March 20, 1934. H. E. MILLINGAR ET AL 1,951,433

SAFETY ATTACHMENT FOR PRINTING PRESSES

Filed April 13, 1931 3 Sheets-Sheet 1

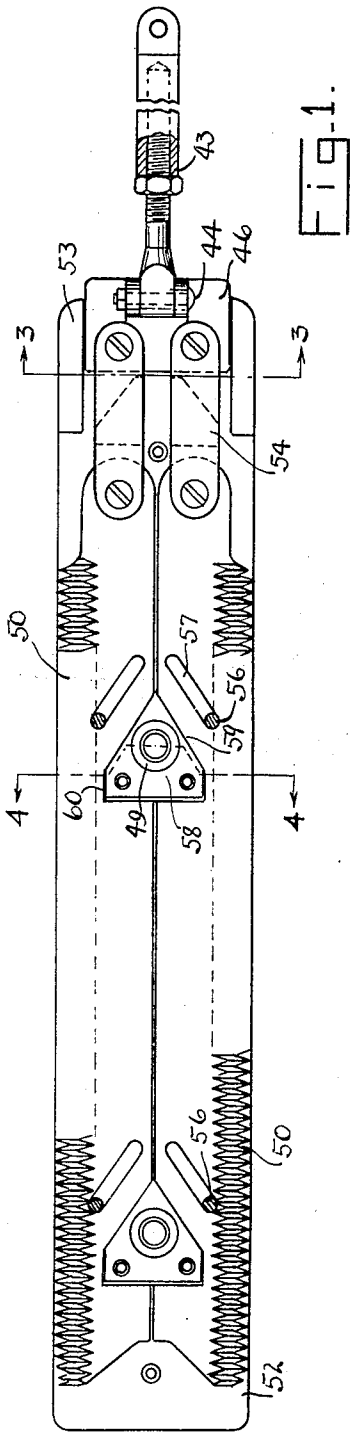


Fig. 1.

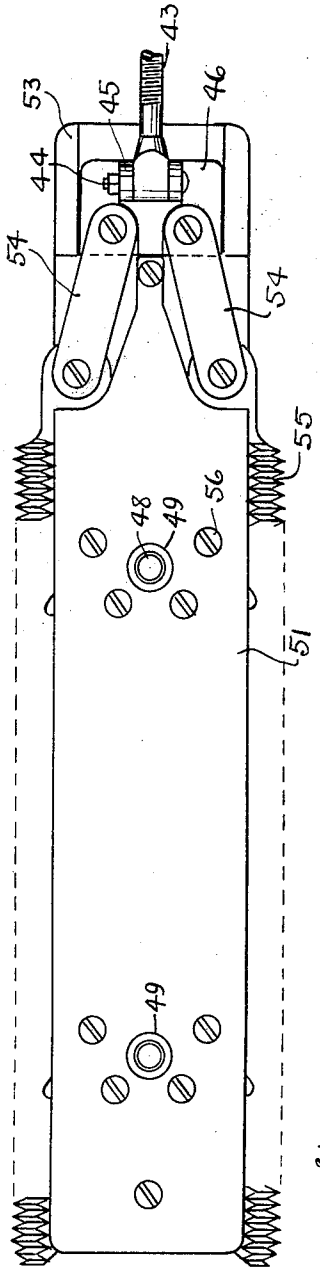


Fig. 2.

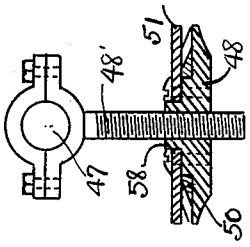


Fig. 4.

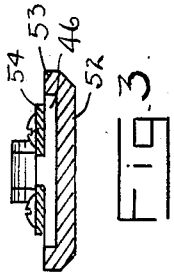


Fig. 3.

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March 20, 1934. H. E. MILLINGAR ET AL 1,951,433

SAFETY ATTACHMENT FOR PRINTING PRESSES

Filed April 13, 1931 3 Sheets-Sheet 2

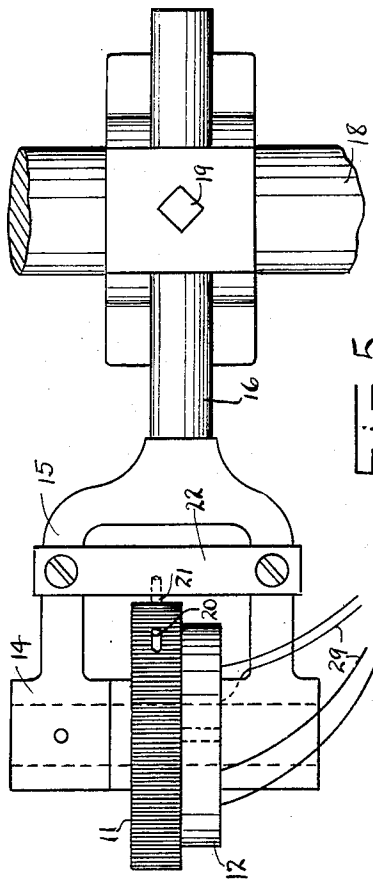


Fig. 5

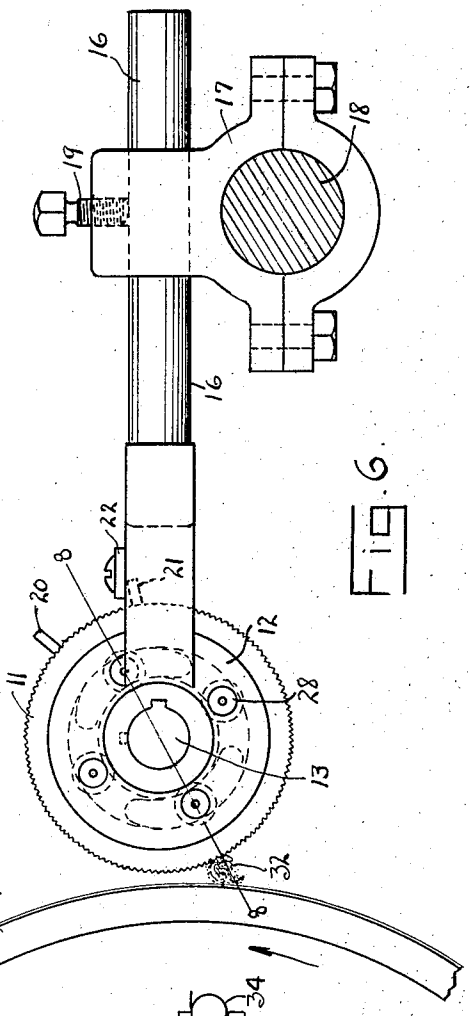


Fig. 6

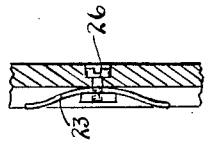


Fig. 9

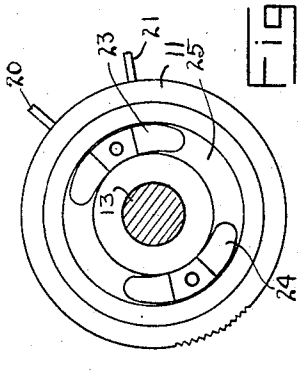


Fig. 7

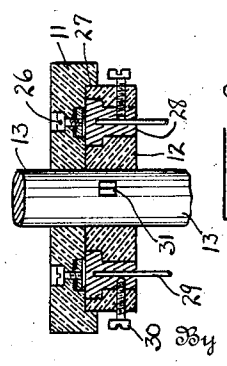


Fig. 8

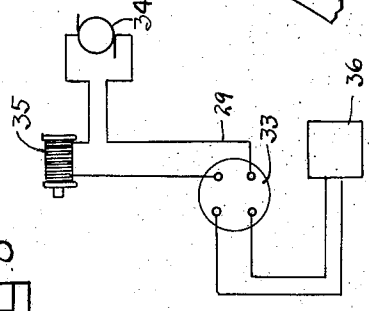


Fig. 10

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SAFETY ATTACHMENT FOR PRINTING PRESSES

Filed April 13, 1931 3 Sheets-Sheet 3

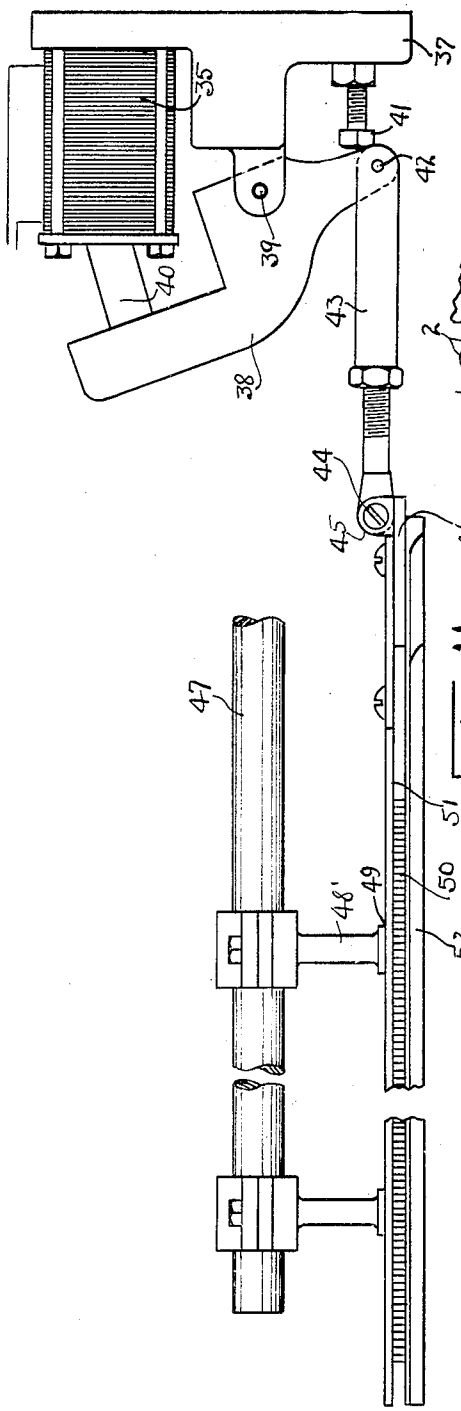


Fig. 11

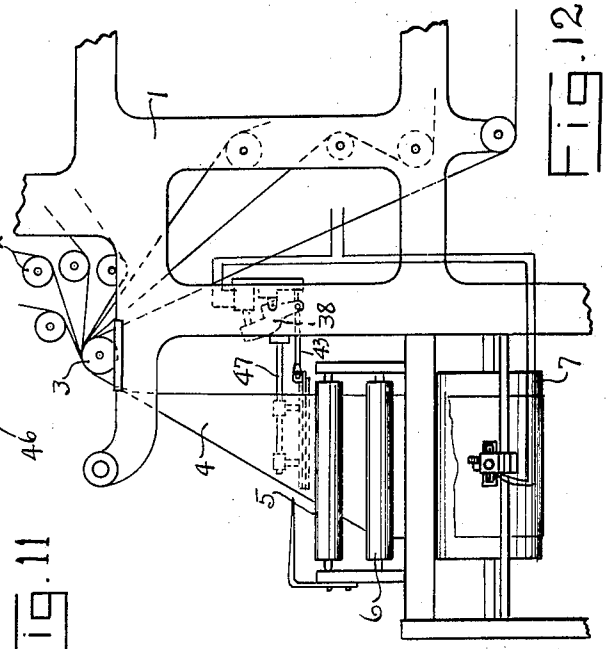


Fig. 12.

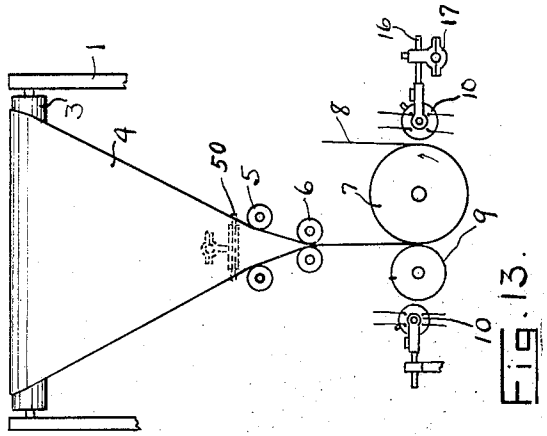


Fig. 13.

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Patented Mar. 20, 1934 1,951,433

UNITED STATES PATENT OFFICE

1,951,433

SAFETY ATTACHMENT FOR PRINTING PRESSES

Harry E. Millingar and Turner T. Pope, Houston, Tex., assignors of one-third to F. G. Dorsey, Houston, Tex.

Application April 13, 1931, Serial No. 529,745

8 Claims. (Cl. 164—49)

Our invention relates to attachments for printing presses to prevent breaking or injury to the press at the discharge end of the press. It has to do with the delivery of the printed paper to the folder and is designed to protect the delivery and folding mechanism when the paper is not properly severed, or for some other reason is wrapped about the folding or cutting cylinders.

When the printed paper is delivered from the press, it passes over a forming device and through guide and nipping rollers to the folding and cutting cylinders. The cutting cylinder serves to sever the paper at the proper point to separate each finished newspaper from the following one. If, by some chance, the cutting knife fails to properly sever the paper, it is drawn around the folding cylinder or around the cutting cylinder itself, and due to the speed of operation of the press, it wraps about the cylinder so quickly as to wad itself between the rollers and exert a strain upon the folding mechanism which may be either broken or damaged to some extent before the press can be stopped.

It is an object of our invention to provide a safety attachment to be used in connection with the folder whereby the press will be stopped and the paper diverted in its passage from the press to the folder so that no damage may be caused through any failure of the cutting mechanism or through the accidental wrapping of the paper about the cylinders.

It is desired that this action be automatic and preferably under electrical control so that the attachment will function promptly and accurately to prevent damage to the folding structure. It is an aim of the invention to not only stop the press but to cut the paper as it is delivered from the former, so that it will be diverted from the folding device, thus preventing strain upon the machine, which might otherwise occur before the press could be stopped.

The invention consists in the particular construction and arrangement of the parts making up the attachment, and this structure will be set forth in greater detail herein.

Referring to the drawings herewith, Fig. 1 is a top plan view of the saw-toothed cutting device with the cover plate removed, and showing the cutters in retracted position. Fig. 2 is a similar view with the cover plate in position and the cutters in expanded arrangement. Fig. 3 is a transverse section on the line 3—3 of Fig. 1. Fig. 4 is a similar view taken on the line 4—4 of Fig. 1. Fig. 5 is an enlarged detail of the automatic switch controlling the operation of the press and the cutter. Fig. 6 is a side elevation of the device shown in Fig. 5. Fig. 7 is a detail of the movable switch member. Fig. 8 is a transverse section of the assembled switch members. Fig. 9 is a broken detail illustrating the mounting of the contact arms. Fig. 10 is a diagrammatic representation of the electrical connections employed with the device. Fig. 11 is a side elevation of the cutting knives and the operating solenoid, certain parts being broken away. Fig. 12 is a broken side view of the printing press illustrating the delivery of the paper to the folder and showing our device thereon. Fig. 13 is a front elevation showing the arrangement of the folder and the paper delivering device. Like numerals of reference are employed to designate like parts in all the views.

The position of our device relative to the press may be seen from Figs. 12 and 13. The frame of the press is indicated at 1, there being so-called pipe rolls 2 mounted thereon to guide the various printed sheets of paper over drag rollers 3 and across a triangular former plate 4 to the guide rollers 5 and the nipping rolls 6. The former 4 and the guide and nipping rollers 5 and 6 deliver the paper folded once to the folding cylinder 7. The paper, indicated at 8, passes from the folding cylinder to the usual folding mechanism, not shown. Adjacent the folding cylinder 7 and contacting therewith is the cutting cylinder 9. This cutting cylinder has thereon one or more cutting blades which are positioned so as to contact with the paper at predetermined intervals as it passes over the folding cylinder 7 and cut it into sections of the proper lengths before these sections are delivered to the folder proper. At times the knife upon the cutting cylinder fails to properly function to completely sever the paper into sections and the result usually is that the paper instead of passing from the folding cylinder to the folder, wraps itself about the folding cylinder 7 or the cutting cylinder 9 and wads into lumps which may wedge between the cylinders and cause material damage. To stop the press and to otherwise provide against damage, we position adjacent each of the cylinders 7 and 9 a switch member 10. This switch is shown best in Figs. 5 to 10 inclusive. It comprises two discs 11 and 12 mounted closely adjacent each other upon a short shaft 13. Said shaft is mounted non-rotatably within the bearing members 14 upon the forked forward end 15 of a supporting arm 16. Said arm 16 is mounted adjustably within a clamping member 17 by which it is secured to a shaft 18 upon the frame of the press. The ad-

justability of the arm 16 in the clamping member 17 is secured by mounting the arm slidably in an opening in said clamping member and providing a set screw 19 whereby it may be set in position.

The two discs 11 and 12 comprising the switch member, are set at a point closely adjacent the periphery of the cylinder 7. The disc 11 is larger than the disc 12 and has its outer periphery corrugated to provide a frictional surface to be engaged by the paper. There are two stop arms 20 and 21 mounted upon the disc 11 on the side toward the arm 16, and we place a plate 22 upon the yoke 15 adjacent the disc 11 so that the contact arms 20 and 21 may engage therewith, thus limiting the extent of rotation of the disc 11. On the inner face of said disc 11 are mounted spring contact arms 23 and 24 at opposite sides of the central shaft 13. These contact arms are set within a groove 25 on the inner face of the disc and are arcuate in shape to fit said groove. The arms are preferably made of one integral piece of resilient metal, as shown best in Fig. 9. They are secured in position by central bolts 26.

The disc 12 is smaller in diameter than the disc 11 and fits within a shallow recess 27 on the inner face of said disc 11. Both discs are made of electrical insulating material. The disc 12 has at diametrically opposite points transverse posts or plugs 28, said plugs being of conducting material and having a central opening to receive a conducting wire 29 held in position in said opening by set screws 30. The disc 12 is keyed at 31 to the shaft 13 and is hence stationary. As will be noted from Fig. 6, the contacting arms 23 on the disc 11 are normally in a position at right angles to the two contact plugs 28. It will be noted, however, that when a thickness of paper, such as is shown at 32, wedges between the cylinder 7 and the disc 11, the said disc 11 will be rotated sufficiently to throw the upper stop arm 20 against the stop plate 22, and in doing so one arm of each spring 23 will engage with a contacting plug 28, which is on the clockwise side of the said arm. This will serve to close the circuit between the contact arm and the plug.

In Fig. 10, the switch is indicated diagrammatically at 33 and it will be noted that when the rotation of the disc 11 takes place so as to connect the circuit across the switch 33, the source of electricity, indicated at 34, will send the electricity across the switch to connect up the solenoid 35 and the control member 36. It is to be understood that the control board, indicated diagrammatically, is such an electrical control board as is ordinarily employed in connecting in or shutting off the motor which operates the press.

In Fig. 11 the solenoid 35 is shown in position upon a bracket 37 adjacent a lever 38 pivoted to the bracket at 39 between its ends and having at one end of said lever a core 40 projecting within the solenoid 35 so that when the solenoid is energized through closing the circuit in which it is placed, the core 40 will be drawn into such solenoid, thus moving the lever.

The opposite end of the lever normally engages with an adjusting screw 41 within the bracket. It has pivotal connection at 42 with an arm 43 adjustable in length. The forward end of the arm 43 is connected by means of a cross pin 44 to lugs 45 upon a sliding plate 46.

The sliding plate 46 is operatively connected with saw-toothed cutters positioned so as to be expanded to cut the paper. The position of these cutters relative to the paper which is to be severed is shown in Figs. 12 and 13. In Fig. 12 it will be noted that the cutter is mounted in position to depend from a shaft 47 mounted in the frame of the press. On this shaft are downwardly extending posts 48' having threaded engagement with the central portion 49 of the supporting frame for the cutters. It will be noted that this places the cutters between the two sides of the paper as it is folded together between the guide rollers 5.

The cutters comprise two sliding plates 50 supported upon a frame made up of upper and lower plates 51 and 52 respectively. At the forward end of the lower plate 52 are formed marginal guide flanges 53 between which the plate 46 is adapted to slide. The said plate 46 is connected to the adjacent ends of the cutting knives 50 by means of links 54, said links having pivotal connections with said plate and said knives. The outer edges of said knives are provided with teeth, as shown at 55. Said knives are guided in such manner as to be moved outwardly as they are moved longitudinally of the supporting plates by means of pins 56 extending between said plates and through inclined slots 57 in said cutters. The pins are positioned in the slots 57 so that when the knives are moved longitudinally of the plate they will also be expanded outwardly by the cam action of the pins 56 in said slots.

The supporting posts 48 which hold the frame work of the knives in place are extended through bosses 58 centrally of the lower plate. Said bosses serve to space the upper plate 51 from the lower plate 52 and have their forward sides beveled, as shown at 59, so as to assist in expanding the knives which have recesses 60 to receive said bosses. It will be noted that when the knives are again moved toward the solenoid they will be retracted into inoperative position. It is understood that when the paper wads in between either of the cylinders and the adjacent switch the circuit will be closed including the solenoid which will operate to expand the knives and engage the paper above the guide rolls 5 and sever it. If the paper is delivered over the drag roll 3 thereafter it will not be carried down between the guide rolls 5 but will be carried past the rolls and will not hence serve to injure the machinery. The switch will also serve to throw out the motor which runs the press at the same time the paper is cut and apply the brakes so that the press will stop in a very short time, thus preventing the running of paper to the folder.

It will be noted that the device may be easily attached to the ordinary press now in use and will be operated automatically in a positive manner to prevent injury to the machinery due to the failure of the cutter to operate or when for any other reason the paper winds about the folding or cutting cylinders in the manner described. It is believed that the advantages of this construction will be apparent without further description.

What we claim as new and desire to protect by Letters Patent is:

1. In a device of the character described including paper receiving and cutting cylinders, the combination of a normally closed cutter adjacent said paper, means to expand said cutter into contact with said paper, a switch adjacent said cylinders, electrically controlled means in a circuit including said switch adapted to operate said expanding means, and means responsive to an in-

creased thickness of paper on said cylinders to close said switch to operate said electrically controlled means.

2. In a device of the character described including paper receiving and cutting cylinders, the combination of a normally closed cutter adjacent said paper, means to expand said cutter into contact with said paper, a switch adjacent said cylinders, a solenoid operated lever controlling said expanding means, said solenoid being connected in a circuit including said switch, and means responsive to an abnormal thickness of paper on said cylinders to close said switch to operate said solenoid.

3. In a device of the character described including paper receiving and cutting cylinders, the combination of a normally closed cutter adjacent said paper, means to expand said cutter into contact with said paper, a switch adjacent said cylinders, electrically controlled means in a circuit including said switch adapted to operate said expanding means, and means responsive to an increased thickness of paper on said cylinders to close said switch to operate said electrically controlled means, and additional electrically controlled means to simultaneously stop the rotation of said cylinders.

4. In a device of the character described including paper receiving and cutting cylinders, the combination of a normally closed cutter adjacent said paper, means to expand said cutter into contact with said paper, a switch adjacent said cylinders, said switch having one rotatable contact member and one stationary member electrically operated, and means in circuit with said switch to actuate said cutter expanding means, said rotatable member being operated to close said switch by contact with an abnormal thickness of paper on said cylinders.

5. In a paper delivering mechanism including rotatable cylinders, the combination of means to control the rotation of said cylinders, and means operated by an abnormal thickness of paper on said cylinders to actuate said controlling means to stop the rotation of said cylinders.

6. In a paper delivering device including rotatable cylinders between which said paper passes, the combination of a support adjacent said paper, longitudinally slidable knives on said support, means on said support to force said knives laterally as they are moved longitudinally of said support, means to move said knives, and electrically operated means controlling the operation of said means, said electrically operated means being responsive to increases of thickness of paper on either of said cylinders.

7. In a paper delivering device including rotatable cylinders between which said paper passes, the combination of a support adjacent said paper, knives on said support, means to move said knives outwardly to cut said paper, and electrically operated means controlling the operation of said means, said electrically operated means being responsive to increases of thickness of paper on either of said cylinders.

8. In a paper delivering device including rotatable cylinders between which said paper passes, the combination of a support adjacent said paper, knives on said support, means to move said knives outwardly to cut said paper, and electrically operated means controlling the operation of said means, said electrically operated means including a solenoid, a switch adjacent said cylinders, an electric circuit including said switch and solenoid, the said switch being responsive to increases of thickness of paper on either of said cylinders.

HARRY E. MILLINGAR.
TURNER T. POPE.