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G. H. RIDINGS

2,350,417

SUPPLY ROLL FOR BLANK SHEETS

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FIG. 1

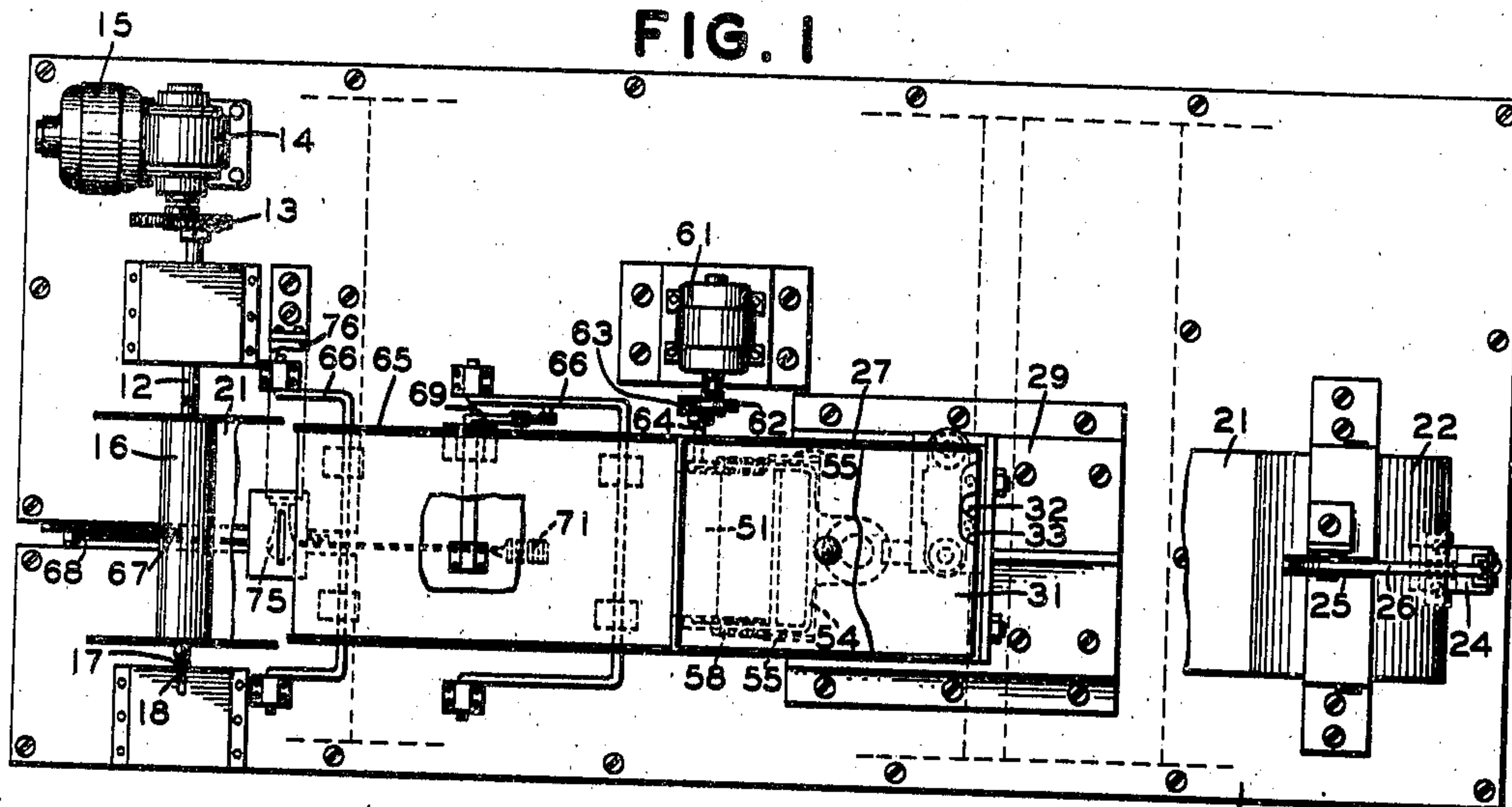


FIG. 2

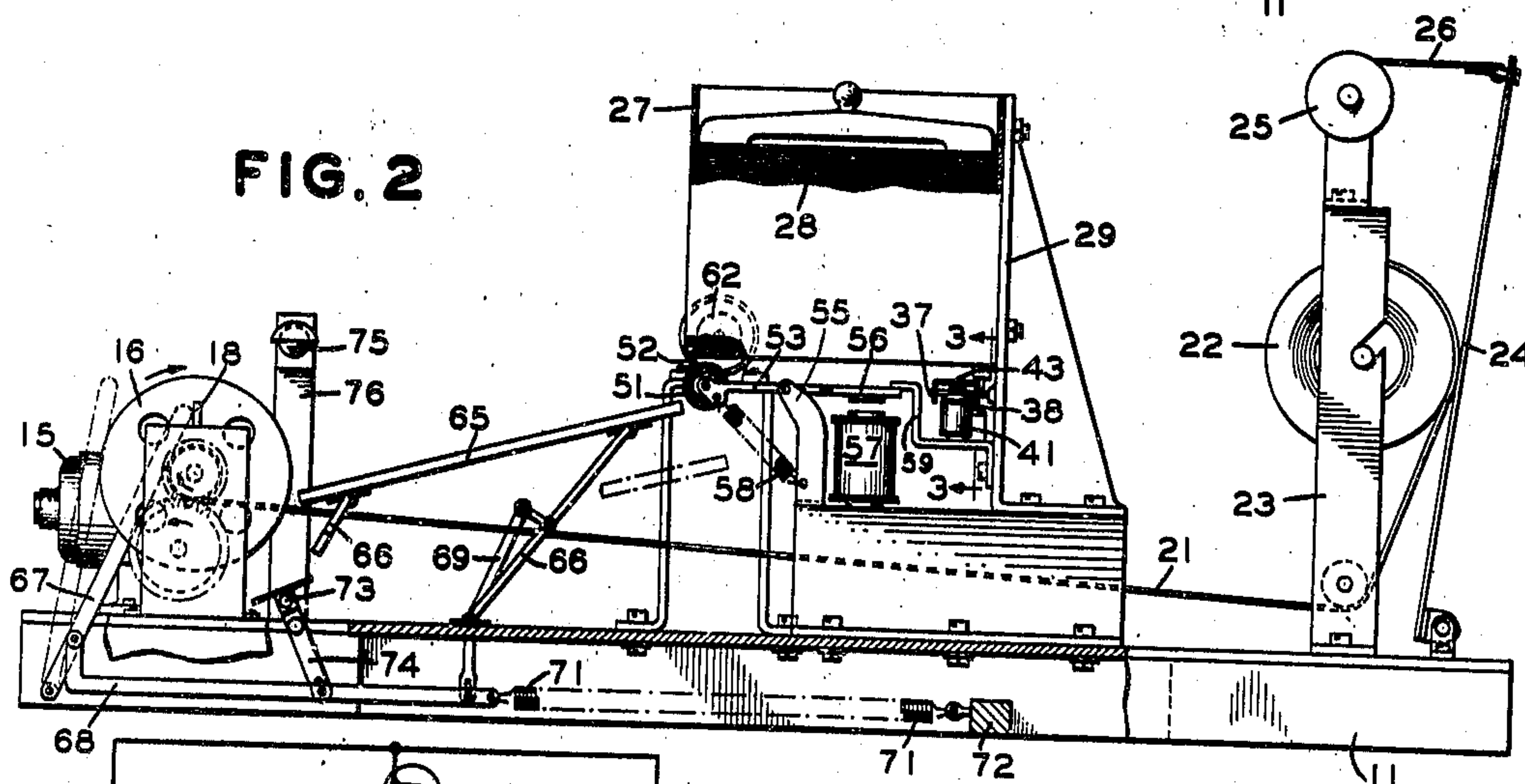


FIG. 3

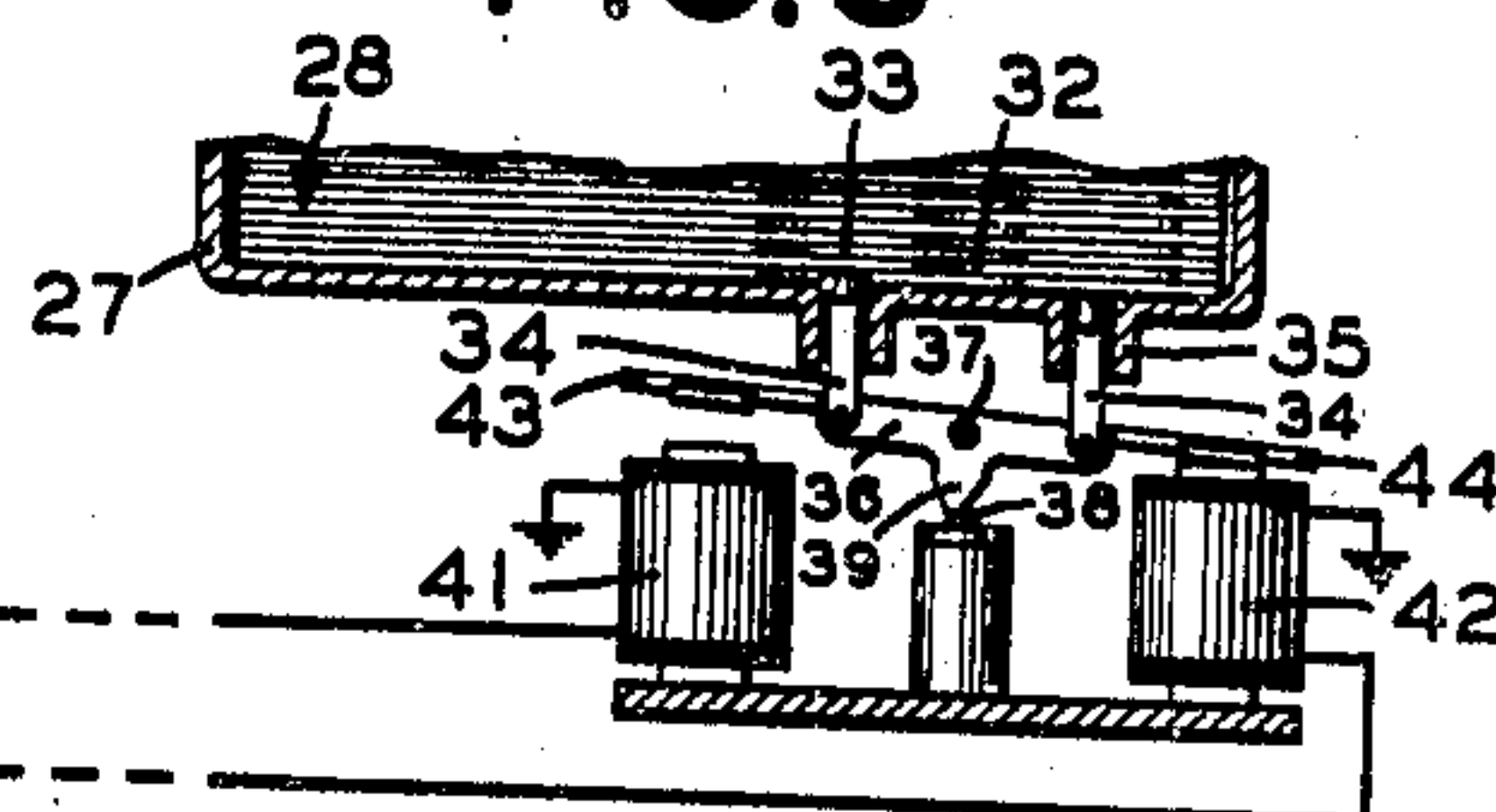
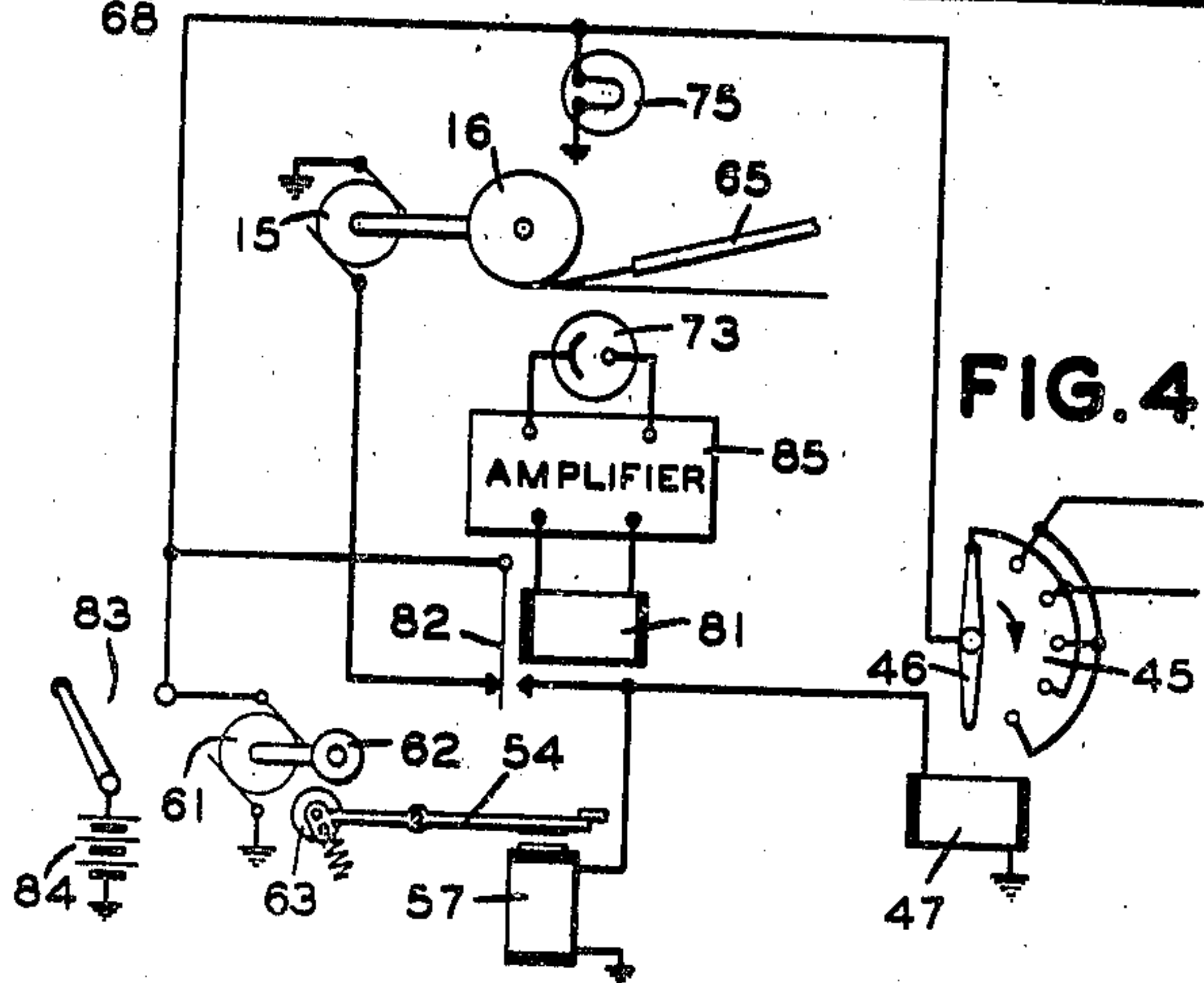


FIG. 4



INVENTOR
G. H. RIDINGS

BY *M. J. Reynolds*
ATTORNEY

UNITED STATES PATENT OFFICE

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SUPPLY ROLL FOR BLANK SHEETS

Garvice H. Ridings, Summit, N. J., assignor to
The Western Union Telegraph Company, New
York, N. Y., a corporation of New York

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16 Claims. (Cl. 242—59)

This invention relates to a machine for preparing supply rolls of blank sheets such, for example, as telegraph blanks.

An object of this invention is to provide a machine constructed and arranged to enable separate sheets or blanks to be applied in predetermined spaced relation to a winding spool where they are formed into a supply roll of such form that when subsequently used it will, upon unwinding, release the sheets successively one at a time.

This and other objects which will be apparent to those skilled in the art are accomplished by the present invention, one embodiment of which is illustrated in the accompanying drawing, in which:

Fig. 1 is a top plan view of a machine constructed in accordance with one embodiment of this invention;

Fig. 2 is a side elevation of the machine shown in Fig. 1;

Fig. 3 is a view on an enlarged scale, partly in section, on the line 3—3 of Fig. 2, of a detail; and

Fig. 4 is a wiring diagram showing one circuit arrangement for controlling the operation of the machine.

The present machine is arranged to enable sheets to be fed successively, one at a time, down an inclined slide to a supporting belt to be wound therewith on a spool to form a supply roll. The sheets in the roll may or may not have their edges overlapped as hereinafter described. The finished roll when later put into use will, upon being unwound, deliver the sheets one at a time as each sheet is successively released by unwinding the supporting belt. A supply roll of this type is particularly adapted for use in such an automatic telegraph machine as is described in the copending application of Wise et al., filed April 18, 1941, Ser. No. 389,164, entitled "System and apparatus for facsimile telegraphy," in the manner therein set forth, although it is apparent that it may also be used for a wide variety of other purposes.

As illustrated, the machine is mounted on a base 11 and includes a live spool-supporting center shaft 12 driven through gearing 13 and a gear reduction box 14 by a motor 15 to rotate a spool 16 adapted to be supported between the live center shaft and a dead center 17 which can be retracted by a lever 18 in the usual manner to permit changing spools.

A blank supporting belt 21 is adapted to be wound on the spool, and is drawn off a belt sup-

ply roll 22 mounted between supporting uprights 23 at the opposite end of the base 11. The belt is tensioned by a drag or brake arm 24 pivoted at one end on the base and held against the belt supply roll 22 by a spring pulley 25 connected by a cord 26 to the upper end of the arm.

A magazine 27 may be provided for holding a stack 28 of separate sheets and as shown is mounted on a standard 29 above the belt 21 between the spool and the belt roll 22.

Each sheet 31, for use in the particular feeding mechanism shown, has a notch 32 in one edge which is provided to cooperate with the peel mechanism forming a part of the automatic telegraph machine described in the said application with which the particular sheets described herein are adapted for use. As shown in Figs. 1 and 3, the notches in alternate sheets in the magazine stack are offset so as to always expose a face 33 of the sheet next to the bottom sheet in the magazine stack. By this means one or the other of two sheet engaging plungers 34 slidably mounted in openings 35 in the bottom of the magazine 27 can be moved upwardly to engage the second sheet from the bottom and hold it against ejection while the bottom sheet is being drawn out from the magazine by an ejector mechanism to be described. The projecting end of each plunger is secured to a rocker arm 36 supported on a pivot 37 located between the plungers so that movement of the arm moves one plunger in to engage a sheet at the same time that it retracts the other. A detent 38 engages a point 39 on the arm to yieldingly hold it in one or the other extreme position. The arm is moved by energizing one of the other of a pair of magnets 41, 42, the respective armatures 43, 44 of which are secured to opposite ends of the arm. The magnets are alternately energized and deenergized by means of a stepping switch 45 having a rotary arm 46 operated by a stepping magnet 47 to successively engage the switch contacts.

A friction roller 51 is movable through a slot 52 into engagement with the bottom sheet in the magazine for ejecting it therefrom. The roller is supported on a shaft 64 between the arms 53 of a U-shaped yoke 54 pivotally supported on arms 55 and connected to the armature 56 of an ejector magnet 57 which moves the roller into engagement with the bottom sheet when energized. Coil springs 58 retract the roller to inoperative position when the magnet is deenergized. A stop arm 59, see Fig. 2, limits the downward movement of the roller. When in ejecting position, in engagement with the bottom sheet,

the ejector roller is rotated by an ejector motor 61 having a friction wheel 62 in position to engage a similar wheel 63 on an extension of the roller shaft 64.

The sheets are delivered by the ejector roller to an inclined slide 65 supported on parallel arms 66 pivoted to the base whereby the slide is movable as the roll increases in diameter so as to always deliver the sheets to the spool substantially tangent thereto. The increase in diameter of the spool as the belt 21 and sheets are wound thereon is employed to cause the arms 66 and slide 65 to move so as to maintain tangency. A lever 67 which rests against the face of the spool is pivoted to the base and connected by a link 68 to a pivoted lever 69, the other end of which is connected to one of the parallel arms 66. The initial position of the slide 65 and arm 67 is shown in full lines in Fig. 2, while the final position at the end of a winding operation is indicated in broken lines. A coil spring 71 connecting the end of the link 68 to a frame member 72 or the like maintains the lever 67 against the face of the spool.

Operation of the machine is controlled by a photoelectric cell 73 mounted below the belt 21 under the edge of the slide 65 on a pivoted support 74 connected to the link 68 whereby the cell is always pointed toward the face of the spool as it increases in diameter for a purpose to be described. An exciter lamp 75 is mounted in a standard 76 above the edge of the slide to actuate the photocell the moment the rear edge of a sheet passes off the slide.

Preferably a weight 79 rests on top of the stack of sheets in the magazine to insure a downward feed of the stack.

In operation, assuming the end of the belt 21 has been threaded across the machine and connected to the empty spool preparatory to winding, and that a single sheet has been placed with its leading edge in the bite of the belt and spool, it will be apparent that the sheet prevents light from the exciter lamp 75 from activating the photocell 73. Under these conditions the relay 81 is deenergized so that the tongue 82 thereof is in the position shown in Fig. 4 in which the circuit of the motor 15 is closed. The machine is then started by closing the hand switch 83 to connect a suitable source of power 84 to the machine. This operates the motor 15 and rotates the spool, winding up the belt and sheet thereon. As soon as the rear edge of the sheet is drawn off the slide 65 the lamp 75 operates the photocell, the belt 21 being of some material sufficiently translucent for this purpose. Through the amplifier 85 the photocell operates the relay 81 breaking the circuit of the spool motor 15, which is immediately stopped by a suitable brake (not shown), and simultaneously energizing the stepping magnet 47 and the ejector magnet 57. Through the switch 45 the stepping magnet oscillates the arm 36 in an obvious manner to release the bottom sheet in the stack and move one or the other plunger 34 upwardly through the notch 33 in the bottom sheet to engage the face of the next sheet to hold it in place during ejection of the bottom sheet. The magnet 57 operates the arm 54 to lift the ejector roller into engagement with the bottom sheet and simultaneously move the friction roll 63 into engagement with the motor driven friction roll 62 which rotates continuously. This rotates the ejector roller and delivers the bottom sheet to the inclined slide down which it moves until its

leading edge is positioned in the bite of the belt and spool. At this point the sheet cuts off the light to the photocell, deenergizing the relay 81, returning the ejector roll to inoperative position by deenergizing the magnet 57, and closing the circuit of the spool motor 15 whereupon the cycle is repeated.

Preferably the arrangement is such that the winding of each sheet is stopped just before the sheet is completely wound on the spool and while there is about an inch or more of the rear edge exposed. The following sheet is then delivered to the spool so as to overlap the projecting edge of the preceding sheet. However, it will be apparent that the sheets can be wound in spaced relation without any overlap whatever, if desired, the degree of overlap and whether or not there is any overlap being determined by the setting of the photocell.

It will be understood, of course, that any suitable sheet feeding means may be used to apply the sheets to the incline 64 or they may be applied thereto by hand, and that many other modifications and changes can be made in the structure and circuit arrangements shown without departing from the essential attributes of the invention. All such changes are contemplated as come within the scope of the appended claims.

What is claimed is:

1. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, an adjustably positionable slide for directing separate sheets successively into position relatively to said belt for winding therewith to form a supply reel of separate sheets, and means controlled by said belt for adjusting the position of said slide during a winding operation for maintaining said slide substantially tangent to said reel as it increases in diameter.

2. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, an adjustably positionable slide for directing separate sheets successively into position relatively to said belt for winding therewith to form a supply reel of separate sheets, means controlled by the diameter of said reel for adjusting the position of said slide during the winding operation for maintaining said slide substantially tangent to said reel as it increases in diameter, and means for delivering individual sheets to said slide.

3. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, a slide for directing separate sheets successively into position relatively to said belt for winding therewith to form a supply reel of separate sheets, and sheet controlled means for controlling the winding operation in accordance with the delivery of sheets to said slide.

4. A machine comprising a spool support, means for rotating a spool on said support, means for supplying an elongated belt to said spool for winding thereon, means for delivering individual sheets successively to said spool for winding thereon in overlapped position, and means controlled by a sheet for timing the operation of said rotating means in accordance with the delivery of sheets to said spool.

5. A machine comprising a spool support, means for rotating a spool on said support, means for supplying an elongated belt to said spool for winding thereon, means for delivering

individual sheets successively to said spool for winding thereon in overlapped position, means controlled by a sheet for actuating said rotating means to start winding said sheet upon said spool and for stopping said rotating means in position to leave the end of said sheet in position to form an overlap with the edge of the next sheet to be delivered to said spool.

6. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, a slide for directing separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, and sheet controlled means for feeding separate sheets successively to said slide in a predetermined spaced relationship.

7. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, a slide for directing separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, means for feeding separate sheets successively to said slide including a magazine for sheets, and means controlled by a sheet being wound on said spool for ejecting another single sheet from said magazine to said slide.

8. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, a slide for directing separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, means for feeding separate sheets successively to said slide including a magazine for sheets, means for ejecting single sheets from said magazine to said slide, and means controlled by a sheet being drawn off said slide by said spool for actuating said ejector.

9. A machine comprising a spool support, means for rotating a spool on said support, a magazine for a plurality of individual sheets, means for feeding sheets from said magazine to said spool for winding thereon, and means operable in response to a predetermined position of a sheet being wound on said spool for operating said feeding means.

10. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, an inclined slide for directing under the influence of gravity separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, and means to adjust the position of said slide without changing the angle of inclination thereof for maintaining said slide substantially tangent to said reel as it increases in diameter.

11. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon,

a slide having a predetermined angle of inclination with reference to the horizontal for directing under the influence of gravity separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, and means actuated by said reel as it increases in diameter to adjust the position of said slide without changing the angle of inclination thereof for maintaining said slide substantially tangent to said reel as it increases in diameter.

12. A machine comprising a rotatable spool support, means for supplying an elongated belt to a spool on said support for winding thereon, an inclined slide for directing under the influence of gravity separate sheets successively into position relative to said belt for winding therewith to form a supply reel of separate sheets, and a linkage for adjusting the position of said slide during a winding operation without changing the angle of inclination thereof, said linkage including an actuating member bearing on the periphery of said reel whereby to position said slide according to the diameter of said reel.

13. A machine comprising a spool support, means for feeding a succession of separate sheets to said spool for winding thereon, an optical system responsive to a predetermined position of each sheet being wound on said spool, and means including said optical system for operating said feeding means.

14. A machine comprising a spool support, means for rotating a spool on said support, means for feeding a succession of separate sheets to said spool for winding thereon, optical means for detecting a predetermined position of each sheet being wound on said spool, and means controlled by said optical means for operating said feeding means.

15. A machine comprising a spool support, means for rotating a spool on said support, means for feeding sheets to said spool for winding thereon to form a supply reel of separate sheets, a light responsive element for detecting a predetermined position of a sheet being wound on said spool, means controlled by said light responsive element for operating said feeding means, and means to adjust the position of said light responsive element in accordance with the size of said reel.

16. A machine comprising a spool support, means for rotating a spool on said support, means for feeding sheets to said spool for winding thereon to form a supply reel of separate sheets, a light responsive element for detecting a predetermined position of a sheet during a winding operation, means actuated by said light responsive element for controlling said feeding means, and means actuated by said reel as it increases in diameter to adjust the position of said light responsive element.

GARVICE H. RIDINGS.