March 22, 1949. L. H. DICKEY 2,465,210

AUTOMATIC STOP-CONTROL DEVICE

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Fig. 1.

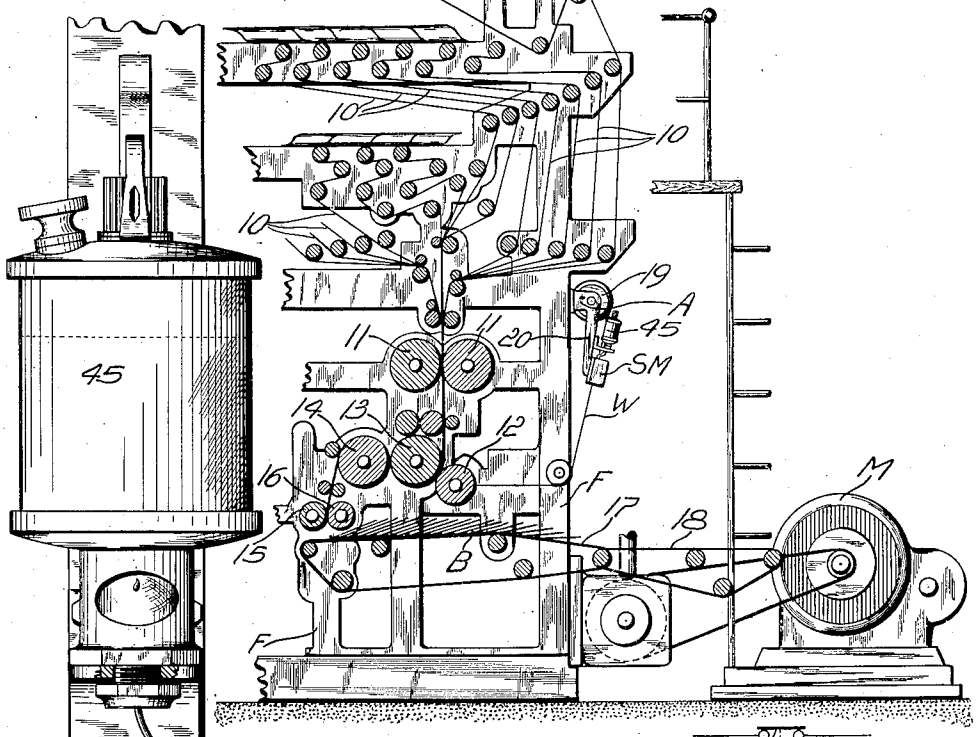

Fig. 2.

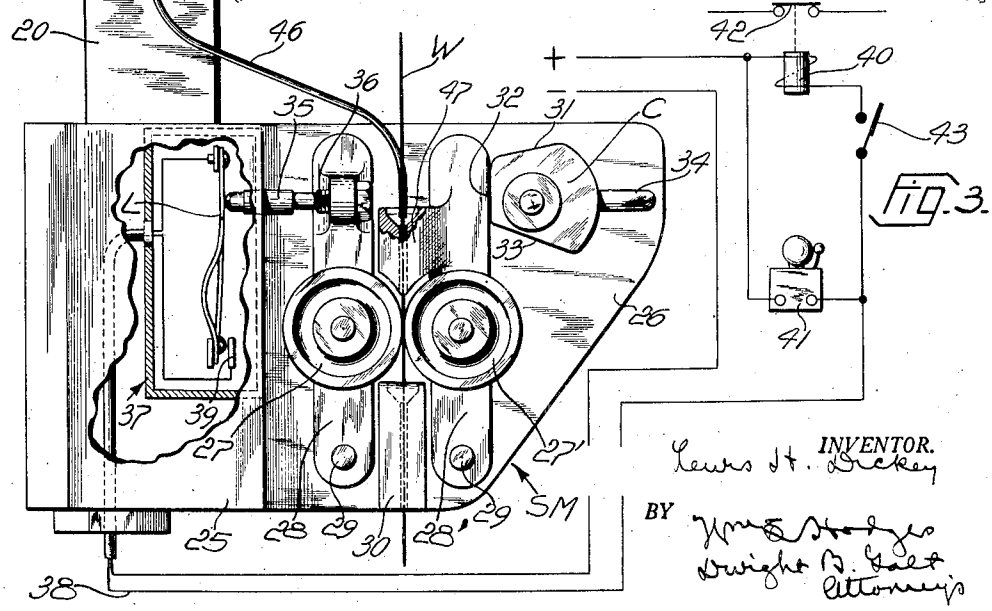

Fig. 3.

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AUTOMATIC STOP-CONTROL DEVICE

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6 Claims. (Cl. 192—127)

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This invention is an emergency stop-control means for wire stapling mechanism, and is primarily designed for use in connection with automatic printing machines, but not necessarily limited to such use.

In the commercial printing of books, pamphlets, and other types of work involving the assembly and binding of a plurality of printed pages, it is customary practice to lead a plurality of ribbons, previously cut from a web of paper, through a multi-cylinder printing machine which is equipped with mechanism to print, cut, staple, fold and deliver the work in the form of assembled "books." One of the objects of the present invention is to provide automatic means associated with the stapling mechanism of such a printing machine, for instantly arresting the operation of the printing machine, if and when the feed of the staple wire to the stapling mechanism is interrupted for any reason, and thereby insure against delivery of books from the machine without the staples required to hold the pages together.

While producing printed products which require two or more staples to hold the pages together, it is sometimes desirable to avoid stopping the printing machine if travel of the staple wire through either of the stapling heads is arrested. A further object of the invention is to provide a stop-control mechanism of the character above mentioned having means for selectively neutralizing the operation of the stop mechanism as to either of the staple wires, and in lieu thereof to provide for automatically sounding a warning when feed of the stapling wire is interrupted.

A further object is to provide simple and efficient means for lubricating the staple wire before it is delivered to the stapling head.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing:

Figure 1 is an enlarged front elevation of an emergency stop-control device constructed in accordance with the invention.

Figure 2 is a diagrammatic view illustrating the folder mechanism of a standard type automatic printing machine, with the invention applied thereto.

Figure 3 is a schematic view showing the relationship of the circuit for controlling the prime-mover of the printing machine, and the stop-control device.

Referring to the drawing, and more particularly to Figure 2, F designates the frame of an automatic printing press, driven by a motor M in

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a manner well understood in the art. In practice, a plurality of ribbons 10 which have been cut from a single web, are led through the various cylinders which operate to cut, staple, and fold the work in the form of small books B. The cutting cylinders are indicated at 11, the stapling cylinder is indicated at 12, a staple clinching cylinder is indicated at 13, a folding cylinder is indicated at 14, and delivery cylinders are indicated at 15 and 16, respectively. The cylinders 12 and 13 conventionally illustrate complemental parts of a stapling mechanism of any desired structure, not shown in detail. Such a machine is illustrated and described in U. S. patent to Meyer, No. 2,026,135, but it is to be understood that the present invention is not to be limited to use with this particular mechanism. The completed books B are delivered upon a belt 17, and conveyed to a suitable delivery position 18. All of these parts are old and well known, and no claim for novelty is herein made for the same, they having been selected solely for the purposes of illustration.

The stapling wire W is fed from a spool 19 rotatively mounted in a bracket A, suitably supported by the frame F, and delivered to the stapling roll 12 during operation of the machine. The emergency stop mechanism of the present invention indicated as a unit at SM, is located at a position between the feed spool 19 and the roll 12, and is mounted on an arm 20 extended downwardly from the bracket A. For purposes of illustration the stop mechanism is shown as comprising a chambered portion 25, and a back-plate 26 extending laterally therefrom. The stapling wire W is passed between two adjacently located feeler rolls 27, 27', said rolls being rotatively mounted on arms 28, 28' respectively, each of which is pivotally mounted on the back-plate 26, as indicated at 29, and a wire guide 30 is located between the arms 28, 28' adjacent their lower ends.

The arm 28 is yieldingly urged toward the arm 28' so as to maintain peripheral contact of the rolls 27 and 27' with the wire W, by a plunger 35 slidingly mounted in a wall of the chamber 25, with its outer end in engagement with an adjustable abutment screw 36 carried by the arm 28. The inner end of the plunger is engaged by a leaf spring L, forming the movable contact of a switch 37 located within the chamber 25. The switch is provided with a fixed contact 39, which is engaged by the leaf spring L, except when the contacts are opened by pressure on the plunger 35. A cam C is pivotally mounted on the back-plate 26 and is provided with three cam faces

31, 32 and 33, and a handle 34, whereby it may be turned to bring any of the said faces into engagement with the arm 28'. When said cam is adjusted to bring cam face 31 into engagement with the arm 28', the roll 27' will be forced against the roll 27, and even though no wire be present between the rolls, the plunger 35 will press on the leaf spring L sufficiently to disengage it from the contact 39. When the cam C is adjusted to bring cam face 32 into engagement with the arm 28', the latter will be held in normal operating position so that with a wire present between the rolls 27 and 27', the switch contact 39 will not be engaged by the leaf spring L, but with no wire present between the rolls, the contact 39 will be engaged by the leaf spring L. When the cam C is adjusted to bring cam face 33 into engagement with the arm 28', the roll 27' will be freed from engagement with the roll 27, and the switch contact 39 will be engaged by the spring L. A circuit wire 38 leads from the spring L through the wall of the chamber 25, and a second circuit wire leads in a similar manner from the fixed contact 39. As shown in Figure 3, a solenoid 40 and a bell 41 are connected in multiple, and to the wire 38. Said solenoid controls a switch 42 in the circuit to the printing press motor controller (not shown). A manual switch 43 is provided so that if desired, the circuit through the solenoid may be broken and only the bell 41 will be energized if the wire feed should be interrupted.

Sometimes it is desirable to lubricate the staple wire before it is fed to the stapling mechanism. To provide for this contingency an oil cup 45 of any desired design is suitably supported above the horizontal plane of the stop-control device. A delivery tube 46 conducts lubricant from said cup 45 to a funnel-like wire guide 47 carried by the upper end of the arm 28'. The wire W is passed through a hole in the wire guide 47 of such small diameter that the surface tension of the oil will smooth out the flow thereof between drops delivered by tube 46. The diameter of said tube 46 is also small enough to smooth out the drops of lubricant as they are delivered.

In operation, the cutting, stapling, folding and delivery functions of the printing machine are all performed in a manner well understood in the art. While the machine is being made ready for a run and the stapling mechanism is not in use, the cam C is set with the face 31 in engagement with the arm 28', movement of which is thus effected to such an extent that the plunger 35 will prevent the spring L from engaging the contact 39. When the machine is ready to run and it is desired that the stapling mechanism operate, the cam C is turned to bring the face 33 into engagement with the arm 28', and the stapling wire W is fed through the wire guide 47, between the rolls 27 and 27' (which then are not pressed together), through the wire guide 30, and then to the stapling roll 12. For operation of the machine, the switch 43 is normally closed, the cam C is adjusted to bring the cam face 32 into engagement with the arm 28' and the wire will be held between the rolls 27 and 27' by the pressure of the spring L. With the cam in this position, the thickness of the wire is sufficient to disengage the spring L from its fixed contact 39, so that the circuit to the solenoid 40 will be broken at this location. Should the wire W be broken or the spool 19 become exhausted, the absence of the wire between the rolls 27 and

27' immediately permits movement of the arm 27, under the pressure of the spring L, a sufficient distance to allow said spring to engage its complemental contact 39, and thereby close the circuit through the solenoid 40 and the bell 41. The action of the solenoid breaks the circuit to the printing machine motor. If a plurality of staples are to be applied to each piece of work, one or more additional staple mechanisms are required, each having a switch connected in parallel with the switch 37. With such equipment, when it is not desired to stop the printing machine if one of the stapling devices should fail to receive its wire, the circuit through the solenoid 40 may be broken by disengaging the contacts of switch 43. When this is done, the circuit to the bell will be completed and sound a warning on failure in the feed of the stapling wire, but the printing machine will not be stopped.

The advantages of the invention will be readily understood by those skilled in the art to which it belongs. For instance, it will be observed that a very simple attachment is provided for automatic printing presses, which is capable of immediately arresting operation of said printing machine at the instant that there is a failure in the feed of the stapling wire to the stapling mechanism associated with said machine. A further advantage is that the stop control mechanism may be neutralized at any time without affecting the feeding operations of the stapling wire, but so arranged that a warning signal may be given if there should be a failure of the feeding of the wire to the stapling mechanism. Another advantage is that simple means are provided for lubricating the stapling wire, if desired, as it passes through the stop control device, and at any time during the stapling operations.

What I claim is:

1. An emergency stop-control device comprising a support, a pair of adjacent feeler arms each pivotally connected with said support, feeler rolls rotatively mounted on said arms, means for guiding a stapling wire between said rolls, means for releasably preventing pivotal movement of one of said arms, means for yieldingly urging the other arm toward the first mentioned arm so as to engage said wire between said rolls, and switch contacts closed upon movement of said yieldingly urged arm toward said first mentioned arm.

2. An emergency stop-control device comprising a support, a pair of adjacent feeler arms each pivotally mounted on said support so as to be movable with respect to each other, feeler rolls rotatively mounted on the respective arms, means for guiding a stapling wire between said rolls, means for locking one of said arms in predetermined adjusted positions, means for yieldingly moving the other arm toward the first mentioned arm so as to engage said wire between said rolls, and switch contacts closed upon movement of said yieldingly moved arm toward the other arm.

3. An emergency stop-control device comprising a support, a pair of adjacent feeler arms, each pivotally connected with said support, feeler rolls rotatively mounted on the respective arms, a wire guide between said arms for guiding a stapling wire between said rolls, means for releasably holding one of said arms so as to prevent pivotal movement thereof, means for yieldingly urging the other arm toward the first mentioned arm so as to engage said wire between said rolls, and switch contacts closed upon movement of

said yieldingly urged arm toward said first mentioned arm.

4. An emergency stop-control device comprising a support, a pair of adjacent feeler arms each pivotally mounted at its lower end upon said support, feeler rolls rotatively mounted upon the respective arms, means on one of the arms for guiding a stapling wire between said rolls, a wire guide mounted on said support located between said arms, an adjustable stop for holding one arm in a plurality of positions so as to limit pivotal movement thereof, means for yieldingly urging the other arm toward the first mentioned arm so as to engage said wire between said rolls when the stop is in one position, and a motor stop control means controlled by movement of said yieldable holding means when the stop is in another position.

5. An emergency stop-control device comprising a support, a rotatable detector roller adjustably mounted on said support, a second detector roller rotatably mounted on said support, means for resiliently urging said second detector roller toward said adjustably mounted roller to engage a stapling wire traveling between said rollers, means for locking said adjustably mounted roller in predetermined adjusted positions, and switch contacts closed on movement of said resiliently urged roller toward said adjustably mounted roller.

6. An emergency stop-control device comprising a support, a pair of adjacent arms pivotally attached to said support, feeler rollers rotatively mounted upon each of said arms, a wire guide mounted on said support between said arms for guiding a stapling wire between said rollers,

means for locking one of said pivotal arms in predetermined adjusted positions, a spring-loaded plunger for urging the other arm toward said locked position arm to engage said stapling wire between said rollers, and switch contacts closed upon movement of said plunger against said arm.

LEWIS H. DICKEY.

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