(No Model.) 2 Sheets—Sheet 1.

R. J. FINLEY.

METHOD OF PRINTING ILLUSTRATED LETTER PRESS.

No. 543,766. Patented July 30, 1895.

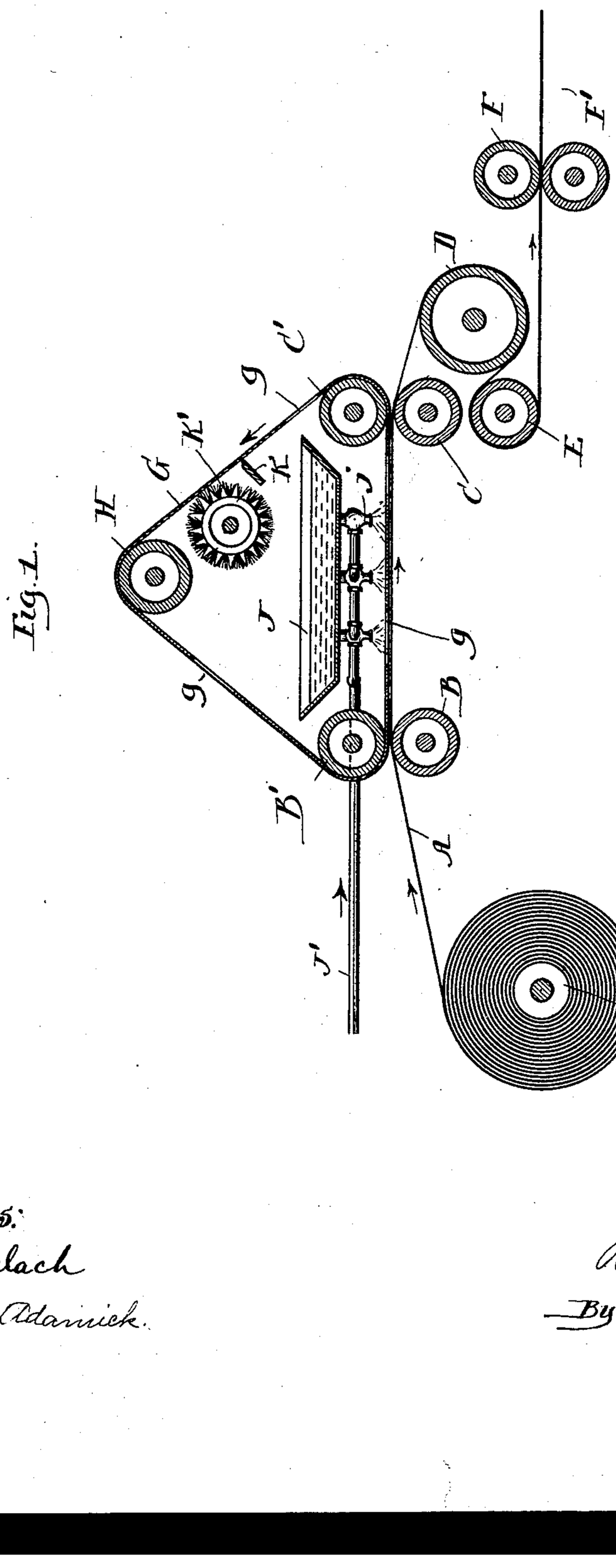

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

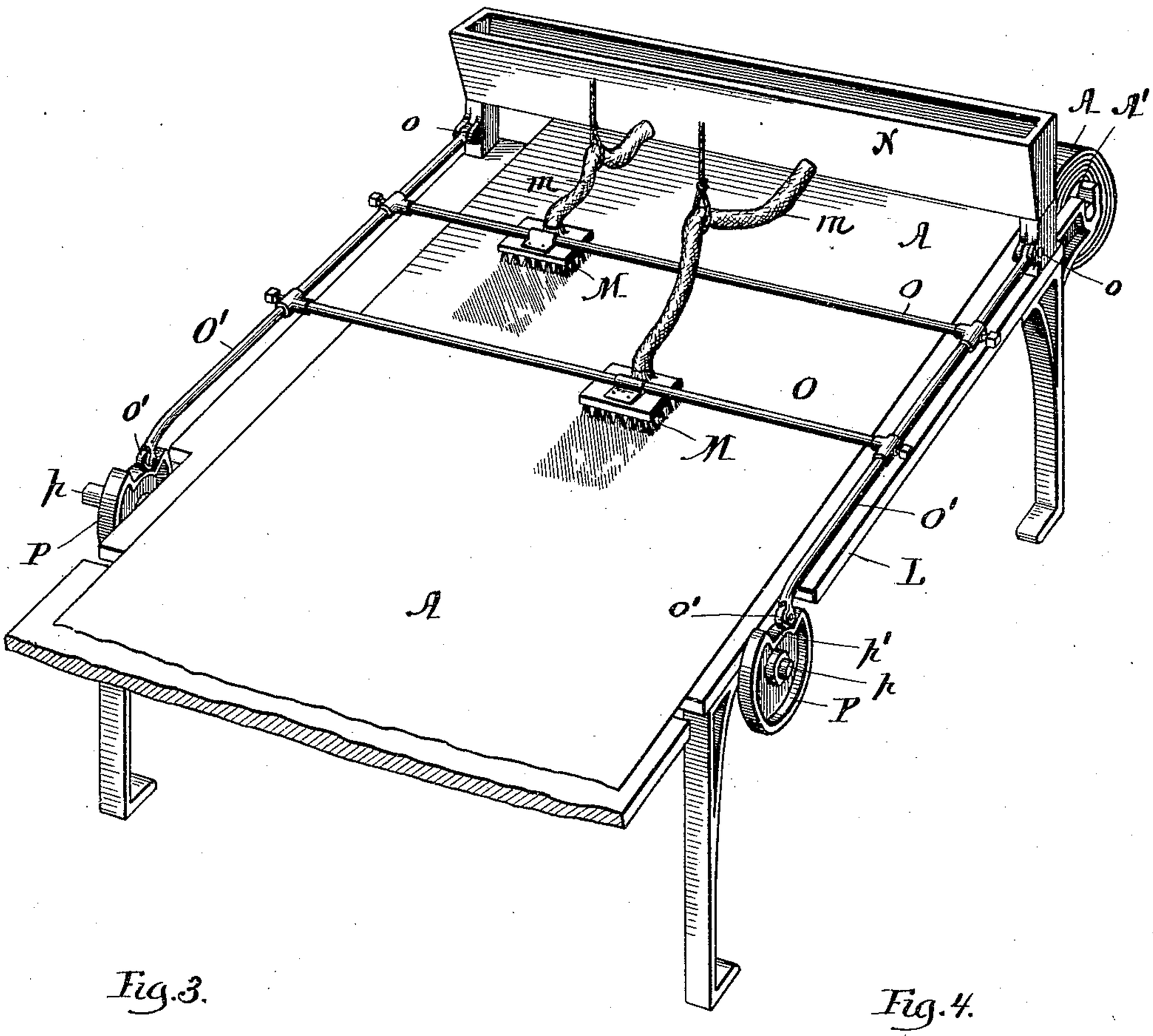


Fig. 3.

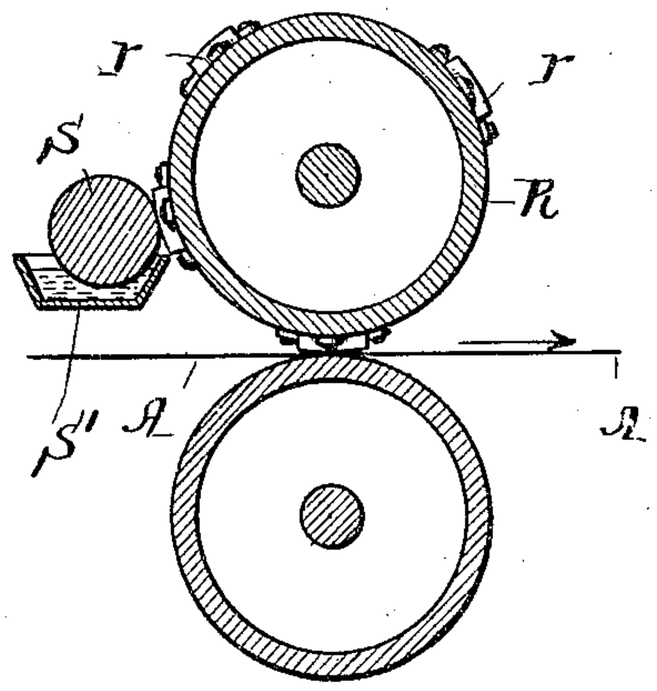
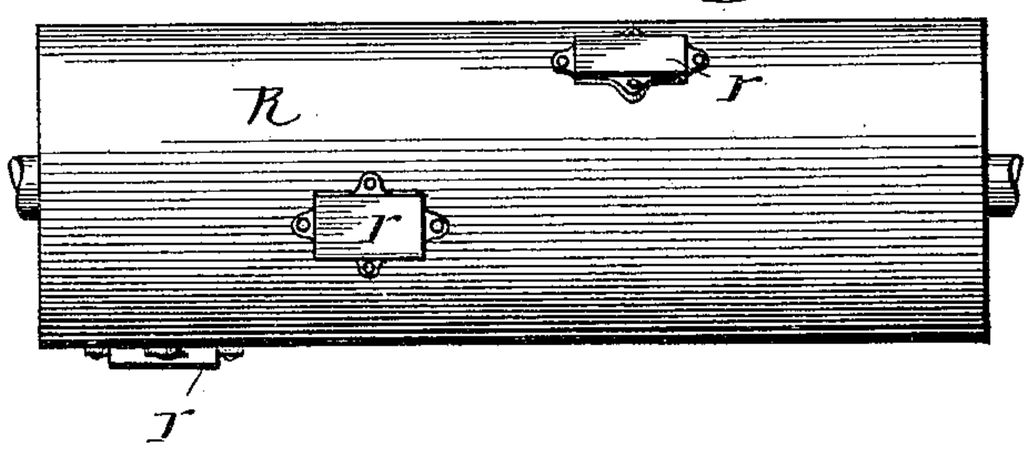


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT J. FINLEY, OF NEW YORK, N. Y.

METHOD OF PRINTING ILLUSTRATED LETTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 543,766, dated July 30, 1895.

Application filed May 28, 1894. Renewed July 5, 1895. Serial No. 555,029. (No specimens.)

To all whom it may concern:

Be it known that I, ROBERT J. FINLEY, a citizen of the United States, residing at New York, New York county, State of New York, have invented certain new and useful Improvements in the Methods of Printing Illustrated Letter-Press, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

In the printing of illustrated letter-press—such, for example, as periodicals, books, or like works in which the letter-press is interspersed with illustrations, such as "half-tone" engravings, wood-cuts, or the like—it has been found that a paper of sufficiently good quality and surface to receive the impression of the letter-press will not serve to give satisfactory reproduction from the cuts or engravings. It is customary, therefore, in the finer classes of work to employ a superior quality—that is to say, paper with a smoother or more polished surface—for taking the impressions from all type-forms in the make-up of which engravings or cuts are included. This, however, is objectionable, first, because it necessitates the use of a large amount of high-grade and expensive paper for a large part of the letter-press for which a lower grade of paper would answer quite as well; second, because it makes a variation in the leaves of the book and thus detracts from its appearance, and, third, because the smooth-surfaced paper required for fine cut printing is not so satisfactory for the letter-press as a rough-surfaced paper, a glossy paper being considered to be injurious to the eyes of the reader.

My present invention has for its object primarily to provide an improved method whereby illustrated letter-press can be printed upon paper such as would be ordinarily regarded as suitable for the letter-press alone, but as unsuitable for receiving the impressions from the engravings or cuts.

To this end my invention consists in imparting a smoother surface or finish to those special parts of the web or sheets of paper that are predeterminately selected to receive the impress of the illustrations, and thereafter simultaneously printing upon the web or sheet both the illustrations and the letter-press.

While it is possible in the practice of the broad feature of my invention to render the definitely-selected portions of the web or sheet of paper smoother or more polished in a variety of ways, I prefer to effect this object by applying to such selected portions of the sheet or web a coating of suitable material adapted to impart to such portions a smoother surface or finish than the remaining and uncoated portions of the web or sheet.

My invention therefore consists, further, in imparting a smooth surface or finish to those special parts of the web or sheets of paper that are predeterminately selected to receive the impress of the illustrations by applying to such special parts of the web or sheets a suitable coating of material adapted to impart to such portions of the web or sheets a smooth surface or finish.

In the accompanying drawings I have illustrated several forms of apparatus whereby my invention may be practiced, it being understood, of course, that the coated paper will be thereafter presented in proper manner to any suitable construction of press by which the illustrated letter-press printing is to be effected. The construction of the printing-press, however, forms no part of my invention, since the prepared web or sheet may be presented to a press of any character and either immediately after the coating has been applied and has become dry or at any subsequent time.

Figure 1 is a view in vertical section through a form of apparatus designed to effect the coating of a web of paper in definitely-selected spots and for the purpose of my invention. Fig. 2 is a perspective view of another type of machine for effecting the coating of the web or sheet of paper. Fig. 3 is a view in vertical cross-section through a pair of rollers adapted to apply the coating to those portions of the web or sheet of paper that are to receive the impression of the engravings or cuts. Fig. 4 is a plan view of the upper roller illustrated in Fig. 3.

Referring to the construction illustrated in Fig. 1 of the drawings, A designates the web of paper to be coated, this web passing in the direction of the arrow from the roll A′ over

the feed-rollers B and C, thence around the drying-rollers D and E, and thence between the calendering-rollers F and F′. Above the rollers B and C are mounted the rollers B′ and C′, around which passes the endless belt G, that passes also over the roller H. It will be understood, of course, that these various rollers will be mounted in a suitable frame and will be geared together to effect their unison movement. The belt G has formed therein a series of openings *g*, corresponding in number, size, and arrangement with the number, size, and arrangement of the engravings or cuts within the illustrated letter-press type-forms. Within the belt G, which is driven by the various rollers around which it passes, is placed a tray J, that contains a suitable material for coating those parts of the web or sheet of paper that are to receive the impression from the engravings or cuts by which the letter-press is illustrated. To the under side of this tray J are connected a series of atomizer-jets *j*, to which compressed air is delivered by a pipe J′. Hence it will be seen that as the web of paper A is fed in the direction of the arrow and beneath the perforated belt G the atomizer-jets *j* will spray a requisite amount of the coating material onto those parts of the web or sheet A that are exposed through the openings or perforations *g* of the belt G, and as these openings correspond in number and position with the parts of the web or sheet A that are to receive the impressions of the illustrations it follows that a coating of the web or sheet will be effected at such points only, while the remaining parts will be uncoated. After the coating has been thus applied by the atomizer-jets *j* to definitely-selected portions of the web or sheet A the web or sheet A will pass around the heated rollers D and E, thereby drying the coating, and will pass also between the heated calendering or polishing rollers F and F′, thereby receiving a perfectly-smooth surface or finish on the coated portions of the paper. From the rollers F F′ the web may be delivered either directly to the printing-press or may be wound upon a roller in readiness for subsequent use upon a press provided with a type-form having letter-press and illustrations arranged in correspondence with the coated and uncoated portions of the prepared web or sheet A.

In order to remove from the inner face of the belt G any coating that has adhered thereto, I prefer to provide a scraper K and a brush K′, this scraper and brush serving to clean the inner face of the belt.

Another simple form of apparatus adapted to be employed in the practice of my invention is that illustrated in Fig. 2 of the drawings. In this apparatus the web A of paper is fed from the roll A′ over the table L, above which are mounted suitable fountain brushes or pads M, whereby the coating will be applied to the definitely-selected spots or portions of the web of paper that are to receive the impressions from engravings or cuts of the illustrated letter-press. It will be understood, of course, that the web or sheet will be fed across the table L by means of rollers (not shown) corresponding to the rollers C, D, E, and F illustrated in Fig. 1 of the drawings, or by other suitable arrangement of rollers. The brushes M are connected by flexible tubes *m* with a trough N, that contains the liquid coating material to be applied to the surface of the web A, and these brushes M are adjustably mounted upon rods O, the ends of which are adjustably held upon the side rods O′, that are pivoted, as at *o*, to a fixed portion of the main frame. The free ends of the rods O′ are furnished with friction-rollers *o′*, that bear upon the rims of the cam-wheels P, these wheels being mounted upon a suitably-driven shaft *p*. The periphery of the wheel P serves to hold the arms O′ at such height that the brushes or pads M are normally out of contact with the surface of the web of paper A; but when the rollers *o′* at the ends of the arms O′ drop into the notches *p′* of the wheels P the brushes M will be allowed to come in contact with the surface of the web A and apply thereto the coating material so long as the brushes are in the depressed position. It will be seen, therefore, that the notches *p′* of the wheels P will be formed in number and arrangement corresponding with the number and position of the illustrations as they occur in the type-form, or with the pages of the type-form upon which an illustration occurs. Thus, for example, if in the make-up of the type-form there are two pages containing illustrations the brushes M (shown in Fig. 2 of the drawings) will apply the coating material to those portions of the web of paper that are to receive the impression from these illustrations, it being understood, of course, that the web A will be subsequently cut up into sheets.

It is obvious that any desired number of brushes M or pads may be employed, and the shaft *p* may be fitted with any desired number of cam-wheels P to operate upon the frames that carry the different brushes M. The brushes M can be adjusted laterally upon the rods O, and as these rods are longitudinally adjustable upon the side bars or rods O′ it is manifest that the brushes M can be caused to apply the coating at any desired point upon the web A.

In the practice of my invention any suitable coating may be employed that will impart the proper surface or finish to the parts of the web or sheet that are to receive the impression of the illustration. One suitable coating consists of a mixture of sulphate of baryta, glue, and water, enough water being mixed with the sulphate of baryta to give the coating the consistency of thin cream and the glue being added from one per cent. to five per cent. or more. Another suitable coating consists of first-quality English clay mixed with water to the consistency of cream, there being preferably added to this mixture about

one-half of one per cent. of ammonia. Another suitable coating consists of a mixture of English white clay, rice starch, and water, sufficient of the white clay being mixed with water to give the consistency of thin cream and sufficient starch being added to insure the adherence of the coating to the surface of the paper. It is manifest, however, that my invention is not restricted to the particular character of the coating that may be employed, since other suitable coatings may suggest themselves to those familiar with the manufacture of paper.

In the form of apparatus illustrated in Figs. 3 and 4 of the drawings, the coating is applied to the desired portions of the web or sheet of paper by means of a roller R, the surface of which has attached thereto raised blocks or pads *r*, corresponding in size, number, and arrangement with those parts of the type-form that include the cuts or illustrations. These pads or blocks *r* have the liquid coating applied thereto by a roller S, that revolves within a trough S′, containing the coating material. The sheet or web of paper is fed by suitable rollers between the roller R and the roller R′, and by means of these rollers the coating material is applied to the web or sheet in predetermined spots by means of the blocks or pads *r*.

Other suitable forms of apparatus may be employed in carrying out my invention; but I have not deemed it necessary to illustrate these.

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

1. That improvement in the art of printing from a composite form made up of type-matter and variably distributed illustration cuts requiring a different surface from the type-matter which improvement consists in preparing a finished web or sheet of paper not suitable for the desired printing of such cuts, by treating the paper at arbitrary parts predeterminately selected in keeping with the variant distribution in the form of the cut or cuts and thereafter simultaneously presenting both the type-matter and cuts to the said sheet or web, substantially as described.

2. That improvement in the art of printing from a composite form made up of type-matter and variably distributed illustration cuts requiring a different surface from the type-matter which improvement consists in preparing a finished web or sheet of paper not suitable for the desired printing of such cuts, by coating the paper at arbitrary parts predeterminately selected in keeping with the variant distribution in the form of the cut or cuts and thereafter simultaneously presenting both the type-matter and cuts to the said sheet or web, substantially as described.

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