

Nov. 20, 1951

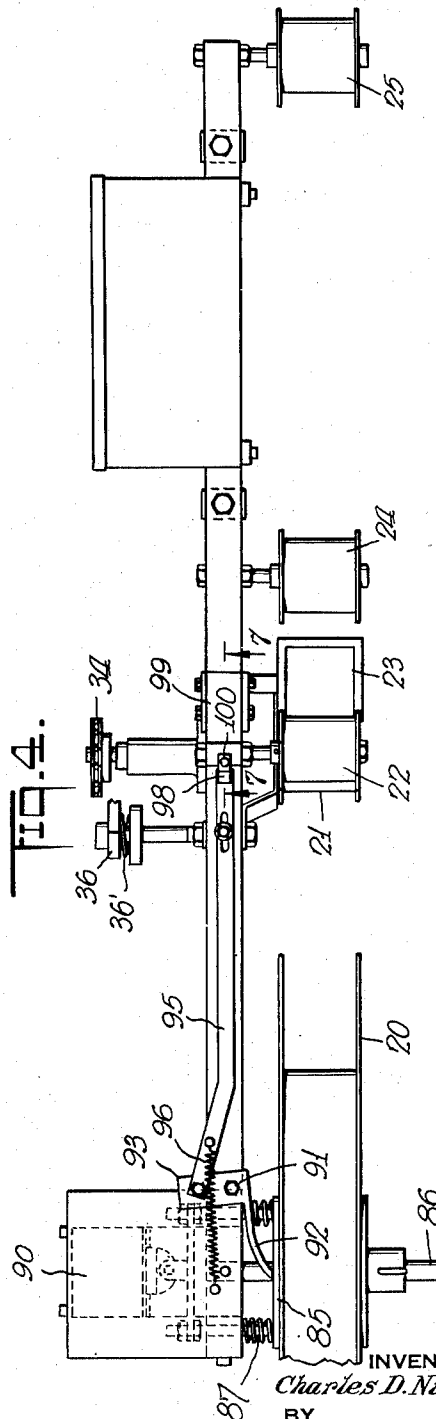
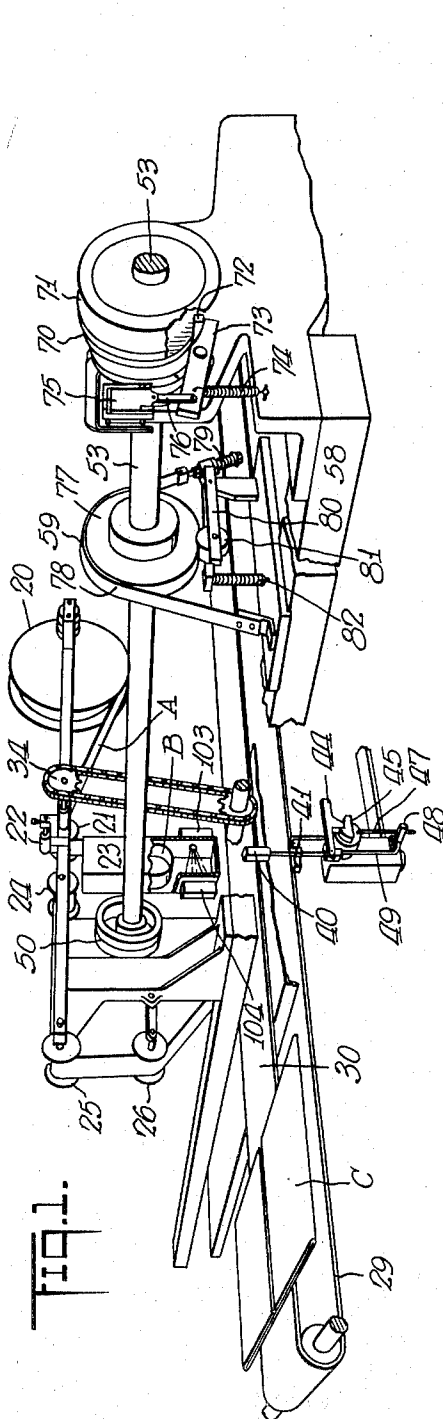
C. D. NITCHIE

2,575,887

BOX BLANK TAPING MACHINE

Filed May 26, 1949

5 Sheets-Sheet 1



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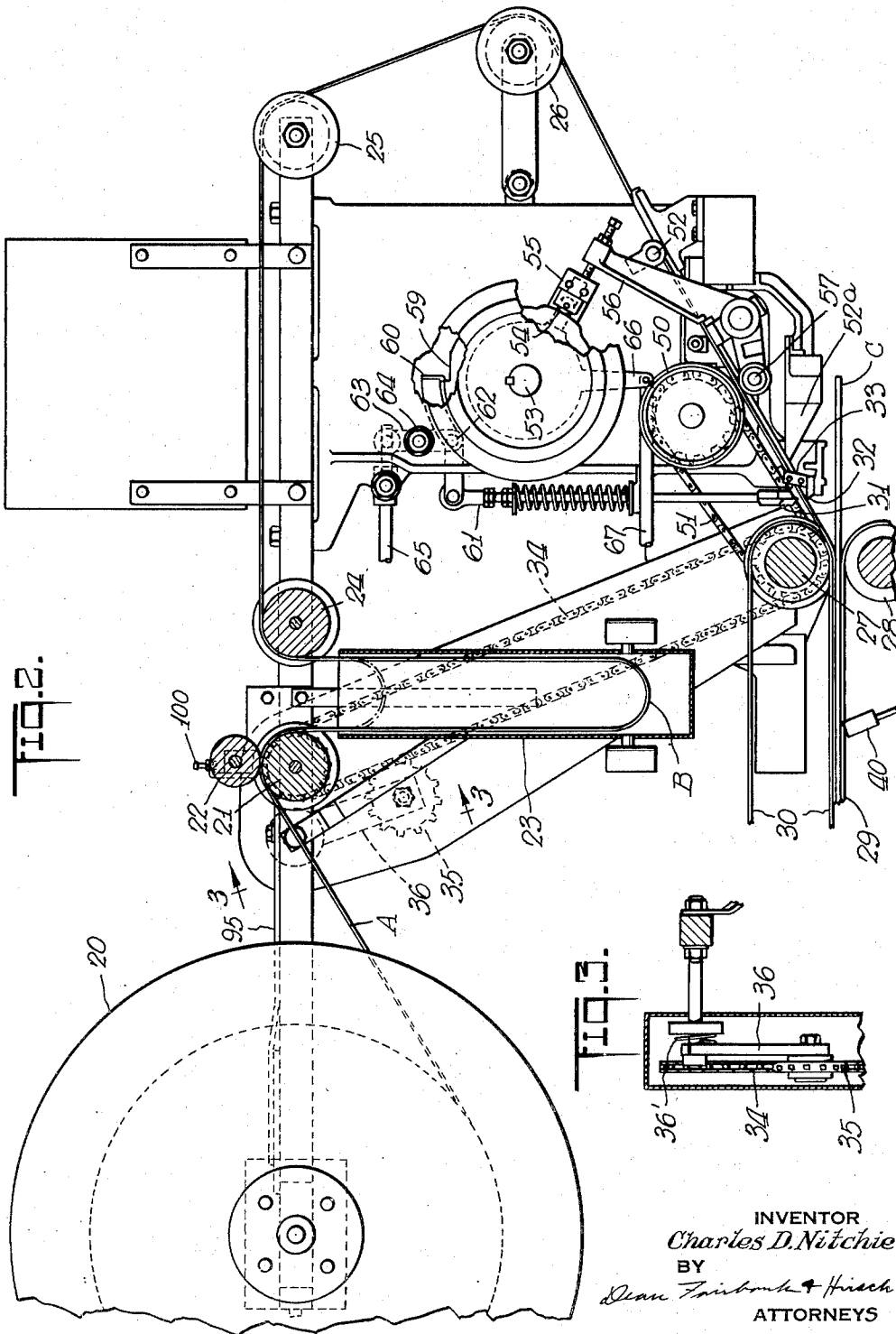
Nov. 20, 1951

C. D. NITCHIE
BOX BLANK TAPING MACHINE

2,575,887

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5 Sheets-Sheet 2



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BOX BLANK TAPING MACHINE

Filed May 26, 1949

5 Sheets-Sheet 3

FIG. 5.

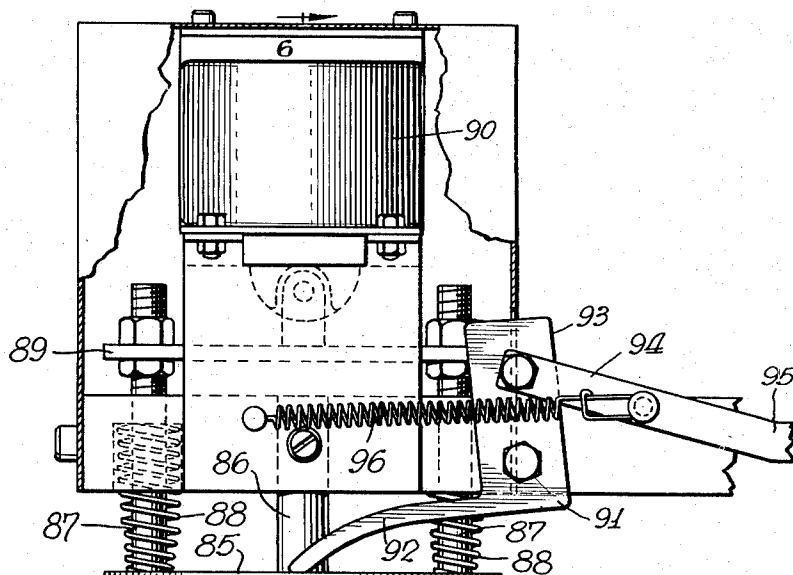


FIG. 7.

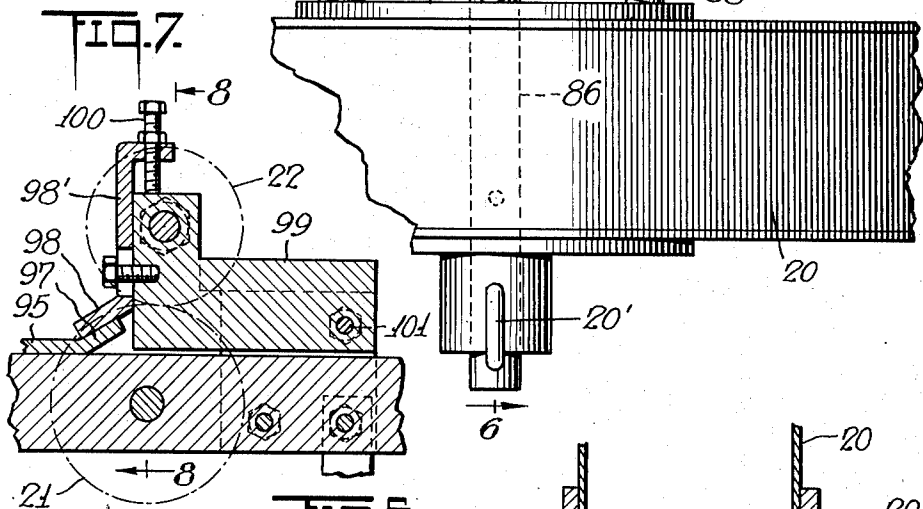
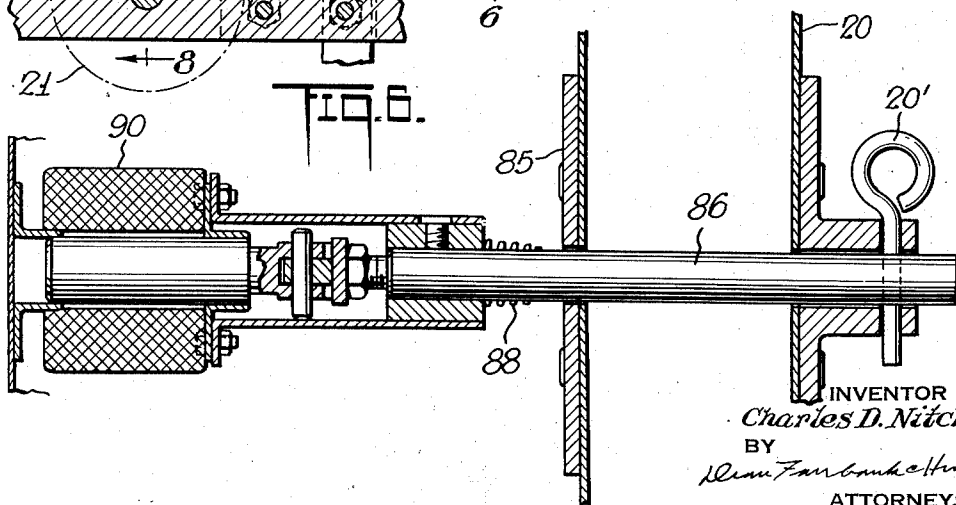


FIG. 6.



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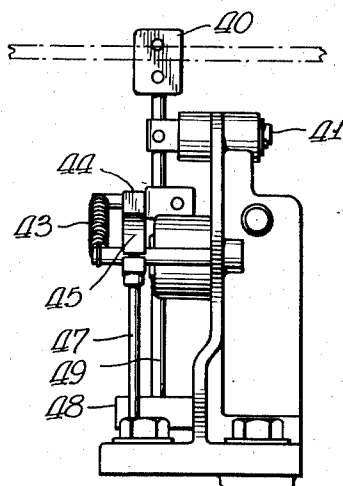
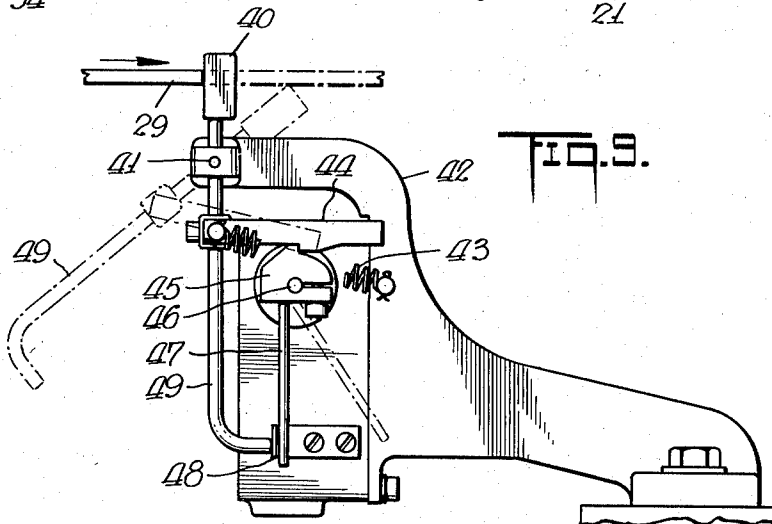
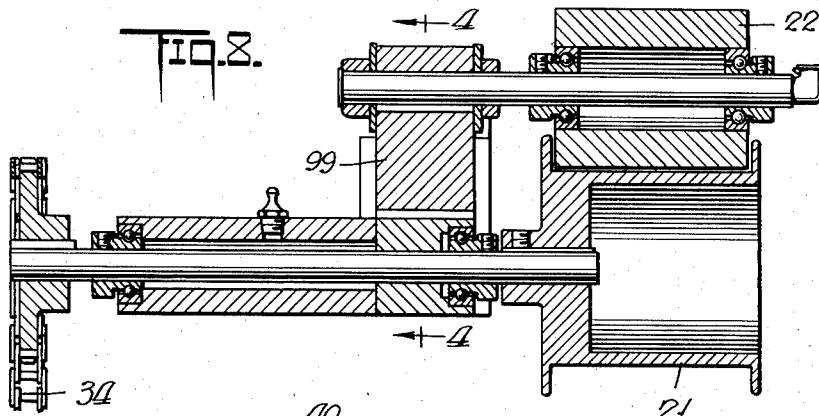
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BOX BLANK TAPING MACHINE

Filed May 26, 1949

5 Sheets-Sheet 4



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BOX BLANK TAPING MACHINE

2,575,887

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FIG. 11.

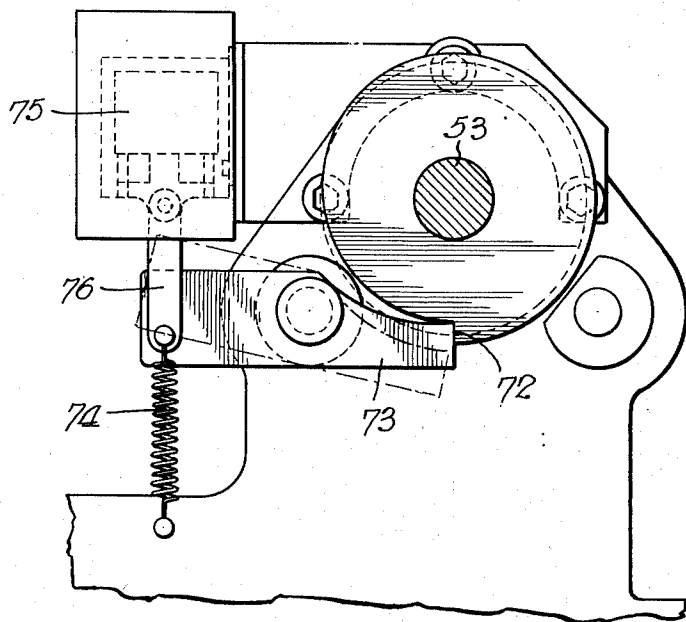
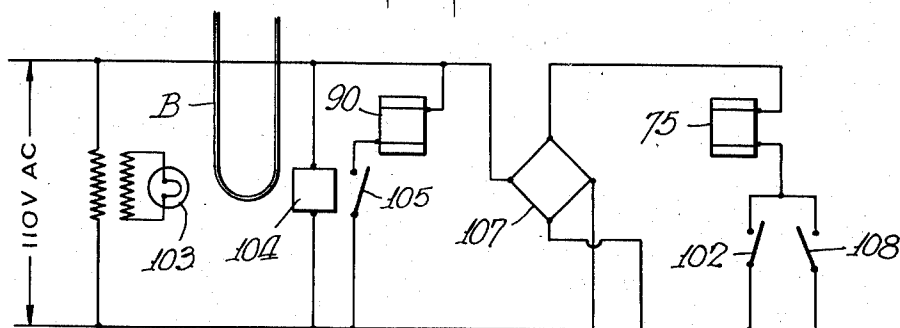


FIG. 12.



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UNITED STATES PATENT OFFICE

2,575,887

BOX BLANK TAPING MACHINE

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Application May 26, 1949, Serial No. 95,491

17 Claims. (Cl. 216—25)

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This invention is an improvement in the type of machines which are employed to apply tape to the outside surface of box blanks to secure together the abutting edges as the blanks are fed in succession through the machine. Each box blank is made from a stiff sheet, usually of double-faced corrugated paper, which is scored to define the side panels of the box and the end flaps, and is slitted inwardly on opposite edges to the score lines which define the height of the box, and thereby to form flaps which may be folded over to form the top and bottom.

In the development of such machines there is a continually increasing demand for higher speeds, thereby to increase the productive capacity of the machine. Box blanks of the type referred to have the strip of tape of a length equal to the height of the desired box, and therefore, as successive blanks are fed through the machine at uniform speed the tape will remain at rest while the end flap portions of the blank pass a given point, and then the tape is applied to the blank, and while being applied travels at the speed of the blank. After the tape has been applied the desired length is then cut off. The tape remaining after a section has been cut off is stopped, and remains at rest while the end flaps of that box blank and the end flaps of the next successive blank pass the point of tape application. Then the tape must start moving again at the high speed of the blank while being applied to the next successive blank. Thus the blank feeding is continuous, but the tape feeding is intermittent.

The roll of tape is usually carried by a supply reel, and it is not practical to start and stop the rotation of the tape roll simultaneously with the applying of the tape to the blank and the cutting of the tape at the proper point dependent upon the height of the box to be formed. It has been proposed to form a loop in the tape from which tape may be drawn when the application of tape begins, and to which tape may be supplied while the box flaps are passing the point of tape application, whereby the length of the loop alternately increases and decreases. A machine of that type is shown in copending application Serial No. 19,531 of Karl Sieg.

The present invention relates particularly to the mechanism employed for controlling the feed of tape to the loop in accordance with the length of the loop, so that tape may be readily fed from the loop at the beginning of the period of tape application to the blank, and may be supplied to the loop during the period while box blank

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flaps are passing the point at which tape is applied.

As one important feature of my invention a free loop is formed in the tape which is under practically no tension. Thus there is the minimum resistance to the sudden and rapid withdrawal of tape from the loop when the end of the tape is attached to a rapidly moving blank.

As another important feature of the invention there is provided a tape feeding means for drawing tape from the roll, so that tape may be readily fed to the loop, and in so doing there is minimum resistance to the sudden and rapid withdrawal of tape from the tape roll.

As another important feature of the invention there is provided electric switch mechanism for controlling the means for feeding the tape to the free loop when the length of the loop has been reduced to a predetermined extent by the attachment of the end of the tape to a blank, the pulling of the tape therefrom, and controlling the termination of the feeding when the tape has been cut off and the length of the loop has been increased to its initial length.

The tape supply reel feeds tape to the loop intermittently, and as a further important feature of my invention there is provided electrically controlled means for intermittently pulling tape from the roll when the loop is below a predetermined length, and for stopping the pulling and applying a brake to the roll when the loop is restored to its desired maximum length.

As a further feature there is provided a tape feeding means for drawing tape from the loop, and which includes a one-revolution clutch electrically controlled by the blank so that as each blank passes a predetermined point, tape feeding is positively started, and thereafter the tape is pulled from the loop by the blank for a period of time varying with the length of the body of the blank, and the feeding of the tape is independently stopped when the loop is extended to a predetermined length and independent of the box body length.

As a further feature of my invention I provide a target trip which is light in weight and therefore has low resistance to movement, so that it may be easily moved at high speed by the blank from rest position without liability of injuring or marring the edge of the blank, and may be snapped back by a spring to operative position after one blank passes and before the next one arrives, even though the blanks are spaced to only a short distance apart.

As a further feature the light weight target

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acts merely to snap a switch controlling the circuits of the different mechanisms, so that the resistance to movement and the inertia are very low.

In machines of the type referred to, the time interval between successive operations varies with the length of the blank being taped, and as a further feature of my invention means are provided whereby the controls of these operations are reset after the blank strikes the target, and the time of re-setting is not dependent upon the length of the blank.

As a further feature I provide a solenoid for effecting the starting of the tape feeding movement, and so control the circuit for the solenoid from the target trip that the solenoid may be de-energized immediately after being operated, and will be ready for the initiating of the next tape feeding operation before the advancing blank being taped has passed beyond the target.

As a further feature I provide a circuit controlling switch to start the feeding of the tape to the freely suspended loop and to stop the feeding of the tape to the loop when the loop has reached a predetermined length, and regardless of the position of the target.

In many plants the available electric current is an alternating one, which is ineffective in the very brief intervals between successive alternations. This is of negligible effect for slow and medium speed operations, but may cause slightly inaccurate timing in high speed operations. In order more accurately to control the timing there is provided a rectifier for the alternating current supplied to the clutch trip solenoid, so that the solenoid is operated by direct current, whereas other parts of the system may be operated by the alternating current.

Other features of my invention will be apparent from or be pointed out in connection with the description of the construction and operation of merely one embodiment of my invention.

In the accompanying drawings merely one of many possible embodiments of my invention are illustrated. In these drawings:

Fig. 1 is a perspective view of my improved apparatus.

Fig. 2 is a face view, partly in section, of the means employed for taking the tape from a roll and delivering it to a folded box blank, this figure being viewed from the opposite direction to that of Fig. 1.

Fig. 3 is a sectional detail on the line 3—3 of Fig. 2.

Fig. 4 is a top plan view of the parts shown in Fig. 2.

Fig. 5 is a top view, partly in section, of the parts shown at the left hand end of Fig. 4, and showing the reel brake.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a section on the line 7—7 of Fig. 4, but on a larger scale and showing the tape feed to the loop.

Fig. 8 is a section on the line 8—8 of Fig. 7.

Fig. 9 is an enlarged view of a portion of the sheet actuated trip shown in Fig. 1.

Fig. 10 shows the parts appearing in Fig. 9, but viewed from the right hand side.

Fig. 11 is a view showing the solenoid controlled clutch, and

Fig. 12 is a wiring diagram.

My improved machine may be positioned at the delivery end of a box blank folder, such for instance that shown in application Serial No. 725,958 of Wilber E. Bowersock, although it will

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be understood that the present invention may be employed in connection with any other suitable type of box blank folding and delivering mechanism, or the folded box blank may be taken from a stack of the folded blanks.

So far as concerns the feeding of the folded blanks, the cutting of the tape into sections each of a length equal to the body portion of the blank, the moistening of the tape, and the applying of it to the advancing blank, any type of machine may be employed, as for instance that shown in the Sieg application Serial No. 19,531, filed March 27, 1948.

In the illustrated embodiment of my invention the tape A, which is to be applied to a traveling folded blank C, is supported by a reel 20, and passes between rollers 21 and 22, then as a loop B in a tube 23. The other end of the loop passes over rollers 24, 25 and 26 to the tape feeder, hereinafter described, which intermittently feeds the tape end from the cutter and delivers it to the box blank after the flaps of the blank have entered between the pair of belts 29 and 30 carried by pulleys 27 and 28. The pulleys and the pair of belts 29 and 30 press the tape onto the blank, advance the blank, and pull the tape from its source of supply. Adjacent to the belt pulleys 27 and 28 there is provided a vertically movable knife 31 coacting with a stationary knife 32 to cut the tape into sections, each of a length corresponding to the length of the panel or body portion of the box blank. Suitable means are employed for moistening the under side of the tape. The rollers 27 and 28 are continuously rotated to receive and advance the blanks, but the blanks are usually spaced a short distance apart, and the spacing of the sections of tape is greater because no tape is applied to the flaps at the opposite ends of the body portions of each blank. The tape may be directed between the knives by a guide 33.

In my improved machine the loop B is free and hangs between the rollers 21 and 24, and the roller 21 acts in conjunction with the roller 22 to intermittently feed tape to the loop. The roller 21 is connected by a chain 34 to the shaft of the roller or belt pulley 27, so that these two both travel continuously, and at the same peripheral speed. An idler sprocket 35 may be mounted on an arm 36 pivoted on the frame and pressed by a spring 36' against the chain to keep the latter taut. Thus, in my improved machine the roller 21 driven by the belt pulley 27 feeds the tape to a freely suspended loop, whereas in the machine of the Sieg application above referred to, the tape is pulled out to form the loop by a swinging roller in the loop. The rollers 21 and 22 when feeding tape to the loop advance it at the same speed as that of the blanks, but as later pointed out, there is a phase lag resulting in first decreasing and then increasing the length of the free loop of tape.

The cycle of operations of my improved apparatus is initiated by a target 40 in the path of movement of the folded blank C. This target has low inertia and offers but slight resistance to the forward movement of the blank. The target in its movement serves to close an electric circuit and initiate the tape feeding, but the circuit may almost immediately open after the end of the tape becomes attached to the blank, and before the target returns to normal position after the passage of the blank.

As shown in Figs. 1, 9 and 10, the target 40 is supported below the path of movement of the

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blanks, and has a pivotal support 41 intermediate of its ends and in a bracket 42. The target is normally held in its substantially vertical position by a spring 43 which holds a lower extension 49 against one side of a stop 48. At a short distance below the pivotal support 41 it has pivoted thereto a pawl 44 engaging a shoulder or catch on an oscillatory cam 45 secured to a pivot pin 46. The ends of the spring 43 may be attached to the pivot pin of the pawl and to the bracket 42. The pin 46 turns with the cam and operates to close and open a switch, as hereinafter more fully explained. The cam is so shaped that after the pawl has rotated the cam through only a comparatively short arc, the pawl 44 lifts out of engagement with the shoulder on the cam. The cam may thereafter return to normal position and thereby break the circuit which it has just previously closed, even though the folded blank in passing over the target still prevents the latter from swinging back until after the blank has fully passed. Thus the pawl holds the switch closed for a predetermined time interval which is independent of the length of the blank. The cam has a depending arm 47 normally engaging the other side of the stop 48, the arm swinging from the solid line position to the dotted line position shown in Fig. 9 by the rotation of the cam to close the switch. When the cam is released from the pawl a torsion spring in the switch body effects the return rotation of the arm 47.

Thus, when a blank engages the target the latter swings from the position shown in solid lines in Fig. 9 to the position shown in dotted lines, and remains there until after the rear end of the blank has passed the target, at which time the spring 43 returns the target to normal position. In the meantime, the cam 45 has been rotated to close switch 102 of the circuit, and almost immediately thereafter returns to the position shown in Fig. 9, and is held in that position by the engagement of the depending arm 47 with the stop 48. Thus, as each blank moves along, the circuit controlled by the cam 45 will be closed by the turning of the cam, and will stay closed for the same time period, regardless of the length of time required for a short blank or a long blank to pass beyond the target 40.

The electric circuit which is momentarily closed by the oscillating of the target acts to start the feeding of the end of the tape onto the blank. The target and its support, shown in Figs. 1 and 9, are secured in the fixed position on the frame of the machine, so that the end of the tape will become attached to the blank across the edges of the latter and accurately register with the first of the fold lines between the side walls and the flaps of the blank.

The apparatus that feeds the tape from the loop may embody many parts similar to those shown in the Sieg application above referred to. The tape in passing from the roller 26 goes beneath a roller 50 which is driven by a chain 51 from the shaft of the roller or belt pulley 27, then beneath a snubber 52, then over a tape moistener 52a and then between the knives 31 and 32. A shaft 53 is driven by a single revolution clutch, hereinafter described, and carries a cam 54 which acts on a plunger 55 to oscillate a lever 56 and press an idler 57 toward the roller 50 to grip the tape. Connected to the cam 54 there is a disc 58 which has a recess 59 acting to oscillate a lever 60 which moves the rod 61 connected to the cutter 31. The pivotal support

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62 of the lever may be carried by a link 63 pivoted at 64 and connected to a rod 65 extending to the delivery end of the machine, whereby the timing of the cutter may be adjusted. The part which carries the plunger may also have an arm 66 which may be connected by a rod 67 extending to the delivery end of the machine and adjustable to control the time at which the cam 54 swings the lever 56 to grip the tape to the feed roller 50 and start the feeding of the latter to the blank. These parts form no portion of my invention, and reference is made to the same Sieg application for a fuller explanation of the construction and operation thereof.

In my improved machine the shaft 53 is driven from any suitable source of power, and is intermittently rotated through one revolution for each box blank fed to the machine. The rotation of this shaft is controlled by the electric circuit which is in turn controlled by the target 40.

As shown, the shaft 53 has a single revolution clutch 71, such for instance as a Hilliard clutch, and which is operated by a trip cam 70. The latter has a shoulder 72 on its periphery, and with which the end of a pivoted lever 73 may engage. (See Fig. 11.) The lever is normally held by a spring 74 in position to engage the trip cam 70, thus disengaging the driving means within the clutch. The pivoted lever is connected to a solenoid 75 by link 76, so that when the electric circuit of the solenoid is closed, the lever is disengaged and the trip cam 70 returns the driving means into driving position within the clutch, and the shaft 53 may rotate to cause roller 57 to engage the tape and the tape to be gripped by feed roller 50 and advance the end of the tape to the blank, where it becomes attached by the pressure of the belt 30.

The shaft 53 is stopped after a single revolution, and in a predetermined position. This is effected by means of a brake disc 77 having a brake band 78, one end of which is anchored and the other end connected to a spring 79. A lever 80 has a roller 81 engaging the periphery of the brake disc and a spring 82 pressing the lever toward the disc. The brake disc 77 has a recess or depression on the periphery, so that when the roller enters the depression after a single revolution, the spring 79 applies the brake and stops the shaft in a predetermined position. The brake band is not so tight but what the shaft can be rotated to move the depression past the roller 81 and loosen the brake band when the circuit is closed to disengage the pivoted lever 73 and cause the clutch to engage.

Thus it will be seen that when the blank strikes the target 40 the electric circuit is closed, the pivoted lever 73 is released, and the shaft 53 will rotate through one revolution and then stop. During this revolution the cam 54 causes the tape to be gripped by the feed roller 50 and the roller 57 and fed to the blank. The feed of the tape will be continued by the pull of the moving blank until disc 58 causes the cutter 31 to cut the tape. The shaft 53 continues rotating, and is stopped at the end of this one revolution. When the cutter operates there will be no further pull on the tape or from the loop B, but return slipping of the tape is prevented by the snubber. During the tape feeding operation above described, the tape has been pulled from the loop B to shorten the latter, and there is practically no resistance to this pulling action as the tape is under negligible tension.

The means for feeding tape to the loop involves

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an important feature of my invention. As previously noted, the roller 21, which is a part of the means for feeding tape to the loop, is continuously rotated from the shaft of one of the belt pulleys which feed the blanks, but the roller 22 is intermittently raised and lowered.

In the specific form of my invention illustrated, the roller 22 is intermittently lowered to an operative position to press the tape against the driven roller 21, and at the same time a brake on the tape roll is released to permit rotation of the roll and delivery of tape from the roll to the loop. Driven roller 21 is a smooth faced roller, and as such the tractive force applied to the tape is proportional to the resistance in the rotation of the tape roll when unwinding. When roller 22 is lowered to an operative position to press the tape against the driven roller 21, slippage of the tape occurs during which time rotation of the tape roll is gradually accelerated. This in effect is to apply a constant tension on the tape when feeding to the loop and unwinding the tape roll and not to snap the tape or jerk the tape roll into rotation, thus breaking the tape. Delivery of the tape from the roll to the loop may occur very promptly after start of tape withdrawal from the loop, and until the loop is restored to its normal maximum desired length. The feeding of tape to the loop is then stopped and the brake is reapplied to the tape roll to prevent continued unwinding of the tape roll. The brake is shown in Fig. 5 as having a friction plate or brake disc 85 coaxial with the spindle 86 of the reel 20, supported by two or more rods 87 which carry springs 88. The rods 87 are connected by a bar 89, and the latter is connected to the core of a solenoid 90.

The means which causes the release of the brake on the tape roll also acts to lower the feed roller 22 so that the rollers 21 and 22 will withdraw tape from the tape roll. As shown in Fig. 5, a bell crank lever is mounted on a pivot 91 on the frame of the machine, and one arm 92 of this bell crank lever engages the brake disc 85. The other arm 93 of the bell crank lever is connected by a link 94 to a horizontally movable bar 95 slidable on the frame of the machine. A spring 96 normally acts on this bar to pull it endwise and also acts through the arm 92 to press the brake disc 85 onto the tape roll. The other end of the bar 95, as shown in Fig. 7, has an upwardly inclined flange 97 disposed beneath a similarly inclined flange 98 on an arm 99 connected to the frame by a pivot pin 101, so that the flange 98 may rest on the flange 97 and the roller 22 may rest on the driven roller 21. This arm 99 carries the roller 22 which coacts with the roller 21 of the tape feed mechanism. When the brake is applied to the tape roll, the arm 92 of the bell crank lever moves to the position shown in Fig. 5. It pulls the bar 95 endwise to the left from the position shown in Fig. 7, and the inclined 97 acts as a cam on the flange 98 to swing the arm 99 and roller 22 up and about the pivot 101 and lift the feed roller 22 away from the feed roller 21. Therefore, even though the feed roller 21 continues to rotate, there will be no further tension on the tape to pull it from the roll 20, and feed it to the loop. When the brake is released by the solenoid 90 the arm 93 pushes the bar 95 endwise and lets the roller 22 press the tape onto the driven roller 21, and the tape is gripped and fed by these rollers. In order to effect accurate timing, the base plate 98' of the flange 98 may be vertically adjusted on the

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arm 99, and with its limiting down position controlled by an adjusting screw 100.

The sequence of operations in the apparatus above described is as follows, reference being had to the wiring diagram, Fig. 12:

When a blank advanced by the belts 29 and 30 strikes the target 40 the latter is moved from the position shown in solid lines in Fig. 9 to the position shown in dotted lines. The cam 45 oscillated by the target is connected to a normally open switch 102 which is in the electric control circuit, and the momentary closing of this switch energizes the solenoid 75 to release the clutch 71 and the brake band 78, and permits the shaft to be driven through one revolution. At the same time it causes the cam 54 to swing the lever 58, and causes the roller 57 to press the tape against the driven roller 50, and causes it to be fed from the knives 31, 32 to the blank, and between the belt pulleys. By the time that roller 57 moves back after the cam 54 leaves the plunger 55, the tape has become attached to the blank, and the latter pulls the tape over the rollers 26, 25 and 24, and from the loop.

When the loop of the tape is lifted above the path of the light rays from the light source 103, the light rays acting on the electric eye 104 close the switch 105 in the circuit of the solenoid 90 to energize the latter and release the brake 85 from the tape roll. At the same time it lowers the roller 22 to cause this roller in cooperation with roller 21, to feed tape to the loop. The feed roller 21 is continuously rotated, but the roller 22 is an idler and is in raised position so that this rotation of the roller 21 does not feed tape except when the roller 22 is in lowered position.

The feeding of tape to the loop by the rollers 21 and 22 and the withdrawal of the tape from the loop, first by the rollers 50 and 57 and then by the blank, continues until the tape is cut by the knives 31, 32. Thereafter the withdrawal of tape from the loop terminates and the feeding of the loop continues until the lower end of the loop shuts off light from the light source 103 to the electric eye 104. The circuit then automatically opens at the switch 105, the brake 85 is reapplied, rotation of the roll is stopped, and the roller 22 is lifted.

Thus the blank does not pull tape directly from the tape roll, but pulls it from the loop, and there is very little resistance to this pulling action. The feed of tape from the loop continues for a time interval controlled by the length of the blank and its speed of travel, but the feed of tape to the loop begins after the loop has shortened to a predetermined extent, and continues after the cutting of the tape, and for a sufficient time interval to restore the tape to its desired maximum length. The closing of the circuit by the switch 102 takes place when the target has moved through only a part of its path of movement, and is opened when the pawl 44 releases the cam 45. Thus the feed of tape to the loop may begin shortly after the tape has shortened. The switch operated by the target is released before the rear end of the blank passes the target, and snaps back to close the switch 102, so that the circuit is ready for the next operation by the target when the next blank engages it.

From the wiring diagram it will be seen that where the current supplied is an A. C. one, a rectifier 107 is employed to supply D. C. current to the solenoid 75, so that the latter will operate

instantly regardless of the phase of the A. C. current at the instant the switch 102 is closed. A manually operated switch 108 may be connected in parallel with the switch 102, so that the tape feeding may be started by hand in starting up the machine, or at any other time desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A box-blank taping machine having means for intermittently feeding tape to a suspended loop supported only at the ends thereof, means for intermittently feeding tape to said loop, means for delivering tape intermittently from said loop to successive box blanks, thereby shortening said loop, means for projecting light rays transversely of the path of the lower end of said loop, and means controlled by said light rays for feeding tape to said loop only when said loop is out of the path of said light rays.

2. A box-blank taping machine having means for advancing a series of blanks in succession, means for intermittently feeding tape to a suspended loop supported only at the ends thereof, means for delivering tape intermittently from said loop to successive box blanks whereby said blanks pull tape from said loop to shorten it, means for projecting light rays transversely of the path of the lower end of said loop, and means controlled by said light rays for feeding tape to said loop when said loop is of less than a predetermined length and stopping said feeding when said loop reaches said length.

3. A box-blank taping machine including a pair of spaced members for supporting therebetween a freely suspended loop of tape, means for intermittently feeding tape to said loop, means for intermittently withdrawing tape from said loop and applying it to successively advancing box blanks, means below said members for projecting light rays in a transverse direction to the lower portion of said loop, and means controlled by said light rays for feeding tape to said loop only when said loop is above the path of said light rays.

4. A box-blank taping machine including a pair of spaced rollers for supporting therebetween a freely suspended loop of tape, means for continuously rotating one of said rollers, an idler roller movable toward and from said last mentioned roller to grip and release said tape, and thereby start and stop delivery of the tape to said loop, means for projecting light rays in a transverse direction below said rollers, and means controlled by said light rays for moving said idler roller to effect tape delivery to the loop when said loop is above the path of said light rays.

5. A box-blank taping machine having a tape supply reel provided with a friction brake, means for drawing tape from a tape roll supported by said reel to form a freely suspended loop, and means for applying said brake to stop rotation of said tape roll when the loop exceeds a predetermined length.

6. A box-blank taping machine including a pair of horizontally disposed spaced rollers for supporting a loop of tape, a tape supply reel, a brake for said reel, a roller coacting with one of said first mentioned rollers for feeding tape from a tape roll on said reel to said loop, and means for applying said brake and moving said third mentioned roller to stop feeding of tape to the loop when the loop exceeds a predetermined length.

7. A box-blank feeding machine including a pair of horizontally disposed spaced rollers for supporting a loop of tape, a tape supply reel, a brake for said reel, a roller coacting with one of said first mentioned rollers for feeding tape from a tape roll on said reel to said loop, means for projecting a beam of light transversely below said loop, an electric circuit including means energized by said light beam for closing said circuit, and means operating when said circuit is closed for operating said brake and disengaging said coacting roller.

8. A box-blank taping machine including a tape supply reel, a brake on said reel to prevent rotation of the tape roll thereon, a pair of rollers for feeding tape from said reel to form a freely suspended loop, means for positively rotating one of said rollers, an electric circuit, means for closing said circuit when the loop is of less than a predetermined length, and means actuated by said circuit for moving the other roller to operative position and releasing said brake.

9. A box-blank taping machine including a tape supply reel, means for supporting a freely suspended loop of tape delivered from a tape roll on said reel, means for projecting light rays in a direction transverse to the loop, electrically operated means for delivering tape from a tape roll on said reel to said loop to lengthen the latter, and means actuated by said light rays for stopping the delivery of tape to said loop when the latter intersects said light rays.

10. A box-blank taping machine including a tape supply reel, means for supporting a freely suspended loop of tape delivered from a tape roll on said reel, means for intermittently drawing tape from said loop for application to spaced box blanks advancing in succession, means for projecting light rays in a direction transverse to the loop, means for delivering tape from the tape roll on said reel to said loop to lengthen the latter, and means controlled by said light rays for stopping the delivery of tape to said loop when the latter intersects said light rays.

11. A box-blank taping machine having means for feeding tape to successively advancing blanks, an electric control circuit for initiating the operation of said feeding means, a switch in said circuit, a pivoted target in the path of movement of said blanks, an oscillatory member for operating said switch, means connected to said target for moving said member, and means releasing said member from said target and permitting return movement thereof before the target reaches the end of its path of movement by a blank.

12. A box-blank taping machine having a roller for feeding tape to successively advancing blanks, means for stopping rotation of said roller after a single revolution, an electric circuit including means for operating said stopping means, a switch in said circuit, a pivoted target in the path of movement of the blanks, an oscillatory member for operating said switch, means connected to said target for moving said member, and means for releasing said member from said target and permitting return movement thereof before the blank completely passes the target.

13. A machine as defined in claim 12, in which the oscillatory member has a cam portion for disengaging the connection of said member and said target before the latter reaches the end of its path of movement.

14. A box-blank taping machine having means for feeding blanks in succession, means for feed-

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ing tape to a freely suspended loop, means for feeding tape from said loop to successively advancing blanks, an electric circuit for controlling said first mentioned tape feeding means and initiating said second mentioned feeding means, a target in the path of movement of the blanks, a switch for said target, an oscillatory member for operating said switch, a member connected to said target for oscillating said member during a portion only of the movement of the target, and means for effecting return movement of said member and the operating of said switch before the target reaches the end of its path of movement by a blank.

15. A machine for applying tape to separate folded box blanks which are being fed in succession in spaced relationship into and between blank advancing members, said machine having a target in the path of movement of the blanks and operated by each successive blank, an electric circuit, means in said circuit for feeding tape for application to said blanks while said circuit is closed, means operated by said target during the initial portion of its movement for closing said circuit, and means for opening said circuit during further movement of said target.

16. A machine for applying tape to separate folded box blanks which are being fed in succession in spaced relationship into and between superposed traveling belts, said machine having means for feeding tape to a freely suspended loop, means for feeding tape from said loop to the blanks, a target in the path of movement of the blanks and operated by each successive blank, an electric circuit, means in said circuit for operating both of said tape feeding means when said circuit is closed, means operated by

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said target during the initial portion of the movement of the target for closing said circuit, and means for opening said circuit during further movement of said target.

17. A machine for applying tape to separate folded box blanks which are being fed in succession in spaced relationship into and between superposed traveling belts, said machine having a driven roller and an idler roller bodily movable in respect thereto, gradually to accelerate the tape and feed it to a freely suspended loop, means for feeding tape from said loop to the blanks, a target in the path of movement of the blanks and operated by each successive blank, an electric circuit, means controlled by said circuit while closed for initiating the operation of both of said tape feeding means, means operated by said target during the initial portion of the movement of the target for closing said circuit, and means for opening said circuit during further movement of said target.

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