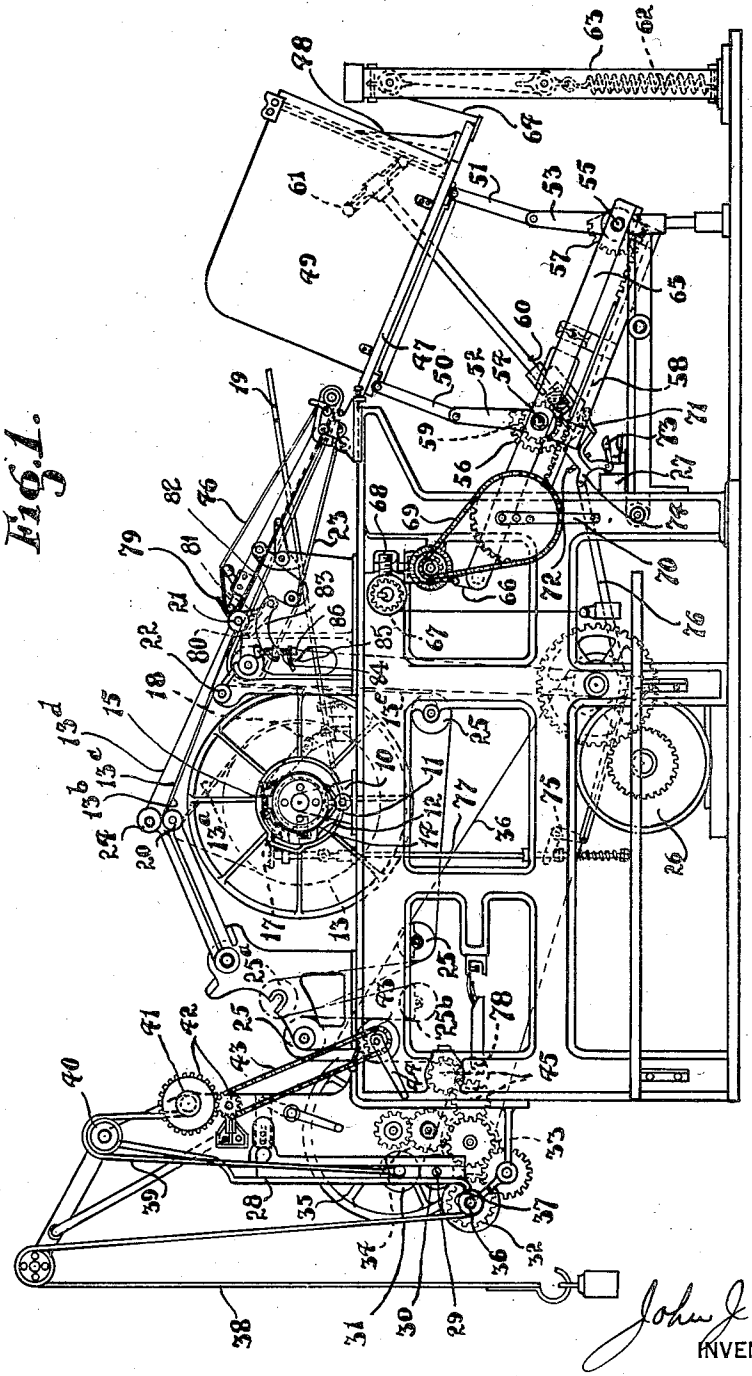
Oct. 6, 1931. J. J. MURRAY 1,825,885

SHEET COLLECTING MACHINE

Filed Jan. 19, 1929 5 Sheets-Sheet 1

Fig. 1.



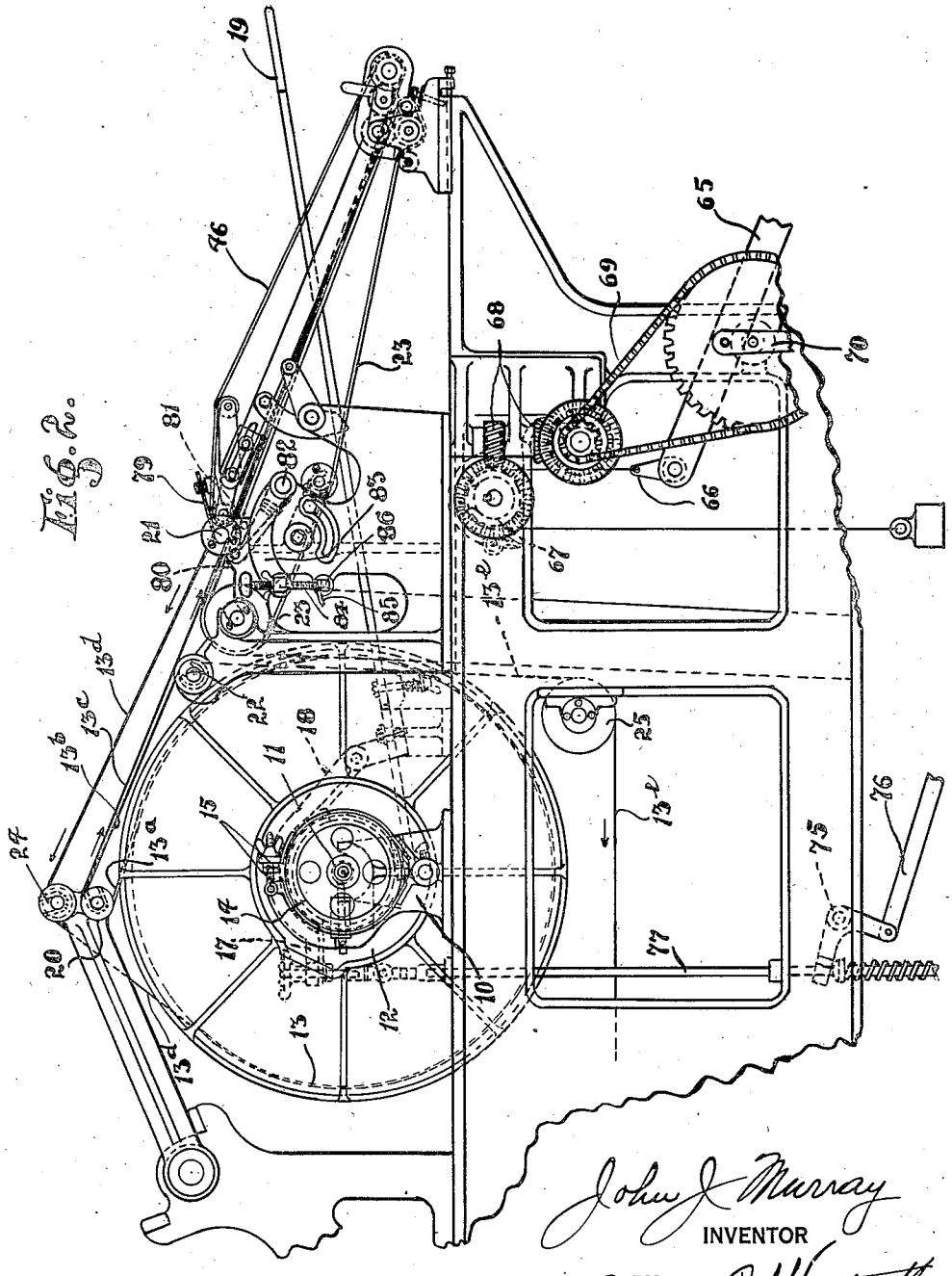
John J. Murray
INVENTOR

BY Frank P. Wentworth
ATTORNEY

Oct. 6, 1931. J. J. MURRAY 1,825,885

SHEET COLLECTING MACHINE

Filed Jan. 19, 1929 5 Sheets-Sheet 2



John J. Murray
INVENTOR

BY Frank P. Wentworth
his ATTORNEY.

Oct. 6, 1931. J. J. MURRAY 1,825,885

SHEET COLLECTING MACHINE

Filed Jan. 19, 1929 5 Sheets-Sheet 3

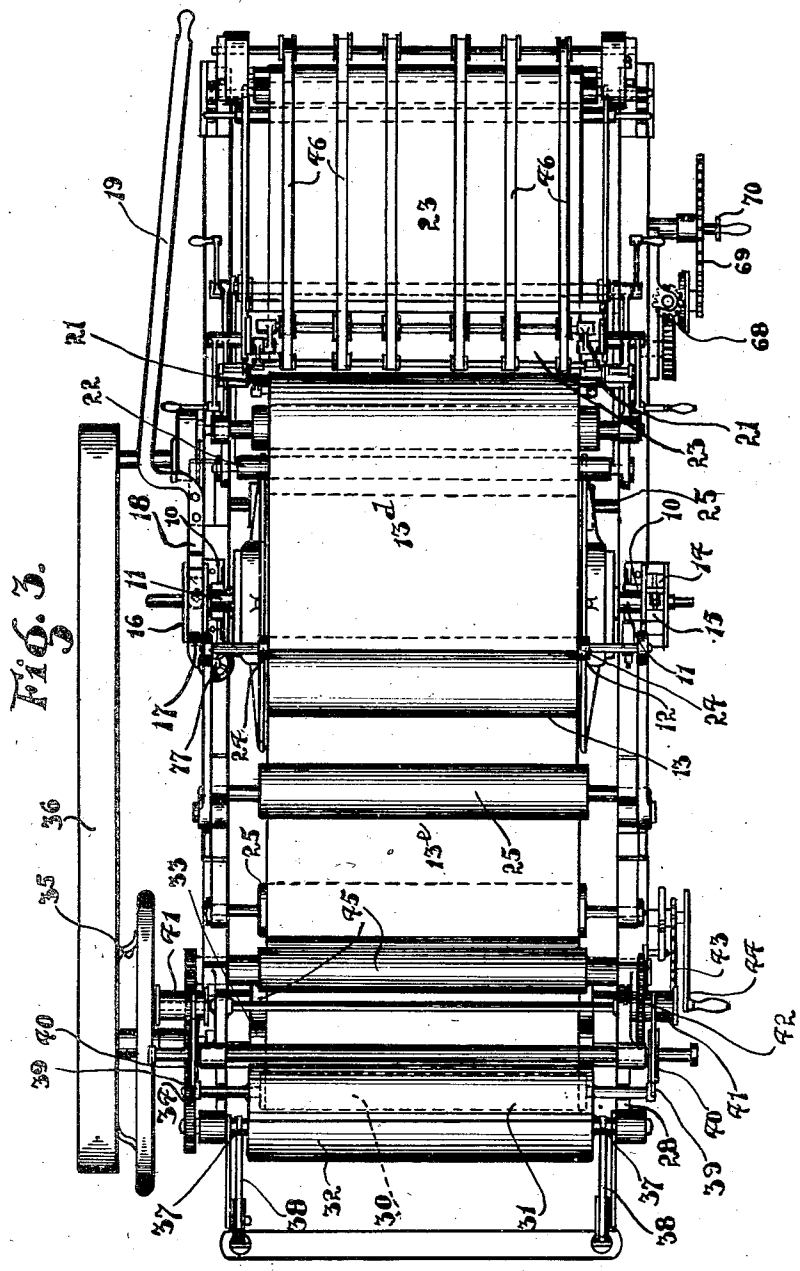


FIG. 3.

John J. Murray
INVENTOR

BY Francis P. Wentworth
his ATTORNEY.

Oct. 6, 1931. J. J. MURRAY 1,825,885

SHEET COLLECTING MACHINE

Filed Jan. 19, 1929 5 Sheets-Sheet 4

Fig. 4.

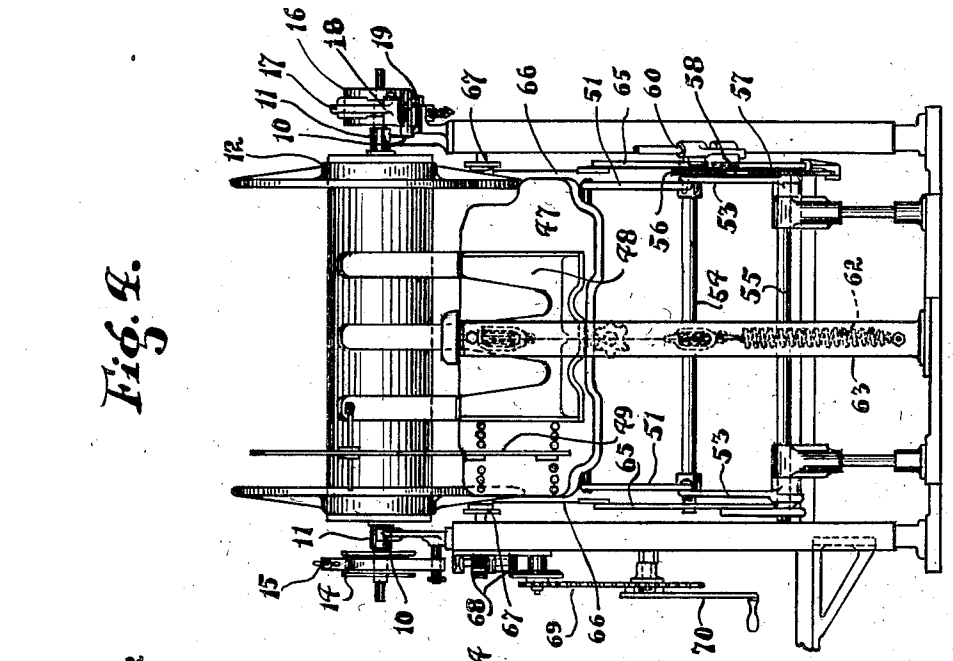
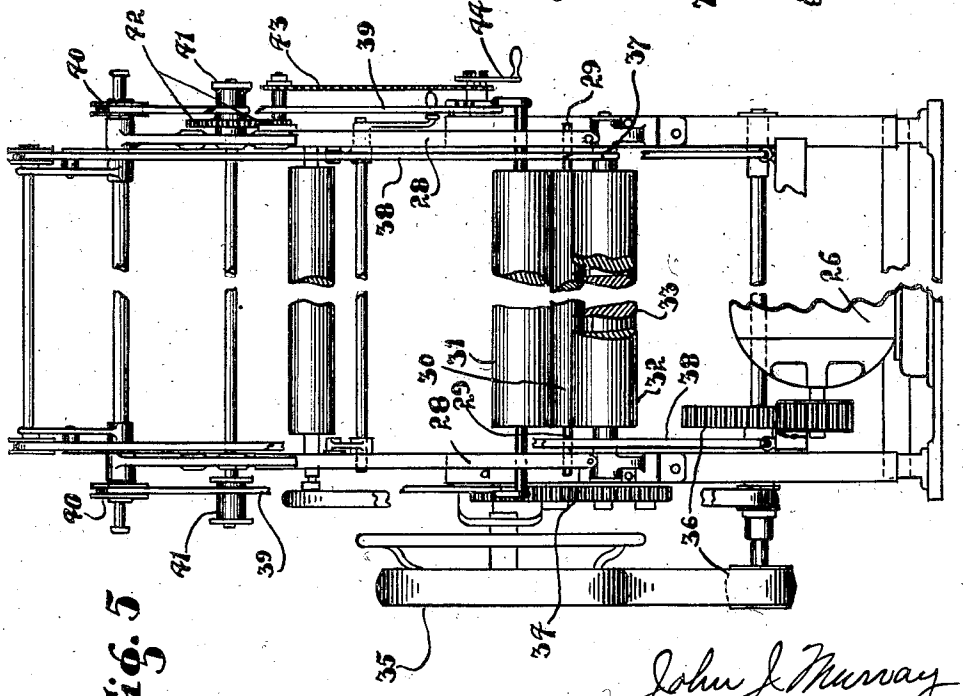


Fig. 5



John J. Murray
INVENTOR

BY Grant P. Wentworth
his ATTORNEY.

Oct. 6, 1931. J. J. MURRAY 1,825,885

SHEET COLLECTING MACHINE

Filed Jan. 19, 1929 5 Sheets-Sheet 5

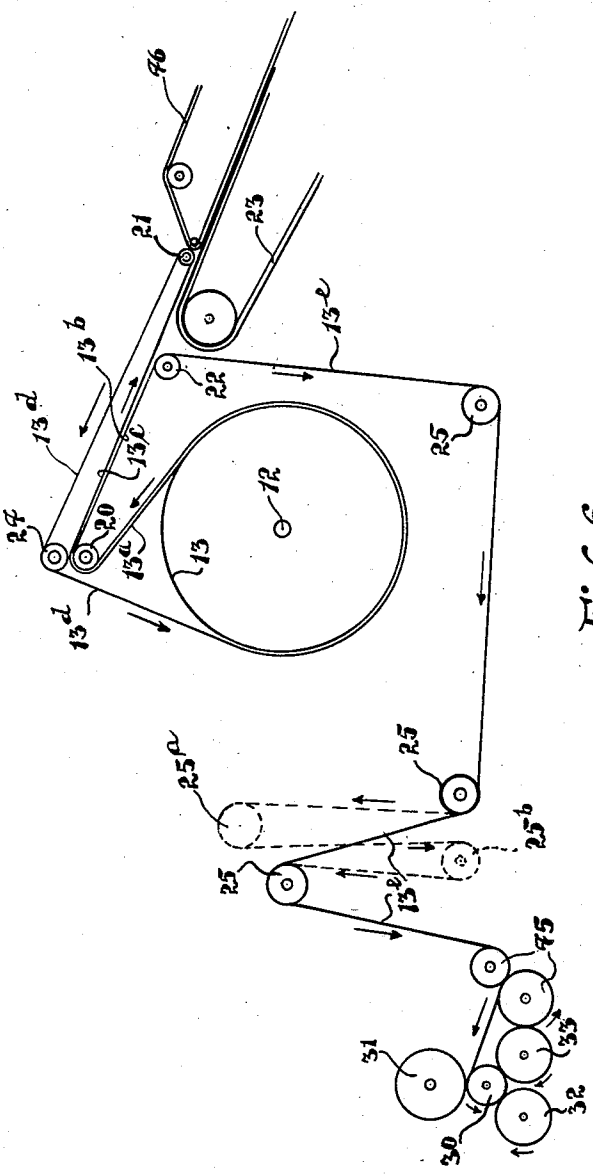


Fig. 6

John J. Murray
INVENTOR

BY Frank J. Wentworth
ATTORNEY.

Patented Oct. 6, 1931 1,825,885

UNITED STATES PATENT OFFICE

JOHN J. MURRAY, OF RYE, NEW YORK, ASSIGNOR TO AMERICAN BANK NOTE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

SHEET COLLECTING MACHINE

Application filed January 19, 1929. Serial No. 333,685.

My invention relates to sheet collecting machines, and more particularly to a machine by which a paraffin paper or other web having printed sheets wound therein may be so actuated as to transfer the printed paper sheets to delivery tapes or other collecting mechanisms.

In printing from engraved steel plates upon rotary machines, a delivery mechanism is sometimes used which includes therein a web of treated paper within which the sheets are wound as they are delivered from the tapes. It is necessary, prior to each successive operation upon said sheets, to remove the sheets from the roll of web and stack them in a pile so that they may be conveniently fed to the printing machines, whether plate or numbering, by the operator of such other machines.

It has been found, in actual practice, particularly when dampened sheets of paper are used, that there is a tendency of the sheets to adhere, either by suction, the action of static electricity, or for some other reason, to the material of the web during the unwinding of the roll incidental to the collection of the sheets therefrom, but that frequently such adherence of the sheets is very weak. With the condition last named, the sheets drop from the exposed surface of the web as it is being unwound, and are not delivered to the collecting shelf. As sheets are delivered from the printing machine, the freshly inked surface of the sheets is presented toward the axis of the roll of web, and adheres to the portion of the roll between the paper and said axis, so that during the unwinding of the roll while the printed sheets are exposed outwardly of the web they will ordinarily adhere to and follow the upper or outer surface of the web during the unwinding operation, but if this adherence be weak, they will drop from such surface before the web reaches a position where gravity can act to prevent such separation.

Due to the constantly changing diameter of the roll as it is unwound, there is a constantly varying pressure or suction condition between the web and the printed sheets, the smaller the diameter of the roll, and the sharper the bend in the web, the greater being the tendency towards a loss of that adhesion relied upon to ensure a proper conveyance of the sheet to the delivery point because of the increased tendency of the forward and rear edges of the paper to move away from the web when relieved of the pressure from an outer ply or convolution of the web. To minimize the tendency of the sheets to thus escape from the web, it was the practice, prior to my invention, to pass the return run of the web below, and in pressure exerting contact with, the unwound portions of the web, thus applying pressure to the sheets and also providing a surface upon which any sheets which might become separated from the web, notwithstanding such pressure, would be caught and carried away from the roll. This condition required constant attention from the operator to avoid occasional sheets being conveyed to the end of the machine opposite the collecting shelf, with the always present possibility of such sheets falling upon the floor or being soiled by unnecessary handling.

In the old type of unwinding machine above referred to, the printed sheets were delivered to the collecting shelf with the printed face thereof downwardly, and by printed surface thereof, I refer to the most recently printed face in the event that the sheets have had imprints made on both sides thereof.

With the above conditions in mind, I have provided a sheet collecting machine in which the web upon the roll is so guided in its course through the machine that during the run of the web from the roll, each sheet will be conveyed between parallel courses of the web, up to the point of its delivery to ordinary delivery tapes, thus avoiding all possibility of the delivery of a sheet to any point excepting these delivery tapes, and ensuring a proper delivery of every sheet without requiring any special attention from the operator.

In a machine embodying the invention, each sheet will be reversed by a change in the course of the web, so that the printed surface, or most recently printed surface thereof, will be presented upwardly. Furthermore, at

the point where each sheet passes from the web to the delivery tapes, the parallel reaches of the web have a sharp upward bend imparted thereto, thus weakening or entirely breaking the light adhesion between the sheet and one, the upper, reach of the web at this point, so that the sheet will separate by gravity from the web, except under very unusual conditions, and will pass to the delivery tapes without rubbing contact with strippers or other fixed parts of the machine.

While the sheets are in contact with the lower parallel reach of the web during only a short run thereof, they will not adhere thereto, and this lower reach will always hold the sheets in a fixed position in relation to the upper reach of the web, to which they adhere. If a sheet should separate from the upper reach, it will nevertheless be conveyed in the same course as all other sheets, and be transferred to the delivery tapes or belt by which it will be conveyed, in the same position as all other sheets, to the collecting shelf by the lower reach of the web.

The tapes themselves will deliver the sheets to the collecting shelf, face upward, where they may be readily inspected by the operator.

The collecting shelf, in order to permit the sheets to properly adjust themselves thereupon, or upon a collected pile of sheets, is set at an angle to the horizontal in a plane substantially parallel with but below the run of the delivery tapes, and in the machine of my invention, means are provided whereby the height of this collecting shelf, and the position of the tailboard thereof, may be mechanically adjusted by the operator so as to substantially preserve the relative position of the top of the pile of sheets thereon, and of the delivery tapes, irrespective of the height of the pile of sheets. While the adjustment of the collecting shelf is manually controlled, the mechanisms operative thereon so operate as to effect the lowering of the shelf, and such an adjustment of the position of the tailboard as to cause the top of the pile of sheets to always occupy substantially the same position in relation to the delivery tape mechanism. The use of joggers with a delivery shelf of the character to which my invention relates is impracticable and unsatisfactory.

In a machine embodying the invention, an operator is required during the operation of the machine adjacent the collecting shelf only, and the sole attention required of the operator is the occasional lowering of the collecting shelf to compensate for the increasing height of the pile of sheets thereon, the changing of the angularity of the shelf, to maintain a substantially uniform distance between the delivery tapes and the tailboard of the collecting shelf, and the inspection of the imprints on the sheets, if desired.

The invention consists primarily in a sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings,

Fig. 1 is a side view of a collecting machine embodying the invention;

Fig. 2 is an enlarged detail view of the end of the machine adjacent the collecting shelf, with the collecting shelf omitted;

Fig. 3 is a plan view of the machine with the collecting shelf omitted;

Fig. 4 is a view from the right hand end of the machine;

Fig. 5 is a similar view from the left hand end of the machine; and

Fig. 6 is a diagrammatic view showing the run of the web.

Like numerals refer to like parts throughout the several views.

A machine embodying the invention is for the purpose of removing printed sheets from within a roll of a continuous web such as is commonly used in what is generally termed the paraffin strip delivery mechanism of a steel plate engraving machine, and to rewind the web upon a reel so that it may be subsequently assembled in the delivery mechanism of the press, the removed sheets being stacked or piled upon a collecting shelf following their removal from the roll.

In such a machine, the mechanisms must be such as to permit the convenient mounting of the supply and the rewind reels in proper relation to the mechanisms acting thereon, or upon the web as it is withdrawn from the roll upon the reel, and the removal of the reels as required, since these reels do not form a permanent part of the machine.

In the embodiment of the invention shown in the accompanying drawings, I provide in the side frames of the machine, suitable bearings 10 adapted to receive the arbors 11 at opposite ends of the reel 12, upon which

a continuous strip or web 13 of properly treated paper is wound so as to inclose printed sheets as delivered by a steel plate printing machine.

One arbor 11 has mounted thereon a suitable friction drum 14 co-operating with which is a suitable braking device 15 for properly tensioning the strip or web at all times. Upon the other arbor 11 of the reel, I provide a brake drum 16, co-operating with which is a mechanically actuated brake shoe 17 for stopping the rotation of the reel substantially simultaneously with the stoppage of the application of power to the machine, to prevent overrunning of the reel following the stoppage of the machine, and a manually operative brake mechanism 18, having a handle 19 for the same purposes. These tensioning and stopping devices, however, are merely such as are commonly used with various machines for ensuring substantial uniformity in the speed of rotation of a roll of a continuous strip or web of paper or the like, and for positively stopping this rotation by a braking action.

My invention relates more particularly to the arrangement of various rollers by which the web, as it is withdrawn from the roll upon the supply reel, is so directed in its course that when the machine is in operation, different portions of this web will be brought together or "collated" so as to pass in contacting parallel relation with each other from the roll, with the printed sheets positioned between these parallel reaches, to a point adjacent a travelling collecting belt and its associated mechanisms, said parallel reaches being separated adjacent said belt, and thereafter so directed that one of them will be collated with succeeding portions of the web, as described, and the other one will be directed to the rewind reel. The arrangement above described, with a single continuous strip or web, will secure the effect of parallel webs with the progressive unwinding of the roll, so that under no circumstances can a printed sheet, wound within the convolutions of the roll, escape from the web at any point excepting upon its delivery to the delivery belt. The construction and arrangement of these rollers is also such as to secure a turning action of the inclosed sheets in a manner to be hereinafter described.

Referring more particularly to the accompanying drawings, I provide a guide roller 20 adjacent the bearings 10, guide rollers 21 and 22 adjacent a delivery belt 23, a guide roller 24 adjacent the roller 20, and a plurality of guide rollers 25 positioned between the guide roller 22 and the rewind mechanism, to be more fully described hereinafter.

For convenience of expression, the roller 20 will be called the collating roller, since the function of this roller is to bring different portions of the same web into parallel relation with each other as the web is drawn from the roll. The rollers 21 and 22 will be called the separating rollers, since one function of these rollers is to separate the parallel reaches of the web. The roller 24 will be called the upper collating roller.

To clarify the description of the operation of the machine, I shall designate the reach of the web passing from a convolution of the roll to the collating roller 20, as 13*a*; the reaches of the web between the collating roll 20 and rollers 21 and 22 respectively, as 13*b* and 13*c*; the reach passing from the separating roller 21 and about the upper collating roller 24, as 13*d*, and the reach passing from the separating roller 22 to the rewind mechanism, as 13*e*, it being understood that during the operation of the machine and the continuous run of a web therethrough, the conditions illustrated in Fig. 6 will be present at all times.

The power for unwinding the roll of web is applied through the rewind mechanism, from a motor 26, the circuit of which is controlled by a switch 27. Mounted in the frame of the machine, at the end opposite that at which the collecting belt 23 is located, is a vertical elongated bearing 28, in which the arbors 29 of a rewind reel 30 are adapted to be slidably and rotatably mounted, the end plates, drums, etc., being removed from the shaft of the reel. Also slidably mounted in said bearings 28 is a weighted roller 31 to assist in the friction drive of the rewind reel by means of friction rollers 32 and 33 adjacent the bottom of the bearing slot 28. The rollers 32 and 33 are driven by a gear train 34, from a pulley 35 connected by a pulley belt and gear train 36 with the motor 26.

One of the friction rollers as 32 is provided with a brake drum 37, acted upon by a weighted brake band 38. The arbors of the weighted roller 31 are mounted in bearings carried by lifting chains or cables 39 passing about a roller 40, above the top of the bearing 28, and connecting with a winch 41 actuated by a gear train 42, the driven gear of which is actuated by a chain and sprocket mechanism 43 having a hand crank 44.

Adjacent the friction roller 33 is a pair of pinch rollers 45 to ensure a positive uniform feed of the web prior to its passage about the rewind reel.

Adjacent the belt 23, and having one reach extending parallel and in close contact therewith, is a delivery tape system 46. While the belt 23 extends adjacent to the separating roller 22, the tapes 46 extend only to adjacent the separating roller 21. The tapes are provided with the usual takeup means, which are old and well known in the delivery mechanism art and will not, therefore, be described in detail.

The discharge end of the belt 23, and the

tapes 46 is adjacent the collecting shelf, which will now be described.

The feed shelf consists of a vertically adjustable board 47, having an adjustable tail board 48 and one adjustable side gauge plate 49.

To permit the vertical adjustment of this board with the accumulation of the stack or pile of sheets thereon, I support it by means of links 50 and 51 pivoted thereto at one end, and having the other end pivoted to cranks 52 and 53 carried by shafts 54 and 55. Each shaft 54 and 55 also carries a segmental gear 56 or 57, each of which is in mesh with a sliding rack 58. One of the shafts, as 54, carries a worm wheel 59 in mesh with which is a worm shaft 60 having an operating handle 61 adjacent the feed shelf and the operator. This arrangement ensures a parallel movement of the links and the cranks with which they are connected at all times.

While this construction will result in a tendency of the shelf to descend by gravity, and to have a movement away from the delivery end of the belt 23 and tapes 46, this is prevented by means of suitable means having a counterweighting effect, acting upon the board adjacent the tail plate thereof. In the form of the invention shown, this consists of one or more springs 62, each carried in a housing 63 and connected with the collecting board in any desired manner, as the cables 64. The link and crank mechanism, and the mechanism last described, is preferably duplicated upon each side of the collecting shelf.

The shaft 54 and the sliding rack 58 are mounted on a frame 65, pivotally mounted upon the shaft 55. The free end of said frame is supported by means of the flexible connection 66 passing about a winch 67, which winch may be rotated by means of a suitable worm wheel and gear mechanism 68, operated by a chain and sprocket mechanism 69, the driving sprocket of which is actuated by means of a hand crank 70.

By paying out the flexible connection 66, the frame 65 may be lowered at the end thereof adjacent the delivery belt 23 and tapes 46, thus not only changing the angularity to the horizontal of the collecting shelf board 47, but the angularity to the vertical of the tail board 48.

With the construction above described, the weight of, and upon, the collecting shelf will be sustained by the counteracting springs 62, which, by their action, will prevent that movement of the links 50 and 51 necessary to permit the descent of the board, and at the same time will permit that pivotal movement of the board 47 resulting from the lowering of the frame 65 and the horizontal component of movement incidental thereto.

Adjacent the switch 27 is a pedal 71 carrying an adjustable impact member 72 engageable with a spring pressed switch actuating lever 73. This pedal 71 has an arm 74. Pivotally connected with this arm, and with one arm of a bell crank lever 75, is a link 76. The other arm of this lever 75 acts upon a spring rod 77, the upper end of which is detachably connected with the brake shoe 17 so that the actuation of said foot pedal will develop a braking action upon the drum 16, and immediately following this braking action, will actuate the circuit controlling switch 27 through which power is applied to the motor 26.

One of the guide rollers 25 is mounted in a downwardly opening bearing so that its weight may be utilized as a take-up for keeping the reach 13*e* taut. If desired, additional guide rollers 25*a* and 25*b* may be used, one of which, as 25*b*, may be mounted in a downwardly opening bearing so as to supplement the action of the adjacent guide roller 25 in keeping the web taut.

The strip or web 13 is subject to irregular lateral stretch with repeated use, and in order to secure at least one straight edge and maintain a proper width of the web, I associate with the pinch rollers 45, a rotary slitter wheel 78 for trimming one edge of the web. If desired, such wheels may be used to trim both edges of the web.

To avoid any possibility of the printed sheets passing about the separating roller 21, I provide, closely adjacent this roller and the adjacent delivery tape mechanism 46, a stripper plate 79. This stripper plate, however, is provided merely to meet a possible emergency.

The operation of the herein described machine is substantially as follows:—

The reel 12, as it is removed from the steel plate engraving machine, has the ends and the drums 14 and 16 already applied thereto and a full length of the web 13 wound thereon with the printed sheets between the convolutions of the web upon the reel.

Before mounting the reel upon the collecting machine, the various braking devices, 15, 17 and 18 are moved from the bearings 10 to provide a clear field for mounting the reel in such bearings, and are set upon their respective drums when the reel is in the proper position.

The end of the web 13 is then drawn from the roll, passed about the collating roller 20, about the separating roller 21, about the upper collating roller 24 and about the roll of web. It is then threaded about the collating roller 20 beneath the portion of the web previously passed about this roller, and about the other separating roller 22, the various guide rollers 25, between the pinch rollers 45 and about the rewind reel 30 which has previously been mounted in the slotted bearing 28. The weighted roller 31 is then lowered so as

to rest upon the portion of the web wound upon the rewind reel.

When the web has thus been threaded through the machine, it will be noted that the reach 13*d* completely incloses the lower portion of the roll of web upon the reel 12, and passes with the reach 13*a* in parallel relation thereto from the reel, which parallel relation is continued in the reaches 13*b* and 13*c* until the reach 13*c* passes about the separating roller 22. As heretofore explained, the printed sheets will almost invariably adhere to the outwardly presented surface of the reach 13*a* and the downwardly presented surface of the reach 13*b*, notwithstanding that the parallel reaches receive a fairly sharp turn when passing about the collating roller 20. The most that this short turn appears to effect is a very substantial weakening of the adherence of the sheets to the web, so that during the run of the parallel reaches 13*b* and 13*c*, the sheet is so lightly adherent that when said reach passes about the separating roller 21, the forward edge of a sheet, and every succeeding portion thereof, will fall from the web upon the collecting belt 23.

The most recently printed surface of each sheet, as it passes with the reach 13*a* to the collating roller 20, is presented downwardly, but as it passes about this roller to the reach 13*b*, this surface will be presented upwardly. As the sheet leaves the web, as a consequence, the freshly printed surface thereof will be presented upwardly, in which position it will be, when delivered to the collecting shelf.

Experience has demonstrated that there is no tendency whatever for these sheets to adhere to the reach 13*c*, and no tendency for them to pass downwardly through the gap between the separating roller 22, and the roller for the collecting belt 23. The latter condition may be due to the moving inertia of the sheet, or to an effective adhesion thereof with the web in the reach 13*b*. If a sheet should separate from the reach 13*b*, it merely falls upon the reach 13*c* and is conveyed thereby to the delivery belt.

As the sheets pass upon the belt 23, they are engaged by the delivery tapes 46 and conveyed by the belt and tapes to adjacent the collecting shelf, upon the board 47 of which they will be collected in a pile, the sheets receiving sufficient momentum to cause the forward edges thereof to engage the tailboard 48

The pinch rollers 45 ensure the travel of the web 13 at a uniform speed at all times, notwithstanding the progressively decreasing diameter of the roll upon the reel 12, and the correspondingly increasing diameter of the web being wound upon the rewind reel 30.

The rewind friction rollers 32 and 33 wind the web paid out by the pinch rollers 45, upon the rewind reel 30 at a substantially constant rate, notwithstanding the gradually increasing diameter of the roll of web upon said rewind reel. The weighted roller 31 causes a fairly tight winding of the web upon the rewind reel, and also ensures the desired frictional engagement between the roll of web and the friction rollers 32 and 33. It is obvious that the reel 30 will rise in the slotted bearing 28 as the diameter of the roll increases.

The mechanism including the winches 41 is used to raise the weighted roller 31 to provide clearance for the removal of the completely wound rewind reel, and for lowering the roller following the mounting of a new rewind reel in the bearings 28.

The slitter 78 is merely a device for trimming an edge or edges of the web to compensate for possible increased width from expansion, due to the repeated use of a web. This is to permit the web to be more readily guided through the printing machine.

The stripper 79, acting in relation to the web as it passes about the separating roller 21, is merely to guard against any possibility of a printed sheet being carried about this roller. This stripper is used because of a rather remote possibility that some portion of the printed sheet between the front and the rear edges thereof may have too strong an adherence to the web. The short bend of the web about the rollers 20 and 21 ordinarily can be relied upon to separate the forward edge of the sheet from the web.

The operation of the brake and retard devices is obvious from the foregoing description.

The board of the collecting shelf, prior to the application of power to the machine, is raised to the desired height to accommodate a pile or stack of sheets of a height which will cause each sheet, as it is delivered by the belt 23, to engage the tailboard 48 and the side gauge plate 49. This movement is effected by means of the links 50 and 51 and cranks 52 and 53 upon the shafts 54 and 55, said shaft 54 being turned by means of the worm wheel 59 and worm shaft 60, and said shaft 55 being turned by the gear 57 enmeshed with the rack 58 which in turn is actuated by the gear 56 upon the shaft 54. Both shafts 54—55 receive similar simultaneous movement.

To secure the proper angularity of said board 47, and of the tailboard 48, the winch 67 may be actuated to raise or lower the free end of the frame 65. The springs 62, or their equivalent, will restrain any tendency of the links 50 and 51 to turn upon their pivots in a manner to allow the collecting shelf to drop beyond the point determined by the movement of the cranks 52 and 53 except as hereinafter noted.

With the accumulation of weight in the constantly increasing pile of sheets upon the collecting board, the springs 62, or their

equivalent, will yield so that the links 50 and 51 may turn, thus allowing the board to descend, which lowering of the board will be accompanied by a movement away from the delivery tapes and belt. With this condition, by turning the worm shaft 60, the cranks 52 and 53 may be moved toward said tapes and belt to restore the position of the tailboard with relation thereto. This operation is repeated from time to time until a sufficiently high stack of sheets has accumulated upon the shelf.

When the stack of sheets is fairly high, the winch 67 may be actuated to lower the free end of the frame 65 so as to advance the top of the tailboard towards the tapes and belt.

When it is desired to remove the collected stack of sheets, the winch 67 is actuated to bring the collecting shelf upon a horizontal plane, the side gauge plate 49 is removed from said board 47, and a board, known as a wetting board which is removably mounted upon the shelf 47, is slid laterally from the shelf with the sheets thereon.

When the load is removed from the shelf, the spring 62 or other equivalent device will immediately raise the collecting shelf to an extent permitted by the links 50 and 51. Preparatory to a succeeding run of the machine, this shelf must be raised to the desired elevation by means of the cranks 52 and 53 and the actuating means therefor.

By the arrangement of collating, separating and guide rollers described, the delivery of every printed sheet at the same point is assured, and not only that, but the sheets are reversed in their travel so as to be delivered face upward upon the collecting shelf. By using rollers 20 and 21 of small diameter, the web 13 receives a sharp turn when passing about such rollers, thus ensuring greater reliability in the breaking down of the adherence between the sheet and the web immediately prior to the delivery of the sheet to the belt 23. It will be noted that there is no rubbing contact of the sheet with the web or other mechanisms in the machine, so that in the event of the ink not being thoroughly oxidized or dried, there will be no smutting of the imprint.

By using tensioning rollers 80 and 81 upon opposite sides of the vertical diameter of the separating roller 22 to press the belt 23 against the web passing about this roller, and by regulating the pressure exerted by said rollers 80 and 81 through the shaft 82 having the crank arm 83 carrying the adjusting screw 84, likelihood of sheets passing about the roller 22 is still further minimized. The screw 84 bears upon the cam plate 85 and is mounted in a swiveling block 86 facilitating the quick disengagement of the rollers 80 and 81 to facilitate the threading of the web through the machine. The operation of the tensioning devices upon the belt 23 and the tapes 46 will be readily understood from the drawings and requires no description either as to arrangement or mode of operation.

It is not my intention to limit the invention to the precise details shown in the drawings, it being apparent that such may be varied without departing from the spirit and scope of the invention.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

2. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller above and adjacent said supply reel, separating rollers arranged in different horizontally spaced planes, the upper roller being above said belt, and the lower one being adjacent the end of said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, and the sheet is conveyed by the upper of said reaches and delivered to said belt, an upper collating roller above said first named collating roller, whereby the upper of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the lower of said separating rollers and said rewind mechanism.

3. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, web guiding means, including a collating roller

above and adjacent said supply reel, separating rollers arranged in different horizontally spaced planes, the upper roller being above said belt, and the lower one being adjacent the end of said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, and the sheet is conveyed by the upper of said reaches and delivered to said belt, an upper collating roller above said first named collating roller, whereby the upper of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the lower of said separating rollers and said rewind mechanism, and a stripper co-operating with the upper of said separating rollers.

4. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism, and a pair of pinch rollers between said last named rollers and said rewind mechanism.

5. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a vertically elongated bearing for a rewind reel, a rewind reel slidably and rotatably mounted in said bearing, two friction rollers adjacent the bottom of said bearing, means simultaneously rotating said rollers in the same direction, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

6. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a vertically elongated bearing for a rewind reel, a rewind reel slidably and rotatably mounted in said bearing, two friction rollers adjacent the bottom of said bearing, means simultaneously rotating said rollers in the same direction, a weighted roller rotatably and slidably mounted in said bearing in engaging relation with the web being wound upon said rewind reel, mechanical means for raising and lowering said weighted roller, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

7. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a vertically elongated bearing for a rewind reel, a rewind reel slidably and rotatably mounted in said bearing, two friction rollers adjacent the bottom of said bearing, means simultaneously rotating said rollers in the same direction, web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism, and a pair of pinch rollers between said last named rollers and said friction rollers.

8. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a vertically elongated bearing for a rewind reel, a rewind reel slidably and rotatably mounted in said bearing, two friction rollers adjacent the bottom of said bearing, means simultaneously rotating said rollers in the same direction, a weighted roller rotatably and slidably mounted in said bearing in

engaging relation with the web being wound upon said rewind reel, mechanical means for raising and lowering said weighted roller, web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism, and a pair of pinch rollers between said last named rollers and said friction rollers.

9. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism bearings for a rewind reel adjacent said mechanism, web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism, a pair of pinch rollers between said last named rollers and said rewind mechanism, and a rotary slitter wheel associated with said pinch rollers for trimming an edge of a web being fed by said rollers.

10. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, collapsible supporting means for said shelf, means for actuating said collapsible supporting means for raising and lowering said shelf with a parallel movement, counterbalancing means acting upon said shelf, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

11. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, collapsible supporting means for said shelf, means for actuating said collapsible supporting means for raising and lowering said shelf with a parallel movement, counterbalancing means acting upon said shelf, means whereby one end of said shelf may be vertically adjusted independently of the other end thereof to control the angularity of the shelf, or bring it to a horizontal position, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

12. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a plurality of rotatable crank shafts each having a crank thereon, links pivotally connected with said cranks and with said shelf respectively, means for imparting similar simultaneous movement to said shafts for positioning said shelf in relation to said belt, counterbalancing means acting upon said shelf, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

13. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a plurality of rotatable crank shafts

each having a crank thereon, links pivotally connected with said cranks and with said shelf respectively, gear wheels upon said shafts respectively, a sliding rack enmeshed with said gear wheels, means for rotating one of said shafts for positioning said shelf in relation to said belt, counterbalancing means acting upon said shelf, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

14. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a plurality of rotatable crank shafts each having a crank thereon, links pivotally connected with said cranks and with said shelf respectively, gear wheels upon said shafts respectively, a sliding rack enmeshed with said gear wheels, means for rotating one of said shafts for positioning said shelf in relation to said belt, an oscillatory frame pivoted concentric with one of said shafts and carrying the other of said shafts, a mechanically actuated winch, and flexible connections between said winch and said frame, whereby one end of said shelf may be vertically adjusted independently of the other end to control the angularity of the shelf, or bring it to a horizontal plane, counterbalancing means acting upon said shelf, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, and web guiding means, including a collating roller adjacent said supply reel about which different portions of the web in contacting parallel reaches are passed, separating rollers adjacent said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, an upper collating roller whereby one of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the other of said separating rollers and said rewind mechanism.

15. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, web guiding means, including a collating roller above and adjacent said supply reel, separating rollers arranged in different horizontally spaced planes, the upper roller being above said belt, and the lower one being adjacent the end of said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, and the sheet is conveyed by the upper of said reaches and delivered to said belt, an upper collating roller above said first named collating roller, whereby the upper of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the lower of said separating rollers and said rewind mechanism, tensioning rollers engaging said belt upon opposite sides of the vertical diameter of the upper separating roller, and means for regulating the pressure exerted by said tensioning rollers upon said belt and therethrough upon said separating roller.

16. A sheet collecting machine embodying therein bearings for a supply reel having wound thereon a continuous web inclosing printed sheets, a delivery belt, a collecting shelf adapted to receive such sheets from said belt, a rewind mechanism, bearings for a rewind reel adjacent said mechanism, web guiding means, including a collating roller above and adjacent said supply reel, separating rollers arranged in different horizontally spaced planes, the upper roller being above said belt, and the lower one being adjacent the end of said belt, whereby the portions of the web in said parallel reaches respectively are led in opposite directions, and the sheet is conveyed by the upper of said reaches and delivered to said belt, an upper collating roller above said first named collating roller, whereby the upper of the parallel reaches, after passing about one of said separating rollers, is directed into contact relation with the roll of web upon said supply reel, and rollers between the lower of said separating rollers and said rewind mechanism, tensioning rollers engaging said belt upon opposite sides of the vertical diameter of the upper separating roller, a revoluble shaft, means carried by said shaft operative upon said tensioning rollers respectively, a crank arm carried by said shaft, a cam plate, a swiveling block carried by said crank arm, and an adjusting screw mounted in said block co-operating with said cam plate, whereby the tensioning pressure developed by said tensioning rollers may be adjusted.

In witness whereof I have hereunto affixed my signature this 11th day of January, 1929.

JOHN J. MURRAY.