Nov. 10, 1959 E. W. HEWITT 2,912,501

MESSAGE PAPER CUTTER

Filed May 3, 1955 4 Sheets-Sheet 1

FIG. 1.

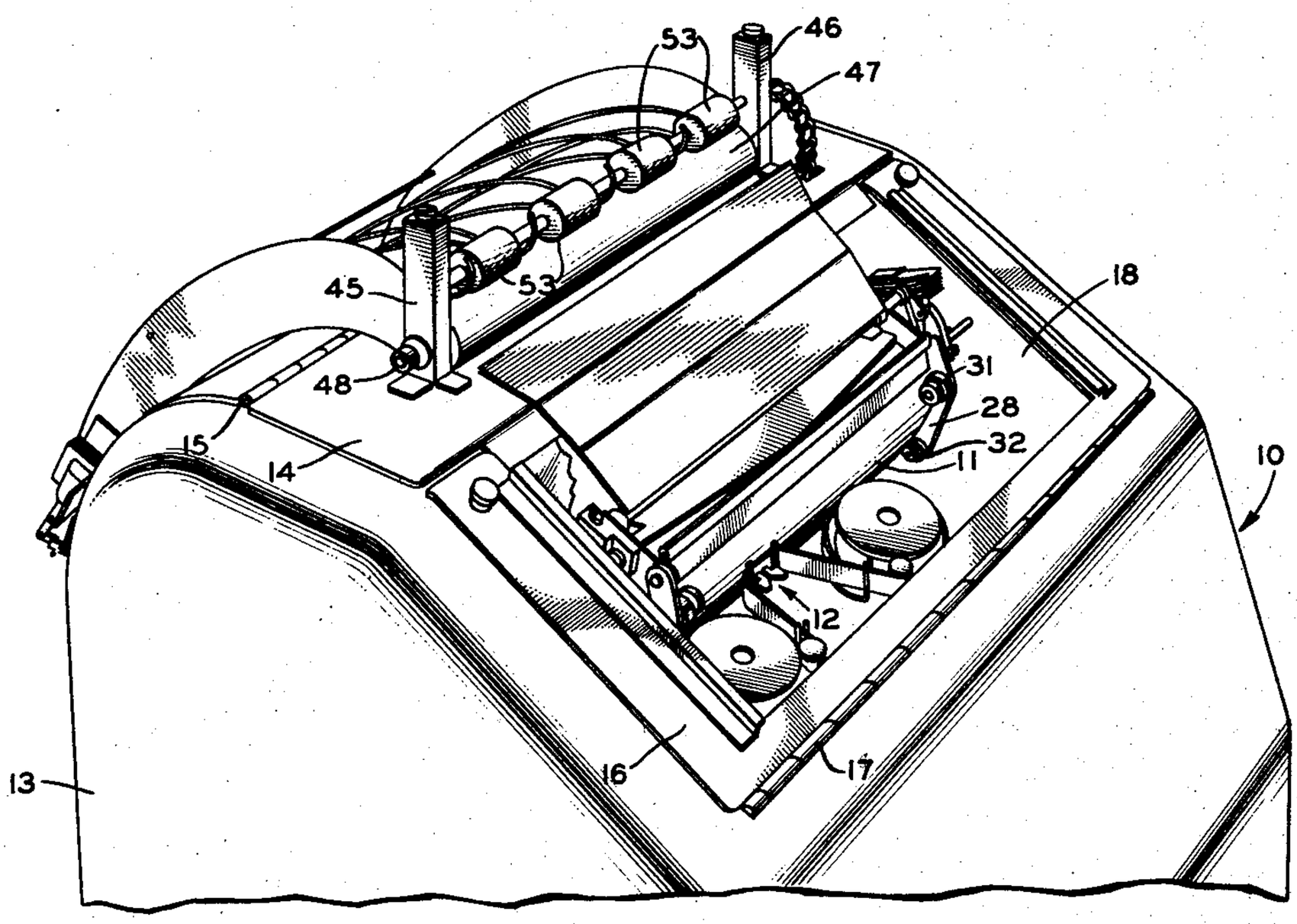
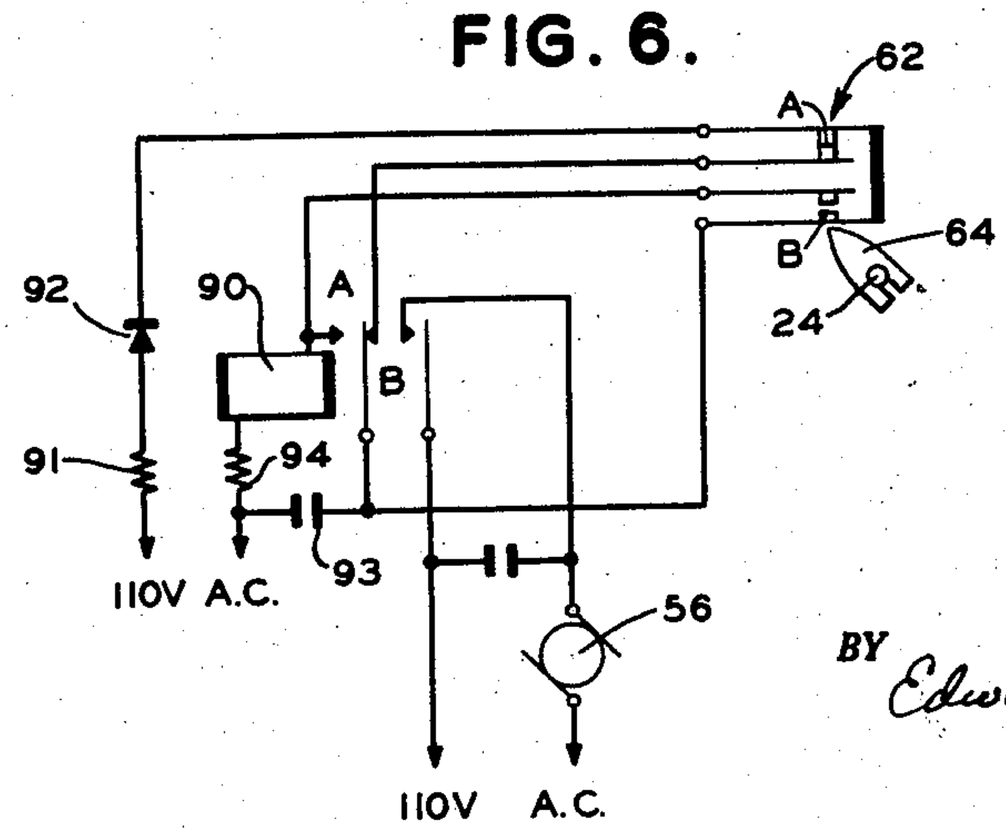


FIG. 6.



INVENTOR.
E. W. HEWITT
BY Edward R. Hyde Jr.
ATTORNEY

Nov. 10, 1959 E. W. HEWITT 2,912,501

MESSAGE PAPER CUTTER

Filed May 3, 1955 4 Sheets-Sheet 2

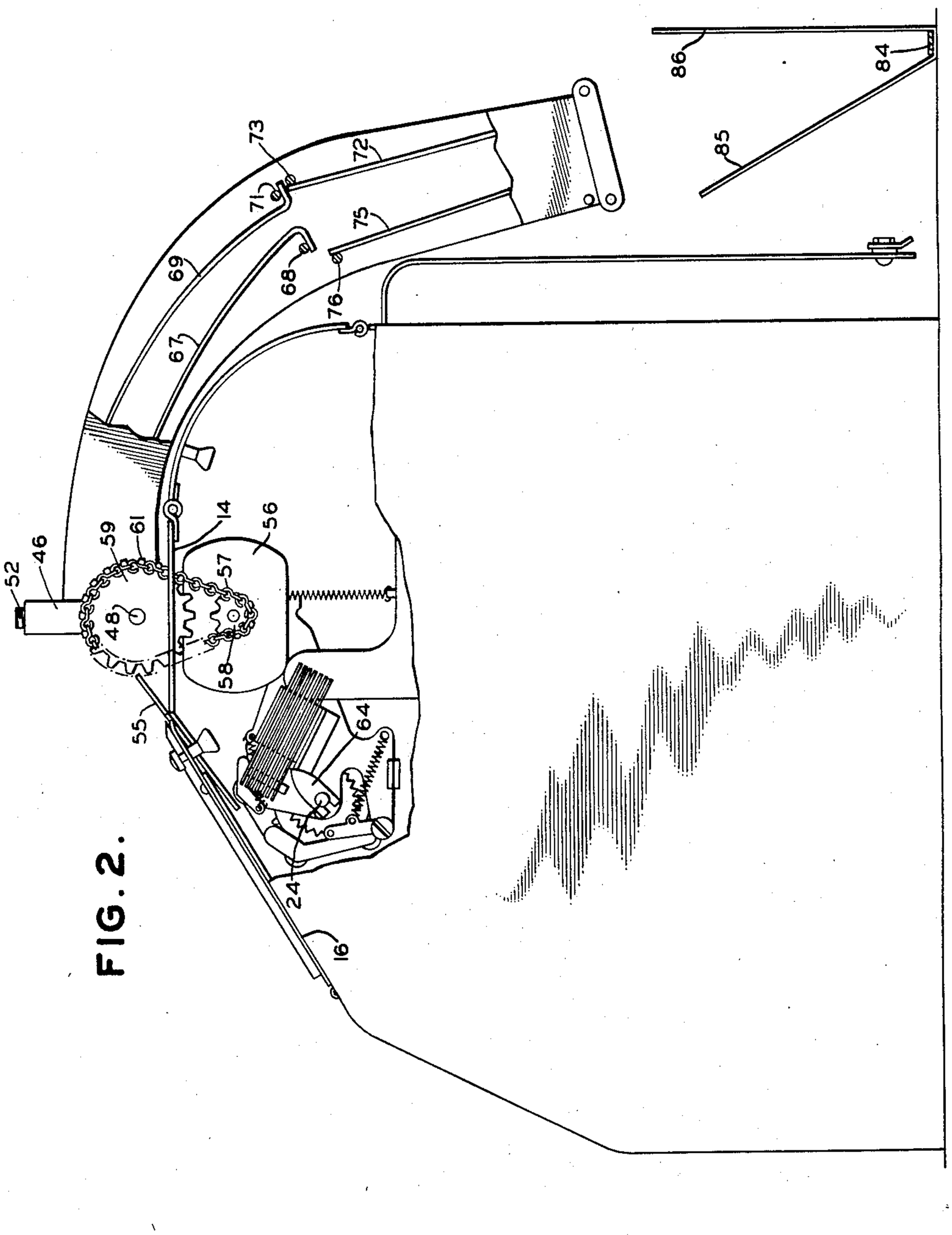


FIG. 2.

INVENTOR.
E. W. HEWITT
BY Edward R. Hyde Jr.
ATTORNEY

Nov. 10, 1959 E. W. HEWITT 2,912,501

MESSAGE PAPER CUTTER

Filed May 3, 1955 4 Sheets-Sheet 3

FIG. 3.

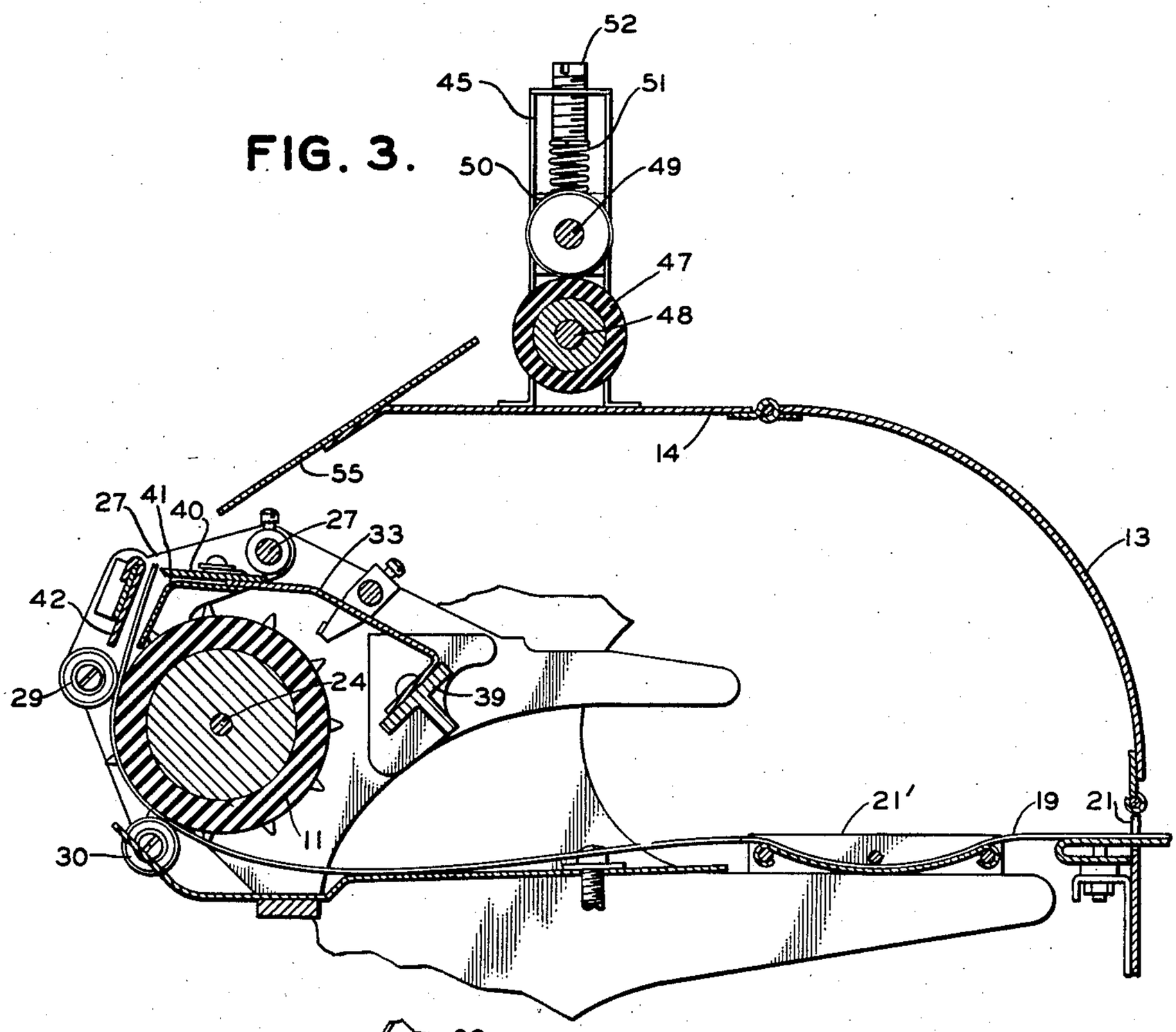
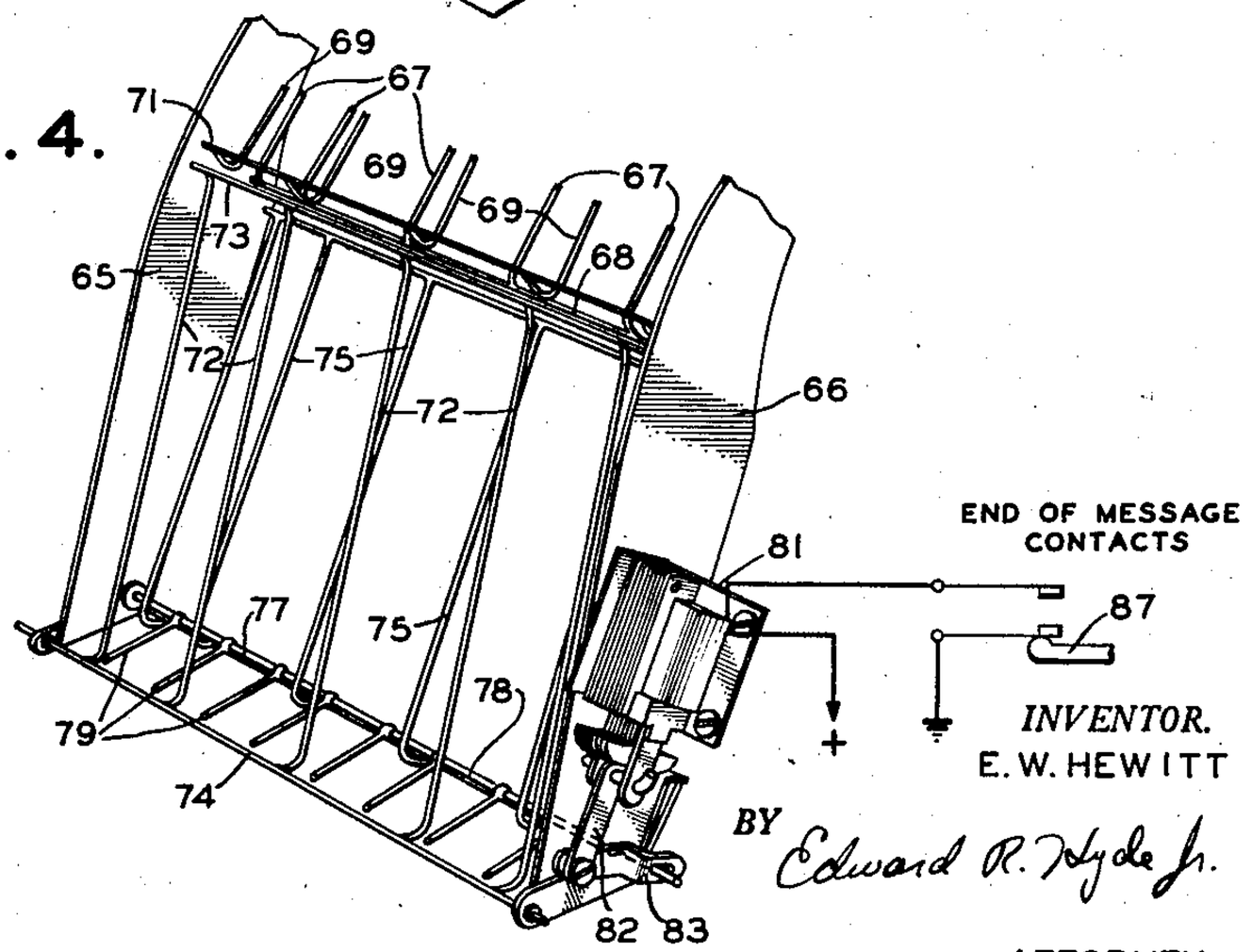


FIG. 4.



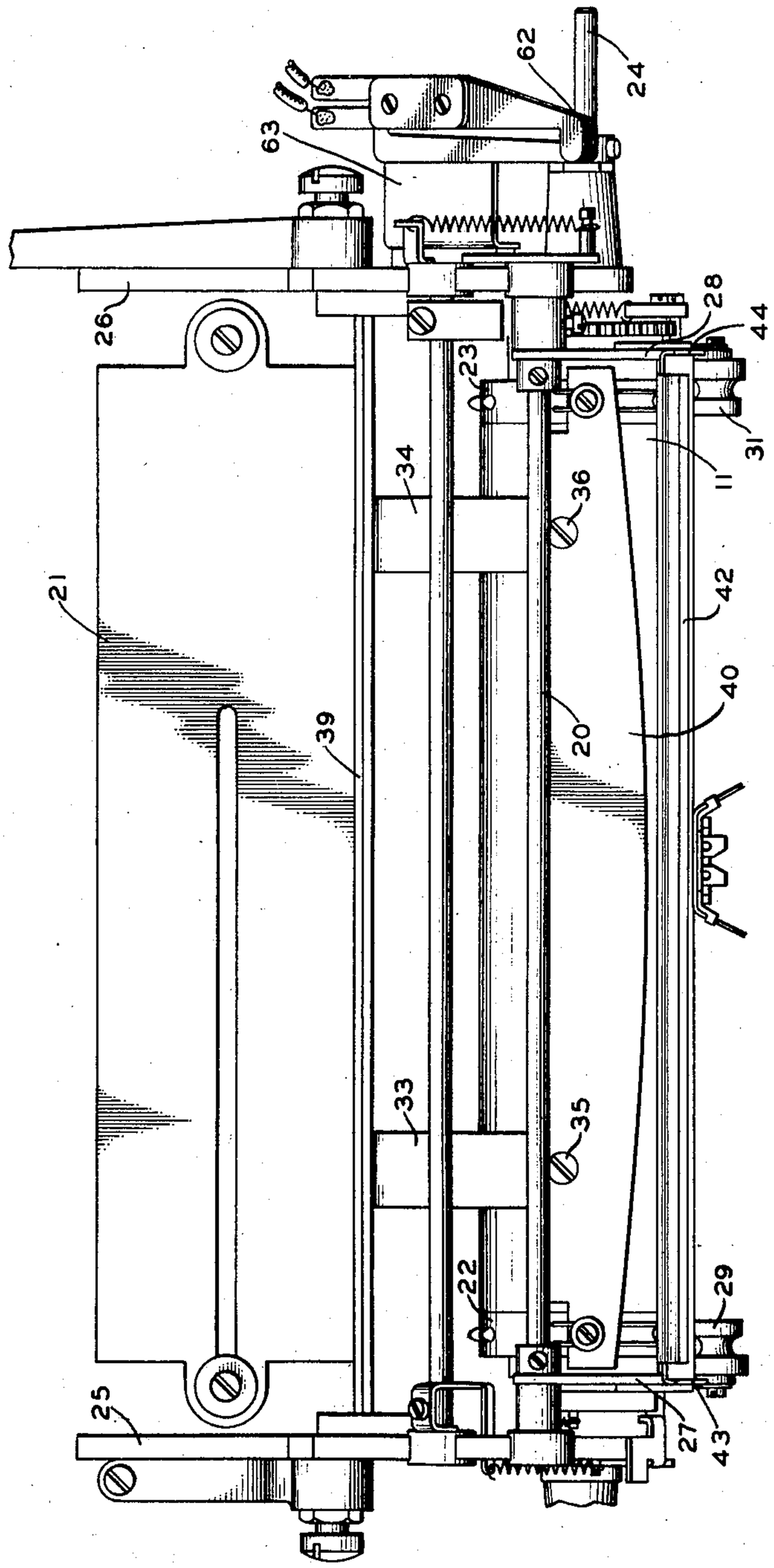
INVENTOR.
E. W. HEWITT
BY Edward R. Hyde Jr.
ATTORNEY

Nov. 10, 1959 E. W. HEWITT 2,912,501

MESSAGE PAPER CUTTER

Filed May 3, 1955 4 Sheets-Sheet 4

FIG. 5.



INVENTOR.
E. W. HEWITT
BY Edward R. Hyde Jr.
ATTORNEY

United States Patent Office

2,912,501

Patented Nov. 10, 1959

2,912,501

MESSAGE PAPER CUTTER

Ernest W. Hewitt, Stamford, Conn., assignor to The Western Union Telegraph Company, New York, N.Y., a corporation of New York

Application May 3, 1955, Serial No. 505,667

4 Claims. (Cl. 178—42)

The present invention relates to telegraph printing apparatus and more particularly to means for severing message sheets from a continuous strip as it passes through the teleprinter machine with the messages imprinted thereon.

The standard type teleprinter in commercial use feeds a continuous strip of message paper over a platen where the received messages are imprinted line by line. The paper is then fed through a slot or opening in the top of the machine. One type of paper strip in common use is provided with a series of feed holes along each edge that are gripped by feed sprockets to cause intermittent feeding of the strip. To facilitate the cutting of the individual message sheets the strip is provided with a series of longitudinally spaced transverse weakened severance lines. Thus as the strip passes through the slot in the top of the teleprinter, an attendant or operator can conveniently cut or tear the sheet along the weakened lines. In order to avoid this manual operation of cutting each individual sheet, the present invention provides an automatic severing means to cut each sheet after the message is printed.

It is an object of this invention to provide an improved severing device, especially adapted for a teleprinter, that automatically cuts individual message sheets from a continuous strip.

Another object of this invention is to provide a severing device operating with a teleprinter to cut a continuous strip that is provided with equally spaced transverse weakened severance lines.

Another object of this invention is to provide a severing device for a standard teleprinter that avoids the use of a movable cutting blade.

Accordingly, the present invention contemplates a stationary severing blade located in the path of strip feed between a sprocket feed means and a pair of severing or tension rollers. Thus, as the message strip is fed through the teleprinter and the leading edge reaches the line of contact of the tension rollers, the message paper is pulled or tensioned across the severing blade to cut off the leading message sheet. The blade and rollers are appropriately positioned so that the distance between the blade and the contact line of the rollers is slightly less than the distance between the severance lines of the message strip. The rollers are normally stationary and a control means is provided to cause rotation of the rollers as the leading edge of the strip reaches the line of contact of the rollers. At this point in the operation the intermittently operated feed sprockets are stationary to exert a restraining force on the paper to permit the tensioning thereof across the severance blade. The leading sheet is thus snapped or severed and passes between the rollers to an appropriate message receiving bin or conveyor located at the rear of the teleprinter. The invention will be more fully understood from the following description taken with the drawings in which:

Fig. 1 is a perspective view of a teleprinter modified with the severing device of the present invention;

Fig. 2 is an elevation of the right side of the machine of Fig. 1 with part of the casing broken away;

Fig. 3 is a cross-section of the upper part of Fig. 1 showing the details of the severance blade, its mounting means and the tensioning rollers;

Fig. 4 is a perspective view of the message receiving bin located on the rear of the teleprinter;

Fig. 5 is a plan view showing certain details of the present invention; and

Fig. 6 is a schematic diagram of the control circuit for the severing rollers.

Referring now to the drawings and more particularly to Fig. 1, numeral **10** indicates generally a teleprinter of the type shown in the Morton U.S. Patent No. 1,904,164 and the Zenner U.S. Patent No. 2,273,081. The operation and construction of the teleprinter are well known to those skilled in the art and reference may be had to the above patents for the details of construction of this machine. For present purposes it need only be pointed out that a continuous strip of message paper is fed over a platen **11** where the message characters are printed. A printing mechanism not shown but generally indicated at numeral **12** includes type bars which are selectively operated by received pulses from the distant transmitter. The printing mechanism travels from left to right to print the characters as it travels. The message paper is stationary as the printing mechanism travels across the paper and at the end of a line the printing mechanism reverts to the left side of the machine and the message paper is advanced one line. The teleprinter is enclosed in a casing **13** which has a cover plate **14** hinged thereto as at **15**. A U-shaped frame **16** is also hinged to the casing at **17**. The frame mounts a transparent window **18** so that the operation of the machine may be conveniently viewed.

The continuous strip of message paper of the type herein contemplated is fan folded in a known manner and the supply may be located in an appropriate container located to the rear of the teleprinter. As shown in Fig. 3, the strip **19** is threaded through an opening **21** in the rear of the casing **13** and then over a paper guide plate **21'**, forward around platen **11** where the characters are printed. Paper feeding is effected by means of sprockets **22** and **23** (Fig. 5) located at either end of the platen and suitably secured to the platen shaft **24**. The distance between the sprockets of course corresponds to the distance between the lines of feed holes along either edge of the strip. The sprockets are rotated intermittently by a mechanism shown in the above mentioned Zenner patent. The platen shaft **24** is mounted in bearings in side frames **25** and **26** of the teleprinter. A shaft **20** is also secured to the side frames and pivotally mounts pressure levers **27** and **28**. These levers serve as a mounting means for two pair of pressure rollers **29**, **30**, **31** and **32** which serve to hold the strip in contact with the platen **11**. The pressure roller assembly is spring urged against the platen in the well known manner shown in the Zenner patent and may be pivoted upwardly on shaft **20** to permit the threading of the paper strip around the platen. Severing blade **40** is secured to blade brackets **33** and **34** by means of screws **35** and **36** respectively. The blade brackets, as shown in Fig. 3, are bent over at their remote ends and screwed to a cross brace **39** which in turn is mounted at its ends in the side frames **25** and **26**. To insure that the strip is fed along the edge of the knife blade inner paper guide **41** and outer guide **42** are provided. The inner guide is secured to the underside of the blade and extends downward parallel to the feed of the strip as seen in Fig. 3. Outer guide **42** is secured at its ends by means of brackets **43** and **44** to the pressure roller levers **27** and **28** respectively.

A pair of vertical end brackets 45 and 46 are secured in any suitable manner as by spot welding to the cover plate 14 and are spaced apart a distance slightly greater than the width of the message strip. A lower severing roller 47 is mounted on a shaft 48 received in bearings in the end brackets 45 and 46. A shaft 49 is received in vertically adjustable bearings 50 which are slidably received in the end brackets 45, 46. Shaft 49 mounts a plurality of rollers 53 which may be made of any suitable metal and knurled. Roller 47 may be made of rubber to provide sufficient friction between it and the upper rollers 53 so that the message sheet is firmly gripped. The upper rollers 53 and lower roller 47 are urged together by a compression spring in each of brackets 45 and 46. As seen in Fig. 3, spring 51 urges bearing 50 downward and may be adjusted by screw 52.

The message sheet is guided from the platen to the tension rollers between the transparent window 18 and a paper guide plate 55 which is secured to a bent over forward portion of the cover plate 14. Paper guide plate 55 is located a small distance below the transparent window and substantially parallel therewith as seen in Fig. 2 so that the strip will pass between these two elements and be directed to the line of contact of the tension rollers.

Power is supplied to the tension rollers by means of a motor 56 mounted on the underside of cover plate 14. A sprocket wheel 57 is secured to the motor shaft 58 and is aligned with a sprocket wheel 59 mounted on an extension of lower severing roller shaft 48. A link chain such as 61 encircles the pinion and sprocket wheel 59 so that energization of the motor results in rotation of the severing rollers. The direction of rotation of the motor shaft 58 is such that lower severing roller 47 rotates in a clockwise direction as seen in Fig. 3. The plurality of upper severing rollers 53 being in frictional contact with roller 47 will rotate in a counterclockwise direction so that a message sheet gripped between the two rollers will be ejected rearwardly.

Operation of motor 56 is controlled by switch contacts 62 (Fig. 5) which are secured in place by bracket 63 fastened to the side frame of the teleprinter. A cam 64 is fastened to an extension of the platen shaft 24 to close switch 62 with each complete revolution of the platen. It has been found that the circumference of the platen used in standard teleprinters is equal to 22 line feeds. Also, the distance between the transverse weakened lines on the message paper is equal to the circumference of the platen and hence equivalent to 22 line feeds. Thus, when the platen completes one revolution, the message strip is advanced a distance equal to that between an adjacent pair of severance lines. In this manner, when the platen has made one revolution, the message strip has advanced a distance of one message sheet and cam 64 being secured to the platen shaft has made one revolution to close contacts 62.

Referring now to Fig. 3, the distance from severance blade 40 to the line of contact of the severing rollers is slightly less than the length of a message sheet defined by the weakened severance lines. Cam 64 will close the contacts just as the leading edge of the strip reaches the line of contact of the tension rollers. At this time a severance line is located along the edge of blade 40 and cam 64 closes contacts 62 resulting in the energization of motor 56.

The motor control circuit is shown in Fig. 6. Motor 56 is connected in series with a source of power and normally open B contacts of relay 90. Also connected to the power source is the series combination of resistor 91, rectifier 92, normally closed A contacts of switch 62, break contacts A of relay 90 and capacitor 93. The rectifier provides a D.C. current that maintains capacitor 93 in a normally charged condition. Coil 90 in series with normally open B contacts of switch 62 is connected across charged capacitor 93. With coil 90 normally de-

energized its break contact A completes the charging path for capacitor 93. As the leading edge of the strip reaches the tension rollers cam 64 actuates switch 62. The B contacts of switch 62 close to connect relay coil 90 across charged capacitor 93. The relay thereupon energizes to close its B contacts to operate motor 56. The A contact of relay 90 will transfer to the make position and the relay will lock up. The time constant of capacitor 93 and resistor 94 will determine the energization period of relay 90 and hence the period of time that motor 56 operates the tension rollers. The A contacts of switch 62 open the charging circuit of capacitor 93 so that after the capacitor discharges across coil 90, it remains discharged until the next line feed advances cam 64 to permit switch 62 to return to the normal position.

It is seen then that the intermittently rotating cam 64 will cause energization of the motor 56 at the end of a line feed operation. At this time feed sprockets 22 and 23 are stationary to exert a restraining force on the message sheet as the leading edge is gripped and pulled forward by the gripping rollers. The sheet is thus tensioned across the blade 40 and severance is effected along the weakened line with a bursting action.

One important feature of the present invention is the convex contour of the blade 40. As seen in Fig. 5, the blade is wider at the center and tapers toward the edges in a direction away from the path of paper feed. It is readily seen therefore that a tensioned sheet will start to sever at a single point at the center and tear outwardly therefrom in two directions toward the edges. This blade shape has distinct advantages over a straight blade or one with a concave cutting edge. Manifestly less tensioning force is required to initiate cutting at one point than at two points as in the case of a concave blade. Also, were severing initiated at the edges of the paper there would be likelihood of random tearing. The reason for this is that the paper is less firm at the outer portions than in the center. In addition, any slipping of an upper gripping roller would tend to permit the paper to slack along an edge with the result that severance along the proper line would not be insured. The convex contour of blade 40 of the present invention avoids these possible malfunctions by initiating tearing at a single center point.

After the message sheet passes through the severing rollers it is guided to a receiving compartment by a paper chute more clearly shown in Figs. 2 and 4. The sides 65 and 66 of the chute are pivotally mounted on shaft 48 at the ends of the lower severing roller. The chute guides are curved to conform generally to the rear contour of the machine and extend downwardly. A network of guide wires 67 define the inner side of the chute and terminate in bent over portions which are secured as by welding or soldering to a cross wire 68. Another set of guide wires 69 define the top of the paper chute and also terminate in bent over portions suitably secured to a cross wire 71. The chute terminates in a message sheet receiving bin similarly constructed of an upper set of guide wires 72 secured at their upper ends to a cross wire 73 and at the lower ends to a cross wire 74. The cross wires are all mounted to the sides 65 and 66. Another set of guide wires 75 are secured to cross wires 76 and 77, also suitably mounted to the sides of the chute. A cross wire 78 is pivotlly mounted in sides 65, 66 and has an offset portion at one end extending through chute side 66. A plurality of wire fingers 79 are fastened to pivotally mounted wire 78 and serve to form the bottom of the sheet receiving compartment.

It is readily seen therefore that as a message sheet is severed by the severing rollers, it will pass down the chute into the receiving compartment where it will be held by fingers 79 which form a gate. A solenoid 81 is mounted to the side of the receiving compartment and through links 82 and 83 connects to the offset portion of pivotally mounted wire 78. Energization of solenoid 81 will retract its armature to cause gate fingers 79 to pivot

downwardly to permit the message sheet located in the compartment to pass down into V-trough type of conveyor comprising a conveyor belt 84 and a pair of diverging sheet guides 85 and 86, which insure that ejected sheets will fall onto the conveyor belt.

One purpose of the receiving compartment with the selectively operated gate is to permit message sheets that together comprise a single message to be ejected simultaneously onto the conveyor belt 84. It is understood that the severing operation will occur to cut sheets of equal length. If a message is received that requires more than one sheet, the severing operation will nevertheless occur and the remaining part of the message will be printed on the next succeeding message sheet. It is, of course, desirable to keep these sheets together since they comprise a single message. In order to accomplish this the normally closed receiving compartment is provided which opens under control of the transmitting machine at the end of a message rather than as each sheet passes into the compartment. It is seen therefore that if a message were to require a large number of message sheets, each sheet would be severed and passed to the receiving compartment where it would be maintained by wire fingers 79. When the message has been completely received, all the message sheets containing that message would be located in the sheet receiving compartment and solenoid 81 will operate to pivot fingers 79. Solenoid 81 operates under the control of the distant transmitter and energizes when the end-of-message contacts close as the result of a special signal from the sending station. The mechanism for closing the end-of-messsage contacts may be similar to that shown in the U.S. patent to Reiber No. 2,224,883 wherein the usual function lever 87 is selectively operated by a predetermined signal. Alternatively, solenoid 81 could be controlled to remain inoperative upon failure of a message sequence check. Thus if a message is out of its proper order, it would remain in the message compartment. When the compartment opens, the group of sheets forming the received message will fall together upon conveyor belt 84 to be conveyed to another point in the office in which the machine is located.

While the present invention has been disclosed with reference to a specific embodiment thereof, it should be understood that this is not to be considered as limiting the appended claims.

What is claimed is:

1. In a telegraph printer in which message characters are printed on a continuous strip of message paper fed in a step-by-step manner over a platen, a stationary blade mounted on said printer, said blade having a cutting edge projecting into the path of said strip and extending transversely thereacross, a plurality of normally stationary gripping rollers mounted on the printer and longitudinally spaced from said stationary blade in the path of said strip, means to periodically actuate the gripping rollers as the leading edge of the strip reaches said rollers to tension the strip across the cutting edge thereby effecting transverse severing of the strip, a sheet receiving bin mounted on the printer to receive sheets cut from the strip, said bin having a normally closed gate to retain cut sheets and means connected to said gate to open the bin upon receipt of a special signal whereby a plurality of sheets are simultaneously ejected from the receiving bin.

2. In a telegraph printer in which message characters are printed on a continuous strip of message paper, intermittently operated feed means to advance said paper in a step-by-step manner, a stationary blade mounted on said printer, said blade having a cutting edge projecting into the path of said strip and extending transversely thereacross, a plurality of normally stationary gripping rollers mounted on said printer and longitudinally spaced from said stationary blade in the path of said strip, means to periodically actuate the gripping rollers during a stationary interval of said intermittently operated feed means as the leading edge of the strip reaches said rollers to tension the strip cross the cutting edge thereby effecting transverse severing of the strip, a chute located adjacent said gripping rollers in the path of sheet feed to receive severed sheets, said chute terminating in a sheet receiving bin to collect the severed sheets from said chute, said bin having a normally closed gate to retain cut sheets and means connected to said gate to open the bin upon receipt of a special signal whereby a plurality of sheets are simultaneously ejected from the receiving bin.

3. In a telegraph printer in which message characters are printed on a continuous strip of message paper fed in a step-by-step manner over a platen, a stationary blade mounted on said printer, said blade having a cutting edge projecting into the path of said strip and extending transversely thereacross, a plurality of normally stationary gripping rollers secured to said printer and longitudinally spaced from said stationary blade in the path of said strip, means to periodically actuate the gripping rollers as the leading edge of the strip reaches said rollers to tension the strip across the cutting edge thereby effecting transverse severing of the strip, a chute mounted to said printer and located adjacent said gripping rollers to receive severed sheets, a sheet receiving bin mounted to said chute to receive sheets from said chute, said chute having a normally closed pivotal gate to retain cut sheets, and a solenoid connected to said gate to open the bin upon receipt of a special signal.

4. In a telegraph printer in which message characters are printed on a continuous strip of message paper fed in a step-by-step manner over a platen, a stationary blade mounted on said printer, said blade having a cutting edge projecting into the path of said strip and extending transversely thereacross, said cutting edge being tapered from the center to the edges thereof, a plurality of normally stationary gripping rollers secured to said printer and longitudinally spaced from said stationary blade in the path of said strip, means to periodically actuate the gripping rollers as the leading edge of the strip reaches said rollers to tension the strip across the cutting edge thereby effecting transverse severing of the strip from the center to the edges thereof, a chute mounted to said printer and located adjacent said gripping rollers to receive severed sheets, a sheet receiving bin mounted to said chute and adapted to receive sheets therefrom, said chute having a normally closed pivotal gate to retain cut sheets, and a solenoid connected to said gate to open the bin upon receipt of a special signal whereby a plurality of sheets are simultaneously ejected from the receiving bin.

References Cited in the file of this patent

UNITED STATES PATENTS

2,478,218	Wise	Aug. 9, 1949
2,513,093	Hageman	June 27, 1950

FOREIGN PATENTS

678,411	Great Britain	Sept. 3, 1952