April 30, 1946. J. E. MEYER 2,399,445

WEB BREAKER

Filed Dec. 18, 1943 4 Sheets-Sheet 1

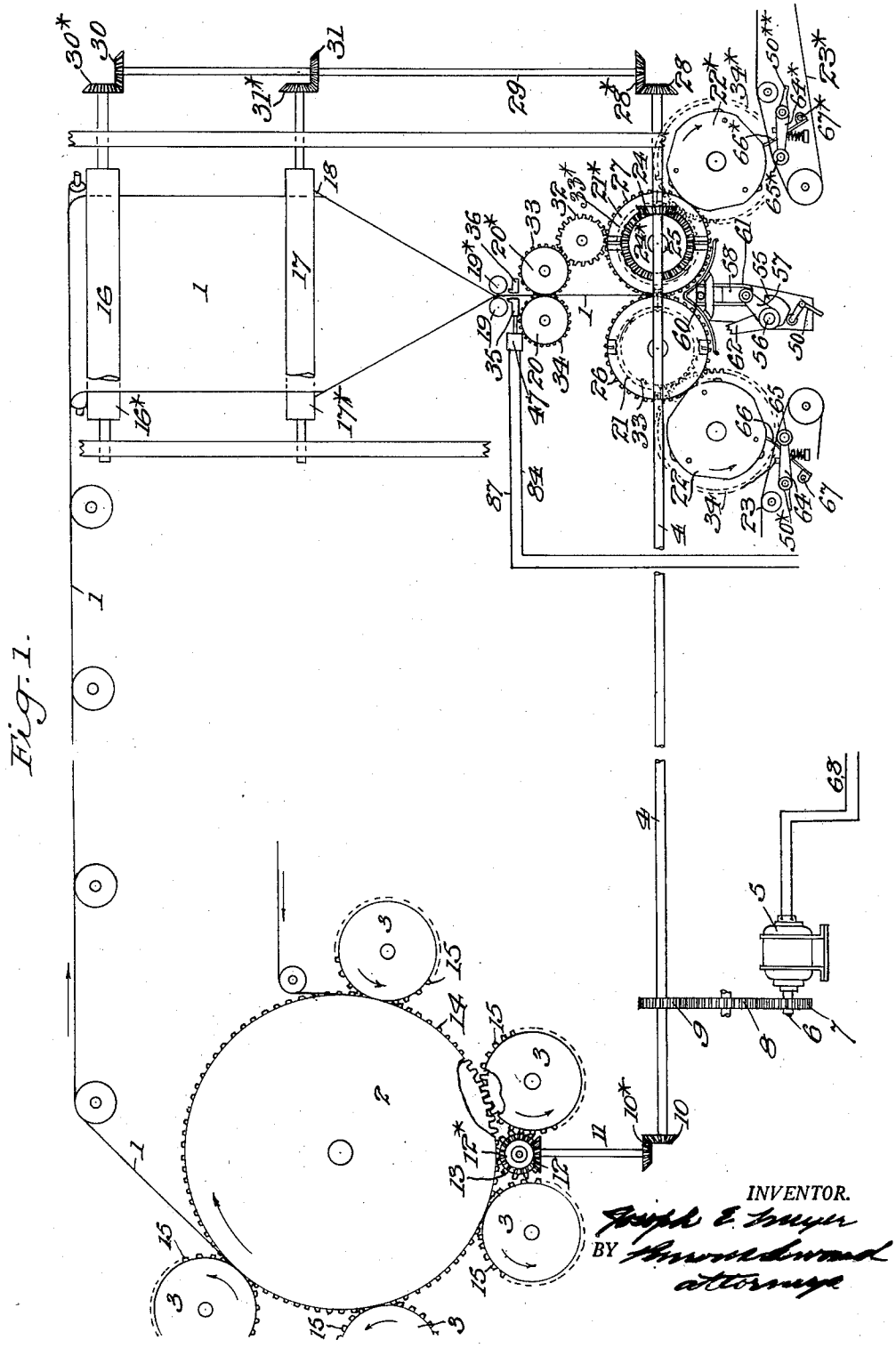


Fig. 1.

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WEB BREAKER

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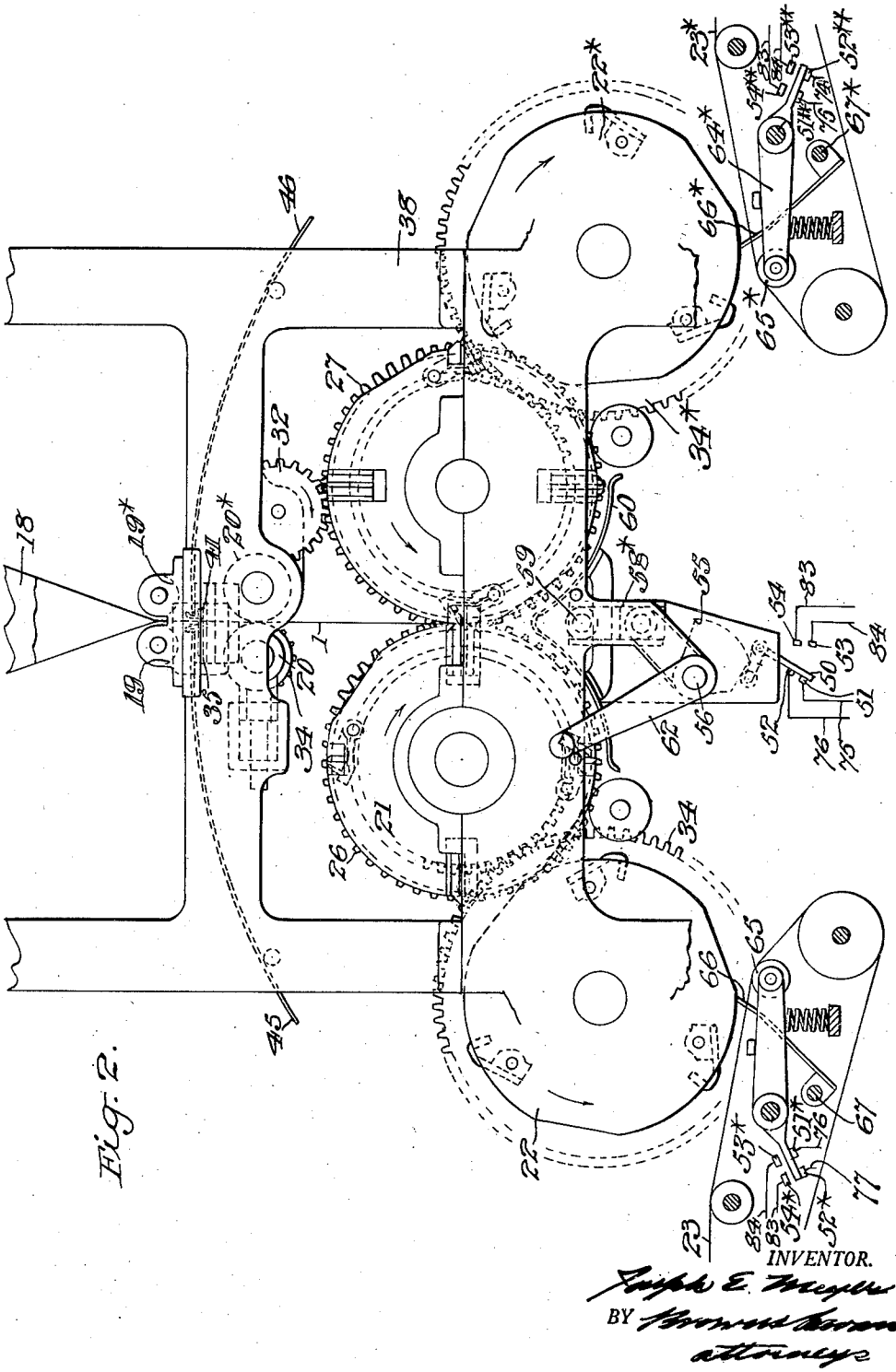


Fig. 2.

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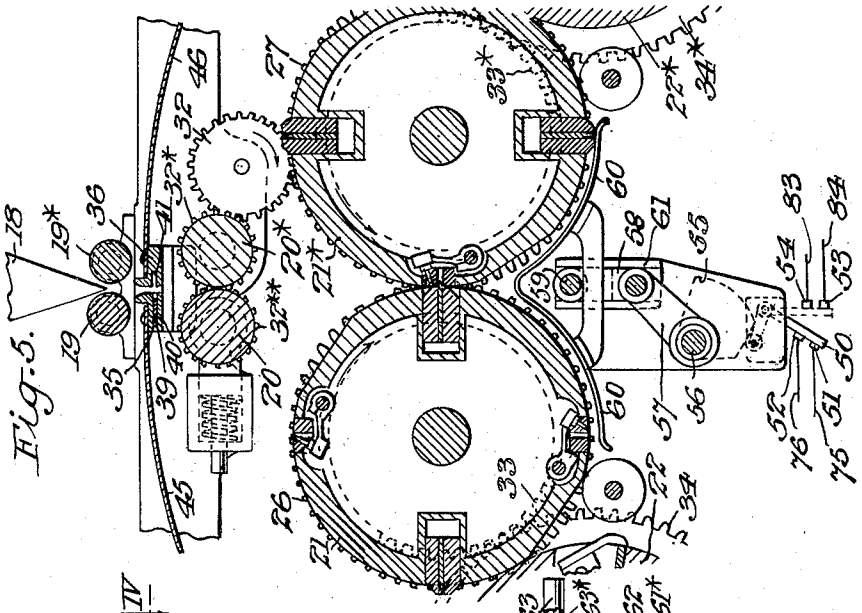


Fig. 5.

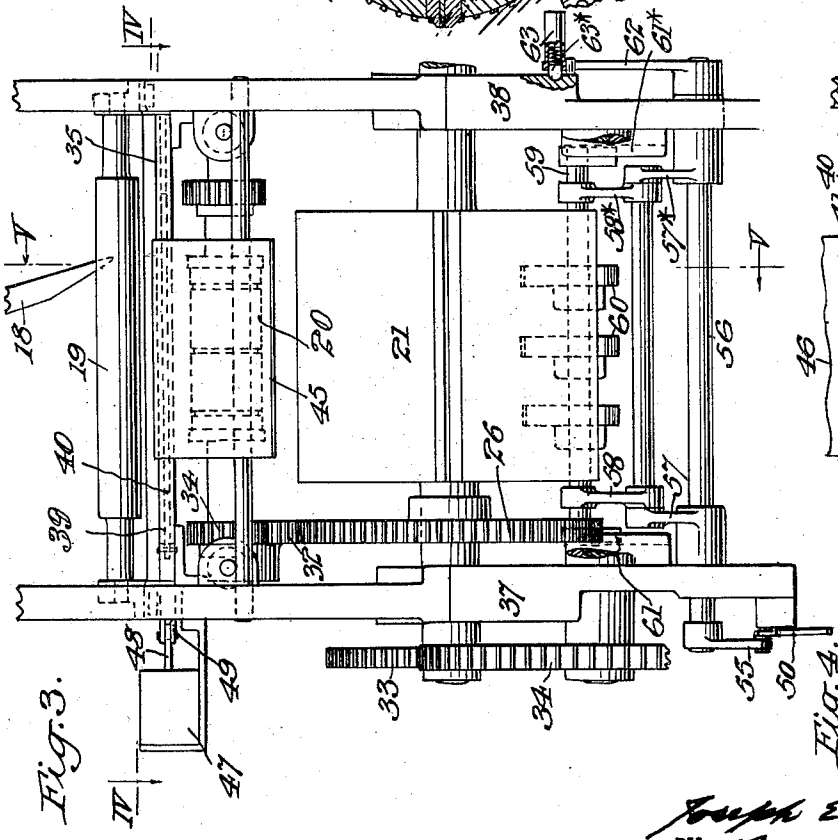


Fig. 3.

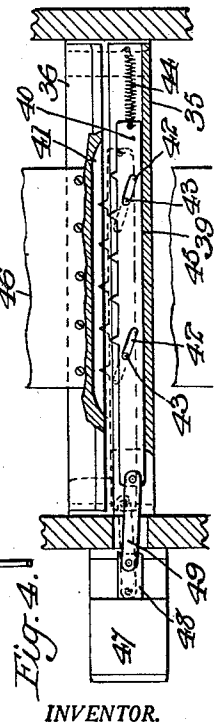


Fig. 4.

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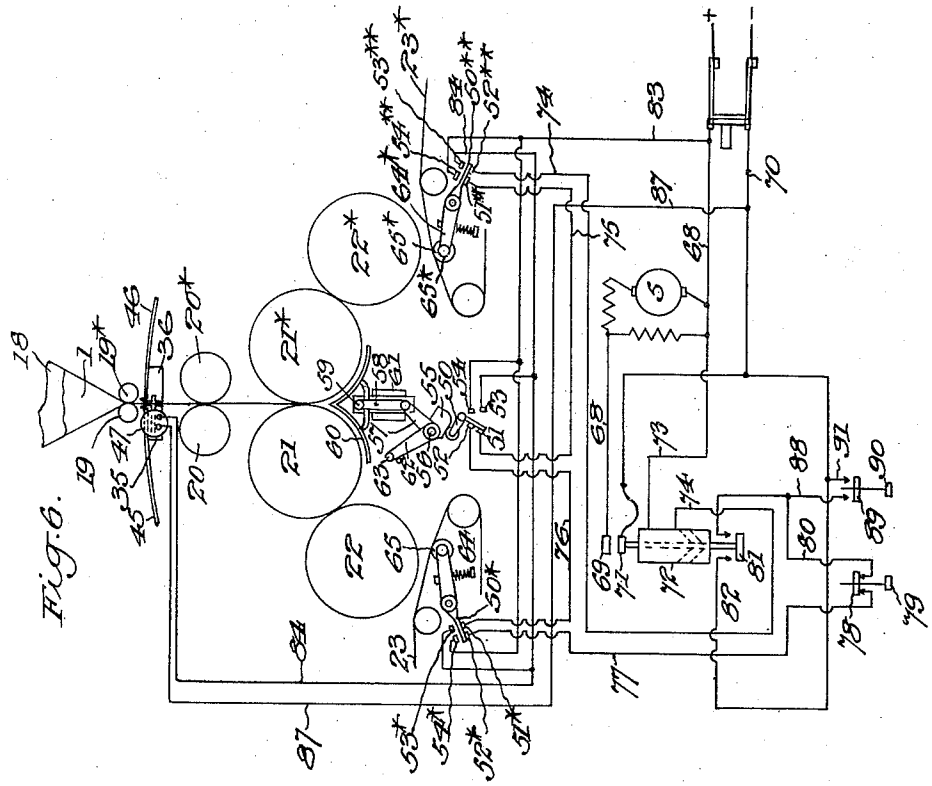


Fig. 6.

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Patented Apr. 30, 1946

2,399,445

UNITED STATES PATENT OFFICE

2,399,445

WEB BREAKER

Joseph E. Meyer, Westerly, R. I., assignor to C. B. Cottrell & Sons Company, Westerly, R. I., a corporation of Delaware

Application December 18, 1943, Serial No. 514,795

3 Claims. (Cl. 270—41)

Due to the great increases in web speeds the danger of damage by chokes in the folder has materially increased. This damage is occasioned by the fact that when a choke occurs in the folder the press cannot be brought to a standstill until it has made a number of revolutions and a considerable amount of the web has been fed to the already choked folder.

My invention comprises novel, simple and effective means whereby when a choke starts in the folder the press is stopped and the web is automatically and instantly broken and deflected, thereby reducing the amount of web fed to the choke during the time that the press is slowing down.

My invention also comprises an electrically operated web breaker and deflector operated the moment a choke occurs at any predetermined point in the folder.

My invention also comprises a web breaking element forming part of the web breaker and folder, which element, when a choke occurs in the folder, will be operated by the energization of an electromagnet operatively connected to the said web breaking element; the throwing of the control switch to close the electric circuit through the electromagnet serving also to open the electric circuit through the press drive motor.

A practical embodiment of my invention is represented in the accompanying drawings in which the web breaker and deflector is shown as operated by a choke either at the coacting rotary cutters or at either one of the two deliveries.

Fig. 1 represents in diagram so much of a rotary web printing press and its folder as will give a clear understanding of my invention.

Fig. 2 represents a detail side view on an enlarged scale of the folder, the web breaker and deflector being shown in its normal open position to permit the passage of the longitudinally folded web therethrough.

Fig. 3 represents a detail front view of the folder.

Fig. 4 represents a horizontal section, partly broken away, taken in the plane of the line IV—IV of Fig. 3.

Fig. 5 represents a detail vertical section taken in the plane of the line V—V of Fig. 3.

Fig. 6 represents in diagram an electric wiring of the means for controlling the web breaker and press drive, the several elements of the folder being shown in the same scale as Fig. 1.

The traveling web is denoted by 1. The portions of the rotary printing press shown herein include the impression cylinder 2 and its form cylinders 3. The press drive shaft 4 is driven by the electric motor 5 through the motor shaft 6 and spur gears 7, 8, 9. The impression and form cylinders are shown as driven from the press drive shaft 4 through the bevel gears 10, 10*, vertical shaft 11, bevel gears 12, 12* and spur gears 13, 14, 15.

The illustrated portions of the folder for the traveling printed web include the upper nipping rollers 16, 16*, the intermediate nipping rollers 17, 17*, the former 18, the guide rollers 19, 19*, the lower nipping rollers 20, 20*, the rotary cutters 21, 21*, the delivery cylinders 22, 22* and the endless delivery carriers 23, 23*. The above elements may be of any well known or approved construction operable to longitudinally fold the web, cut the signatures therefrom and deliver the signatures in opposite directions.

The rotary cutters 21, 21* are shown as operatively connected to the press drive shaft 4 through the bevel gears 24, 24*, cross shaft 25 and spur gears 26, 27.

The upper and intermediate nipping rollers 16, 16* and 17, 17* are shown as driven from the press drive shaft 4 through the bevel gears 28, 28*, the vertical shaft 29 and the bevel gears 30, 30* and 31, 31*. The lower nipping rollers 20, 20* are shown as driven from one of the rotary cutters 21, 21*, in the present instance the rotary cutter 21* through the spur gears 32, 32*, 32**. The rotary cutters are shown as driving the delivery cylinders 22, 22* through gears 33, 33* and 34, 34*.

The web breaker and deflector is shown as located between the point of the former 18 and the lower nipping rollers 20, 20* and it includes the following elements: the crossbars 35, 36 extend across the folder between the side frames 37, 38 which crossbars are spaced apart to normally permit the passage of the longitudinally folded web therethrough to the rotary cutters 21, 21*.

The crossbar 35 is shown as having a groove 39 within which the web breaking element, i. e., the cutter blade 40 is mounted to slide diagonally into and out of a groove 41 in the crossbar 36 to close and open the space between the crossbars 35, 36. The movement of the cutter blade into the groove 41 will serve to sever the longitudinally folded web at this point. The diagonal movement of the cutter blade 40 is accomplished by providing diagonal slots 42 through the blade for receiving pins 43 carried by the crossbar 35.

The cutter blade 40 is yieldingly held at the limit of its retracted or open position within the crossbar 35 by spring means 44.

Downwardly curved guards 45, 46 extend in opposite directions from the crossbars 35, 36 over the lower nipping rollers 20, 20* and the rotary cutters 21, 21* to deflect the web coming from the former after the web has been severed by the cutter blade 40 to prevent the said leading end of the web from passing through the web breaker and deflector and thereby adding to the choke in the folder during the time the press is slowing down to a standstill.

An electromagnet 47 has its core 48 operatively connected by a link 49 to the adjacent end of the cutter blade 40, the energization of which magnet will move the cutter blade outwardly to sever the traveling web and also to close the space between the crossbars 35, 36 to deflect the incoming leading end of the so-cut web. Switches 50, 50*, 50** are located at the rotary cutters, the endless delivery carrier 23 and the endless delivery carrier 23* respectively, which switches are held normally in their positions to close the motor circuit through the pairs of contacts 51, 52, 51*, 52* and 51** and 52** and to close the electromagnet circuit through the pairs of contacts 53, 54, 53*, 54* and 53**, 54**. When a choke occurs at any one of the predetermined points the switch at that point is moved to open the motor circuit and to close the electromagnet circuit to stop the press and at the same time operate the cutter blade to sever the advancing web. The switch 50 at the rotary cutters is operated by a cam 55 on a rock shaft 56 of a lever whose arms 57, 57* are operatively connected by links 58, 58* to the crossbar 59 of a double guide 60 vertically slidable in the channels 61, 61* on the side frames 37, 38 of the folder. This cam lever may be provided with a crank arm 62 having a handle 63 for the manual operation of the cam lever so that the double guide 60 may be moved further away from the rotary cutters 21, 21* when it is desired to free the choke at this point. This crank arm 62 is shown as releasably held to its adjacent side frame by a bullet lock 63* for normally holding the double guide 60 in its normal position close to the said rotary cutters.

The switches 50* and 50** at the two delivery points are respectively connected to the levers 64, 64* which carry the compensating rollers 65, 65*. Spring means are provided for urging these rollers 65, 65* upwardly and thus yieldingly holding the switches 50*, 50** in position to connect the pairs of contacts 51*, 52* and 51**, 52**. The usual stop fingers 66, 66* are mounted on the crossbars 67, 67* in position to allow the stop fingers to project to points within the peripheries of the delivery cylinders 22, 22*.

An electric wiring diagram is represented in Fig. 6 for causing the stopping of the motor 5 and the operation of the electromagnet when a choke occurs at a predetermined point in the folder. The main line wire 68 leads through the motor 5 to the contact 69. The other main line wire 70 leads to the contact 71 movable by the energization and deenergization of the electromagnet 72 into and out of connection with the contact 69. The circuit wire 73 leads into the electromagnet 72 from the main line wire 68 and the circuit wire 74 leads from the electromagnet 72 to the switch contact 51**. A wire 75 leads from the contact 52** to the switch contact 51 and a wire 76 leads from the switch contact 52 to the switch contact 51*. A wire 77 leads from the switch contact 52* to the contact 78 of the stop switch 79, and a wire 80 leads from the contact 78 to the contact 81 of the electromagnet 72. A wire 82 leads from the contact 81 to the main line wire 70. This arrangement completes the motor circuit when all the switches 50, 50* and 50** connect their respective pairs of contacts 51, 52, 51*, 52* and 51**, 52**.

A circuit wire 83 leads from the main line wire 68 to the switch contact 54**. A wire 84 leads from the contact 53** to the cutter blade operating electromagnet 47 and branches 85, 86 connect the contacts 53 and 53* with said wire 84. A wire 87 leads from the electromagnet 47 to the main line wire 70. A branch wire 88 leads from the wire 80 to the contact 89 of the start switch 90 and a wire 91 leads from said contact 89 to the wire 82.

In operation: If a choke starts to form between the rotary cutters, 21, 21* and the double guide 60 the guide will be immediately forced away from the cutters. This movement of the guide will rock the cam lever and cause its cam 55 to throw the control switch 50 to open the circuit through the press drive motor 5 and to close the circuit through the electromagnet 47. It will also be seen that if a choke starts to form either at the endless delivery carrier 23 or the endless delivery carrier 23* the depression of the compensating roller 65 or 65* will throw the control switch 50* or 50** to open the circuit through the motor 5 and close the circuit through the cutter blade operating electromagnet 47. It will also be seen that the energization of the electromagnet 47 will cause it to move the cutter blade 40 outwardly in a diagonal direction to coact with a side wall of the groove 41 in the crossbar 36 to sever the traveling web and to close the space between the crossbars 35, 36 to thus cause the deflection of the web on to either one of the deflecting guards 45, 46 and thereby prevent the incoming web from reaching the choke.

If the choke occurs at the rotary cutters 21, 21* the handle 63 of the cam lever 62 may be swung to further separate the double guide 60 from the rotary cutters for facilitating the removal of the choked material at this point. After the choke has been removed the cam lever may be swung back to its original position and there releasably held by the "bullet" lock 66 to permit the control switch 50 to again close the circuit through the press drive motor 5 for starting it and the press and also to open the circuit through the electromagnet 47 to deenergize it and thereby permit the cutter blade 40 to be retracted and open the space between the cross bars 35, 36 for the passage therethrough of the traveling web.

After the choke starts to form between either one of the delivery cylinders 22, 22* and the endless carriers 23, 23* the depression of the proper one of the tension rollers 65, 65*, the swinging of the proper one of the arms 64, 64* will close the circuit through the electromagnet 47 and also open the circuit through the motor 5 to stop the press. It will also be seen that the stop and start switches may be used for controlling the operation of the parts.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the particular embodiment herein shown and described, but what I claim is:

1. In a traveling web folder, a press drive, an electromagnet and their respective electric circuits, a former, two coacting rotary cutters, two spaced crossbars located between the former and

the rotary cutters, a normally retracted web cutting blade carried by one of the crossbars and operated by said electromagnet to coact with the other crossbar to sever the web, oppositely directed web deflecting guards carried by their respective crossbars, a vertically yielding element located between the rotary cutters, and a control switch in the press drive and electromagnet circuits, operated by said yielding element when moved by a choke in the web between the rotary cutters for opening the press drive circuit to stop the press drive and for closing the electromagnet circuit to operate the web cutting blade.

2. In a traveling web folder, a press drive, an electromagnet and their respective electric circuits, a former, two coacting rotary cutters, two spaced crossbars located between the former and the rotary cutters, a normally retracted web cutting blade carried by one of the crossbars and operated by said electromagnet to coact with the other crossbar to sever the web, oppositely directed web deflecting guards carried by their respective crossbars, a vertically yielding element located between the rotary cutters, a control switch in the press drive and electromagnet circuits, operated by said yielding element when moved by a choke in the web between the rotary cutters for opening the press drive circuit to stop the press drive and for closing the electromagnet circuit to operate the web cutting blade, and a hand lever for moving the yielding element further away from the rotary cutters to permit the ready removal of the choke material at this point.

3. In a traveling web folder, a press drive, an electromagnet and their respective electric circuits, a former, two coacting rotary cutters, rotary delivery cylinders coacting with their respective cutters, traveling endless delivery carriers coacting with their respective delivery cylinders, two spaced crossbars located between the former and the rotary cutters, a normally retracted web cutting blade carried by one of the crossbars and operated by said electromagnet to coact with the other crossbar to sever the web, oppositely directed web deflecting guards carried by their respective crossbars, yielding elements located respectively between the rotary delivery cylinders and their endless delivery carriers and between the rotary cutters, and control switches in the press drive and electromagnet circuits operated by any one of the yielding elements when moved by a choke in the web adjacent thereto, for stopping the press drive and to close the electromagnet circuit for operating the web cutting blade.

JOSEPH E. MEYER.