

1,149,018.

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PAPER-FEED-CONTROLLING APPARATUS.

1,149,018.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THEODORE J. BERECH, a citizen of the United States, and a resident of the city of New York, Woodhaven, borough of Queens, in the county of Queens and State of New York, have invented a new and Improved Paper-Feed-Controlling Apparatus, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide means for automatically avoiding the feed of paper in damaged condition, or in an irregular manner, to printing presses; to arrest the operation of a printing press in the event of damage to the paper being fed; and to automatically adjust the paper being fed, to maintain the register thereof with the printing devices.

Drawings.—Figure 1 is a rear end view of a press having a controlling apparatus constructed and arranged in accordance with the present invention, showing in conjunction therewith a roll of paper in position to be fed to the printing rolls; Fig. 2 is a vertical section taken on the line 2—2 in Fig. 1.

Description.—As shown in the accompanying drawings, the paper supply is delivered in the shape of a roll 7, which is mounted on a spindle 8, which rests in bearings 9 formed in brackets 10. The paper is fed to the printing rolls over a pipe roll 11. The pipe roll 11 is mounted in bracketed bearings 12 extending from the uprights 13 of the press frame, one of which uprights is represented in the drawings as being placed in circuit by means of a wire 14, which is connected with an electric main 15.

Disposed in parallel relation to the roll 11 is a rail 16, perforated to form guides for plungers 17. The plungers 17 are disposed in position perpendicular to the axis of the rail 16, and extend in a plane in which is incorporated the axis of the roll 11. The plungers 17 are each provided with a rounded head 18. The heads 18 are normally pressed by springs 19, upon the roll 11, with which they form electrical contact except when the paper being printed and drawn from the roll 7 is interposed between said heads and said roll.

If, in the operation, a blemish, such as a hole or marginal tear, is present, one or more heads 18 in the path of said blemish, hole or tear makes a contact with said roll 11 and

completes an electric circuit, in which is incorporated a solenoid 20, with which said rail 16 is connected by means of a wire 21 and a switch 22, when the latter is closed. The circuit in which the solenoid is incorporated also includes a branch wire 23, a switch 24, a branch 25, and a resistance 26, arranged substantially as shown in Fig. 1 of the drawings.

To insure the rapid saturation of the solenoid coil, the resistance of the same is low relative to the voltage of the source of supply. The core 27 has a sliding guide bearing in a yoke 28 mounted on the solenoid casing, and is provided with a spindle 29 rigidly connected with an electric switch 30. A second spindle 31, which is connected with the core 27, is attached to the switch 24. The switch 30 normally completes an electric circuit in which an automatic stop-motion or machine for the printing press is included. When by reason of a defect in the paper, as above indicated, the electric circuit which includes the solenoid 20 is completed, said solenoid is energized, and the core 27 drawn within the coil thereof. Normally, the core 27 is held by a spring 33, where the switch 24 is in contact with the branch wire 23. The current supplied by the mains 15 and 32 having a relatively high voltage, the solenoid is rapidly saturated, and operates vigorously to move the core 27 and the switch 24 connected therewith, to the position shown in dotted lines in Fig. 1 of the drawings. Until the switch 24 is moved out of contact with the wire 23, the current flows through the wire 23, and the solenoid 20 may be said to be overcharged. As soon, however, as the core is drawn to within the solenoid, the current flows through the resistance 26, which is calculated to balance, in conjunction with the resistance solenoid 20, the current supplied from the mains 15 and 32.

The removal of the switch 30 from contact with the wires 34 and 25 of the stop-motion mechanism of the press opens the circuit controlling said mechanism, and operates to arrest the press. In this manner, the defects in the paper above mentioned are detected as the same passes under the plungers 17 and over the pipe roll 11, and the press is arrested in its action before the damaged portion of the paper reaches the printing bed.

Plungers 36 and 37 adjacent the ends of the rail 16, are disposed so that the heads 18 thereof ride the paper close to its marginal edges. The plungers 36 and 37 are disposed to operate reversely and alternately an electric motor 38.

The motor 38 is provided on its armature shaft with a widened wheel 39, the teeth whereof are meshed with a gear-toothed screw-nut 40. The nut 40 is mounted to travel on an elongated screw 41, which is stationarily held in bearings 42. The nut 40 has rigidly attached thereto a grooved collar 43, into the groove of which extends the yoke end of a rocking lever 44. The lever 44 is pivotally mounted by means of a pin 45, upon a bracket 46 extending from the adjacent upright 13 of the printing press. Intermediate the ends of the lever 44, an eyelet, the edges of the sides 47 whereof are curved, is engaged with the end of the spindle 8, collars 48 providing a groove therebetween to hold said lever. It is obvious that as the armature shaft having the wheel 39 is driven, the nut 40 is rotated on the screw 41 in one or other of its rotary directions. It is equally obvious that in accordance with the direction, the nut is moved toward one or other of the opposite ends of the screw 41. The lever 44 is rocked on the pin 45, and the spindle 8 having the roll 7 is moved lengthwise of said spindle, in the bearings 9 of the brackets 10. The direction of rotation of the nut 40 and of the wheel 39 is controlled by the plungers 36 and 37, and operates in accordance with the contact of one or other of said plungers with the roll 11. Thus if, in being fed, the paper creeps to the left, the plunger 37 engages the roll 11, and completes the electric circuit through the wire 49, the switch 50, the branch 51, the solenoid 52, the branch 53, the main 32, the main 15, the wire 14, and the roll 11. The immediate effect of saturating the solenoid 52 is to draw within it the core 54 and the cross bar 55 rigidly connected therewith. At the outer ends of the cross bar 55 are spindles 56 and 57. The spindles 56 and 57 are extended at both sides of the cross bar 55, and each spindle is provided at each side with springs 58, which are compressed when the heads at either end of said spindles engage the contact blocks 59 and 60, or 61 and 62. The cross bar 55 is held normally central by oppositely-disposed pull-springs 63. When in the operation above described, the plunger 37 makes contact with the roll 11 and the solenoid 52 is energized to draw the core 54 and cross bar 55, the heads of the spindles 56 and 57 engage the blocks 59 and 60, respectively. This engagement energizes the motor 38. The energizing circuit passes from the main 32 through a branch wire 64 to the spindle 56, through the block 59 and a wire 65, through the motor wind-

ings, and thence by a wire 66, a switch 67 and a wire 68 to the block 60, and thence by the spindle 57 and a branch wire 69 to the main 15. The circuit above traced is designed to rotate the motor so that the nut 40 will be moved on the screw 41 to the right of Fig. 1 of the drawings. This movement of the nut moves the lever 44, the spindle 8 and roll 7, to deliver the paper into the path of the head 18 on the plunger 37, automatically correcting or re-registering the feed of the paper. With the passage of the paper between the roll 11 and the plunger 37, the electric circuit energizing the motor 38 is discontinued, and the springs 63 are permitted to move the bar 55 and cores 54 and 70 to a balanced position in their respective solenoids 52 and 71. After the paper passes from beneath the plunger 56, the solenoid 71 is energized, the current for this purpose being established through a wire 72, a branch 73, solenoid 71 and branch 74 to the main 32. The effect of this saturation of the solenoid 71 is to draw the core 70 and cross bar 55 toward said solenoid until the heads of the spindles 56 and 57, respectively, press upon the blocks 61 and 62. The block 61 is connected by a jumper 75 with the block 59, and so with the wire 65 and motor 38. The block 62 is connected with the block 60 in a similar manner by a jumper 76, and therefore with wires 68 and 66 and the motor 38. When the spindles 56 and 57 now engage the blocks 61 and 62, it will be seen that though the motor is energized, the current passing therethrough is reversed, thereby reversing said motor, with the effect that the wheel 39 and nut 40 are rotated in a manner the reverse of that previously mentioned. Reversing the nut 40 reverses the direction of movement of the lever 44, with the result that the spindle 8 is moved lengthwise until the paper is re-inserted under the plunger 36.

It will be understood that in both operations as above described, coincident with the passage of the paper below either of the plungers 36 or 37, the feed of the nut 40, and the consequent movement of the spindle 8, terminate to remain quiescent until called into action by the disarrangement of the paper being fed to the printing press.

The rail 16 is suitably mounted on the uprights 13 in bracket bearings 77, thereby electrically isolating the rail 16 and members mounted thereon. The plungers 36 and 37 are electrically insulated from the rail 16 by bushings 78.

Claims:

1. An apparatus as characterized, comprising a contact rail forming part of one branch of an electric circuit; a paper-supporting roll forming part of the opposite branch of said electric circuit; a motor electrically connected with said rail and said roll; a plurality of contact members elec-

trically insulated from said rail to normally rest on paper covering said roll; a support for the supply of said paper; a shifting mechanism for said support, embodying a feed screw and a traveling nut mounted thereon; and means operatively connecting said nut with said motor.

2. An apparatus as characterized, comprising a contact rail forming part of one branch of an electric circuit; a paper-supporting roll forming part of the opposite branch of said electric circuit; a motor electrically connected with said rail and said roll; a plurality of contact members electrically insulated from said rail to normally rest on paper covering said roll; a support for the supply of said paper; a shifting mechanism for said support, embodying a feed screw and a traveling nut mounted thereon; means operatively connecting said nut with said motor; and a rocking lever operatively connecting said nut and said support to shift said support laterally across the path of said paper.

3. An apparatus as characterized, comprising a contact rail forming part of one branch of an electric circuit; a paper-supporting roll forming part of the opposite branch of said electric circuit; a motor electrically connected with said rail and said roll; a plurality of contact members electrically insulated from said rail to normally rest on paper covering said roll; a support for the supply of said paper; a shifting mechanism for said support, embodying a feed screw and a traveling nut mounted thereon; means operatively connecting said nut with said motor; and means, embodying electric solenoids and a cross-over switch, for completing and reversing the current energizing said motor.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THEODORE J. BERECH.

Witnesses:

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