G. K. HENDERSON.

PAPER DELIVERING APPARATUS.

APPLICATION FILED APR. 28, 1910.

1,133,959.

Patented Mar. 30, 1915.

5 SHEETS—SHEET 1.

Fig - 1 -

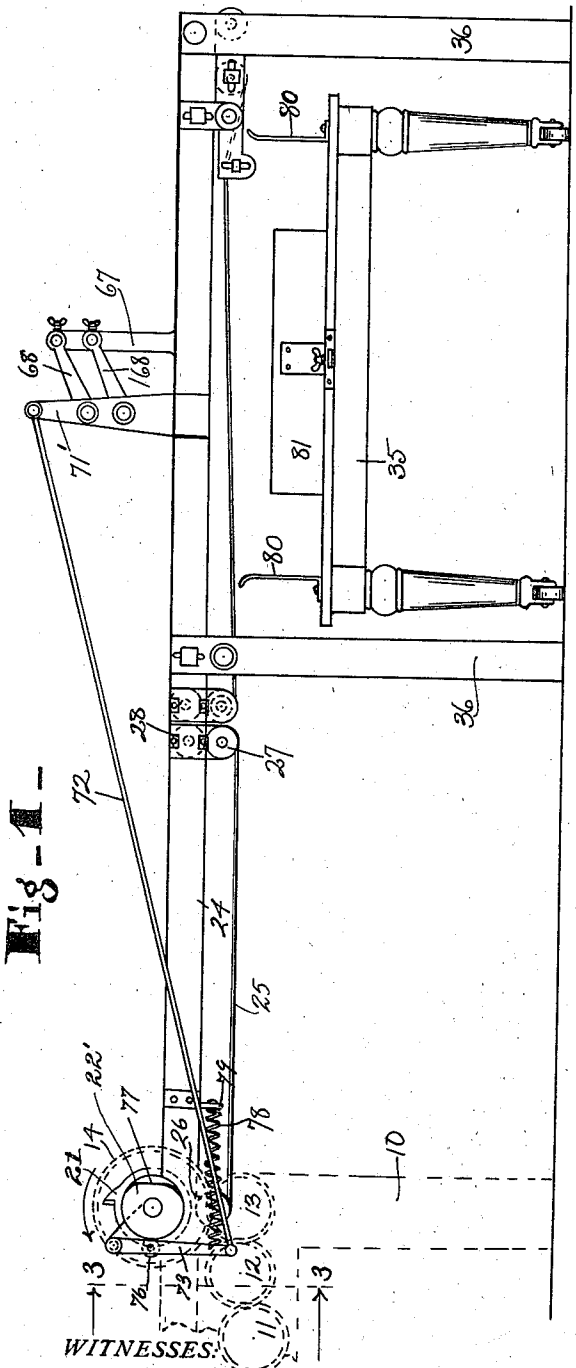


Fig - 3 -

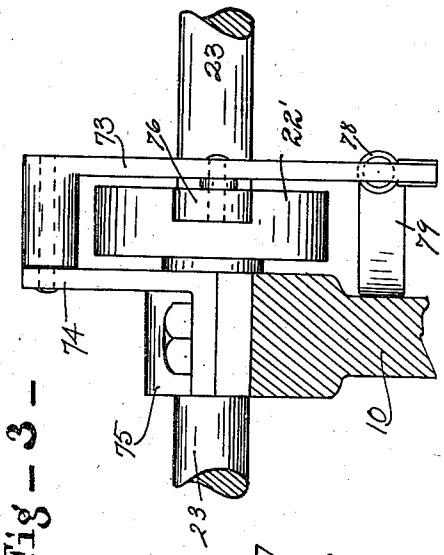
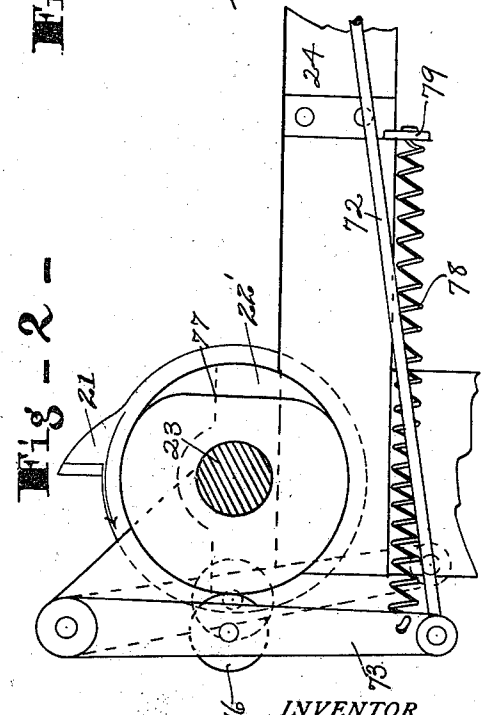


Fig - 2 -



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5 SHEETS—SHEET 2.

Fig-4-

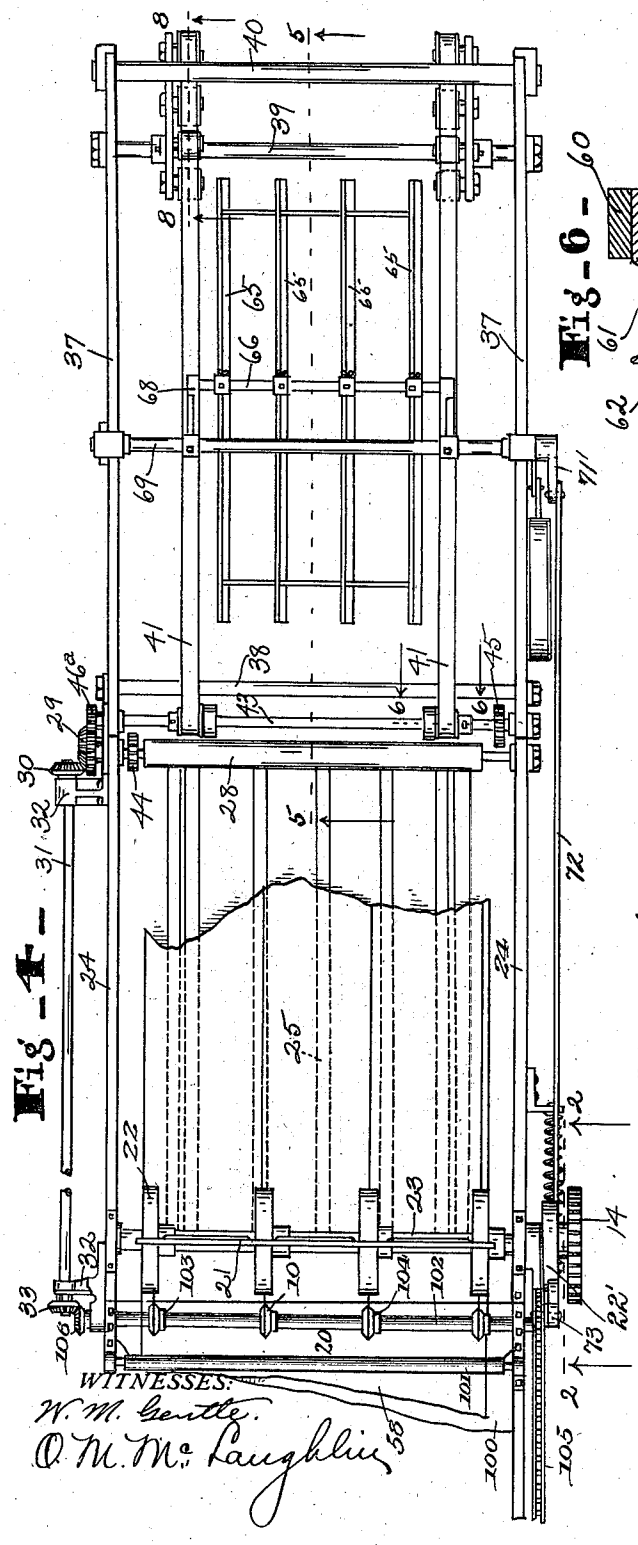


Fig-6-

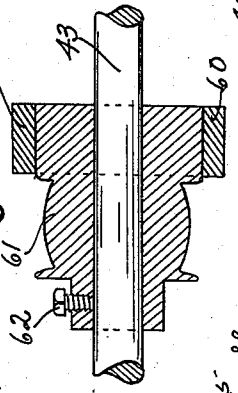


Fig-5-

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5 SHEETS—SHEET 3.

Fig. 7.

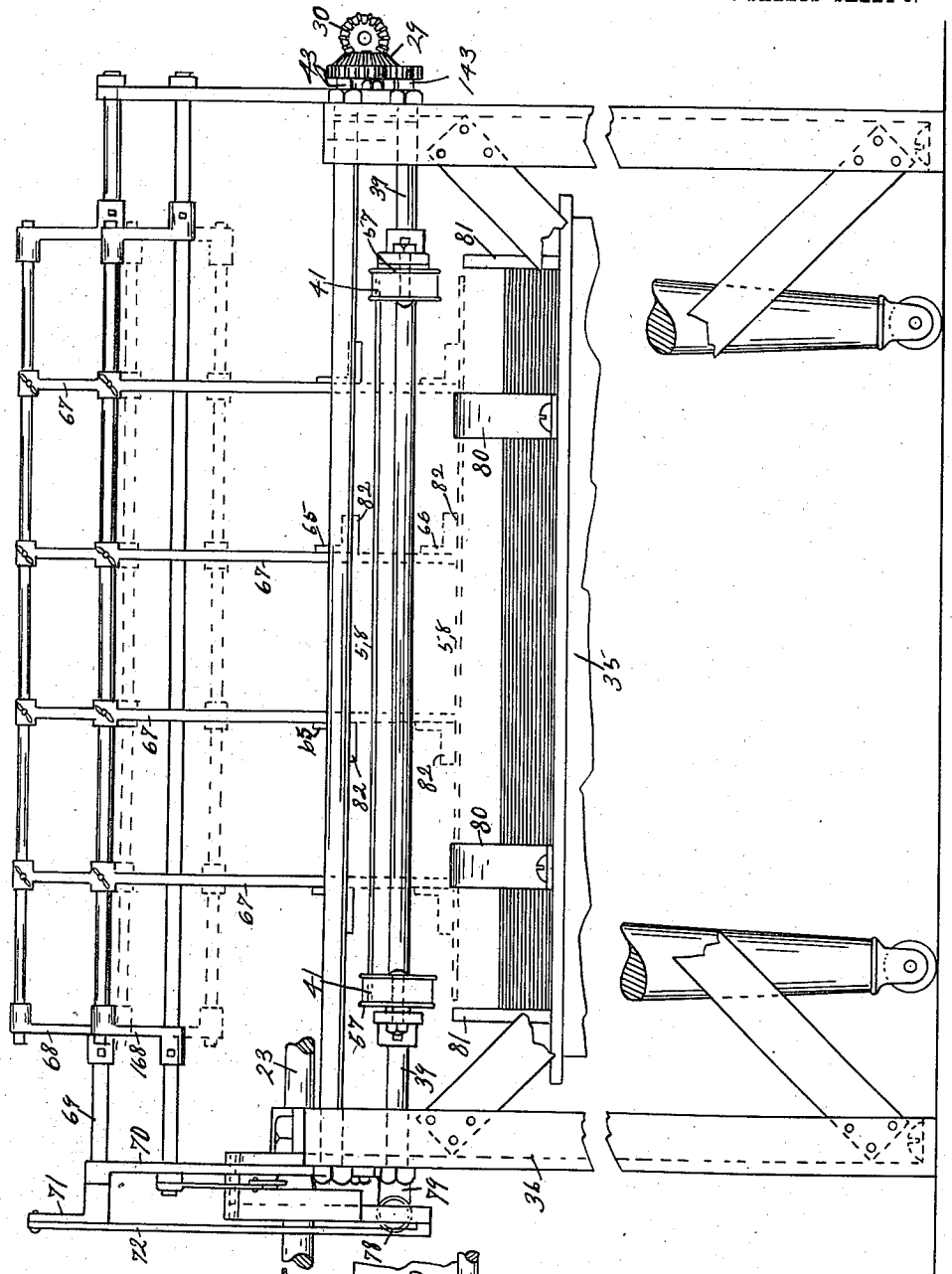
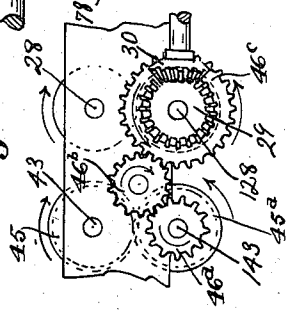


Fig. 12.



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5 SHEETS—SHEET 4.

Fig. 8.

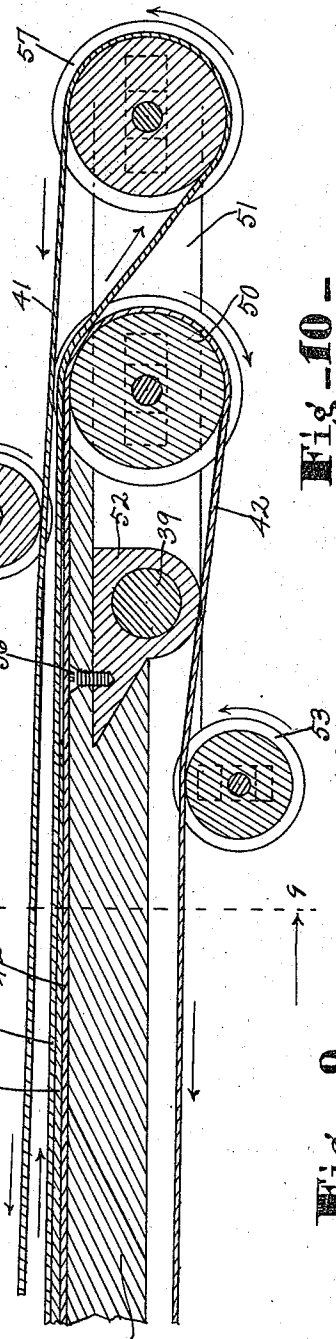


Fig. 10.

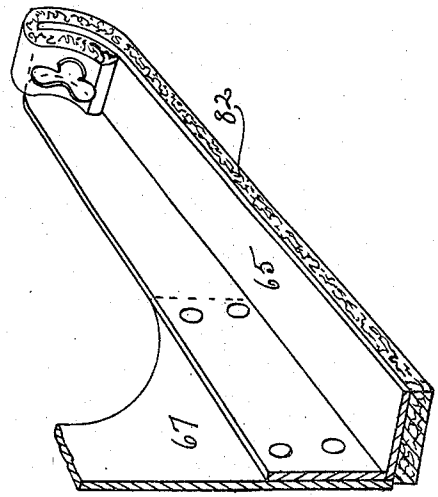
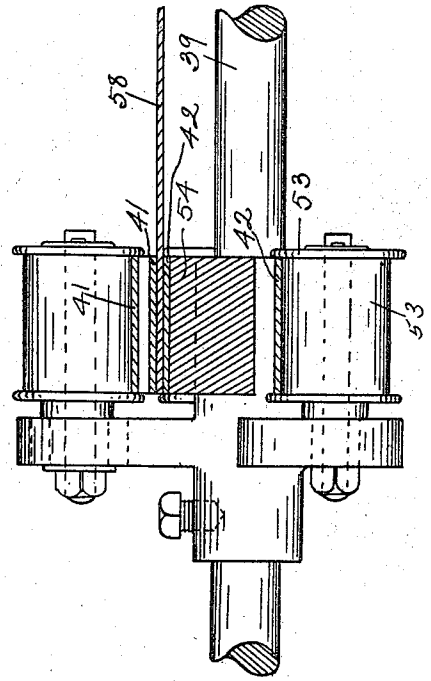


Fig. 9.



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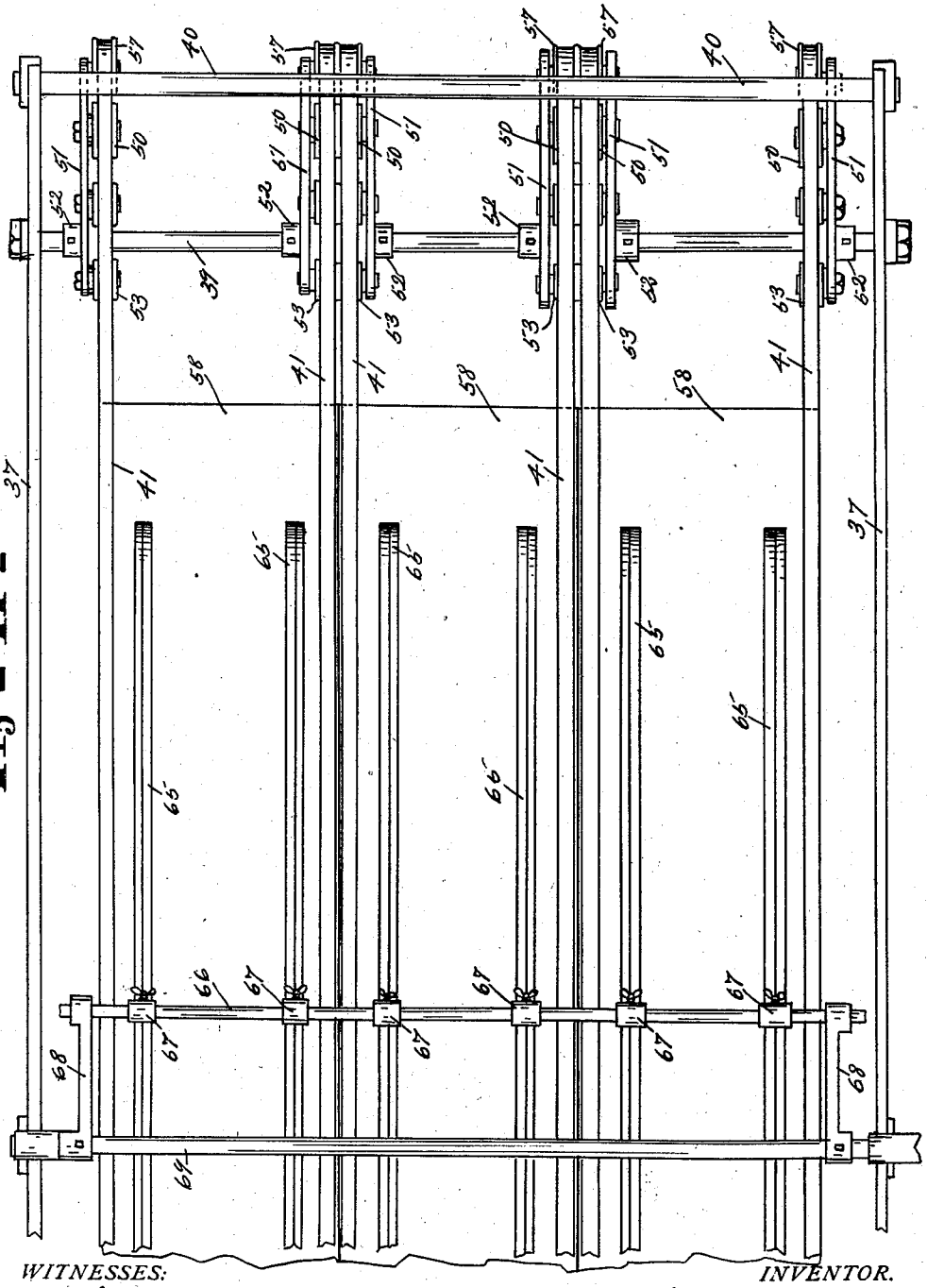
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5 SHEETS—SHEET 5.

Fig - 11 -



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UNITED STATES PATENT OFFICE.

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PAPER-DELIVERING APPARATUS.

1,133,959. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed April 28, 1910. Serial No. 558,120.

To all whom it may concern:

Be it known that I, GEORGE K. HENDERSON, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Paper-Delivering Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

The object of this invention is to provide means for the delivery of sheets of paper from a paper making machine, printing press or like device, without interfering with the movement of the sheets of paper as the same approach the delivery apparatus.

The chief feature of the invention consists in providing means for taking the sheets of paper as they leave the discharging or cutting mechanism and moving them at a greater speed than that at which they had been moving previously, and delivering the same on a table, or the like, so that the sheets being delivered will have been advanced sufficiently far before the operation of the means for depositing the same on the table, and the said depositing means will have time to operate on the sheet and place it on the table in position without interference with or by the succeeding sheets.

Another feature of the invention consists in providing in the delivery apparatus a pair of coöperating tapes for grasping each lateral edge of the sheet of paper and holding it until the depositing apparatus acts on the sheet of paper and removes it from the grasp of the tapes. To that end the depositing apparatus moves downwardly between the tapes upon the sheet of paper held by the tapes and pushes it out of the grasp of the tapes and deposits it on the table below.

The nature of the invention will be understood from the accompanying drawings and the following description and claim.

In the drawings Figure 1 is a side elevation of the paper delivering apparatus. Fig. 2 is an enlarged view of the portion of the apparatus at the left-hand end of Fig. 1 on the line 2—2 of Fig. 4. Fig. 3 is a section through a part of the apparatus on the line 3—3 of Fig. 1. Fig. 4 is a plan view of what is shown in Fig. 1. Fig. 5 is a vertical longitudinal section on the line 5—5 of Fig. 4 with a sheet of paper in place. Fig. 6 is a transverse section on the line 6—6 of Fig. 4. Fig. 7 is an end elevation of the extreme end of the device, parts being centrally broken away. Fig. 8 is a section on the line 8—8 of Fig. 4 on an enlarged scale. Fig. 9 is a transverse section on the line 9—9 of Fig. 8. Fig. 10 is a perspective view of the delivery arm, parts being broken away. Fig. 11 is a modified form of the right-hand half of what is shown in Fig. 4. Fig. 12 is a side elevation of the gear for driving the delivery mechanism.

It is understood that this apparatus is at the discharge end of a paper making machine, printing press, or like machine 100, or a continuation thereof, from which one or more continuous sheets of paper are fed to the paper delivering apparatus herein shown see Fig. 4. In Fig. 1 parts of the rear end of what may be termed technically the "paper making machine or printing press" are indicated by dotted lines, 10 represents a part of the frame, and 11, 12, 13 and 14 are gears associated with said frame. At the rear of what may be termed the "main frame" 10, the continuous sheet of paper which has been previously trimmed at the edges and longitudinally slit, if necessary, is cut into sheets by a transversely disposed cutting mechanism consisting of a stationary plate 20 and the revolving knife 21, which is fastened on a series of rollers 22, which are mounted on a shaft 23 extending transversely of the machine and mounted in the side bars 24 and carrying on its end the gear 14, whereby the knife is revolved in the direction indicated by the arrow in Fig. 1. The sheet of paper, after passing the cutting mechanism, is received by a series of tapes 25 which are endless and are operated by the pulleys 26 and 27, see Fig. 1, which are mounted also in the side bars 24, and said side bars are a continuation of the main frame 10. 28 is a feed roller coöperating with the tape roller 27. Said roller 27 is operated by a bevel pinion 29, see Fig. 4, that meshes with the bevel pinion 30 on the shaft 31 mounted in brackets 32 on one of the side bars 24. At the left-hand end of said shaft 31 there is a driving bevel gear 33 that meshes with some means for transporting power to said shaft. The roller 28 is driven by a spur gear 44 which meshes with the corresponding spur gear on the roller 27 immediately below.

All which has been so far described is old and has heretofore been used in connection

with the delivery table 35, and boys or girls have been employed to stand on both sides of the machine and catch the edges of the sheets with their fingers and move them on to the delivery table 35; but it is tiresome, tedious work and boys and girls could not keep up with the machine. Therefore, there is added to the foregoing mechanism the following means for doing the work of said delivery girls or boys, which means operates more rapidly than the tapes 25, so that it gets the sheets of paper out of the way and delivers the same on the table 35. To the foregoing end there is a frame heretofore described consisting of four uprights 36, which support side bars 37 which are practically continuations of the side bars 24. There are cross rods or bars 38, 39 and 40 extending through said side bars 37 which hold them in position and constitute the remainder of said added frame. The table 35 is located within said frame and on a lower level than the side bars 37, and tapes 41 and 42 travel from front to rear on a higher level than said table. The tapes 41 are immediately above the tapes 42, as shown in Figs. 8 and 9. They are driven by the shaft 43, which is driven by a spur gear 45 thereon, which meshes with a corresponding spur gear 45^a on a shaft 143 corresponding with 43, but immediately below the same and which drives the lower sheet of tapes 42. As shown in Fig. 12, said shaft 143 is driven by the pinion 46^a, which is driven through idler 46^b by a spur gear portion 46^c of the gear 29.

The outer ends of the tapes 42 are carried over rollers 50 mounted on bars 51 extending from brackets 52 secured on the shaft 39, see Fig. 11. The lower side of the tapes 41 are guided by guide rollers 50 that are mounted on the bars 51. The upper side of the tapes 42 travel over guide bars 54, which extend longitudinally of the machine and at one end are secured to brackets 55 on the rod 38, and at the other end on the brackets 52 carried on the rod 39. Screws 56 secure the bars 54 to the brackets.

The tapes 41 run over the rollers 57 at their rear ends, said rollers being likewise mounted in the bars 51. The rollers 57 are on the same level as the rollers 50 and the lower side of the tapes 41 ride over the rollers 50, as shown in Fig. 8, and, therefore, upon the upper side of the tapes 42, so as to pinch and hold the edges of the sheets of paper 58 until dislodged by the depositing means.

The shafts 43 and 143 are provided with rubber tired wheels 60, which coöperate to grasp the advancing edges of the sheet of paper as the same passes from the tapes 25. Adjacent said rubber tired wheels 60 are the rollers 61, upon which the tapes 41 and 42 travel. They are convex transversely. As shown in Fig. 6, the wheel 60 and rollers 61 may be integral and held in place by the screw 62 on the shaft.

The tapes 41 and 42 travel at a higher speed than the tapes 25, as indicated by the gearing at the upper middle portion of Fig. 4, and shown in detail in Fig. 12. The tapes 25 are driven by the gear 29 and shaft 128. The tapes 41 and 42 rotate together through the gears 45^a and 45 on the shafts 143 and 43. A gear 46^a is driven from spur gear 46^c through idler 46^b, so that one revolution of the gear 29 will cause about two revolutions of the gears 45 and 45^a. The shafts 128, 43 and 143, and the rollers on which the tapes run are substantially of the same proportionate diameter, so the tapes 41 and 42 will travel about twice as fast as the other tapes 25, and hence the former tapes would convey a sheet of paper rapidly away from a sheet being conveyed by the tapes 25 and get it far enough away so that the depositing means could have time to act on it.

The depositing means or frame 65, see Fig. 4, is a frame with the bars thereof rigidly secured about midway between their ends to an upwardly extending bar 67, see Figs. 1 and 5, to which a pair of parallel arms 68 and 168 are pivoted at their ends. The arms 68 are rigidly secured to the shafts 69, while the arms 168 are pivoted at 70 to the standards 71, which extend up from the side bars 37 of the frame. The shaft 69 has bearings in the upper end of said standards and at one end has an actuating crank 71′ secured to it, from which a connecting rod 72 extends to the lower end of a swinging bar 73, see Figs. 1 and 2. This latter bar is pivotally mounted at its upper end to a bracket 74, which extends upwardly from the bearing 75 of the shaft 23 on the frame 10, see Fig. 3. The bar 73 is actuated or swung in one direction by a roller 76, which is pivoted thereto between its ends and runs on the cam portion of the wheel 22′, that is, the roller 73 travels on the periphery of said wheel 22′ until it comes to the cam 77, which is formed on one side of the wheel 22′, see Fig. 4. The bar 73 is returned by the spring 78 that is secured to said bar at one end and at the other end to a bracket 79 on one of the side bars 24. Hence the wheel 22′ will force the part shown in Fig. 2 to the full-line position normally, which will hold the depositing frame 65 in its upward position, the bars 67, arms 68 and 168 and crank 71 being in the position shown in Fig. 1. But when the cam surface 77 comes around to the roller 76, the spring 78 will cause the roller 76 and bar 73 to move to the dotted-line position shown in Fig. 2, and then the connecting rod 72 and other parts will give the depositing frame 65 a quick downward movement upon the sheet of paper which is being conveyed by its edges by the tapes 41 and 42 below the depositing

frame. Such quick downward movement of the depositing frame, therefore, will dislodge the sheet of paper and deposit it on a table 35 between the guides 80 and 81.

The parts which have been described are so formed and timed in their operation that the depositing movement of the frame 65 will occur when the sheet of paper is in a predetermined position. The bars forming the depositing frame are preferably lined on the underside with rubber 82 to cause some frictional engagement between the depositing frame and the paper being deposited.

In the modified form shown in Figs. 4 and 11, there is shown the end of a paper making machine 100 in which a continuous sheet of paper 58 passes under a roller 101 and thence to a trimmer shaft 102 having rotary knives 104. There is one knife at each lateral edge for trimming the edges and two intermediate knives for dividing the sheet longitudinally into three parallel sheets. The shaft 102 is driven by a sprocket chain 105 operated over a sprocket wheel 102 and at the other end of the shaft 102, a beveled gear 106 meshes with and drives the beveled gear 33 on the shaft 31. In Fig. 4, there are a plurality of sets of tape 41, that is, three sets, so that the device can take a plurality of parallel sheets, which have been longitudinally slit, from the discharging device and deliver the same, and a single depositing frame 65 is shown for depositing all of the parallel sheets simultaneously. Thus with this machine the sheets can be very rapidly delivered and will be moved away from the discharging means faster than the sheets are supplied by the discharging means to the delivering means, and the vertically acting depositing means will prevent ballooning of the sheets while being deposited from the tapes.

I claim as my invention:

A paper delivering means for a paper making machine, printing press or like device including a main frame, a movable means for grasping the lateral edges of sheets of paper as they come from the machine, a paper depositing frame with upwardly extending rigid bars at each side thereof, uprights on said main frame, a shaft mounted in said uprights, an arm secured at each end of said shaft and pivoted to the bars of said depositing frame, similar and parallel arms pivoted to said uprights and also to said bars extending upwardly from said depositing frame, and means for oscillating said shaft.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

GEORGE K. HENDERSON.

Witnesses:
V. H. LOCKWOOD,
G. H. BOINK.