

No. 882,800.

PATENTED MAR. 24, 1908.

W. SCOTT, DEC'D.

I. & D. J. SCOTT, EXECUTORS.

WEB PRINTING MACHINE.

APPLICATION FILED MAY 19, 1905.

6 SHEETS—SHEET 1.

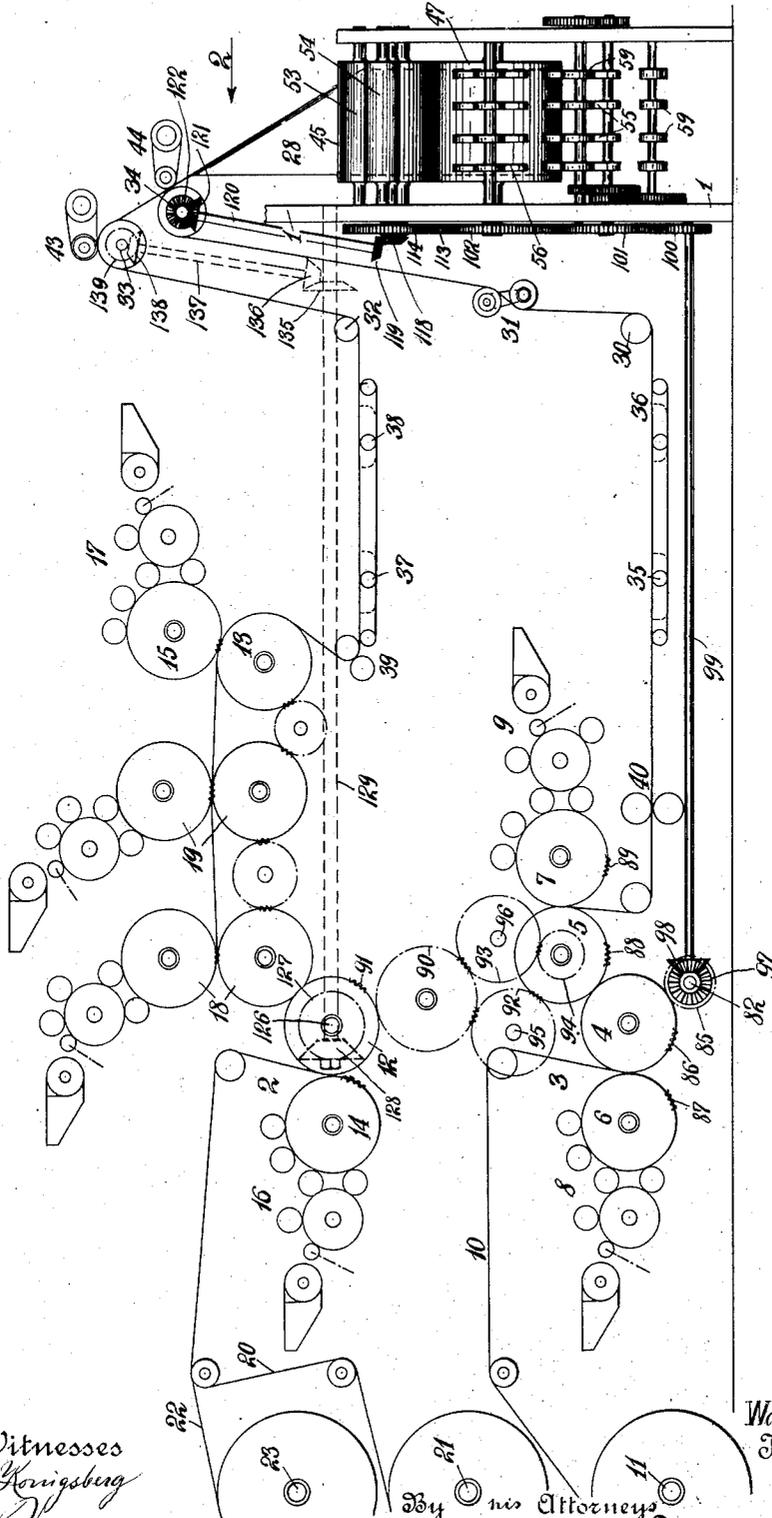


Fig. 1

Witnesses  
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*Anna Nissemann*

Walter Scott.  
 Inventor

By *Belknap & Spaulding* Attorneys

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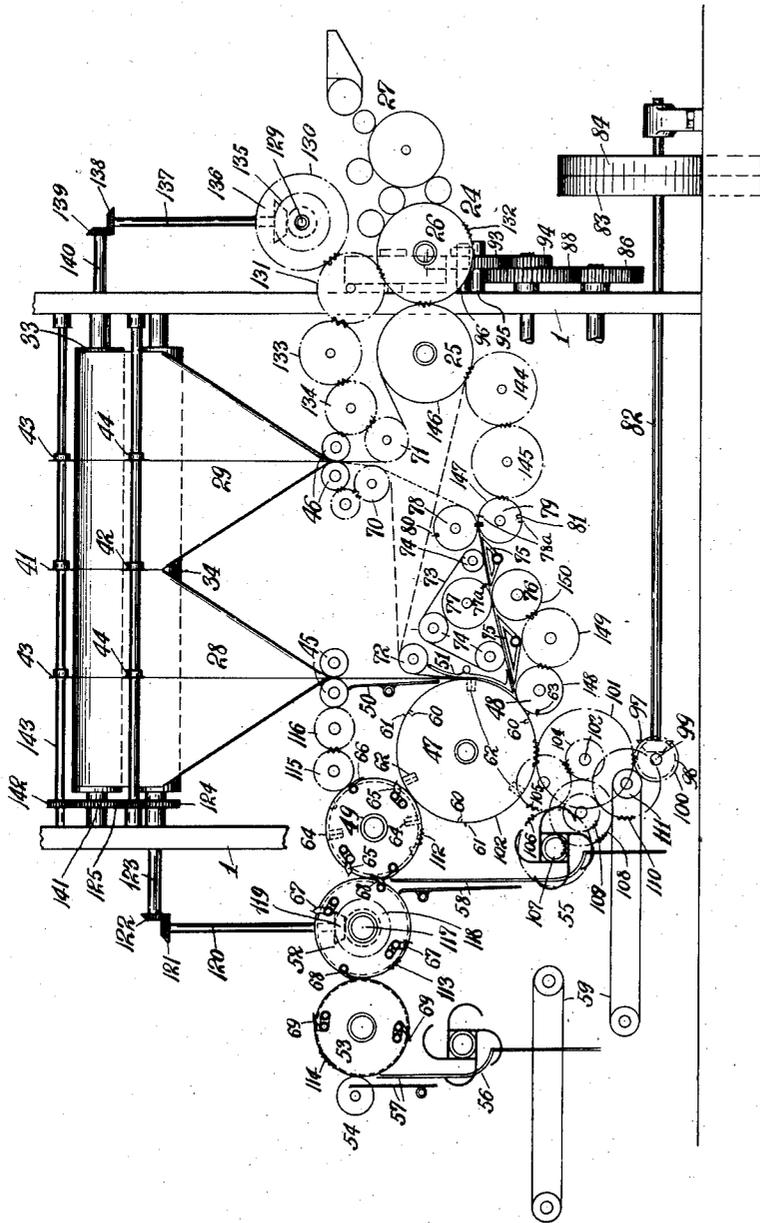


Fig. 2

Witnesses  
Evan Koringsberg.  
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6 SHEETS—SHEET 4.

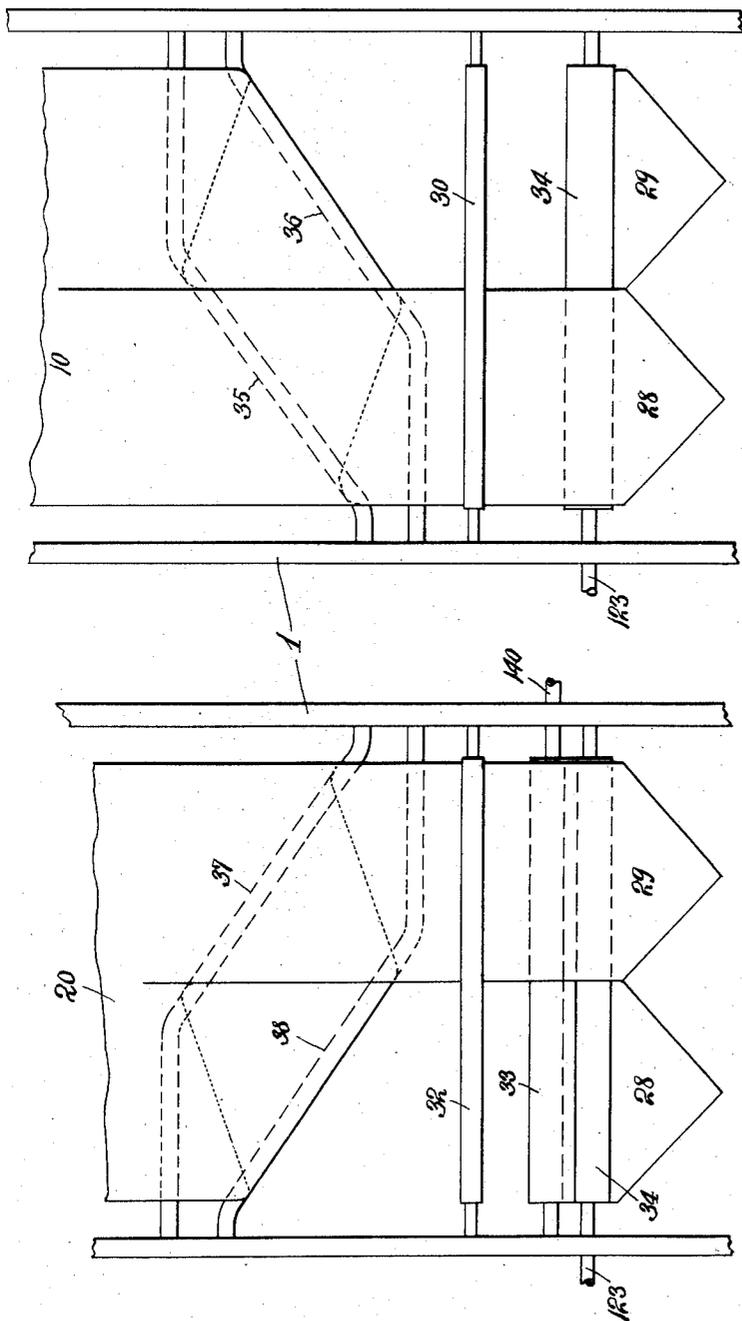


Fig. 5

Fig. 4

Witnesses  
Ivan Korrigberg.  
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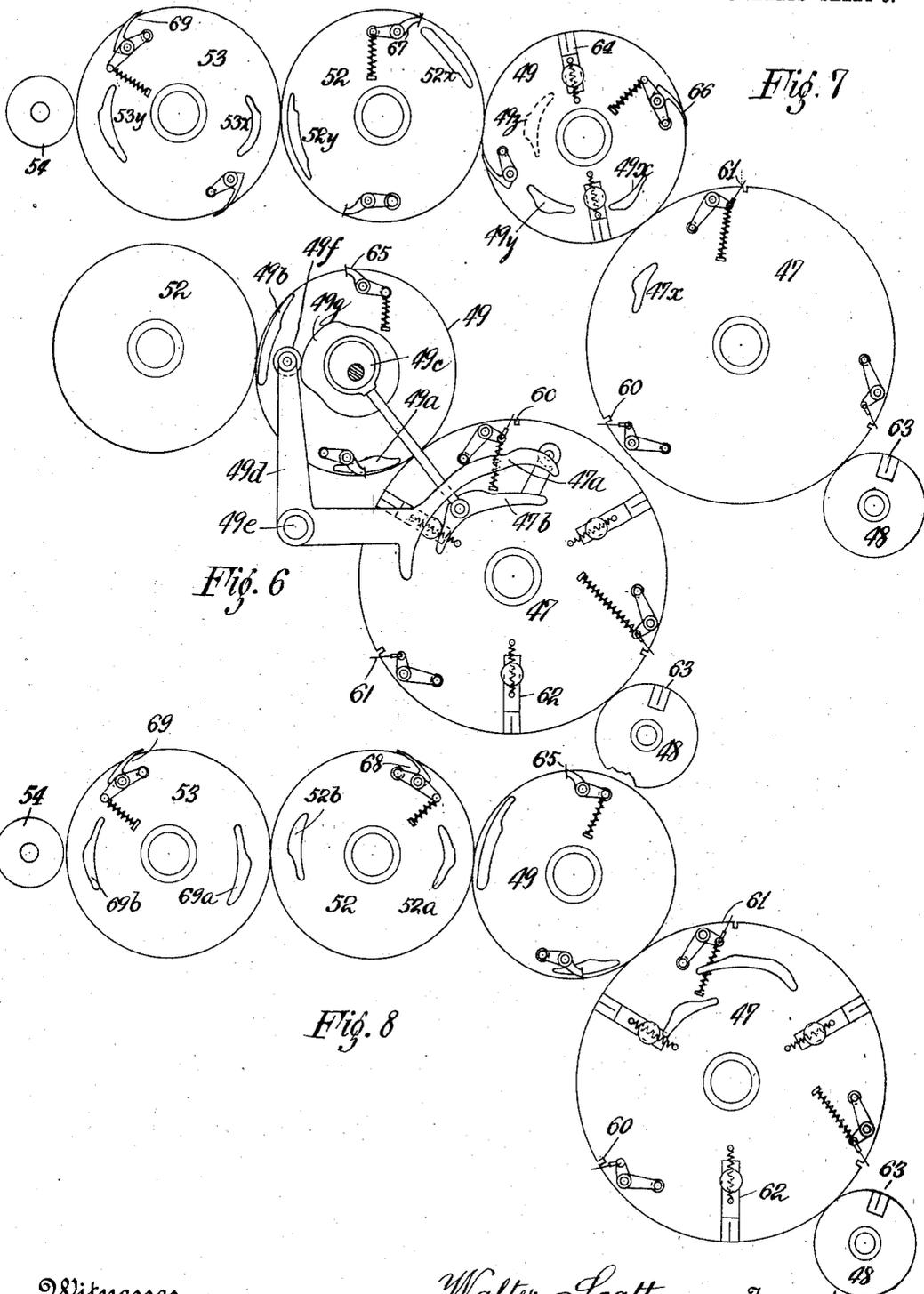
W. SCOTT, DEC'D.

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WEB PRINTING MACHINE.

APPLICATION FILED MAY 19, 1905.

5 SHEETS—SHEET 5.



Witnesses  
Franz Koringsberg  
Anna Thesdorff

Walter Scott  
Inventor  
By his Attorneys  
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# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY; ISABELLA SCOTT AND DAVID JOHN SCOTT  
EXECUTORS OF SAID WALTER SCOTT, DECEASED.

## WEB-PRINTING MACHINE.

No. 882,800.

Specification of Letters Patent.

Patented March 24, 1908.

Application filed May 19, 1905. Serial No. 261,148.

*To all whom it may concern:*

Be it known that I, WALTER SCOTT, a citizen of the United States of America, and a resident of Plainfield, Union county, New Jersey, have invented certain new and useful Improvements in Web-Printing Machines, of which the following is a specification.

My invention relates generally to web printing machines, in which the product of one or more webs is printed, associated, cut into sheets, folded, and delivered; and has more particularly reference to the arrangement of the parts with relation to each other and to such features of construction as will more fully hereinafter appear.

The main object of the invention is the production of means whereby the number of pages of the product may be varied at will, and whereby that web, or portion of a web, which is to form the outside cover of the product, can receive an extra imprint, or can be printed on a different color or quality of paper from that of the main portion of the product either before or after it has been associated, and can be subsequently folded and delivered as one product with the said main portion.

Other objects will appear as the specification proceeds.

To this end the invention comprises the features of construction and arrangement and combinations of parts as will more fully hereinafter appear.

In the accompanying drawings the invention has been embodied in a concrete form for the sake of illustration, but the particular form followed is not to be construed as a limitation, as the embodiment may be widely varied without departing from the invention.

In the said drawings: Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is an end elevation looking in the direction of the arrow 2 in Fig. 1. Fig. 3 is a plan view of a portion of Fig. 1. Fig. 4 shows a plan view of the web turners for associating a portion of the product of the upper machine with its companion portion from the same machine. Fig. 5 shows a plan view of the web turners for associating a portion of the product of the lower machine with its companion portion from the same machine. Fig. 6 shows the arrangement of the parts when the cutting and folding cylinders are adapted to fold the product of the upper machine as the outside cover, and also

when it is desired to collect successive cuts before delivering. Fig. 7 shows the arrangement of the parts when the cutting and folding cylinders are adapted to fold the product of the upper machine as the center pages of the associated products. Fig. 8 shows the arrangement of the parts when the cutting and folding cylinders are adapted to deliver alternate packs of sheets to the two deliveries.

Similar numerals of reference indicate corresponding parts in the different views.

1 indicates a suitable framework of any convenient construction for properly supporting the parts comprising the machine.

2 and 3 indicate respectively an upper and a lower printing machine arranged preferably in substantially parallel planes one above the other.

The lower printing machine is preferably composed of two printing couples consisting of the impression cylinders 4 and 5 and the plate cylinders 6 and 7, each of the latter provided with suitable inking apparatus 8 and 9. This lower printing machine may be constructed of such a length as to print magazine or other pages of 2, 3, 4, 5 or other numbers, either in length or width of pages. It is here shown as having a 4 page width. The web or webs 10 which pass through this machine are received from a suitable roll of paper mounted on the spindle 11.

The upper printing machine consists also preferably of two printing couples composed of the impression cylinders 12 and 13 and the plate cylinders 14 and 15 having suitable inking apparatus 16 and 17. This upper printing machine is adapted, if desired, to print on a web or a portion of a web of a different color or quality of paper and to print the same in several colors if desired by means of the additional printing cylinders as 18 and 19. In the arrangement disclosed in Fig. 3 there are shown two webs of paper, one of which is indicated by the numeral 20 coming from a roll of paper mounted on the spindle 21 and is, in the present instance, one page in width. The other web of paper 22 is shown as coming from the roll mounted on the separate spindle 23 and is three pages in width.

In addition to the foregoing, there is provided an auxiliary printing machine 24 composed of the impression cylinder 25 and plate cylinder 26 having suitable inking apparatus

27 which may be designated as additional printing cylinders to be used instead of the cylinders 18 and 19 or in addition thereto. This auxiliary printing machine is preferably arranged at right angles to the first two printing machines. This auxiliary printing machine, like the printing cylinders 18 and 19, is adapted to print an extra color, agent's name or similar device on that web or portion of a web coming from the upper printing machine and which will generally form the outside cover of the product. This auxiliary printing machine is so positioned that it will act on the web or portion of a web after it has been associated. To this end there is interposed between the two printing machines and the auxiliary printing machine suitable associating devices having slitters if necessary as well as means such as guide rolls for bringing the webs together. Suitable cutting, folding and delivery mechanisms are also provided for acting upon the webs after they have been printed and associated. The associating and slitting devices located intermediate the two printing machines and the auxiliary printing machine are preferably arranged so that the webs will be associated into two products one of which goes directly to the cutting, folding and delivery mechanism, while the other product can either be diverted so as to pass through the auxiliary printing machine to receive an additional imprint, or can be associated direct with the other product before the webs are acted upon by the cutting, folding and delivery mechanisms. Interposed between the two printing machines and the auxiliary printing machine are two former folders or web associators, one for each machine, arranged side by side in the same plane, whereby the webs are associated into two products. In addition to these, however, there are means for individually associating the companion webs coming from one or both machines into separate products,—that is: in such a manner that the webs belonging to each machine will form a separate product—before the webs reach the former folders. This, it will be understood, is necessary when the two printing machines are running at different speeds.

28 and 29 indicate two associators shown as triangular former folders and adapted to associate or fold the webs coming from both machines into two products. In connection with these former folders are guide rolls 30, 31, 32, 33 and 34 which serve to guide the webs together before they are acted upon by said former folders.

Interposed between the former folders and the two printing machines and located one above the other, are the associating devices for associating the companion webs coming from each machine before the said webs reach the former folders. In this instance,

these associators take the form of turning bars as 35 and 36 which are adapted to turn a web or portion of a web coming from the lower printing machine laterally in one direction and associate it with the companion web or portion before delivering it to the former folder 28 while the turning bars 37 and 38 are adapted to associate the web or webs coming from the upper printing machine before delivering it to the former folder 29 by turning a portion of the product laterally in the opposite direction. If either of the machines is acting upon a web only two pages in width or less, it is of course not necessary to use the web turners belonging to that machine. If the web passing through each machine is more than half the width suitable slitting devices as 39 and 40 will be used to slit the webs on the center line of the machine. If the webs coming from both machines are passed direct to the former folders without passing over the turning bars, suitable slitting devices as 41 and 42 may be used to slit the webs centrally of the machine in case the width of the webs is more than half size. In addition to the foregoing, there may be employed additional slitting devices in connection with the former folders as 43 and 44 for slitting the webs into one page widths if it is desired to associate the webs instead of merely folding them in a well known manner and throughout the claims the words web associators are to be construed to mean both means for folding the webs or for associating the webs. At the apex of the triangular former folders are the rollers 45 and 46 adapted to receive the two products as they come from said former folders.

47 indicates a female cutting and collecting cylinder adapted to act in conjunction with the male cutting cylinder 48 and with the folding cylinder 49. The said cylinder 47 has a circumference equal to the length of three sheets of two pages each and the cutting cylinder 48 has a circumference substantially equal to one sheet to be cut from the web. Suitable guides as 50 and 51 are interposed between the rollers 45 and the cylinder 47. Adjacent to the cylinder 49 is placed a second folding or transfer cylinder 52 and adjacent to the latter the delivery cylinder 53 against which bears the pressure roller 54. Each of the three cylinders 49, 52 and 53 are equal in length to two sheets of two pages cut off from the web.

55 and 56 indicate two rotating deliveries, one to receive the sheet from between the cylinders 49 and 52, and the other to receive the sheet between the cylinder 53 and roller 54. Suitable guides as 57 and 58 are provided for guiding the sheets into these rotating deliveries. Below the rotating deliveries are placed two sets of delivery bands 59 of any usual or suitable construction. The cylinder 47 is provided with three female cutting

members 60, and with three sets of retaining pins 61 as well as with three folding blades or creasers 62. The cylinder 48 is provided with one male cutting member 63. The 5 folding cylinder 49 is provided with two folding blades or creasers 64, two folding grippers 65, as well as two transfer grippers 66. The cylinder 52 is provided with two folding grippers 67 and transfer grippers 68, while the 10 cylinder 53 is provided with transfer grippers 69.

Below the rollers 46 are two rollers 70 and 71 and adjacent to the guide 51 there is another roller 72. Adjacent to the point of 15 contact between the cylinders 47 and 48 is a suitable sheet path composed of the tapes 73, passing over the rollers 74, and the guides 75. In this sheet path is located an accelerating device composed of two cylinders 76 and 77 20 the latter having a nipper bar 77<sup>a</sup> of a well known construction. Adjacent to this sheet path are two cutting cylinders 78 and 79, one of which is provided with two male cutting members 80 and the other with two female cutting members 81. As will be seen 25 from an inspection of Fig. 2, these elements are so positioned that they are interposed between the cutting cylinders 47 and 48 and the auxiliary printing machine.

30 The whole device is driven from a suitable shaft as 82 on which are mounted the loose and fast pulleys 83 and 84 or other means for suitably imparting motion to the same. On one end of the shaft 82 there is a pinion 85 35 which engages with the gear 86 mounted on the same shaft as the cylinder 4. This gear 86 meshes with the gear 87 on the plate cylinder 6 and with the gear 88 on the cylinder 5 which, in turn, meshes with the gear 89 on the cylinder 7. The inking apparatus of the 40 lower and the upper printing machines are suitably driven from these gears in a well known manner. Interposed between the lower and the upper printing machines is a 45 train of gears having means whereby the speed of the upper press may be changed so as to run slower than that of the lower machines. This train of gears will preferably take the form of a main intermediate gear 90 50 in mesh with the gear 91 mounted on the cylinder 12 and adapted to receive its motion from either of the two auxiliary intermediate gears 92 and 93. The gear 92 meshes with the gear 88 on the cylinder 5 and when the 55 main intermediate gear 90 receives its motion through this instrumentality both machines will run at the same speed. If, however, it is desired to run the upper machine at a less speed than the lower one, preferably at 60 half speed, the main intermediate gear 90 receives its motion from the auxiliary intermediate gear 93 which meshes with the pinion 94 mounted on the shaft of the cylinder 5. When it is desired to effect this change, one 65 or the other of the two gears 92 or 93 may be

brought out of mesh with their companions or one gear only may be used and may be changed from the stud 95 to the stud 96 or vice versa.

The cutting, folding and delivery cylinders 70 as well as the rollers 45 below the former folder 28 as also the slitters and guide rolls used in connection with the former folder 28 are always driven at the same speed as the lower machine. Hence there is mounted on the end of the shaft 82 a beveled gear 97 75 which engages with another beveled gear 98 mounted on the shaft 99 which is provided at its other end with the pinion 100 engaging with a gear 101 meshing with the gear 102 80 mounted on the same shaft as the cylinder 47. On the same stud 103 which carries the gear 101 there is mounted a pinion 104 which meshes into a gear 105 adapted to impart motion to the gear 106 mounted on the same 85 shaft as the rotating delivery 55. Moving with this gear 106 is a pinion 107 which engages with the gear 108 mounted on the same shaft as the pinion 109 which, in turn, engages with the gear 110 mounted on the roller 90 111 which imparts motion to the delivery bands 59. The other rotating delivery 56 and delivery bands below the same may be driven in a similar manner. The motion is 95 transferred from the gear 102 to the gear 112 mounted on the shaft of the cylinder 49 and from thence to the gears 113 and 114 of the cylinders 52 and 53, and in the other direction through the pinions 115 and 116 to the rollers 45. Mounted on the end of the shaft 117 100 which carries the cylinder 52 there is a beveled gear 118 which meshes with the corresponding beveled gear 119 mounted on the upright shaft 120 provided at its other end with the 105 beveled gear 121 in mesh with the beveled gear 122 mounted on the shaft 123 carrying the roller 34. Mounted upon the shaft 123 is a spur gear 124 in mesh with the pinion 125 carried by the shaft supporting the slitters 42 and 44. 110

From the gear 91 on the cylinder 12 the motion is transmitted in the usual way through the intermeshing gears to the other cylinders of the upper printing machine. Mounted on the shaft 126 which carries the 115 cylinder 12 there is a beveled gear 127 meshing with another beveled gear 128 mounted on the shaft 129 which carries at its other end the spur gear 130 meshing with the intermediate gear 131 which, in turn, is in 120 mesh with the gear 132 on the cylinder 26 thereby imparting motion to the auxiliary printing machine and driving the latter at the same speed as the upper printing machine. The gear 131 meshes into another 125 gear 133 which by means of the gear 134 drives the rollers 46, 70 and 71. Mounted on the shaft 129 is a beveled gear 135 meshing with another beveled gear 136 mounted on the shaft 137 and provided at its other 130

end with another beveled gear 138 meshing with the beveled gear 139 on the shaft 140 of the roller 33. This shaft 140 of the roller 33 is provided with a spur gear 141 which meshes with the pinion 142 mounted on the shaft 143 carrying the slitters 41 and 43 whereby all these members are driven at the same speed as the upper printing machine and the auxiliary printing machine. The cutting cylinders 78 and 79 receive their motion from and are driven at the same speed as the auxiliary printing machine, and hence at the same speed as the upper printing machine by means of the gears 144 and 145, the first one of which meshes with the gear 146 on the cylinder 25 and the other of which meshes with a gear 147 on the cylinder 79.

It will be understood that if the upper printing machine, auxiliary printing machine, and associating, slitting, and cutting devices connected therewith are driven at a less speed than the lower printing machine, the sheet which is cut off between the cylinders 78 and 79 must be accelerated to the speed of the lower printing machine in order to associate the two products. Hence the members located in the sheet path formed by the tapes 73 and guides 75 are in the structure disclosed run at the same speed as the lower printing machine. To this end the accelerating cylinders 76 and 77 receive their motion from the gear 102 mounted on the cylinder 47 through the instrumentality of the gear 148 carried by the cylinder 48 and meshing with the gear 149, which, in turn, meshes with the gear 150 mounted on the cylinder 76.

The operation of the machine is as follows: When the upper and lower printing machines are geared to run at the same speed, the webs coming from the same are led over the former folders, the product coming from the upper printing machine passing over the guide rollers 32 and 33, while the product coming from the lower machine is led over the guide rollers 30, 31 and 34 or both products may be led over the roller 34. If the webs are more than half width, they will be slit by the slitters 41 and 42 so as to separate them into two products, one of which passes to the former folder 28 and the other of which passes to the former folder 29. The product passing over the former folder 28 is then led down between the two rollers 45 and guides 50 and 51 between the cutting cylinders 47 and 48 where the web is cut off in sheets two pages in length. These sheets then in passing around the cylinder 47 will be folded into the bight of the gripper folders 65 on the cylinder 49, the retaining pins 61 on the cylinder 47 being withdrawn by means of the cam 47<sup>a</sup>, and the creaser blades being actuated by means of the cam 47<sup>b</sup>. These two cams are made stationary by means of suitable bolts in a

well known manner. The folding grippers are opened by means of the cam 49<sup>a</sup> as they come around to receive the sheet and are opened by means of the cam 49<sup>b</sup>, thereby allowing the sheets to pass down between the cylinders 49 and 52 between the guides 58 to the rotating delivery 55 and then to the bands 59. The product coming from the former folder 29 will pass down between the rollers 46 and from thence around the roller 70 to the roller 72, thereby associating the two products of the former folded together. The associated webs are then cut, folded and delivered as previously described.

In case it is desired to print an extra signature, color or other device upon the product coming from the upper printing machine, it may be done by means of the cylinders 18 and 19 or that web or portion of web which is to form the outside cover of the book or magazine may be led around the roller 71 to the impression cylinder 25 and from thence back to the roller 72 where it will meet the other web or portion of the web coming from the former folder 29 and the product coming from the former folder 28. If it is desired, the whole product coming from the former folder 29 may pass around the impression cylinder 25 and from thence to the roller 72.

It will be understood that a machine constructed in this way having cylinders in length equal to the length of four pages and operated as described, is capable of producing a product consisting of four, eight, twelve, sixteen, twenty, twenty-four, twenty-eight and thirty-two pages. If it is desired to collect two successive cuts from the webs, the bolts fastening the elements 47<sup>a</sup> and 47<sup>b</sup> are removed and the cam 47<sup>b</sup> is connected up to the eccentric 49<sup>c</sup> so as to be moved out of the way every other time, whereby the creaser blades will only act every other time. Similarly the cam 47<sup>a</sup> will then be rocked out of the way by means of the lever 49<sup>d</sup> pivoted at 49<sup>e</sup> and having a friction roll 49<sup>f</sup> engaging with the cam 49<sup>e</sup>. By this means the retaining pins will be withdrawn only every other time. In this way the product may be increased to 40, 48, 56 and 64 pages.

If the plates on the printing cylinders are not duplicates and it is desired to take advantage of the full capacity of the machine, the parts may be so adjusted that alternating packs of sheets will be delivered to the two deliveries. With this arrangement the sheets will be taken by the retaining pins on the cylinder 47 and be carried around the same and will be folded into the bight of the folding grippers 65 on the cylinder 49. The cylinder 52, however, in this instance will be provided with one set of transfer grippers 68 adapted to be opened by the cams 52<sup>a</sup> and 52<sup>b</sup> which will take off every other pack of sheets carried around by the cylinder 49 and

will deliver the same to the transfer grippers 69 on the cylinder 53 opened by the cams 69<sup>a</sup> and 69<sup>b</sup>. In this way one pack of sheets will pass down between the cylinders 49 and 52 while the next pack of sheets will pass down between the cylinder 53 and friction roller 54.

It will be understood that when the product of the machine is delivered between the cylinders 49 and 52 to the guides 58, that that web or portion of a web which may have received an imprint from the additional printing cylinders which may be either the cylinders 18 and 19 or the auxiliary printing machine or both, will form the outside cover of the product. If it is desired, however, that it should form the center portion of the product, the said product will be delivered between the cylinder 53 and roller 54 to the guides 57, thereby folding the product in the opposite direction. With this arrangement, the creaser blades on the cylinder 47 will be removed or otherwise rendered inoperative and the corresponding folding grippers on the cylinder 49 will also be removed or otherwise made inoperative and the sheets as they are received by the retaining pins on the cylinder 47 will be carried around and will be transferred to the transfer grippers 66 on the cylinder 49, the cam 47<sup>x</sup> opening the retaining pins on the cylinder 47, while the cam 49<sup>x</sup> will open the transfer gripper 66 to receive the sheets from the retaining pins on the cylinder 47. The sheets will then be carried around by the transfer gripper 66 until that point is reached where the said grippers will come opposite to the cam 49<sup>y</sup> when they will be opened. At this moment the creaser blade 64 will be operated by the cam 49<sup>z</sup> and will fold the sheets into the bight of the folding grippers 67 on the cylinder 52 which latter, in turn, will deliver the sheets to the transfer grippers 69 on the cylinder 53 of which there will be in the present instance two sets. The folding gripper 67 will be operated at the proper moments by means of the cams 52<sup>x</sup> and 52<sup>y</sup>, while the transfer gripper 69 will be operated at the proper moments by means of the cams 53<sup>x</sup> and 53<sup>y</sup>.

When the upper printing machine runs at a lesser speed, say half the speed of the lower printing machine, the power, as previously described, will be transmitted from the pinion 94 to the gear 93 and from thence to the gear 90. Under these circumstances, it will be understood that the web or webs from each machine must be associated in such a manner that the webs coming from the same machine will be associated together before they reach the former folders. Under these conditions, the product of the lower machine will be led out over the web turners 35 and 36, after being slit by the slitters 40 if necessary, thereby turning a web or portion of a web of the product of the lower machine lat-

erally in one direction so as to superpose it upon its companion web, coming from the same machine. After this, the product coming from the lower machine will pass over the former folder 28 and will be cut, folded and delivered in any of the ways previously described. The web or webs coming from the upper machine will then be associated together by the web turners 37 and 38, after being slit by the slitter 39 if necessary, but will be turned in the opposite direction so that the total product of the upper machine will pass over the former folder 29. If the web from the upper machine is only two pages in width, it is of course not necessary to use the web turners for this machine. From this point, the product of the upper machine will pass over the roller 70 and down to the cutting cylinders 78 and 79 where it will be cut off in lengths of one or two pages as may be desired and where it may be collected if desired in any well known manner as by means of the retaining pins 78<sup>a</sup>. These sheets will then pass to the accelerating cylinders 76 and 77 which are rotating at the same surface speed as the lower printing machine where the speed of the sheet will be accelerated to equal that of the product coming from the said lower printing machine, and will be associated with the said product at a point where the cylinders 47 and 48 contact. Any other means may of course be used for accelerating the speed of the product of the slow speed machine. This product coming from the upper printing machine may meet the product coming from the lower printing machine at its leading edge or at a point where the fold is subsequently to be formed, as may be desired. From this point on, the action of the folding and delivery mechanism will be the same as previously described.

If it is desired to print an additional color etc., by means of the auxiliary printing machine, a portion or all of the product coming from the former folder 29 is led around the impression cylinder 25 and from thence to the cutting cylinders 78 and 79. If it is desired to pass a portion of the product coming from the former folder 29 direct to the cutting cylinders 78 and 79, this may be done. In that case only the portion of the web to be printed passes around over the impression cylinder 25. From this point onward the operation will be the same as previously described.

It will be understood that with this adjustment, the machine is capable of producing a product consisting of 6, 10, 14, 18, 22, 26, 30 and 34 pages, and if two successive cuts are collected on the cylinder 47, the product may be made to consist of 12, 20, 28, 36, 44 and 52 pages.

It will be understood that if it is desired the webs in passing over the former folders

may be slit by the slitters 33 and 34. Also that the page forms on the cylinders will be arranged in a suitable and well known manner so as to produce the results desired.

5 One or more webs may of course pass through each printing machine, but if it is desired to have the outside cover of the ultimate product of a different quality or color of paper, a separate web as 22 coming from the roll mounted on the spindle 23 and one 10 page wide as indicated in Fig. 3, may be used. It will also be understood that when necessary, suitable adjusting rolls to regulate the travel of the web through various parts of the machine may be used, all of which are 15 well known.

If desired, pasters may be used to apply lines of paste on the margin to form the center of the ultimate product in any well known 20 manner, or the products or signatures may be fastened together by wire staples. Instead of printing the additional color, agent's name, etc., by means of the auxiliary printing machine, the cylinders 18 and 19 may be 25 used, or both sets of cylinders may be used.

What is claimed is:

1. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing 30 cylinders for giving an imprint on the product or a portion of the product of one machine, means for associating the products of each machine into a separate product, means for cutting the two products, means for associating the two products into one product, 35 means for folding the associated products as one product, and two deliveries adapted to alternately receive the associated and folded products.

40 2. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of one machine, 45 means for associating the products of each machine into a separate product, means for cutting the product of one machine, means for associating the cut product with an uncut portion of the other product, means for cutting the said other product, means for folding the associated products as one product, 50 and two deliveries adapted to alternately receive the associated and folded products.

3. The combination of two web printing 55 machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, means for associating the products of each machine into a separate 60 product, means for cutting the two products, means for associating the two products into one product, means for folding the two products as one product, and two deliveries

adapted to alternately receive the associated 65 and folded products.

4. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing 70 cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, means for associating the products of each machine into a separate product, means for cutting the product of the slow speed machine, means for associating 75 the cut product of the slow speed machine with an uncut portion of the full speed machine, means for cutting the product of the full speed machine, means for folding the two products as one product, and two deliveries 80 adapted to alternately receive the associated and folded products.

5. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning 85 a portion of the product of one machine so as to associate it with its companion portion from the same machine, additional printing cylinders for giving an imprint on the product or a portion of the product of one machine, means for associating the products of 90 each machine into a separate product, means for cutting the two products, means for associating the two products into one product, and means for folding and delivering the two 95 products as one product.

6. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning 100 a portion of the product of one machine so as to associate it with its companion portion from the same machine, additional printing cylinders for giving an imprint on the product or a portion of the product of one machine, means for associating the products of 105 each machine into a separate product, means for cutting the product of one machine, means for associating the cut product with an uncut portion of the other product, means for cutting the said other product, and means 110 for folding and delivering the two products as one product.

7. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion 115 of the product of one machine so as to associate it with its companion portion from the same machine, additional printing cylinders for giving an imprint on the product or a portion of the product of one machine, 120 means for associating the products of each machine into a separate product, means for cutting the two products, means for associating the two products into one product, and means for folding the two products with 125 that portion acted upon by the additional printing cylinders as the outside cover and for delivering them as one product.

8. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine so as to associate it with its companion portion from the same machine, additional printing cylinders for giving an imprint on the product or a portion of the product of one machine, means for associating the product of each machine into a separate product, means for cutting the products of one machine, means for associating the cut product with an uncut portion of the other product, means for cutting the said other product, and means for folding the two products with that portion acted upon by the additional printing cylinders as the outside cover and for delivering them as one product.

9. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on a portion of the product of the slow speed machine, web turners for turning a portion of the product of the full speed machine so as to associate it with its companion portion from the same machine, means for associating the product of each machine into a separate product, means for cutting the two products, means for associating the two products into one product, and means for folding and delivering the two products as one product.

10. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on a portion of the product of the slow speed machine, web turners for turning a portion of the product of the full speed machine so as to associate it with its companion portion from the same machine, means for associating the product of each machine into a separate product, means for cutting the product of the slow speed machine, means for associating the cut product of the slow speed machine with an uncut portion of the product of the full speed machine, means for cutting the product of the full speed machine, and means for folding and delivering the two products as one product.

11. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on a portion of the product of the slow speed machine, web turners for turning a portion of the product of the full speed machine so as to associate it with its companion portion from the same machine, means for associating the product of each machine into a separate product, means for cutting the two products, means for associating the two products into one product, and means for folding the two products with that portion acted upon by

the additional printing cylinders as the outside cover and for delivering them as one product.

12. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on a portion of the product of the slow speed machine, web turners for turning a portion of the product of the full speed machine so as to associate it with its companion portion from the same machine, means for associating the product of each machine into a separate product, means for cutting the product of the slow speed machine, means for associating the cut product of the slow speed machine with an uncut portion of the product of the full speed machine, means for cutting the product of the full speed machine, and means for folding the two products with that portion acted upon by the additional printing cylinders as the outside cover and for delivering them as one product.

13. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting the product of the machine running at the slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for cutting the product of the full speed machine, means for associating the two products, and means for folding the associated products in either direction and for delivering them as one product.

14. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting the product of the machine running at the slower speed into sheets, means for cutting the product of the full speed machine, means for associating the two products, and means for folding the associated products in either direction and for delivering them as one product.

15. The combination of two web printing machines, one of which runs at a slower speed

than the other, web turners for turning a portion or the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting the product of the machine running at the slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for associating the two products, and means for folding the associated products in either direction and for delivering them as one product.

16. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting the product of the machine running at the slower speed into sheets, means for cutting the product of the full speed machine, means for associating the two products, and means for folding the associated products in either direction and for delivering them as one product.

17. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for associating the cut product with the uncut product from the full speed machine, means for cutting the product of the full speed machine, and means for folding the associated products in either direction and for delivering them as one product.

18. The combination of two web printing machines, one of which runs at a slower speed than the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same

machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for associating the cut product with the uncut product from the full speed machine, means for cutting the product of the full speed machine, and means for folding the associated products in either direction and for delivering them as one product.

19. The combination of two web printing machines, one of which runs at a slower speed than the other, and is adapted to act on separate webs of paper coming from two rolls, one of which is of a different color or quality, additional printing cylinders for giving an imprint on the web of the slow speed machine having a different color, web turners for turning a portion of the full speed machine so as to associate it with its companion portion from the same machine, means for associating the product of each machine into a separate product, means for cutting the two products, means for associating the two products into one product, and means for folding and delivering the two products as one product with the web of different color or quality as the outside cover.

20. The combination of two web printing machines, one of which runs at half the speed of the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting and collecting two cuts from the full speed machine, means for cutting the half speed product into sheets, means for accelerating the thus cut sheets of the half speed product to the speed of the full speed product, means for associating one cut of the half speed machine with the collected product of the full speed machine, and means for folding the associated products in either direction and delivering them as one product.

21. The combination of two web printing machines, one of which runs at half the speed of the other, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said

other machine, means for again associating the individual products of each machine, means for cutting and collecting two cuts from the full speed machine, means for cutting the half speed product into sheets, means for associating one cut of the half speed machine with the collected product of the full speed machine, and means for folding the associated products in either direction and delivering them as one product.

22. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of both machines and for accelerating the speed of the cut product of the slow speed machine to that of the full speed machine, means for associating the two products, and means for folding and delivering the associated products as one product.

23. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of both machines, means for associating the two products, and means for folding and delivering the associated products as one product.

24. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for

cutting the product of both machines and for accelerating the speed of the cut product of the slow speed machine to that of the full speed machine, means for associating the two products, and means for folding the associated products in either direction and delivering them as one product.

25. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of both machines, means for associating the two products, and means for folding the associated products in either direction and delivering them as one product.

26. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of both machines and for accelerating the speed of the cut product of the slow speed machine to that of the full speed machine, means for associating the two products, and means for folding and delivering the associated products with that portion acted upon by the additional printing cylinders as the outside cover.

27. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for

cutting the product of both machines, means for associating the two products, and means for folding and delivering the associated products with that portion acted upon by the additional printing cylinders as the outside cover.

28. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for associating the cut sheets with the uncut product of the full speed machine, means for cutting the product of the full speed machine, and means for folding and delivering the associated products as one product.

29. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for associating the cut sheets with the uncut product of the full speed machine, means for cutting the product of the full speed machine, and means for folding and delivering the associated products as one product.

30. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally

in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for associating the cut sheets with the uncut product of the full speed machine, means for cutting the product of the full speed machine, and means for folding the associated products in either direction and delivering them as one product.

31. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for associating the cut sheets with the uncut product of the full speed machine, means for cutting the product of the full speed machine, and means for folding the associated products in either direction and delivering them as one product.

32. The combination of two web printing machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for accelerating the speed of the cut sheets to the speed of the full speed machine, means for associating the cut sheets with the uncut product of the full speed machine, means for cutting the product of the full speed machine, and means for folding and delivering the associated products with the web or that portion of the web acted upon by the additional printing cylinders as the outside cover.

33. The combination of two web printing

machines, one of which runs at a slower speed than the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the slow speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting the product of the machine running at a slower speed into sheets, means for associating the cut sheets with the uncut product of the full speed machine; means for cutting the product of the full speed machine, and means for folding and delivering the associated products with the web or that portion of the web acted upon by the additional printing cylinders as the outside cover.

34. The combination of two web printing machines, one of which runs at a slower speed than the other and adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for acting on the web of different quality or color, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting both products, and accelerating the speed of the product of the slow speed machine, means for associating the two products, and means for folding and delivering the associated products as one product.

35. The combination of two web printing machines, one of which runs at a slower speed than the other and adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for acting on the web of different quality or color, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting both products, means for associating the two products, and

means for folding and delivering the associated products as one product.

36. The combination of two web printing machines, means for driving the said printing machines at the same speed or at different speeds, former folders for associating the webs of the two printing machines when the latter runs at the same speed, web turners for associating the webs of each printing machine into separate products before the said webs reach the former folders, when the machines run at different speeds, and means for cutting, associating, folding and delivering the webs coming from the former folders as one product whether the printing machines run at the same speed or at different speeds.

37. The combination of two former folders, a pair of cutting cylinders, means for guiding the webs coming from both former folders to the cutting cylinders, a printing machine located between one of the former folders and the cutting cylinders, a sheet path between the printing machine and the cutting cylinders, sheet cutting and accelerating means located in said sheet path and means for guiding the web from one of the former folders when the said web runs at less speed than the other through the printing machine and sheet path aforesaid to the cutting cylinders aforesaid.

38. The combination of two web printing machines, one of which runs at a slower speed than the other and adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for acting on the web of different quality or color, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting both products and accelerating the speed of the product of the slow speed machine, means for associating the two products, and means for folding and delivering the associated products with the web of a different color or quality as the outside cover.

39. The combination of two web printing machines, one of which runs at a slower speed than the other and adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for acting on the web of different quality or color, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turn-

ing a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting both products, means for associating the two products, and means for folding and delivering the associated products with the web of a different color or quality as the outside cover.

40. The combination of two web printing machines, one of which runs at half the speed of the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the half speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for accelerating the sheets from the half speed machine to the speed of the full speed machine, means for associating the sheets from the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products as one product.

41. The combination of two web printing machines, one of which runs at half the speed of the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the half speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for associating the sheets from the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products as one product.

42. The combination of two web printing machines, one of which runs at half the speed of the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the half speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as

to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for accelerating the sheets from the half speed machine to the speed of the full speed machine, means for associating the sheets from the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products with that portion acted upon by the additional printing cylinders as the outside cover.

43. The combination of two web printing machines, one of which runs at half the speed of the other, additional printing cylinders for giving an imprint on the product or a portion of the product of the half speed machine, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual product of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for associating the sheets from the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products with that portion acted upon by the additional printing cylinders as the outside cover.

44. The combination of two web printing machines, one of which runs at half the speed of the other and is adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for giving an imprint on the differently colored web, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for accelerating the cut sheets of the half speed machine to the speed of the full speed machine, means

for associating the product of the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products as

5 one product.

45. The combination of two web printing machines, one of which runs at half the speed of the other and is adapted to act on separate webs of paper coming from two  
10 rolls, one of which is of a different quality or color, additional printing cylinders for giving an imprint on the differently colored web, web turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion  
15 portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so as to associate it with its companion  
20 portion from the said other machine, means for again associating the individual products of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the  
25 product of the half speed machine, means for associating the product of the half speed machine with the collected product of the full speed machine, and means for folding and delivering the associated products as one  
30 product.

46. The combination of two web printing machines, one of which runs at half the speed of the other and is adapted to act on separate webs of paper coming from two rolls, one of  
35 which is of a different quality or color, additional printing cylinders for giving an imprint on the differently colored web, web turners for turning a portion of the product of one machine laterally in one direction so  
40 as to associate it with its companion portion from the same machine, web turners for turning a portion of the product of the other machine laterally in the opposite direction so  
45 as to associate it with its companion portion from the said other machine, means for again

associating the individual products of each machine, means for cutting and collecting two cuts of the product of the full speed machine, means for cutting the product of the  
50 half speed machine, means for accelerating the cut sheets of the half speed machine to the speed of the full speed machine, means for associating the product of the half speed machine with the collected product of the  
55 full speed machine, and means for folding and delivering the associated products with the differently colored web as the outside cover.

47. The combination of two web printing machines, one of which runs at half the  
60 speed of the other and is adapted to act on separate webs of paper coming from two rolls, one of which is of a different quality or color, additional printing cylinders for giving an imprint on the differently colored web, web  
65 turners for turning a portion of the product of one machine laterally in one direction so as to associate it with its companion portion from the same machine, web turners for turning a portion of the product  
70 of the other machine laterally in the opposite direction so as to associate it with its companion portion from the said other machine, means for again associating the individual products of each machine, means for cutting  
75 and collecting two cuts of the product of the full speed machine, means for cutting the product of the half speed machine, means for associating the product of the half speed machine with the collected product of the  
80 full speed machine, and means for folding and delivering the associated products with the differently colored web as the outside cover.

Signed at New York this 15th day of May, 85  
1905.

WALTER SCOTT.

Witnesses:

WILLIAM BARNES,  
AXEL V. BEEKEN.