

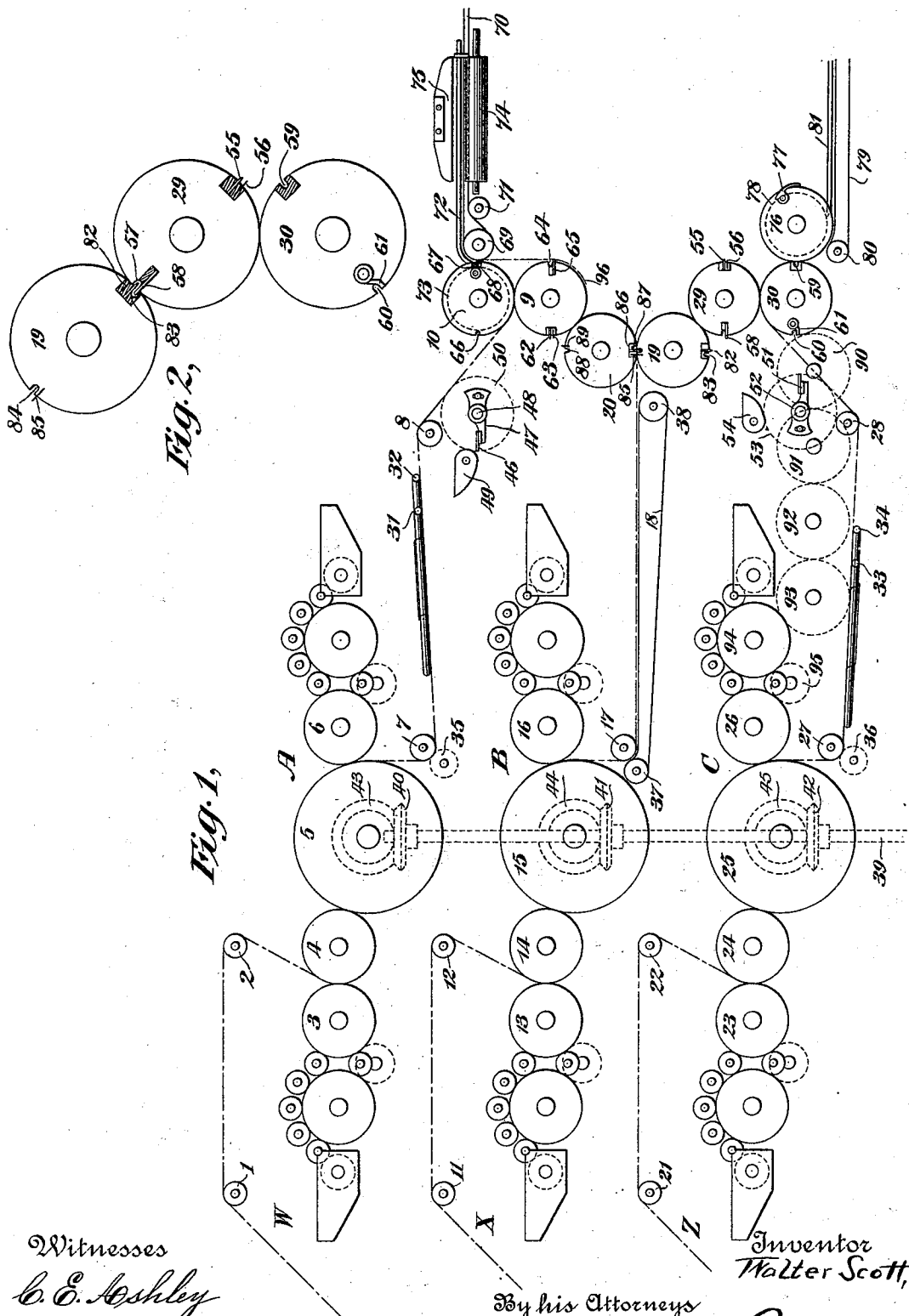
(No Model.)

2 Sheets—Sheet 1.

W. SCOTT.
PRINTING MACHINE.

No. 507,758.

Patented Oct. 31, 1893.



Witnesses
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

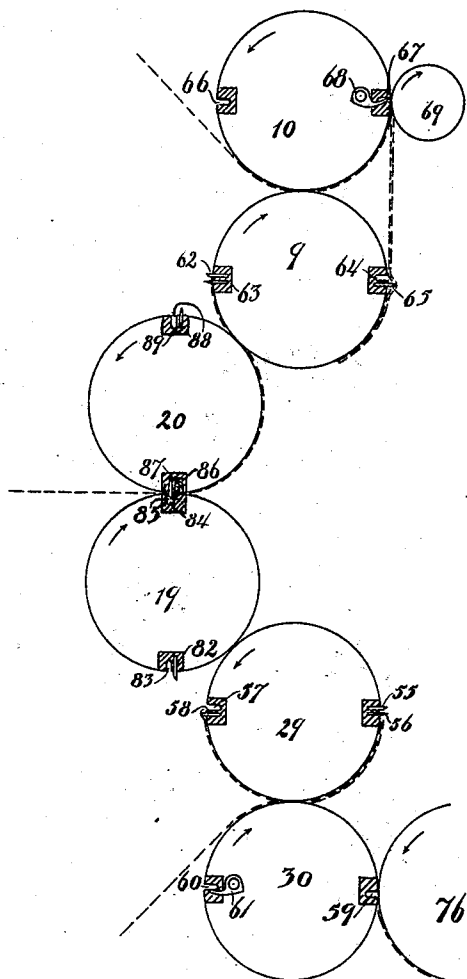
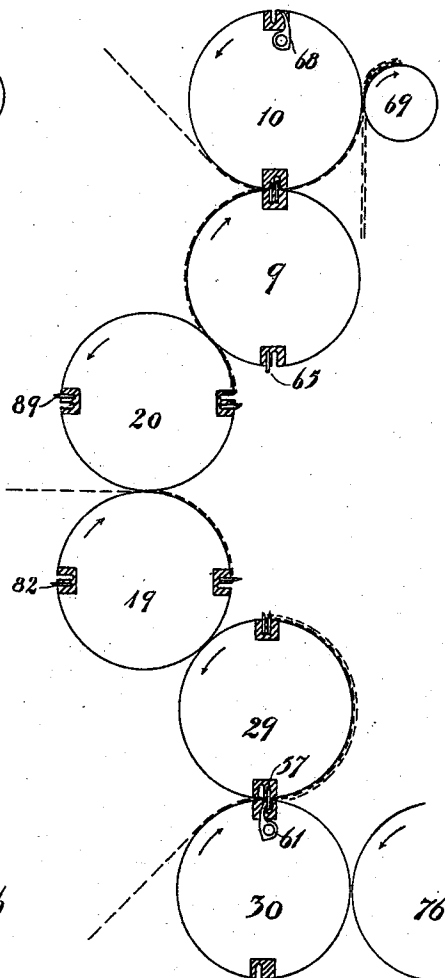


Fig. 4.



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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 507,758, dated October 31, 1893.

Application filed December 28, 1891. Serial No. 416,295. (No model.)

To all whom it may concern:

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

My present invention relates to printing machines, and has for its object the production of copies or packs of sheets, as newspapers, having six, eight, ten, twelve, fourteen, sixteen, or eighteen pages or multiples thereof.

The preferred form of my invention is shown in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the mechanism, the framework and gearing being omitted. Fig. 2 is an enlarged detail view of certain parts. Fig. 3 is an enlarged view of the cutting and folding cylinders in the positions shown in Fig. 1; and Fig. 4 is an enlarged view of the same after they have made one-quarter turn from the positions shown in Fig. 3.

The printing machines shown are of the usual rotary type, and consist of two main printing machines, as A and C, adapted each to perfect a web of desirable width, as single, double or greater width, and a supplemental printing machine, as B, adapted to perfect a web of desirable width. The webs perfected by the main machines may be split into sections either before or after the printing, when and as may be desired, or the main webs for each machine may come from two rolls, the sections entering each main machine edge to edge; suitable turners may be used to superimpose the sections of said main webs to form double, treble, &c., ply webs.

The plate cylinders of each machine are or may be inked by any suitable and usual means; such means therefore will not be described.

Referring to Fig. 1, the web W for main machine A is led from a roll (not shown) in any suitable way, as over rollers 1, 2, to and between the first plate cylinder 3 and first impression cylinder 4. The web then passes under the latter to and over the second impression cylinder 5, down between the latter and the second plate cylinder 6. The per-

fect web is now led in any suitable way as under roller 7 and over roller 8, to the cutting cylinders 9, 10, which will be more particularly described hereinafter.

The web X for the supplemental printing machine B is led from a roll (not shown) in any suitable way, as over rollers 11, 12, to and between the first plate cylinder 13, and first impression cylinder 14. Thence, it passes under the latter to and over the second impression cylinder 15, between the latter and the second plate cylinder 16. It then passes in any suitable way, as under roller 17 and on tapes 18 to the cutting cylinders 19, 20, constructed as hereinafter described.

The web Z of the main machine C is led from a roll (not shown) over rollers 21, 22, to and between the first plate and impression cylinders 23, 24, under the latter to and over the second impression cylinder 25. It then passes between the latter and the second plate cylinder 26; from thence it passes under rollers 27, 28, to the cutting cylinders 29, 30, hereinafter described.

As stated above, the webs of one or both main machines may consist of, or be split into, more than one longitudinal part or section, and said sections be superimposed to form two-, three-, four-ply or greater ply webs. The instances shown in the drawings are for two sections, where parallel bars 31, 32, for web W, and parallel bars 33, 34, for web Z are shown for superimposing the sections of each. Also a splitter 35 co-acting with a groove in roller 7, and a splitter 36 co-acting with a groove in roller 27 divide said webs W, Z, into sections. The number of splitters 35, 36 depends upon the number of sections desired in each case.

The space between roller 17 and cutting cylinders 19, 20, may be bridged over by any suitable means, as by tapes 18, on rollers or pulleys 38.

The printing machines may be driven at equal speeds by any suitable means. The means shown consist of a shaft 39 extending across cylinders 5, 15, 25, and provided with three bevel gears of equal size, as 40, 41, 42 meshing respectively with similar gears 43, 44, 45 respectively on said cylinders 5, 15, 25. Said shaft 39 is rotated by any suitable means

(not shown). It is understood, of course, that the cylinders, &c., of each machine are geared together in the usual manner.

The webs W, Z, may have transverse lines of paste applied thereto by revolving blades. Thus web W gets lines of paste from blade 46, carried by arms 47 of shaft 48, and taking paste from a fountain 49. Said shaft 48 has a gear 50 by which it receives motion from any suitable part of the machine. Web Z receives lines of paste from blade 51, supported by arms from shaft 52, having gear 53, said blade taking paste from the fountain 54. Gear 53 is driven by gearing in any suitable way.

The male cutting cylinder 29 is provided with longitudinal cutting blades 55, adjacent and following which are suitable sheet retainers, as pins 56. Preferably diametrically opposite blade 55 is the groove 57, adjacent and preceding which in the rotation of the cylinder, is the creasing blade 58. The female cutting cylinder 30 is provided with suitably placed longitudinal grooves 59, 60, for co action with said blades 55, 58, and with grippers 61 for retaining the creased sheets in groove 60.

The cylinder 9 is provided with cutting blade 62, pins 63, groove 64, and creaser 65, located and operating like parts 55, 56, 57, 58, above described. Cylinder 10 is provided with suitably placed grooves 66, 67, and grippers 68 corresponding in function with like parts 59, 60, 61, above described. The sheets folded by cylinders 9, 10, and 29, 30, may be delivered folded further or not as may be desired. For cylinders 9, 10, I show a delivery consisting of a roller or pulleys 69 adjacent cylinder 10, tapes 70 on rollers 69, 71, and another (not shown) and stripping bars 72 having their ends curved about rollers 69 and extending into circumferential grooves 73 of cylinder 10. Folding rollers 74 (but one is shown) and vibrating creaser blade 75, may fold the copies taken by the tapes 70. For cylinders 29, 30, I show a delivery consisting of a cylinder 76 adjacent cylinder 30, and having suitable sheet retainers as grippers 77, and circumferential groove 78; tapes 79 on roller 80 and others not shown; and guides 81 above tapes 79 and extending into said grooves 78. Cylinders 19, 20, are or may be alike. Cylinder 19 is provided with cutting blade 82; a groove 83 adjacent and preceding said blade; a groove 84 diametrically opposite said blade; and suitable sheet retainers, as pins 85, adjacent and following said groove 84. Cylinder 20 is provided with cutting blade 86, grooves 87, 88, and pins 89, which are located relatively to each in the same way that the parts 82, 83, 84, 85, are located as described. All said cylinders 9, 10, 19, 20, 29, 30, 76 and roller 69 are geared together (gearing not shown), and have a surface speed equal to that of the printing cylinders. Said cylinders are driven by any suitable means at the described speed, as by gears 90, 91, 92,

93, connecting the gear of cylinder 30 with that of distributing cylinder 94 of machine C. Cylinder 94 is driven by a gear 95 connecting it with plate cylinder 26.

The operation of the parts is as follows:—The pairs of cylinders 9, 10, and 29, 30, sever full length sheets from the webs W, Z, respectively, while cylinders 19, 20, sever sheets of half said full length from the web X. The half sheets cut by cylinder 19 from said web are taken to and by cylinder 29, and those cut off by cylinder 20 are taken to and by cylinder 9. With the parts in the positions shown in Fig. 1, the web W passes under cylinder 10, up to the grippers 68 which hold the fold. The end hangs down to about the point 96. Web Z passes under cylinder 29, the end thereof being caught on the pins 56. Cylinders 19, 20 are just severing a half sheet from the web X, which sheet extends around cylinders 20, 9 to the pins 63, on which the end is caught under grippers 68 of cylinder 10, and one is caught by pins 56. It is to be understood that the pins hereinbefore described are mounted in any usual way to be protruded or withdrawn at proper times to take or to release sheets. On further movement of the parts from the positions shown, grippers 68 open, rods 72 strip the sheets from cylinder 10 which sheets are then run out by tapes 70. The end of the half sheet caught by pins 63 is carried up and the end of web W is caught on said pins. At the time knife 62 cuts the same, the rear end of the half sheet on pins 63 extends over and beyond creaser 65, and is therefore folded or creased when the full length sheet is. In other words, the distance from knife 62 to creaser 65 is less than the length of a half sheet, the half sheets coming close to or against the knife 62. The same is true of the knife 55 and creaser 58. The end of web X is taken downward by pins 85. Creaser 58 folds the half sheet in with the web Z, the grippers 61 closing on the fold and retaining the same in a well known manner. As grippers 61 move down, pins 56 are withdrawn. Next, the knife 55 passes cylinder 19 by means of groove 84, and pins 56 take the end of the half sheet, pins 85 being simultaneously withdrawn. At the same time creaser 65 and cutter 86 pass each other and the opposing cylinders, creaser 65 entering groove 87 and cutter 86 entering groove 64 in so doing. Next, grippers 61 open to release and grippers 77 close to take the sheets on cylinder 30 as they pass each other. At the same time pins 63 are carrying the ends of web W and the half sheet downward, and knife 82 is cutting a half sheet from web X, the pins 89 taking the end of the web, and pins 56 having the leading end of the half sheet. Pins 89 subsequently deliver the end of the web X to pins 63 in the usual manner. Pins 63 withdraw to release the sheets about the time grippers 68 have tautened the same.

In Fig. 2 is illustrated the manner in which the creaser 58 and knife 82 pass each other

and the opposing cylinders at the same time. The manner is the same as that in which two teeth of meshing gears pass each other. It will thus be seen that the placing of the
 5 creasers 58, 65, following the respective cutters 55, 62, at less than a semi-circumference of the cylinders 29, 9, serves a double purpose; to wit, the creasing in of the half sheets and the passing of blades on opposing cylinders.

The grippers, pins, &c., are operated at the described times by suitable cams (not shown).

The subject-matter of this application is shown and described, but is not specifically
 15 claimed in a prior application by me, filed November 12, 1891, Serial No. 411,666.

The cutting blades on the cylinders 19, 20, may be removable for the purpose of associating web X with either of the other webs, and
 20 cutting full length sheets therefrom, as by cylinders 9, 20, or 19, 29. The sheets, after being creased by the cylinders 9, 10 and 29, 30, may be folded along said creases subsequently by suitable means other than those
 25 shown and described.

Having thus fully and clearly described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of two main printing
 30 machines adapted to perfect a web each, a pair of sheet-severing and folding cylinders for each of said main machines cutting full length sheets from said webs, a supplemental printing machine adapted to perfect a web,
 35 a pair of cutting and transfer cylinders for severing half length sheets from the supplemental web, one of said transfer cylinders being adjacent one of the folding and cutting cylinders of one of said pairs, the other
 40 transfer cylinder being adjacent one of the cylinders of the other of said pairs, substantially as and for the purposes described.

2. The combination of two main printing machines adapted to perfect a web each, a
 45 pair of cutting and folding cylinders for each of said main machines, one of said cylinders having oppositely placed cutting and creasing blades, and a groove adjacent one of said blades, the other having grooves for co-action
 50 with said blades and sheet retainers adjacent one of said grooves, said cylinders cutting full length sheets from said webs, a supplemental printing machine adapted to perfect a web, and a pair of cutting and transfer
 55 cylinders for severing half length sheets from said web and carrying them alternately to said pairs of folding cylinders, there being

a groove adjacent and one opposite each cutting blade of said transfer cylinders, one of said transfer cylinders being adjacent one of
 60 the cylinders of one of said cutting pairs, the other being adjacent one of the cylinders of the other of said pairs, whereby opposing blades pass each other and the adjacent cylinders, substantially as and for the purposes
 65 described.

3. The combination of cutting and creasing cylinders one of which carries the cutter and the creaser blades and has a groove adjacent
 70 one of said blades, and a second set of cutting cylinders one of which adjoins said cutting and creasing cylinder and carries a cutter blade and has grooves to receive the creasing and cutting blades first named as they
 75 pass, substantially as described.

4. The combination with cutting and folding cylinders, one having cutting and creasing blades, said creaser being located at a distance less than the length of a half sheet following said cutter, sheet retainers adjacent
 80 and following said cutter, of means supplying half length sheets to said retainers, and means folding the sheets along the crease whereby said half length sheets are creased with the sheets cut off by said cylinders, substantially
 85 as described.

5. The combination with two pairs of cutting and folding cylinders, one cylinder of each pair having a cutter and a creaser blade, said creaser following said cutters at a distance less than half-sheet length, sheet
 90 retainers adjacent and following said cutter, and a groove adjacent and following said creaser, of a pair of cutting and transfer cylinders each having a cutter blade, a groove adjacent and preceding said cutter, a cutting
 95 groove opposite said cutter and sheet retainers, one of said transfer cylinders being adjacent the male cutting cylinder of one of said pairs, and the other transfer cylinder being
 100 adjacent the male cylinder of the other pair, whereby the half sheets are creased with the sheets cut off by said cutting and folding pairs, and the blades of opposing cylinders pass each other and the opposing cylinders,
 105 substantially as described.

Signed at New York, in the county of New York and State of New York, this 24th day of December, A. D. 1891.

WALTER SCOTT.

Witnesses:

ISAAC N. FALK,
 R. W. BARKLEY.