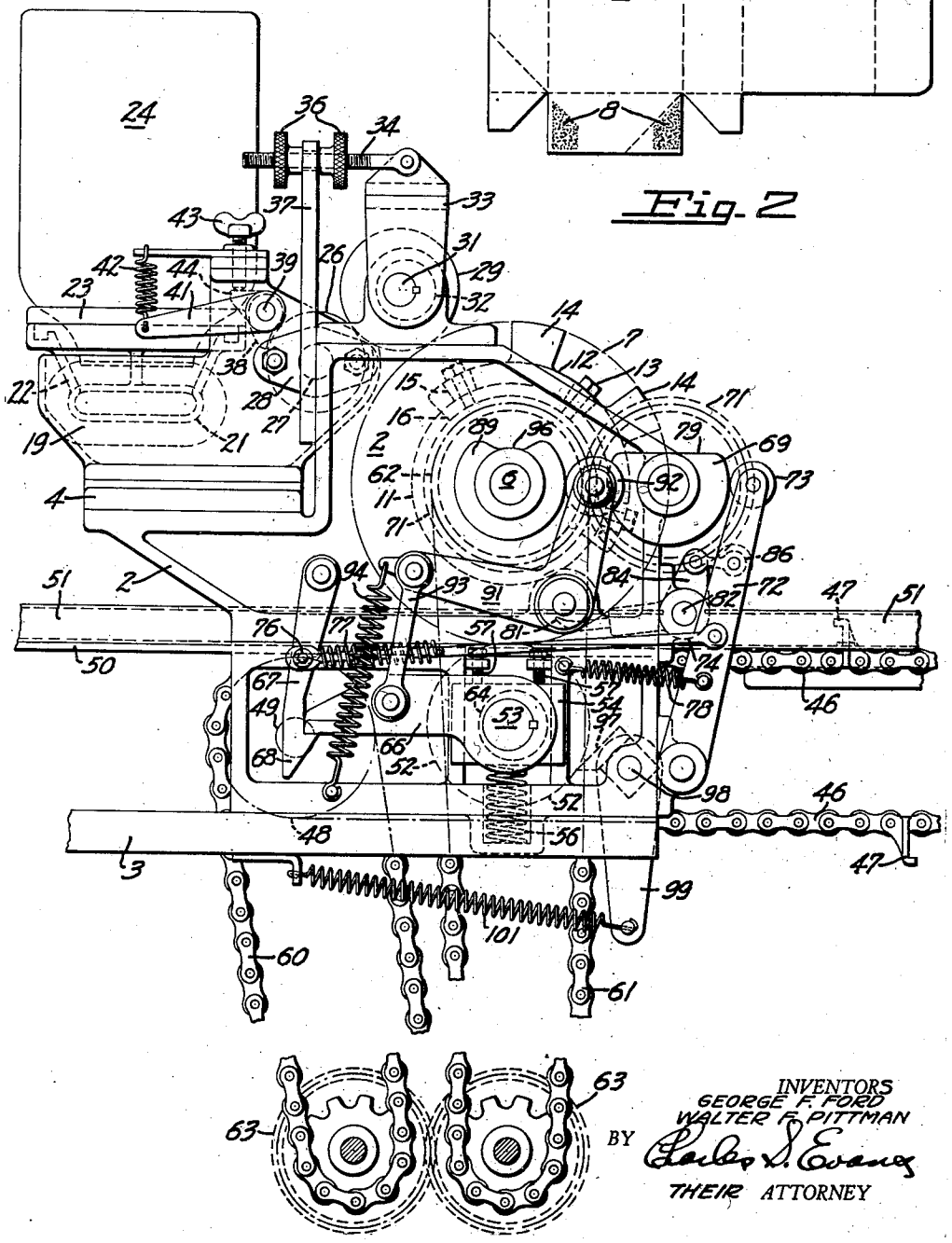

Fig. 2

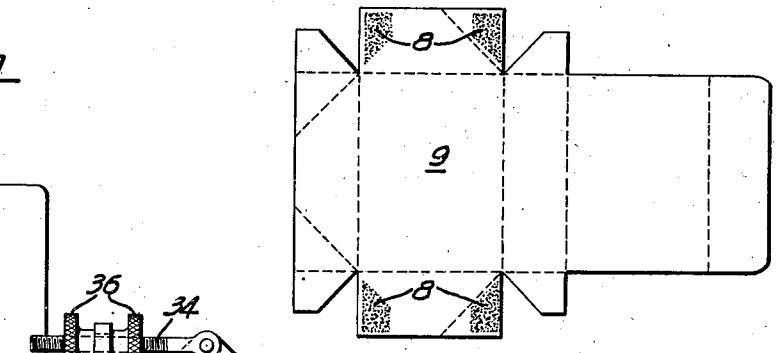

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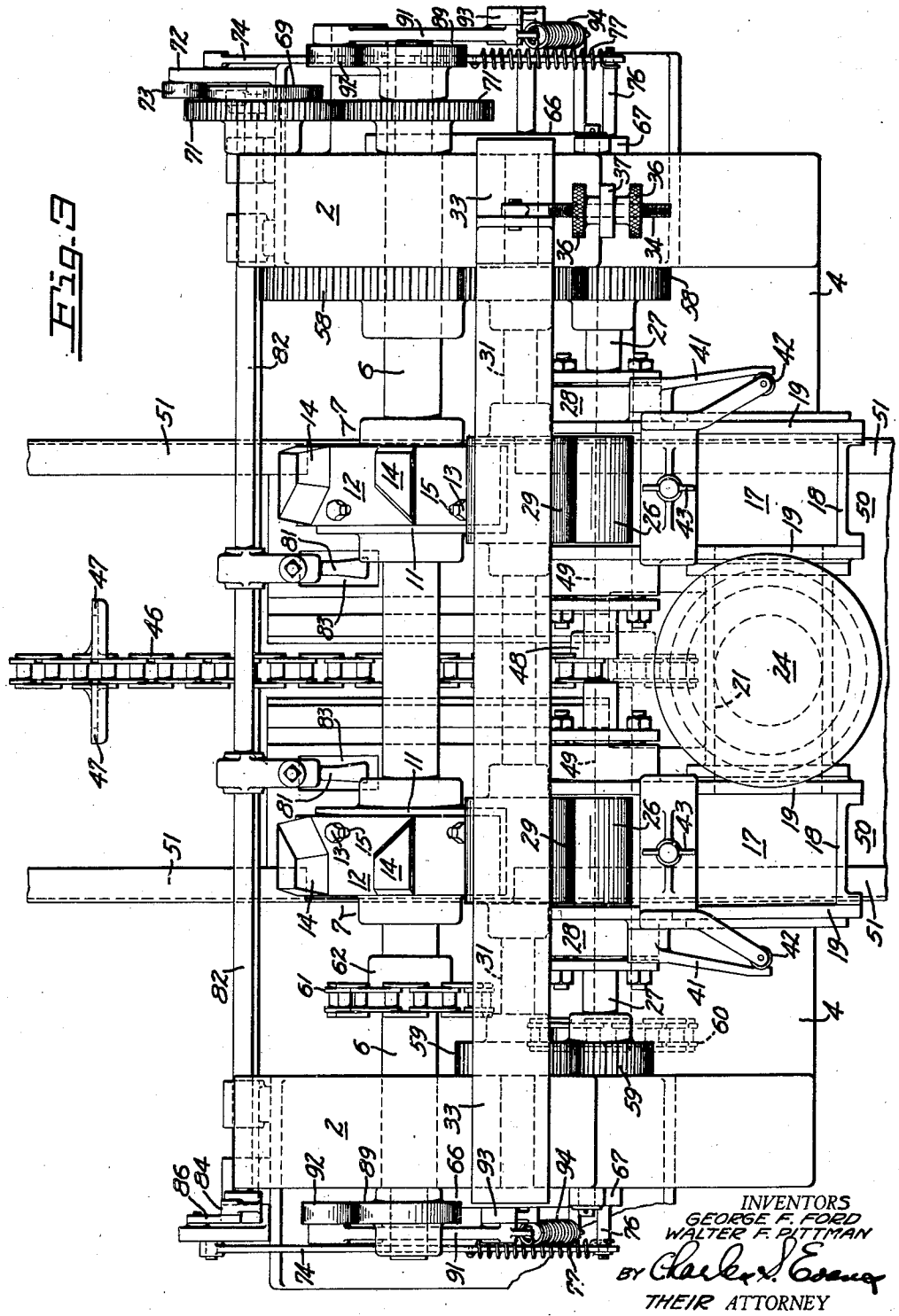
Fig. 3



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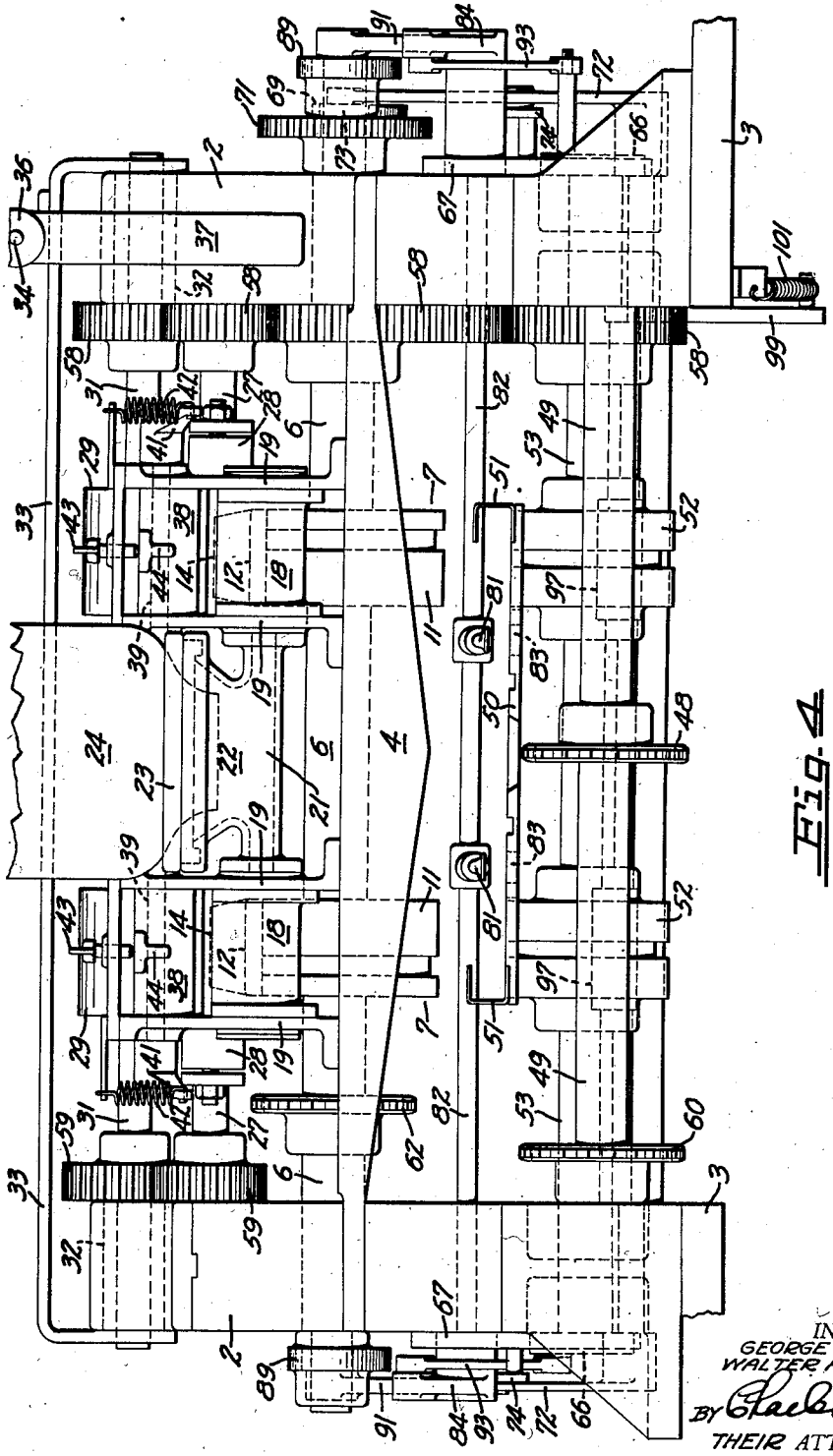

Fig. 4

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2,000,325

GLUING MACHINE

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Application July 15, 1932, Serial No. 622,670

8 Claims. (Cl. 91—50)

Our invention relates to a gluing machine, and particularly to a machine for applying glue on blanks of sheet material, such as the blanks from which cartons are folded.

It is among the objects of our invention to provide a gluing machine which is capable of a materially greater output than the machines heretofore employed.

Another object of our invention is to provide a machine of the character described which is smoother and more accurate in its operation than the usual type of gluing machine.

Further objects of our invention include the provision of a gluing machine which will apply a smooth and uniform film of glue, and which will effect this application with a minimum quantity of glue.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of our invention. It is to be understood that we do not limit ourselves to this disclosure of species of our invention, as we may adopt variant embodiments thereof within the scope of the claims.

Referring to the drawings:

Figure 1 is an end elevational view of the gluing machine embodying our invention.

Figure 2 is a plan view showing the blank of material upon which the glue is deposited.

Figure 3 is a plan view of the machine; and

Figure 4 is a rear elevational view of the same.

In the past, gluing machines have used the stencil form of glue unit, that is, the glue is stamped on the blank of material while the blank is held in a stationary position. The intermittent action of these machines results in slow operation, and renders it almost impossible to regulate the glue deposit. Our invention contemplates the provision of a machine which will permit a continuous, smooth and rapid flow of the blanks therethrough, and which will accommodate adjustments to control the character of the glue deposit.

In terms of broad inclusion, the gluing machine embodying our invention is in the nature of a rotary machine and comprises a gluing roll and means for applying glue on the roll, together with means for feeding blanks of material past the roll. An impression roll having a normal position adjacent the gluing roll is provided for supporting the blanks, and means are preferably provided for adjusting the normal position of the impression roll relative to the gluing roll.

Movable mounting means are preferably provided for the impression roll, adapting the same for movement from its normal position adjacent the gluing roll to a position removed therefrom, and means are provided for urging the roll toward the latter position. A latch is also provided for holding the impression roll in its normal position, and means timed with the movement of the gluing roll are provided for releasing the latch. A finger bearing against the blank is provided for controlling the operation of the releasing means. Means, also timed with the movement of the gluing roll, are provided for returning the impression roll to its normal position.

A reservoir is preferably provided for holding the glue, and a pick-up roll is positioned to dip into the glue. A roll is also provided between the pick-up and gluing rolls for transferring the glue from the first to the latter, and means are provided for adjusting the position of the transfer roll relative to the pick-up and gluing rolls. The gluing roll preferably comprises a cylinder provided with a demountable jacket on which radially extending glue pads are selectively arranged. These pads receive the glue from the transfer roll and deposit it on predetermined areas of the blank of material as the latter moves therepast.

In greater detail, the gluing machine embodying our invention preferably comprises a pair of side frames 2 mounted on a table or other suitable support 3 and connected by a transversely extending beam 4. A cross shaft 6 is provided, journaled in the end frames 2, and serves to carry the gluing rolls 7. In the machine chosen for purposes of illustration the mechanism is designed to apply deposits of glue on predetermined areas 8 on a blank of material 9, such as the carton blank shown in Figure 2. In order to effect this application of glue, a pair of the gluing rolls 7 are provided.

These rolls preferably comprise a cylindrical core portion 11 on which a jacket 12 is demountably secured by suitable bolts 13. The jacket 12 is provided with a pair of radially extending glue pads 14 suitably spaced and shaped and proportioned to deposit glue on the predetermined areas 8 when the gluing roll is rotated and the blank 9 is moved therepast. For purposes of adjustment, slots 15 are provided, through which the locking bolts 13 pass. By this arrangement the sleeves 12 may be shifted on the cylindrical core 11 to adjust the position of the glue pads 14. A rib 16 on the jacket and slidably engaging

a complementary groove in the core 11 serves to maintain the alignment of the jacket.

Means are provided for applying glue on the pads of the gluing roll. A pair of glue reservoirs 17 are provided adjacent the gluing rolls 7. These reservoirs are formed by a channel portion 18 closed at the ends by suitable plates 19 mounted on the cross beam 4. These reservoirs are connected by an oblong cross duct 21 having an upwardly extending funnel portion 22. A removably mounted ring 23 is seated in the upper end of this funnel portion, and provides a seat for the neck of an inverted glue supply bottle 24.

A pick-up roll 26 is positioned to project into each of the reservoirs 17; the rollers being mounted on shafts 27 journaled in the end frames 2 and the reservoir end plates 19 passing through suitable stuffing boxes 28. A roll 29 is positioned between each pick-up roll and its adjacent gluing roll for transferring the glue from the former to the latter. These transfer rolls are carried by a cross shaft 31 journaled in suitable eccentric bearings 32.

The latter bearings are rotatably connected by an overhead cross bar 33 extending transversely of the machine. By this arrangement the position of the transfer rolls 29 relative to the pick-up and gluing rolls may be adjusted; the adjustment being effected by merely shifting the position of the cross bar 33. The bar is held in a selected adjusted position by a threaded rod 34 having a pair of adjusting nuts 36 engaging an upright 37 which is mounted on one of the end frames 2.

Means are provided for varying the thickness of glue collected by the pick-up rolls 26. To this end the scrapers 38 are provided; each scraper being mounted on a shaft 39 journaled in the end plates 19 of the reservoirs. An arm 41 is mounted on an outer end of each of the shafts 39, and suitable tension springs 42 are connected with the arms to urge the scrapers 38 away from the peripheries of the pick-up rolls. The adjustment of each scraper is effected by a thumb screw 43 bearing on a lug 44 connected with the scraper. By adjusting the scrapers 38 and the transfer rolls 29 the thickness of the films of glue applied on the gluing pads 14 may be selectively varied.

Means are provided for feeding the blanks of material past the gluing rolls, and for this purpose a conveyor chain 46 having pusher lugs 47 spaced therealong is preferably provided. The chain passes under the gluing rolls and runs over a sprocket 48 carried by a cross shaft 49; the latter being driven by a suitable chain and sprocket drive 60. The conveyor chain 46 is positioned between the gluing rolls 7, and cooperates with the conveyor table 50 and the guideways 51 to direct a blank of the material accurately past the gluing rolls.

A grooved impression roll 52 is provided under each of the gluing rolls 7 to support the blanks of material while receiving glue from the glue pads 14. These rolls are carried by a cross shaft 53 journaled in suitable blocks 54 slidably mounted on the end frames 2. The blocks 54 are urged upwardly by suitable springs 56, and the upper position of the blocks is determined by suitable limit screws 57. Thus, the position of the impression rolls relative to the gluing rolls may be selectively varied by turning the set screws 57. In the event that a double thickness of material is accidentally fed through the machine, the supporting springs 56 will give and prevent damage to the machine or its adjustment.

The pick-up rolls 26, transfer rolls 29, gluing rolls 7 and impression rolls 52 are timed in their movements so that the peripheral speeds of each is the same. This is accomplished by a suitable gear train 58 disposed adjacent one of the end frames 2. Note Figures 3 and 4. The pick-up roll shaft 27 on the side opposite this gear train is connected for rotation with the transfer roll shaft 31 by suitable gears 59, so that both of the shafts 27 run at the same speed. The system of rolls is preferably driven by a chain 61 running over a sprocket 62 mounted on the gluing roll shaft 6.

Means are provided for timing the movement of the conveyor chain with the movement of the gluing roll, so that the blanks of material will properly register with the glue pads 14 when the former are fed through the machine. To accomplish this, the drive chains 60 and 61 are timed in their movements by suitable gears 63. Note Figure 1.

With the impression rolls in their normal position adjacent the gluing rolls it is likely that these rolls would receive a certain amount of glue from the glue pads 14, in the event that there should be a blank of material missing on the conveyor chain. The following blank would then receive this glue on its under side, which of course is undesirable. In order to preclude this from happening, means are provided for depressing the impression rolls when a blank of the material is missing.

To accomplish this purpose, the impression roll shaft 53 is journaled in the blocks 54 in suitable eccentric bearings 64. An arm 66 is rotatably mounted with each of these bearings, and when the impression rolls are in their normal positions adjacent the gluing rolls the arms 66 are in a substantially horizontal position, as best shown in Figure 1. When these arms are rotated downwardly the impression rolls are depressed to a position removed from the gluing rolls.

Each of the arms 66 is held in the normally horizontal position by a suitable latch arm 67 pivotally mounted on the end frames 2. The lower end 68 of the latch arm is hooked to support the outer end of the eccentric arm 66 and is shaped to facilitate engagement of the eccentric arm when the latter moves upwardly.

Means are provided for releasing the latches when the glue pads 14 approach the impression rolls 52 and there is no blank on the conveyor chain. For this purpose a cam 69 is provided adjacent one end of the machine and is mounted for rotation with the gluing roll 7 by suitable gears 71. A linkage is provided connecting the cam with the latch arm on the same end of the machine, and comprises a lever 72 pivoted on the end frame 2 and having a follower roller 73 riding on the cam 69. A rod 74 is arranged to connect the follower arm or lever 72 with the latch arm 67; the end connecting with the latch arm being slotted to receive the arm fixed pin 76, so that the latch arm is permitted slight movement relative to the connecting rod. A spring 77 is provided to resiliently urge the latch pin 76 toward the inner end of the slot, so that the latch arm 67 is held against the outer end of the eccentric arm 66.

A spring 78 is interposed between the linkage and the end frame 2 and operates to hold the follower roller 73 against the cam 69, and likewise urge the latch arm 67 out of engagement with

the eccentric arm 66. The cam 69 is provided with a flat portion 79 arranged so that the follower arm or lever 72 will move inwardly to disengage the latch when the glue pads 14 approach the impression roll 52.

Means are provided for rendering this releasing action inoperable when a blank of material is approaching the gluing roll. To accomplish this, a pair of fingers 81 are provided and are positioned to bear downwardly against a blank of material on the conveyor. These fingers are mounted on a shaft 82 extending transversely of the machine. The conveyor table 50 is provided with suitable slots 83 so that the fingers may rotate downwardly when a blank is missing. The end of the shaft 82 adjacent the side of the machine having the control cam 69 is provided with a lever 84, and the end of this lever is connected with the follower arm 72 by means of a link 86.

By this arrangement it is evident that the follower arm or lever 72 cannot move inwardly to release the latch while a blank of material is passing under the fingers 81, even though the flat portion 79 of the cam 69 is under the follower roller 73. Thus, automatic means are provided for depressing the impression roll in the absence of a blank of material, and for preventing the impression roll from lowering when a blank of material is approaching the gluing rolls. The opposite side of the machine is provided with a similar latching mechanism, but in this case the cam is omitted. The movement afforded by the cam 69 is transmitted to the latching mechanism on the opposite side of the machine through the finger shaft 82.

Means are provided for returning the impression rolls to their normal positions after the latches have been tripped. For this purpose a cam 89 is provided on each end of the gluing roll shaft 6. These cams are operatively connected to the eccentric arms 66 through a suitable linkage comprising the bellcranks 91 having at one end the follower rollers 92 riding on the cams 89. The other ends of the bellcranks are connected to the arms 66 by suitable links 93. Springs 94 are provided to hold the following rollers 92 in engagement with the cams. Of course these springs also tend to rotate the eccentric arms 66 downwardly.

Each of the cams 89 is provided with an inflected portion 96, and these portions are positioned so that the bellcranks are permitted to move inwardly and downwardly when the gluing pads 14 are approaching the impression rolls 52. The movement of the cams 89 is not only timed with the movement of the gluing pads 14, but is also timed with the action of the latch releasing cam 69. In other words, when a blank of material is missing on the conveyor and the fingers 81 permit the cam 69 to release the latch, the cams 89 simultaneously permit the eccentric arms 66 to rotate downwardly to depress the impression rolls. Of course the cams 89 are ineffective when the latch arm 67 is engaged.

In case that glue accidentally drops on the impression rolls 52, suitable doctors 97 are provided for removing the same. These doctors are mounted on a cross shaft 98 journaled in the end frames 2. A lever 99 is secured on one end of this shaft, and a spring 101 is fastened between the lever and the end frame, to resiliently hold the doctors against the impression rolls.

The machine embodying our invention has a large capacity since the blanks of material are fed therethrough continuously and rapidly. The absence of intermittent and reciprocating actions characterizes the machine with a smoothness and accuracy of operation which has never before been realized. The adjustments which are possible, and which are in fact provided, permit the thickness and character of the film of applied glue to be regulated. Also, the improved machine insures the application of a smooth and uniform deposit. Furthermore, the mode of operation of the machine and the several adjustments provided minimizes waste in the application of the glue.

We claim:

1. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank and having a retracted position away from said roll, means mounting the impression roll for movement from one to the other of said positions, means urging the impression roll toward the retracted position, a latch engageable with said mounting means for holding the impression roll in its normal position adjacent the gluing roll, and means for releasing said latch to retract the impression roll.

2. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank and having a retracted position away from said roll, means mounting the impression roll for movement from one to the other of said positions, means urging the impression roll toward the retracted position, a latch engageable with said mounting means for holding the impression roll in its normal position adjacent the gluing roll, means for releasing said latch to retract the impression roll, and means including a finger bearing against the moving blank for controlling the operation of the releasing means.

3. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank, movable mounting means for the impression roll adapting the same for movement from its normal position adjacent the gluing roll to a position removed therefrom, means urging the roll toward the latter position, a latch for holding the impression roll in its normal position, means for releasing the latch, and means for returning the impression roll to its normal position.

4. A machine for depositing glue on a blank of material, comprising a gluing roll, means for rotating said roll, means for applying glue on the roll, means for feeding the blank past said roll, movable mounting means for the impression roll adapting the same for movement from its normal position adjacent the gluing roll to a position removed therefrom, means urging the roll toward the latter position, a latch for holding the impression roll in its normal position, means timed with the movement of the gluing roll for releasing the latch, and means also timed with the movement of the gluing roll for returning the impression roll to its normal position.

5. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the

blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank, movable mounting means for the impression roll adapting the same for movement from its normal position adjacent the gluing roll to a position removed therefrom, means urging the roll toward the latter position, a latch for holding the impression roll in its normal position, means for releasing the latch, and means including a cam connected for rotation with the gluing roll for returning the impression roll to its normal position.

6. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank, movable mounting means for the impression roll adapting the same for movement from its normal position adjacent the gluing roll to a position removed therefrom, means urging the roll toward the latter position, a latch for holding the impression roll in its normal position, means including a cam mounted for rotation with the gluing roll for releasing the latch, and means including a second cam mounted for rotation with the gluing roll for returning the impression roll to its normal position.

7. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank, eccentric mounting means for the impression roll operable upon rotation to move the impression roll from its normal position adjacent the gluing roll to a position removed therefrom, an arm connected to rotate with the eccentric mounting, a spring connected to rotate the arm and operating to urge the impression roll toward the latter position, a latch for holding the impression roll in its normal position, means for releasing the latch, and means for returning the impression roll to its normal position.

8. A machine for depositing glue on a blank of material, comprising a gluing roll, means for applying glue on the roll, means for feeding the blank past said roll, an impression roll having a normal position adjacent the gluing roll for supporting the blank, eccentric mounting means for the impression roll operable upon rotation to move the impression roll from its normal position adjacent the gluing roll to a position removed therefrom, an arm connected to rotate with the eccentric mounting, a spring connected to rotate the arm and operating to urge the impression roll toward the latter position, a latch engageable with said arm, and operable to resist the action of said spring for holding the impression roll in its normal position, a cam mounted for rotation with the gluing roll, a linkage actuated by said cam and operably connected with the latch for releasing the same, a finger bearing against the moving blank and connected with the cam linkage for controlling the operation thereof, a second cam mounted for rotation with the gluing roll, a linkage actuated by said second cam for returning the impression roll to its normal position.

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