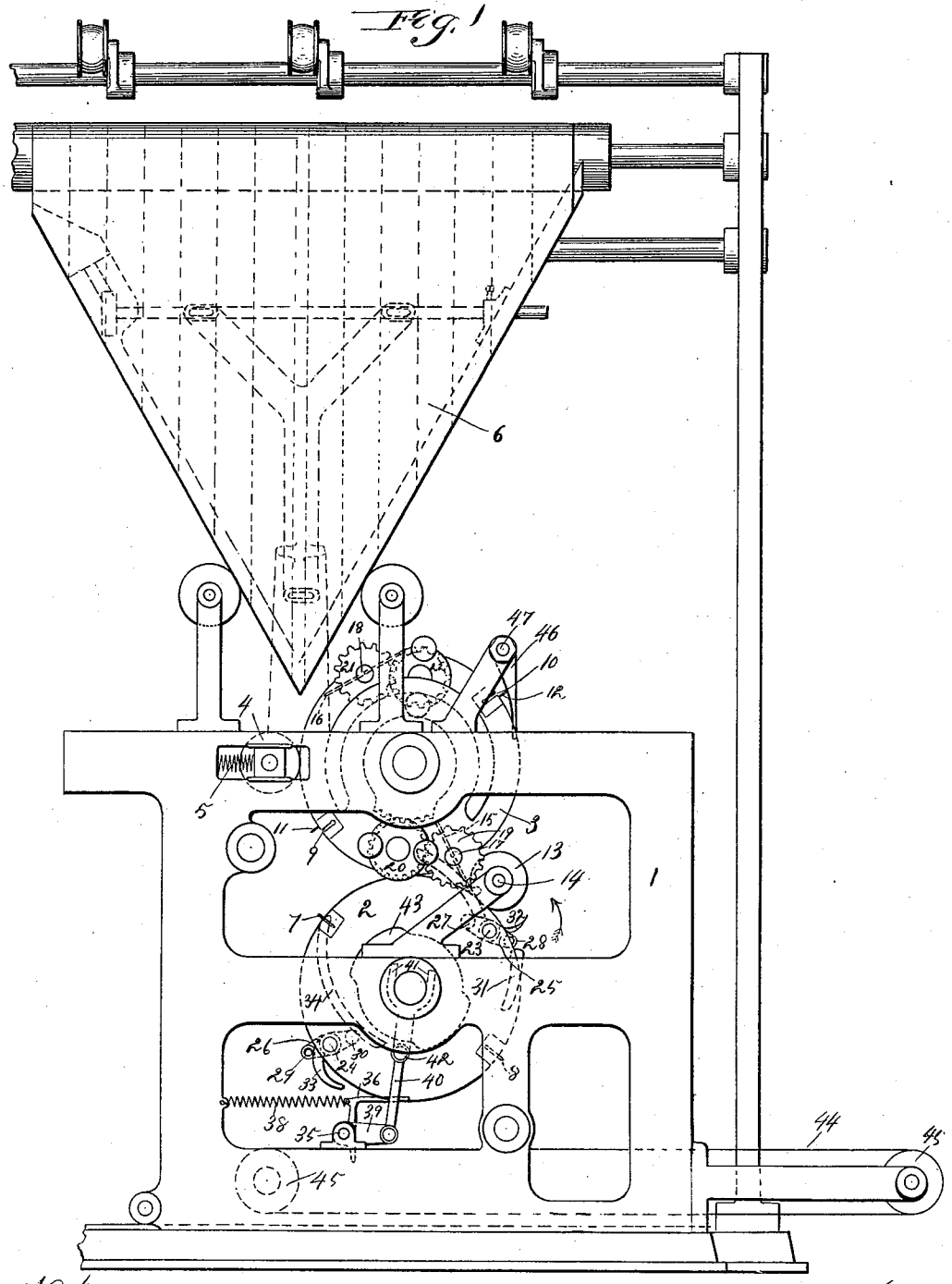
(No Model.) 3 Sheets—Sheet 1.

S. G. GOSS.

DELIVERY DEVICE FOR PRINTING PRESSES.

No. 588,728. Patented Aug. 24, 1897.

Fig. 1



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Fig. 5

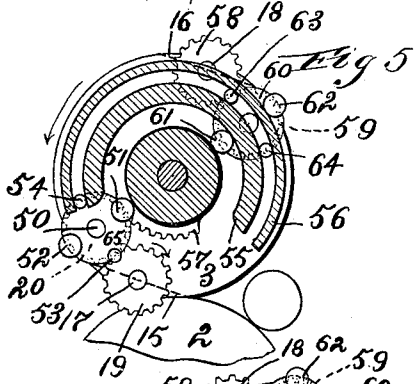


Fig. 6

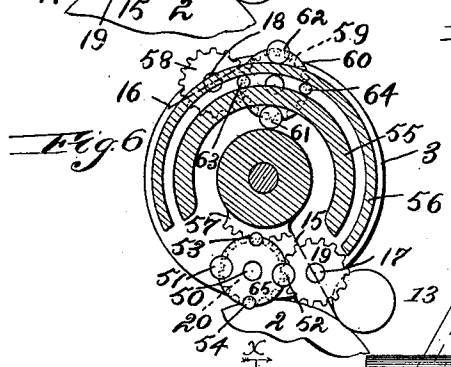


Fig. 7

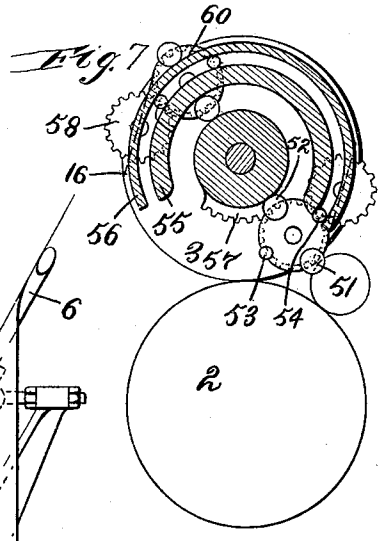
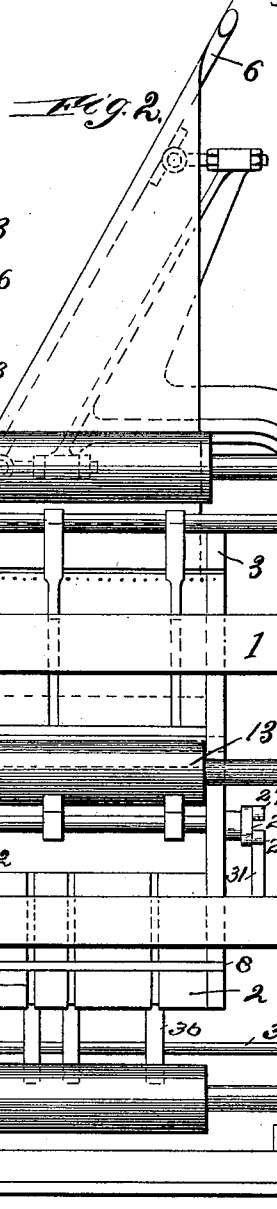


Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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DELIVERY DEVICE FOR PRINTING PRESSES.

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Fig. 3.

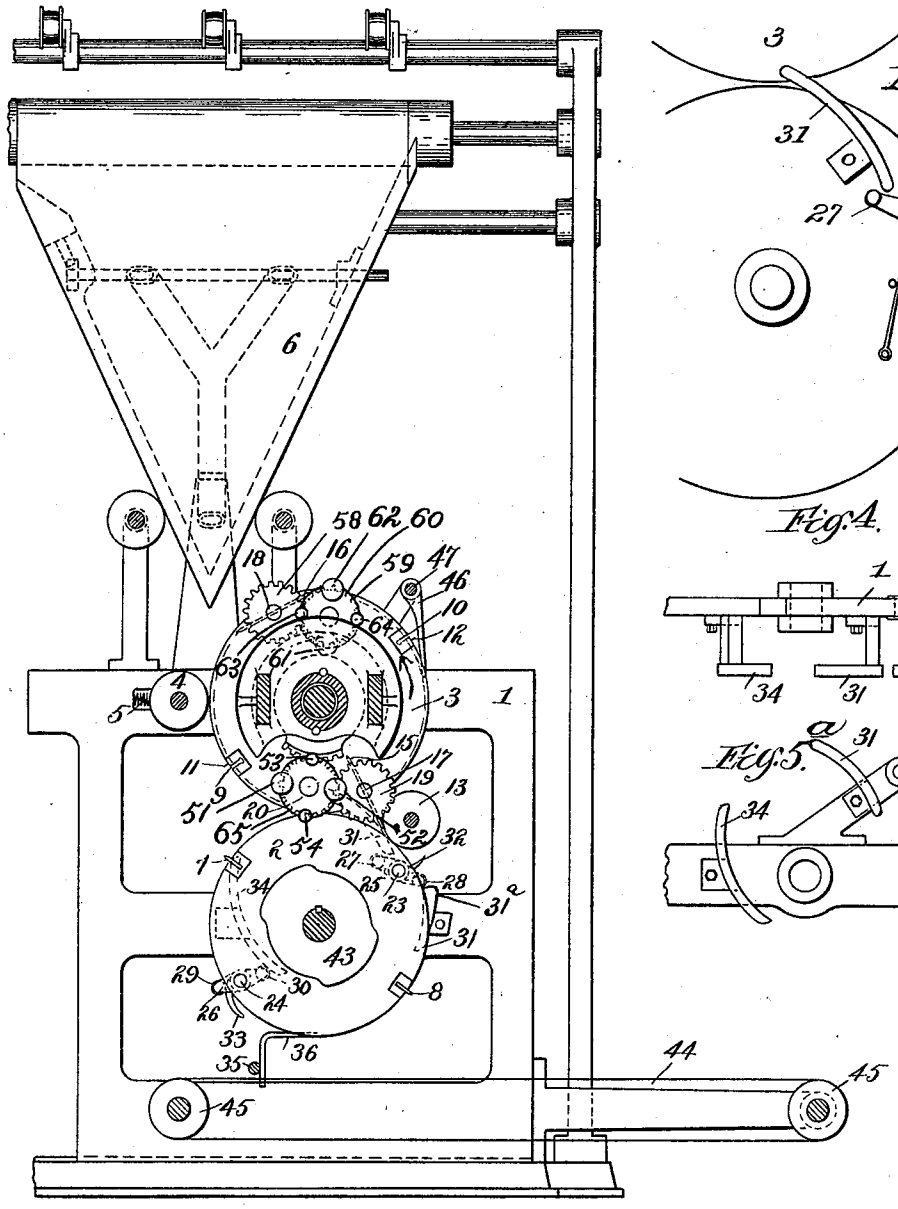


Fig. 4a.

Fig. 4.

Fig. 5.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL G. GOSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF SAME PLACE.

DELIVERY DEVICE FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 588,728, dated August 24, 1897.

Application filed August 30, 1892. Serial No. 444,553. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL G. GOSS, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Delivery Apparatus for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a vertical sectional view taken on a plane directly in front of the disks 60 and 65, Fig. 2. Figs. 4, 4^a, and 5^a are detail views of the cams hereinafter explained. Figs. 5, 6, and 7 are detail sectional views taken on the line *x x*, Fig. 2, and showing the devices for operating the folding-blades in different positions.

My invention relates to delivery apparatus for web-perfecting presses; and the object of my invention is to provide a new and improved delivery apparatus by means of which the web will be folded transversely and severed into sheets, after which it will be delivered. This object I accomplish as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be pointed out in the claims.

In the drawings, 1 indicates a supporting-frame of any suitable construction.

2 3 indicate coacting folding and cutting cylinders mounted in the frame of the press.

4 indicates a pressing-roller the axis of which is in the same horizontal plane as that of the cylinder 3 and is so placed that the surface of the roller 4 and cylinder 3 will lie in close proximity to each other, as shown in Fig. 1. Springs 5, which bear against the journal-boxes of the axle of the roller 4, serve to hold the roller 4 in contact with the cylinder 3, as shown.

6 indicates a former or folder of the usual V-shaped type, the apex of which terminates over the meeting-point of the roller 4 and cylinder 3, as shown in Fig. 1. The web is adapted to be folded longitudinally by the former 6 and to pass between the cylinder 3 and roller 4, as will be hereinafter described.

7 8 indicate cutting-blades mounted in opposite portions of the periphery of the cylinder 2 and extending longitudinally of said cylinder. The blades 7 and 8 are adapted to fit in the recesses 9 10 in the cylinder 3 as the cylinders 2 and 3 rotate.

11 12 indicate impaling-pins which project from the cylinder 3 near the recesses 9 10, as shown in Fig. 1. The pins 11 and 12 impale the web as it passes between the cylinder 3 and roller 4 and carry the forward edge of the web around the cylinder 3 and between the cylinders 2 and 3.

13 indicates a folding-roller mounted in suitable bearings 14, which roller extends longitudinally of the cylinder 2 and lies in close proximity to said cylinder and near the lower portion of the cylinder 3.

15 16 indicate folding-blades mounted upon axes 17 18, respectively, which folding-blades are adapted to engage the web carried by the cylinder 3 centrally between the recesses 9 and 10 and to force such web into the bite of the cylinder 2 and roller 13, thereby causing the web to be gripped and folded transversely by said roller and cylinder.

19 indicates a gear-wheel mounted upon the outer end of the shaft 17, as best shown in Figs. 5 and 6. The wheel 19 intermeshes with a similar wheel 20, mounted upon a stud 50, carried by the cylinder 3, as shown in Figs. 5, 6, and 7.

51 52 indicate antifriction-rollers laterally mounted at diametrically opposite points on a disk 65, carried by the wheel 20.

53 54 indicate guide-rollers mounted upon the disk 65 ninety degrees from the rollers 51 and 52. The guide-rollers 53 54 are adapted to move between circular guides 55 and 56, mounted in the frame 1 opposite the cylinder 3. The arrangement of the guides 55 and 56 is fully shown in Figs. 5, 6, and 7, where it will be seen that the guides 55 and 56 do not form complete circles, but are broken away opposite the lower portion of the cylinder 3. The guides 55 and 56 are so placed that one of the rollers 51 or 52 will run on the outer surface of the guide 56, while the opposite roller will run upon the inner surface of the guide 55, the relative position of the rollers and guides being shown in Figs. 5 and 6 in connection with the disk 59 with its rollers 61 and 62. The inner guide-roller will also rest upon the outer surface of a mutilated gear 57, which is mounted in the frame

of the press in line with the shaft which supports the cylinder 3. The upper portion of the mutilated gear 57 is smooth, leaving an under segment of about fifty degrees, which is toothed.

When the cylinder 3 rotates in the direction indicated by the arrow in Fig. 3 and the wheel 20 arrives at the position shown, its teeth will intermesh with the cogs on the gear 57, thereby causing the wheel 20 to revolve as the cylinder rotates. The rollers 51 and 52, 53 and 54 will about this time be free from the guides 55 and 56, thereby permitting such rotation. At this time the blade 15 will be in the position shown in Fig. 5. As the cylinder continues to rotate the wheel 20 will be rotated by its intermeshing with the gear 57, and the wheel 19 will thereby be caused to rotate in the direction indicated by the arrow in Fig. 5, throwing the lower edge of the blade 15 downward to the position shown in Fig. 6. The adjustment is such that when the parts arrive at the position shown in Fig. 6 the blade 15 will fit between the cylinder 2 and roller 13 in such manner as to force a sheet carried by the cylinder 3 into the bite of the cylinder 2 and roller 13. By the continued rotation of the cylinder 3 the blade 15 will be withdrawn, its lower edge being turned upward, and when the cylinder arrives at the position shown in Fig. 7 the blade will again lie wholly within the surface of the cylinder 3. The guide-roller 54 will now enter into the space between the guides 55 and 56 and the roller 52 will rest upon the smooth portion of the gear 57.

58, 59, 60, 61, 62, 63, and 64 indicate parts of the mechanism for operating the second folding-blade, corresponding to the parts 19, 20, 65, 51, 52, 53, and 54. The operation of the second folding-blade is similar to that of the first.

I do not wish to be limited to the use of the construction shown, as any other mechanism for operating the folding-blades which would be adapted to force the web into the bite of the roller 13 and cylinder 2 could be used.

23 24 indicate shafts which are mounted in suitable bearings in the cylinder 2 and carry upon one end, preferably upon their inner ends, cross-heads 25 and 26, respectively. The cross-head 25 carries two rollers 27 28, which project laterally therefrom, as shown in Fig. 3, and the cross-head 26 carries two rollers 29 30, which are similar to the rollers 27 and 28. The rollers 28 and 29 are adapted to come into contact with a cam-guide 31, (indicated by dotted lines, Figs. 1 and 3,) which is suitably mounted in the frame of the machine, as shown in Figs. 4 and 5[a], is arranged substantially in line with the periphery of the cylinder 2, and the forward or upper end of it is provided with an abrupt inclination 31[a] for the purpose hereinafter described. The arrangement of the cam 31 is such that when the rollers 28 and 29 engage it their respective cross-heads will be tilted in such manner as to rotate the shafts 23 and 24 toward the cylinder 3, as indicated by the arrow in Fig. 1. In order to maintain the cross-heads in the different positions to which they are turned, I fix a pin 25[a] on each of said cross-heads, having several flat sides, which are engaged by the free end of a leaf-spring 26[a], fixed on the end of the cylinder 2.

32 indicates gripping-fingers which are mounted upon the shaft 23, as best shown in Fig. 3.

33 indicates grippers mounted upon the shaft 24, as best shown in Fig. 1.

When the shaft 23 is turned, as above described, by the action of the cam 31, the grippers 32 will be thrown toward the folding-roller 13 and will grip the folded edge of the web firmly against the cylinder 2 immediately after it passes the roller 13 and will carry it around such cylinder. The leading end of the sheet, which is carried upward by the pins 10 as soon as it is released, moves downward rapidly, because the doubled edge of the sheet is at the same time projected between the cylinder 2 and roller 13, and consequently the doubled sheet moves rapidly downward, so that the leading end of the sheet has not time to fall away from the cylinder 3, but is carried down and around the cylinder 2. After the forward end of the web reaches the lower part of the cylinder 2 the cutting-blade 7 will come opposite the recess 9 in the cylinder 3 and will sever the web transversely. When the fingers 32 arrive at the lowermost portion of the cylinder 2, the roller 27 will come into contact with a cam-guide 34, also mounted in the frame of the machine and projecting from above the periphery of the cylinder 2 downward and inward, as shown in dotted lines in Fig. 1. The arrangement is such that the shafts 23 and 24, when their rollers 27 and 30, respectively, engage the cam 34, will be rotated in such a direction as to throw the fingers 32 and 33 outward from the surface of the cylinder 2, thereby releasing the sheet held by such grippers.

Referring to Fig. 3, it will be noticed that the roller 30 bears upon the cam 34 near its lower end. Bearing in mind that the shaft 24 is supported by the cylinder and that the rollers 29 and 30 project beyond its ends, being supported by the cross-head 26, it will be seen that as the cylinder rotates in the direction of the hands of a watch the roller 30 will be gradually moved outward toward the periphery of the cylinder, the roller 29 being moved in the opposite direction. This will give a rotary motion to the shaft 24, which will continue as the cylinder rotates. When the roller 30 has been moved outward until the cross-head assumes a tangential position, which will be when the shaft 24 is opposite the upper portion of the cam 34, the roller 29 will have passed over the upper end of the cam, the gripper-fingers 33 being then on the upper side of the shaft. As the cylinder continues to rotate the shaft 24 will be further

rotated, so that the cross-head 26 will assume an inclined position, the roller 29 being in advance and being lower than the roller 30—that is, the cross-head will have a position somewhat similar to that of the cross-head 25, as illustrated in Fig. 3. As the shaft 24 approaches the upper member of the cam 31 the roller 29 will strike the inclined end 31ª of the cam and will be thus abruptly thrown forward or upward, bringing the grippers into operation immediately after the doubled sheet passes the roller 13, and will ride over the cam and rock the cross-head in the opposite direction to that in which it has been rotating.

35 indicates a shaft mounted in the frame 1 and extending longitudinally of the cylinder 2 under said cylinder. Mounted upon said shaft 35 are stripping-fingers 36, the forward ends of which normally lie in grooves 37 in the cylinder 2, as shown in Figs. 1 and 2. By rotating the shaft 35 the fingers 36 may be thrown out beyond the surface of the cylinder 2 to throw the sheet off of said cylinder.

38 indicates a spring one end of which is connected to one of the fingers 36, the other end being connected to a portion of the frame 1. The tension of the spring 38 serves to hold the fingers 36 in the grooves 37 of the cylinder 2.

39 indicates a lever rigidly mounted upon the shaft 35 and extending substantially horizontally therefrom, as shown in Fig. 1.

40 indicates a connecting-rod the lower end of which is connected to the lever 39 and the upper end of which is provided with a fork 41, which is adapted to fit upon the axle of the cylinder 2, as shown by dotted lines in Fig. 1.

42 indicates a roller carried by said rod 40 and projecting laterally therefrom at some point intermediate between the lever 39 and the fork 41, as shown in Fig. 1.

43 indicates a cam which is rigidly attached to the axle of the cylinder 2 and rotates therewith. The cam 43 is of such shape that as the cylinder 2 rotates certain portions of the cam will periodically engage the roller 42 and bear downward on said roller, thereby pressing downward on the lever 39 and throwing the fingers 36 out of contact with the cylinder 2. The cam 43 is so arranged that the fingers 36 will be thrown out of engagement with the cylinder 2 at about the time when the fingers 32 and 33 release the sheet.

44 indicates an endless belt mounted upon suitable pulleys 45, which belt passes under the cylinder 2 and is adapted to receive the sheets as they fall from said cylinder.

46 indicates stripping-fingers which are mounted upon a shaft 47, mounted in suitable bearings over the cylinder 3. The lower ends of the fingers 46 rest in grooves in the cylinder 3 and serve to strip the forward end of the web from the impaling-pins 11 and 12, carried by the cylinder 3.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a cutting-cylinder, of a folding-roller arranged in close proximity thereto and coacting therewith, means for delivering the web to the cylinder and roller, devices coöperating with the cylinder and roller for folding the web, grippers carried by one of said cylinders adapted to grip the folded edge of the web, and means for operating the grippers, substantially as described.

2. The combination with cutting-cylinders, and a folding-roller 13 arranged in close proximity thereto and coacting therewith, of means for delivering the web to the cylinders and roller, devices coöperating with the cylinders and roller for folding the web, grippers carried by one of said cylinders adapted to grip the folded edge of the said web, mechanism for causing the grippers to release the edge of the web when one of the cylinders makes a half-rotation, and strippers for stripping the web from said latter cylinder, substantially as described.

3. The combination with cutting-cylinders 2 and 3, one of them having cutting-blade 7, and the other a recess 9, of a folding-roller 13 arranged in close proximity to said cylinder 2 and coacting therewith, devices for delivering the web to the cylinders and roller, gripping-fingers carried by the blade-carrying cylinder and adapted to grip the web as it passes between the said cylinder and the folding-roller, and mechanism for operating the gripping-fingers, substantially as described.

4. The combination with cylinders 2 and 3, and a cutting-blade carried by one of said cylinders, of a folding-roller 13 arranged in close proximity to the cylinder 2 and coacting therewith, means for delivering the web to the cylinders and folding-roller, gripping-fingers carried by the cylinder 2 and operating to grip the web as it passes between the said cylinder and the folding-roller, stripping-fingers 36, shaft 35 supporting said fingers, arm 39, rod 40, roller 42, and cam 43 rotating within the cylinder 2, substantially as described.

5. The combination with the cylinder 2, and means for delivering a folded sheet thereto, of a shaft 23, mounted in said cylinder, a cross-head 25 on the shaft, rollers 27 and 28, carried by the cross-head, gripping-fingers 32, on the shaft, and cams 31 and 34, substantially as described.

6. The combination with a cylinder, and a coacting folding-roller arranged substantially in contact therewith, of a folding-blade for projecting the doubled edge of a sheet into the bite of said cylinder and roller, and grippers carried by the cylinder for gripping the doubled edge of the sheet, substantially as described.

7. The combination with a cylinder, and a coacting folding-roller aranged substantially in contact therewith, of a folding-blade for

projecting the doubled edge of a sheet into the bite of said cylinder and roller, and devices adapted to retain the folded edge of the sheet upon said cylinder, substantially as described.

8. The combination with a pair of coacting cutting-cylinders, and a folding-roller arranged substantially in contact with one of said cylinders, of a folding-blade carried by the other of said cylinders and adapted to project the sheets at the line of the fold into the bite of said folding-roller and its coacting cylinder, and means carried by the latter cylinder for retaining the folded edge of the sheet thereupon, substantially as described.

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