

No. 867,778.

PATENTED OCT. 8, 1907.

J. F. AMES.
PRINTING PRESS.
APPLICATION FILED MAY 29, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

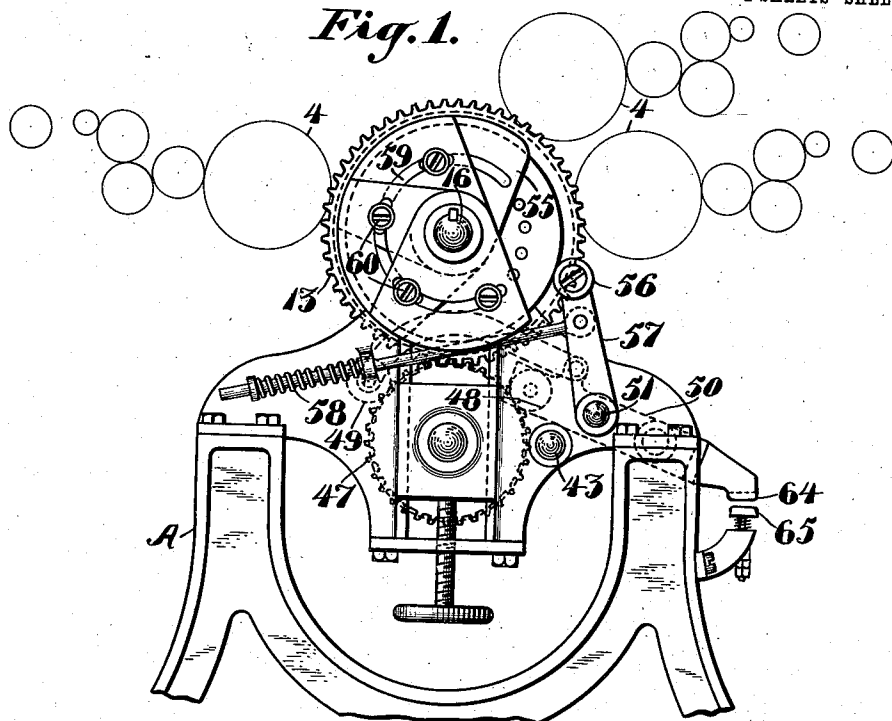
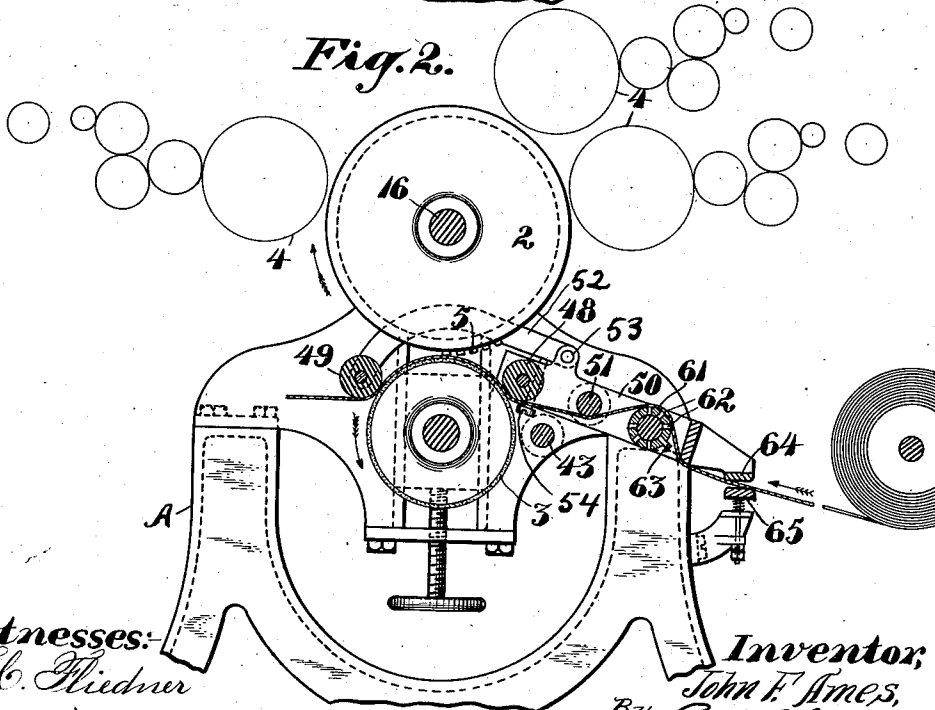


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

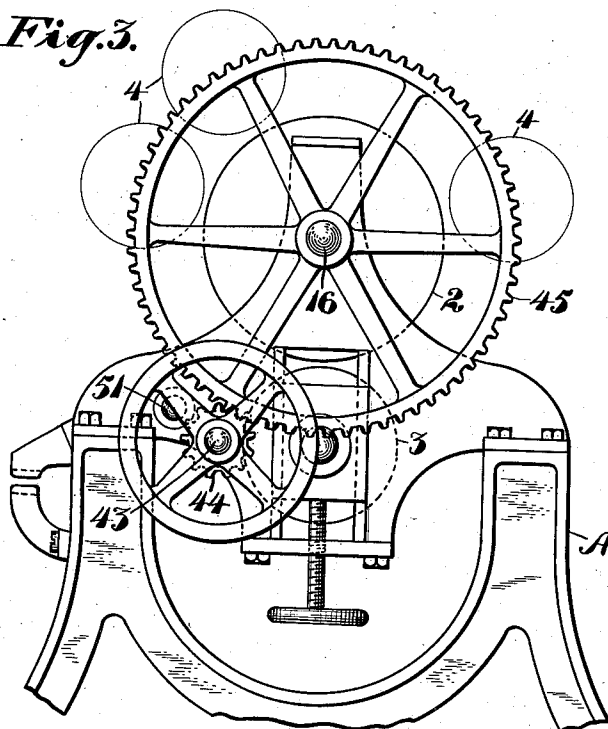
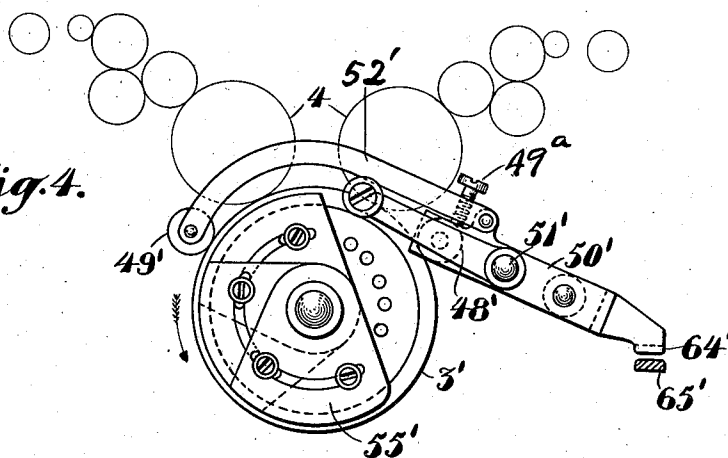


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN FREEMAN AMES, OF PORTLAND, OREGON.

PRINTING-PRESS.

No. 867,778.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed May 29, 1906. Serial No. 319,336.

To all whom it may concern:

Be it known that I, JOHN FREEMAN AMES, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention relates to printing presses and especially to cylinder presses for printing on fabric.

The object of the present invention is to provide a means for suitably feeding the material to the form cylinder to prevent smudge; and to provide means for readily adapting the feed of material to the press, for bags, sheets and the like of different sizes and to brands of different sizes.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the invention. Fig. 2 is a sectional view of same, partially diagrammatic. Fig. 3 is a side elevation of part of the machine from the side opposite to that shown in Fig. 1. Fig. 4 is a side elevation partially diagrammatic of a modified form of the invention.

I have shown the press as particularly adapted to printing on fabric for use in the manufacture of bags; the fabric being wound on a roll, fed through the press, printed at regular intervals, and, after being printed, delivered for subsequent dividing into various lengths.

A represents a suitable frame, 2 the form cylinder, carrying the type and characters by which an impression is transferred to the surfaces of the fabric to be printed on, and 3 the impression cylinder between which and the form cylinder the said fabric is adapted to be passed in order to receive the impression. The form cylinder carries all the printing matter it is desired to print.

Associated with the form cylinder are one or more ink-applying mechanisms or units 4 by which any desired number of colors may be applied to the printing surface on the form cylinder. The printed matter on cylinder 2, representing a form or brand, is indicated at 5.

The form cylinder is driven continuously and may be operated from any suitable source of power through shaft 43 carrying a small pinion 44 engaging the gear 45 on the cylinder shaft 16. The impression cylinder 3 is positively driven in unison with the form cylinder by the gear 13 on shaft 16 meshing gear 47 on the impression cylinder. The latter is covered with felt or other substance commonly employed for receiving the impress of the type, and this felt may be attached to the roller in any suitable manner.

The cloth, if it is desired to print on cloth, is wound as a continuous strip in a roll and is fed from the roll between the cylinder carrying the printing form and

the impression cylinder. As the two cylinders are connected by gears and move on the surface at equal speed, it will be seen that the revolution of the cylinders with the cloth between them when the printing form contacts with the impression cylinder, would operate to move the cloth forward a distance equal to the width or length of the brand. It is not desirable however to rely on the intermittent contact of the two cylinders to advance the cloth through the press, since after each impress by the form, should the cloth be allowed to come to a stand-still there would be a smudge of ink at the beginning of each contact of the form and the cloth; moreover the cloth would likely be drawn forward unevenly and result in an uneven brand on the finished bag; furthermore such intermittent action of the cloth does not advance the cloth sufficiently between each imprint to allow for borders, cutting, seams &c. of the imprinted bag blanks which are subsequently severed from the strip. So, in order to advance the cloth sufficiently before and after each impression, and overcome smudging, I provide means to feed the cloth prior to and subsequent to each imprinting operation and at a unison speed with that of the form cylinder and by means independent of the frictional contact of the form and impression cylinders. On opposite sides of the impression cylinder 3 are the rollers 48—49, Fig. 2. Roller 48 is journaled in arms 50 locked to the rock-shaft 51. Roller 49 is journaled in the arms 52 which are pivoted to arms 50 at 53. By means of set screws 54 the two rollers are adjusted so as both to contact simultaneously with, and with equal pressure on the impression cylinder 3: the one roller to bear on the cloth before it passes beneath and to feed it to the type-form, the other to bear on the cloth after it has passed the form and to aid in stripping the cloth from the form and prevent its following the form cylinder around. These rollers 48—49 are of sufficient weight that when they rest on the cloth which is supported on the impression cylinder, the cloth will be fed forward at the same rate of speed at which the form cylinder revolves since the latter and the impression cylinder turn in unison through the engagement of the gears 13—47 as described. This contact of the rolls 48—49 with the impression cylinder is periodic and is regulated according to the width of the bag blank; for small bags it is less, while for large bags it is more and their contact with the impression cylinder is such that the cloth is set in motion long enough ahead of the contact of the type form with the cloth and is prolonged sufficiently after the type form leaves the cloth to prevent smudging and to advance the cloth the required bag blank distance. This intermittent contact of the feed rollers with the impression cylinder to so feed the cloth as thus described, is effected through the medium of an adjustable and expandible cam 55 on shaft 16 periodically engaging a

roller 56, on an arm 57 keyed to rock shaft 51. Roller 56 is pressed always into the path of the cam through the agency of spring 58.

Cam 55 is important since it is circumferentially extendible or contractible by reason of the pivoted concentric sectors composing it, to offer a more or less extended contact surface to roller 56. The several sectors are slotted as at 59 and are adapted to be locked in suitable mutual relation by the lock screws or bolts 60.

The size of the cam is commensurate with the maximum and minimum sizes of the different bags to be printed. In actual practice I have adapted a press to print a continuous length of cloth to be cut into individual blanks for small salt sacks, and also to print with the utmost precision a strip to be subdivided after printing into blanks for 50 lb. flour sacks. By opening out the cam sectors, the period of contact with roller 56 is prolonged to cause the feed roller to remain out of contact a corresponding length of time with the constantly revolving impression cylinder. By closing up the cam sectors the operation of the feed roller is lengthened and hence a greater quantity of cloth is run through the press during and between each revolution of the form cylinder. Obviously with the press running at a constant rate of speed, the period that the cloth would remain at rest between each impression for a small bag would be greater than for a large bag.

In my structure the feed roller can be set, by adjusting the sectors of the cam properly, so as to cause the feed roller to contact regularly at any desired place on the periphery of the impression cylinder. The importance and the reason of this function of variable-ness, as I term it, will be apparent shortly.

My invention is for feeding a web to be printed with a large or small brand at regular intervals and which web is subsequently to be cut into desired lengths: to accomplish this purpose, I use in conjunction with the feed roll the expansible cam which is not only adjustable to permit of longer or shorter lengths of material being fed into the machine, but it is also variable in that the cam sectors can be so changed or arranged, or turned on their pivots, as to alter the point of contact of the feed roll with the impression cylinder. The ability to make the variation in the point of contact is absolutely essential to the successful operation of the mechanism. It is obvious that if the cam was fixed on the shaft and the time and point of contact of the feed roll with the impression cylinder were always the same, it would be impossible when printing and feeding a continuous web, to adjust the printing to its proper position since no two brands would be exactly the same dimensions and the border at each side of the printed matter would not always be the same. By having a cam made up of movable sectors, I can vary the relative points of contact of the form and impression cylinders in such fashion as to insure the right size border irrespective of the size of the brand.

The imprint is given by the form cylinder at some time before the beginning and after the end of the contact of the cam with the roller 56 although that is not so important as that the engagement of the form with the cloth should be subsequent to the starting in motion of the cloth so as to prevent smudge as before stated.

In order to properly direct the web into position be-

tween the cylinders and in line with the printing form, the arms 50 are connected at the rear by a cross bar 61 having a series of holes 62 for the receipt of the guide pins 63 which can be separated more or less or shifted from side to side according to the width of the strip and the relative location of the brand on the form cylinder.

Having set the web and its roll in motion in the feeding operation, it is desirable to check the further progress of the web between the type and impression cylinder as soon as the rollers 48—49 are lifted. Otherwise there is a tendency for the web to continue in motion after the feed should stop, by reason of the momentum given to it with the result that the brands will not be imprinted at uniform or proper distances apart. I have therefore provided the rear ends of the arms 50 with a clamp bar 64 which is adapted to cooperate with the stationary cross bar 65 to grip the web each time the feed is interrupted. When the feed roller 48 is out of contact with the impression cylinder, the bars 64—65 are engaged with the web and the latter is positively held against movement. When the roller 48 engages the impression cylinder, the clamp bars 64—65 are separated to release the web and the same can feed forward. This engagement of the web by the grippers 64—65 on the feed side of the cylinders, or in other words the arresting of the progress of the imprinted portion of the web, is quite different from checking the progress of the web on the delivery side of the cylinders or after the web has been printed. In the latter case there is nothing to prevent the web bunching up between the stop means and the cylinders; it is liable, if not certain, to result in the brands either going on crooked or in their not being properly spaced.

In Fig. 4 is indicated a modification of my feeding arrangement adapted to a press of the type commonly used for printing cloth or other material in colors. Usually the separate sections or sheets are fed in singly by hand. I have shown how it is possible to adapt my device to feed automatically a continuous web of any sort of fabric to a press of this description and print the same at regular intervals. Usually the impression cylinder of this type of press is from two to three times the size of the form cylinders, and the latter with their several ink applying devices are arranged circumferentially of the impression cylinder; the separate pieces to be printed being held by grippers on the impression cylinder. In my rearrangement of a press of this type, I do not use these grippers but employ a feed roller 48' having a movement to and from the impression cylinder to grip the web periodically and positively feed the same forward. This feed roller is operated in the same manner as first described. I may employ a stripping roller 49' and the web gripping means 64'—65'. The adjustable cam 55' is now placed on the impression cylinder shaft and operates a crank arm 57' which rocks the shaft 51', which latter carries the arms 50' in which the feed roller 48' is journaled. A spring similar to spring 58 of Fig. 1, but which is not shown in Fig. 4, acts to hold the feed roller normally to the impression cylinder. The stripping roller 49' is adjustably carried by the arms 50' and the gripper 64' operates alternately with the feed roller to arrest positively the advance of the imprinted web to the cylinders. The adjustment of the stripping roller 49' is effected by means of the set screw 49^a as plainly shown in Fig. 4. Thus it will be seen

that by my particular combination of form cylinder, an impression cylinder and a feed device movable to and from the impression cylinder, I am able to apply my invention to a great variety of presses already in use.

5 It is possible that various changes and modifications may be made in my invention without departing from the principle thereof and I do not wish to be understood as limiting myself to the specific construction nor the specific uses therein described.

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

1. In a printing-press, the combination with a form cylinder, of an impression cylinder, means for feeding a continuous strip of material to be printed between the form cylinder and said impression cylinder independent of the contact of the two cylinders, and grip means acting prior to the entry of the unprinted portion of the material between the cylinders and alternately with said feeding means to arrest the progress of the material.

2. In a printing-press, the combination with the form cylinder, of an impression cylinder, and variable and adjustable means for intermittently feeding a continuous strip of material between said cylinders, said feed means including a roller movable to and from one of said cylinders.

3. In a printing-press, the combination of continuously operating form and impression cylinders, of adjustable means operated by said cylinders for feeding material intermittently thereto, said adjustable means including a roller movable to and from the impression cylinder.

4. In a printing press, the combination with the form and impression cylinders, of means for operating them continuously, means including a roller movable to and from the impression cylinder for feeding material intermittently to said cylinder, and means for adjusting the feed of the material to the size of the brand and the desired border around the brand on the material to be printed.

5. In a printing-press, the combination with constantly rotating form and impression cylinders, of means operating in unison with the cylinders and including a roller movable to and from the impression cylinder to intermittently feed material thereto, and means including an expansible cam for varying the amount of this feed independent of the rotation of the cylinders.

6. In a printing-press, the combination with form and impression cylinders, of means including a roller movable to and from one of said cylinders and operating in unison therewith to feed material thereto, and means for varying the amount of feed independent of the speed of the cylinders.

7. In a printing-press, the combination with form and impression cylinders, of means operating in unison therewith to feed material intermittently thereto, and means for varying the amount of feed independent of the speed of the cylinders, said last named means including a circumferentially expansible cam.

8. In a printing press, the combination with form and impression cylinders between which a continuous strip of fabric is adapted to be passed, of means for operating the cylinders continuously, means engaging the entire width of the strip of fabric and independent of the contact of the form and impression cylinders to advance the strip step by step, and means for varying the length of feed of said strip.

9. In a printing-press, the combination with the form and impression cylinders, of a feed roller movable to and from the impression cylinder and contacting therewith periodically to advance material between the cylinders and means for varying the interval between the said periods of contact.

10. In a printing press, the combination with the form and impression cylinders, of a feed roller movable to and from the impression cylinder and contacting therewith periodically to advance material between the cylinders and means for varying the interval between the said periods of contact, said last named means comprising an expansible cam.

11. In a printing-press, the combination with the form

and impression cylinders, of a feed roller, an oscillating support for said roller, said roller arranged to contact with the impression cylinder to advance material between the two cylinders, and means for operating the said oscillating support and means for varying the point of contact and also the period of contact of said roller with the impression cylinder.

12. In a printing-press, the combination with the form and impression cylinders of a feed roller, an oscillating support for said roller, said roller arranged to contact with the impression cylinder to advance material between the two cylinders and means for operating the said oscillating support, said last named means including an expansible cam.

13. In a printing-press, the combination with the form and impression cylinders, of a feed roller, an oscillating support for said roller, said roller adjustably mounted on said oscillating support and arranged to contact with the impression cylinder to advance material between the two cylinders, means for operating the said oscillating support, said last named means including an expansible cam, and said oscillating support provided with means for guiding the material between the cylinders.

14. In a printing-press, the combination with the form and impression cylinders, of two rollers movable to and from the impression cylinder and on opposite sides of the form cylinder, and means operating conjunctively with the form cylinder to operate said rollers.

15. In a printing-press, the combination with the form and impression cylinders, of two rollers movable to and from the impression cylinder and on opposite sides of the form cylinder, and means operating conjunctively with the form cylinder to operate said rollers, said last named means including a cam on the form cylinder shaft.

16. In a printing-press, the combination of a suitable frame, form and impression cylinders, an oscillating support journaled in said frame, a roller carried by said support and movable into contact with the impression cylinder to feed material between the cylinders, a second roller carried by said support and arranged contiguous to the impression cylinder and on the opposite side of the form cylinder to strip the printed material from the form, and means to oscillate said support.

17. In a printing-press, the combination of form and impression cylinders, a movable support, two rollers carried by said support and arranged on opposite sides of the form cylinder and movable into and out of contact with the impression cylinder, and means to operate said support.

18. In a printing-press, the combination of form and impression cylinders, a movable support, two rollers carried by said support and arranged on opposite sides of the form cylinder and movable into and out of contact with the impression cylinder, and means to operate said support, said last named means including an expansible cam on the shaft of the form cylinder.

19. In a printing-press, the combination of form and impression cylinders, an oscillating support, a feed roller carried by said support and movable into and out of contact with the impression cylinder, a perforated bar carried by said support with pins fitting the perforations therein for guiding the material between the cylinders, and means operated conjunctively with the form cylinder for oscillating said support.

20. In a printing-press, the combination of form and impression cylinders, an oscillating support, a feed roller carried by said support and movable into and out of contact with the impression cylinder, a perforated bar carried by said support with pins fitting the perforations therein for guiding the material between the cylinders, and means operated conjunctively with the form cylinder for oscillating said support, and a stripping roller carried by said support and arranged proximate to the impression cylinder on the opposite side of the form cylinder.

21. In a printing-press, the combination of a form cylinder and its shaft, an impression cylinder, a feed roller, a movable support for said feed roller, an arm connected with said support, and a cam comprising a plurality of adjustable sectors on the form cylinder shaft engageable with said arm to operate said feed roller.

22. In a printing-press, the combination of a form cylinder and its shaft, an impression cylinder, a feed roller, a movable support for said feed roller, an arm connected with said support, and a cam on the form cylinder shaft engageable with said arm to operate said feed roller, and a stripping roller adjustably carried by said support and arranged on the opposite side of the impression cylinder.
23. In a printing-press, the combination of a form cylinder and its shaft, an impression cylinder, a feed roller, a movable support for said roller, a rock shaft on which said support is mounted, an arm on said rock-shaft, and an expansible cam on the form cylinder shaft engageable with said arm to operate the feed roller.
24. In a printing-press, the combination of a form cylinder and shaft, of an impression cylinder, a feed roller, a movable support for said roller, a rock shaft on which said support is mounted, an arm on said rock-shaft, and an expansible cam on the form cylinder shaft engageable with said arm to operate the feed roller, and a stripping roller pivotally and adjustably mounted on said feed roller support and arranged on the opposite side of the impression cylinder.
25. In a printing-press, the combination with form and impression cylinders of a feed roller arranged to contact with the impression cylinder, means for moving said roller to and from said cylinder synchronously with the revolution of the form cylinder, and a stripping roller on the other side of the impression cylinder movable in unison with said feed roller.
26. In a printing-press, the combination with the form and impression cylinders, of a feed roller, an oscillating support for said roller, said roller arranged to contact with the impression cylinder to advance material between the two cylinders, means for operating the said oscillating support, and a stripping roller adjustably connected with said support and movable in unison with the feed roller.
27. In a printing-press, the combination with form and impression cylinders of a feed roller arranged to contact with the impression cylinder, means for moving said roller to and from said cylinder synchronously with the revolution of the form cylinder, and grip mechanism operated alternately with the feed roller for checking the movement of the material.
28. In a printing-press, the combination with form and impression cylinders of a feed roller arranged to contact with the impression cylinder, means for moving said roller to and from said cylinder synchronously with the revolution of the form cylinder, grip mechanism operated alternately with the feed roller for checking the movement of the material, and means including an expansible cam for operating said feeding and gripping means.
29. In a web printing press, the combination with the form and impression cylinders, of a feed device movable to and from the impression cylinder and co-acting with said impression cylinder to grip the web between said device and said impression cylinder to feed the web positively to the cylinders and means including an expansible cam to operate said feed device.
30. In a web printing press, the combination with the form and impression cylinders, of a feed device movable to and from the impression cylinder and co-acting with said impression cylinder to grip the web between said device and said impression cylinder to feed the web positively to the cylinders, and means for varying the period of contact of said device with said impression cylinder to permit longer or shorter lengths of web to be fed to the cylinders.
31. The combination with form and impression cylinders, of a feed roller movable to and from one of said cylinders to feed material between said cylinders, and means alternating with the action of said feed roller to arrest the feed of the imprinted portion of the web to the cylinders.
32. In a web printing press, the combination with the form and impression cylinders, of a feed device movable to and from the impression cylinder and co-acting with said impression cylinder to grip the web between said device and said impression cylinder to feed the web positively to the cylinders, and intermittently actuated means operating prior to the entry of the unprinted part of the web between the cylinders to arrest the feed of the web.
33. In a web printing press, the combination with the form and impression cylinders, and means to convey the web intermittently therebetween, of a gripping device acting on the web for positively checking the forward movement of the web between each imprinting operation said gripping device positioned to grip the web prior to its entry between the form and impression cylinders, and means to operate it alternately with said web conveying means.
34. The combination with a web printing press, and means for feeding the web intermittently, of a gripping device acting on the web alternately with the imprinting operations to arrest the movement of the web said gripping device comprising two coacting jaw members positioned to engage the web prior to its being imprinted,—one of said jaw members being yieldingly supported, and means to move the other jaw member towards and from the first.
35. The combination with a web printing press, and means for feeding the web intermittently, of a gripping device acting on the web alternately with the imprinting operations to arrest the movement of the web, and means including an expansible cam for operating said gripping device said gripping device comprising two coacting jaws, one of said jaws being yieldingly supported and the other mounted on a rockable support.
36. In a web printing press, the combination of form and impression cylinders, means for feeding a web intermittently, a gripping device acting on the web to arrest its movement, and an expansible cam on the shaft of one of said cylinders to operate said gripping device said gripping device comprising two coacting jaws, one of said jaws yieldingly supported and the other mounted on a rockable support.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN FREEMAN AMES.

Witnesses:

FRANK STONE,
KENT M. AUSTIN.