No. 751,947. PATENTED FEB. 9, 1904.

E. SCHOENING.

METHOD OF PRINTING.

APPLICATION FILED AUG. 28, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

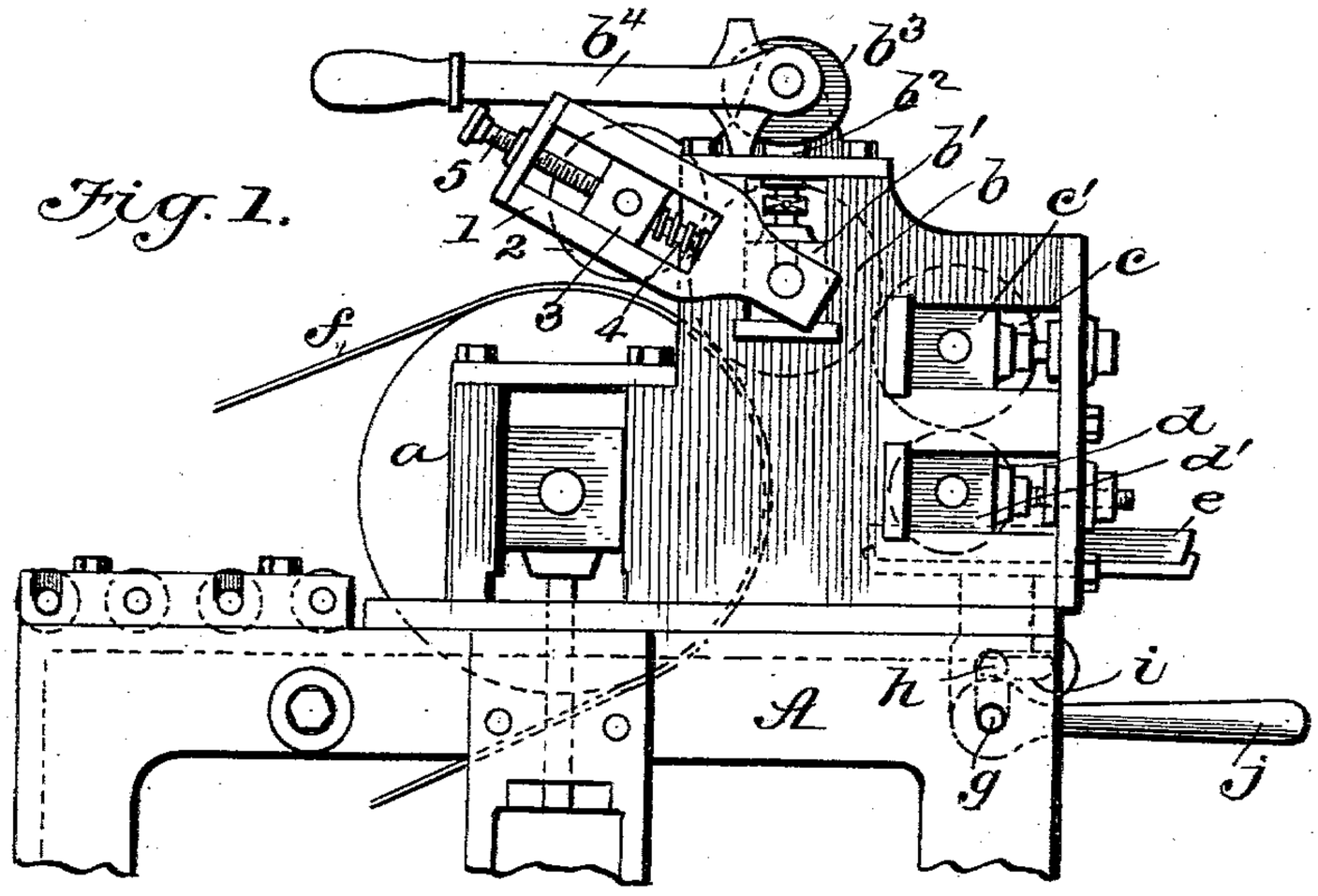
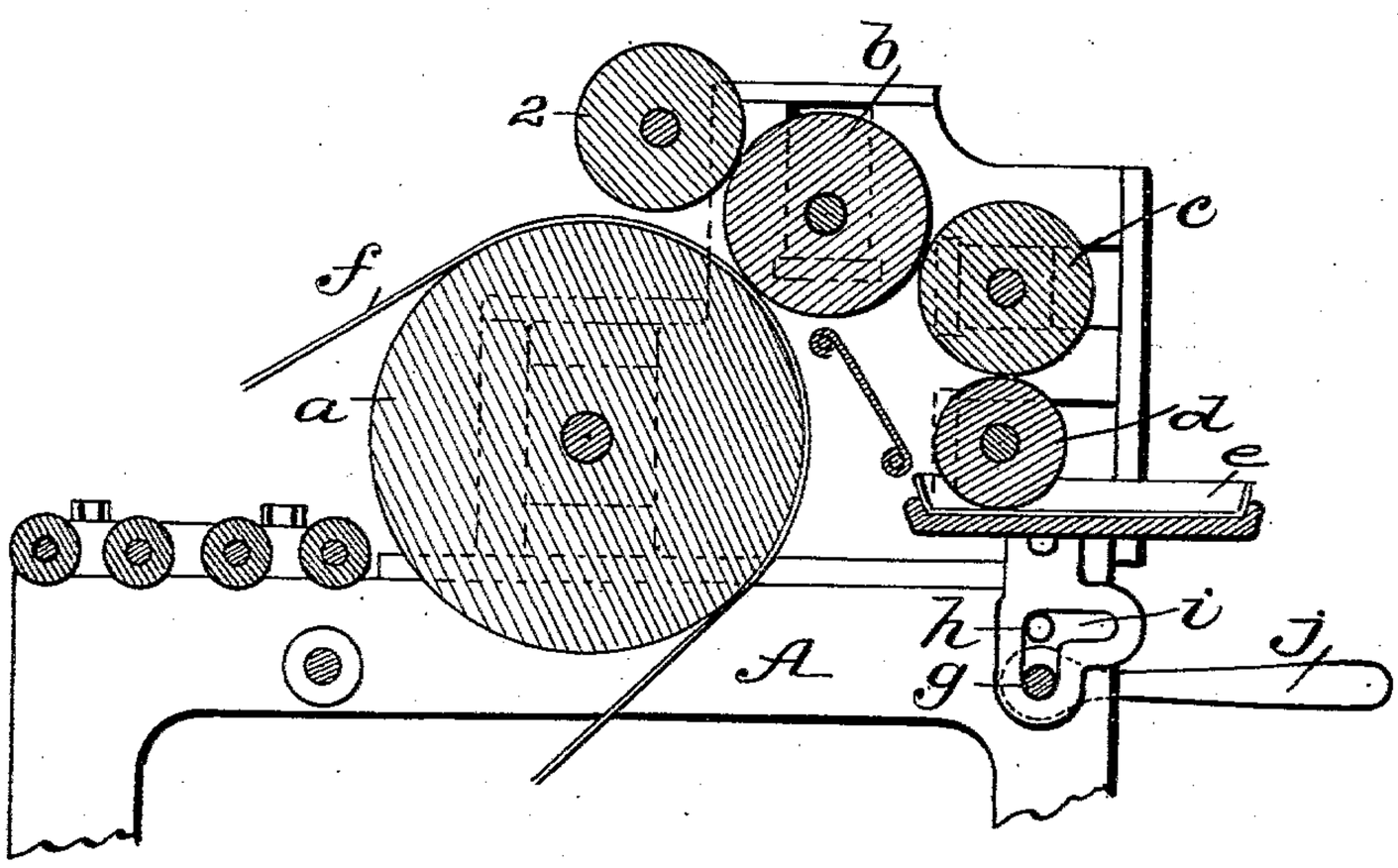


Fig. 2.



WITNESSES:

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No. 751,947. PATENTED FEB. 9, 1904.

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METHOD OF PRINTING.

APPLICATION FILED AUG. 28, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

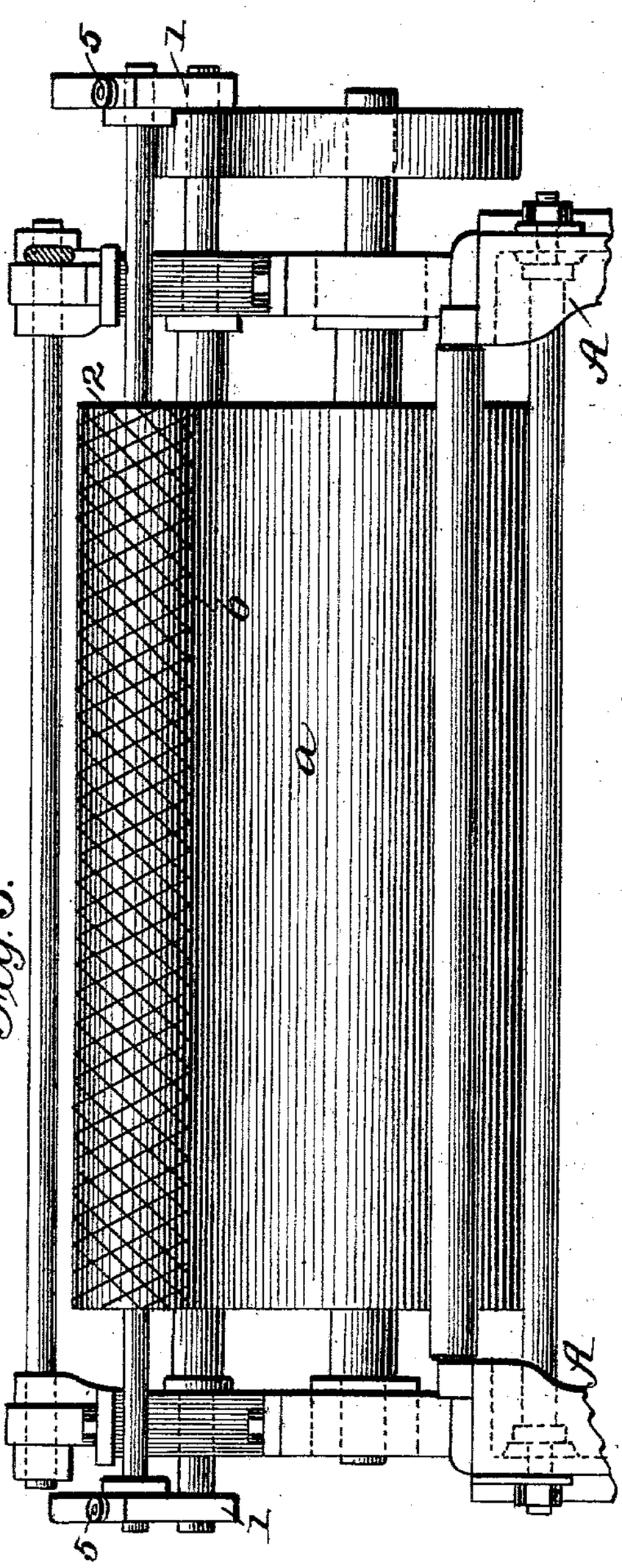


Fig. 5.

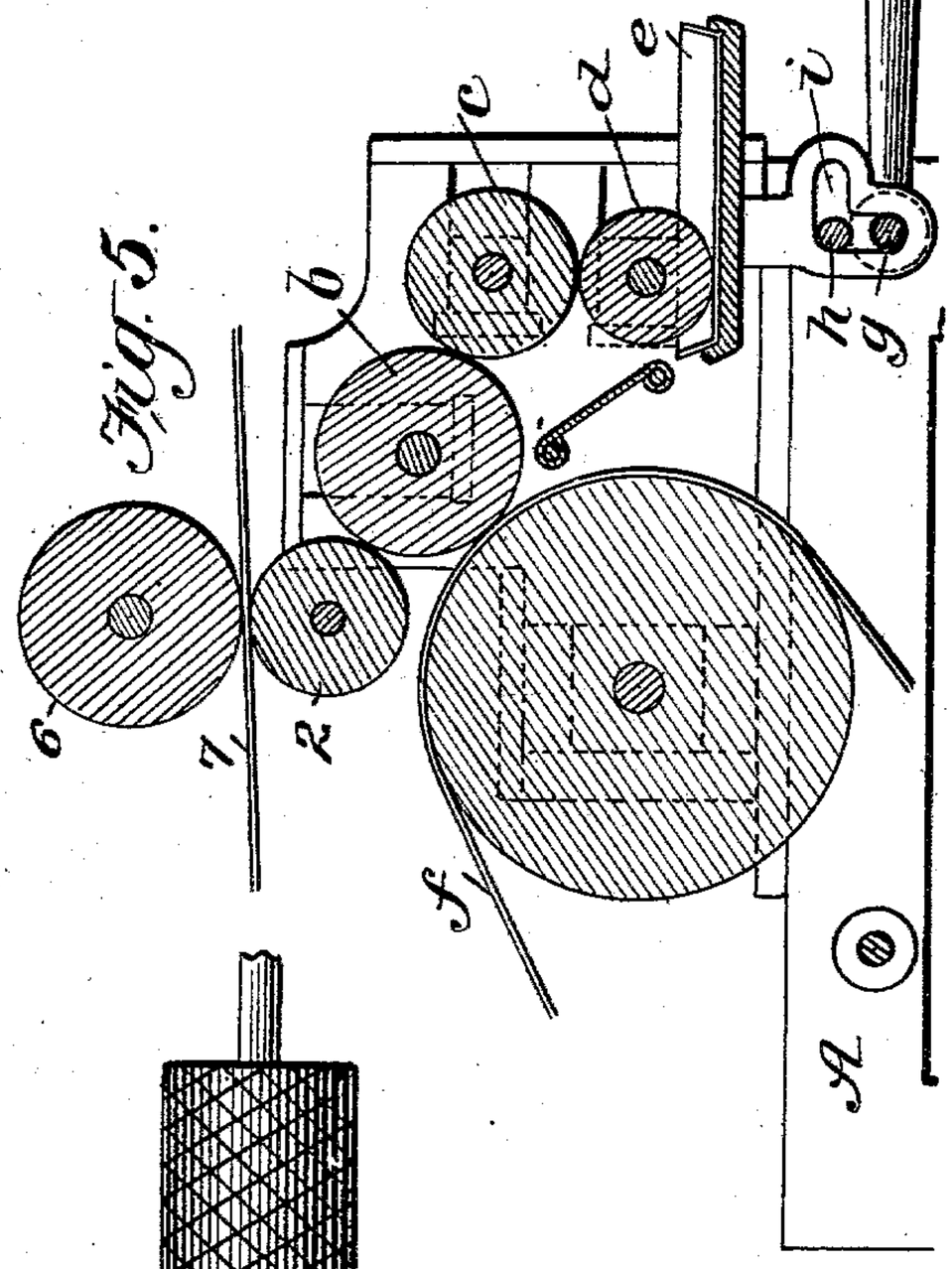
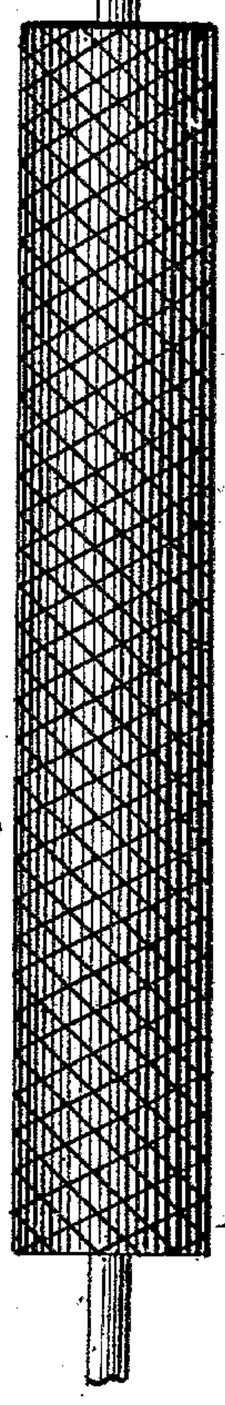


Fig. 4.



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No. 751,947. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

EDUARD SCHOENING, OF BERLIN, GERMANY.

METHOD OF PRINTING.

SPECIFICATION forming part of Letters Patent No. 751,947, dated February 9, 1904.

Application filed August 28, 1903. Serial No. 171,030. (No model.)

To all whom it may concern:

Be it known that I, EDUARD SCHOENING, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a new and useful Improvement in Methods of Printing, of which the following is a specification.

My invention relates to a method of printing, and more particularly for printing wall-paper, first, to produce an ornamental background thereon or what is known in the art as "grounding," and, secondly, for printing thereon in various shades of the same color at one and the same operation.

The invention consists in producing a pattern in the color or ink on a printing-surface and transferring the pattern thus produced on the printing-surface to a sheet, web, or the like.

The invention also consists in subjecting the colored or inked surface of a printing-surface to impressions of a pattern-surface to wholly or partially remove the color or ink from portions of the printing-surface to produce a pattern in the color thereon, which when transferred to a sheet or web will be in two shades of the same color.

The invention further consists in applying a pattern-surface to the colored or inked surface of a printing-surface whereby to ink the pattern-surface and produce a pattern on the printing-surface and printing by the aid of the printing-surface and pattern-surface upon separate surfaces.

Reference is to be had to the accompanying drawings, forming a part of the specification, and wherein similar letters and numerals of reference indicate similar parts in all of the figures.

Figure 1 is a side elevation of a portion of a grounding-machine having my improvement applied. Fig. 2 is a sectional view of the same. Fig. 3 is a front elevation. Fig. 4 is a plan view of the printing-roller having the pattern produced in the color on its surface, and Fig. 5 is a sectional view showing the machine arranged for printing two webs at the same time.

In the drawings, which present a machine for carrying out my method and which is covered in a separate application, Serial No. 158,853, filed May 26, 1903, A is a portion of the supporting-frame; *a*, the web-bearing roller; *b*, the elastic printing-roller; *c*, the distributing-roller; *d*, the color or inking roller; *e*, the color or ink pan in which the roller *d* revolves, and *f* the web of paper fed from a feed-roller (not shown) to and over the roller *a* to receive the color from the printing-roller *b*. The web-bearing roller, the printing-roller, the distributing-roller, and the inking-roller are all operated in the usual manner.

The printing-roller *b* is mounted in adjustable bearings b', which are mounted in a movable support b^2. The support b^2 is adjusted by means of the cam b^3 and lever b^4. The distributing-roller *c* and inking-roller *d* are mounted in adjustable bearings c' d', respectively, to permit them to be adjustable with respect to the printing-roller. The ink or color pan *e* is adjusted to and from the ink or color roller *d* by means of the shaft *g*, provided with crank-arm *h*, engaging grooves *i* in the frame, the shaft *g* being operated by the handle *j*.

Mounted at each end of the frame A and attached to the support b^2 of the printing-roller *b*, so as to be adjusted therewith by the means hereinbefore described for adjusting the said support, are yokes 1. In these yokes a pattern-roller 2, having any desired pattern produced on its surface, is mounted so as to contact with the printing-roller *b*. As shown in the drawings, the pattern-roller is revolved by frictional contact with the printing-roller; but it may be operated by any other suitable means. The pattern-roller is mounted in sliding bearings 3, which rest on springs 4, and said bearings are engaged by screws 5 working in the yokes 1. By thus mounting the pattern-roller it will be yieldingly held in contact with the printing-roller *b* and can be adjusted to bear with more or less pressure upon the said roller, as circumstances may require. The closer the pattern-roller is placed to the web—that is to say, the nearer its point of contact with the printing-roller is to the point of contact of the printing-roller with the web—the more distinct will the pattern be produced upon the web of paper.

As shown in the drawings, the pattern-roller 2 has diamond-shaped figures produced thereon; but it is obvious that the pattern can be

of any other shape or design. In fact, any form of pattern-roller can be used, and even a plain wooden roller may be used with good results.

In operation the ink or color is applied to the printing-roller *b* by means of the rollers *c* and *d*, as usual, and the pattern-roller 2, contacting with the roller *b*, produces the pattern in the color on said printing-roller, and the said printing-roller then prints the pattern on the web at the point of contact of said roller with the web-carrying roller *a*. With the design of pattern-roller shown in the drawings, the diamond-shaped figures being the raised portions and the cross-lines the sunken portions, the figures or raised portions on the pattern-roller will wholly or partially remove the color from portions of the printing-roller, while none of the color will be removed by the cross-lines or sunken portions, and consequently the diamond-shaped figures produced on the web by the printing-roller will be of a very light shade, while the cross-lines will be of a shade of the full depth of coloring substance applied to the printing-roller.

In order to keep the pattern-roller clean and at the same time utilize the color removed from the printing-roller by the pattern-roller in producing the pattern on the printing-roller for printing the first web, I arrange above the pattern-roller a roller 6. Between this roller and the pattern-roller a second web 7 is passed, as shown in Fig. 5, so that the pattern-roller prints upon this second web a pattern the reverse of that produced on the first web.

Instead of transferring the color removed by the pattern-roller from the printing-roller direct to this second web the color may be transferred to another printing-roller having color-applying devices, so that by employing and very lightly applying a different color from that employed for printing the first web a figured pattern in varied colors can be produced on this second web. The same result can be produced by previously coating the second web with a different color. By this latter arrangement it will be seen that I am enabled not only to print two webs at the same time, but that I employ the pattern-roller for printing the second web and utilize the color removed by it from the printing-roller in producing the pattern thereon for the first web.

While I have shown a printing-roller and a pattern-roller, yet it is obvious that the invention could be carried out equally as well by employing printing and pattern surfaces in the form of plates. An elastic printing roller or surface is also not absolutely necessary to the successful carrying out of the invention. I have found out by actual tests that good results can be obtained by the employment of a pattern roller or surface in connection with a plain hard printing roller or surface; but when such printing-surface is used to obtain good results the web-bearing roller should be elastic.

When a plain wooden pattern-roller is employed, the roller by contacting with the printing-roller impresses the grain of the wood on the printing-roller by removing the color from the same corresponding to the grain, and the printing-roller transfers the grain-figuring to the web, the same as hereinbefore described. It will thus be seen that by employing wooden pattern-rollers I am enabled to produce different patterns by simply using different kinds of wood.

While I have shown a pattern-surface having a single pattern thereon, yet it may contain several patterns, and instead of a single pattern-surface a plurality of pattern-surfaces having the same or different patterns can be employed. By employing a plurality of pattern-surfaces all combining to produce the desired pattern and causing them to bear with different degrees of pressure upon the printing-surface a pattern in more than two shades of the same color can be produced.

The amount of color removed from the printing-roller by the pattern-rollers can be varied to vary the pattern by variations in the structural arrangement of the surfaces of the pattern-rollers and in the pressure with which they bear against the printing-roller.

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

1. The method herein described of printing, consisting in applying a color to a printing-surface, producing a pattern in the color on the printing-surface, and transferring the pattern thus produced to a sheet or other surface, as set forth.

2. The method herein described of printing, consisting in applying a color to a printing-surface, wholly or partially removing the color from portions of the printing-surface to produce a pattern in the color, and transferring the pattern thus produced to a sheet or other surface, as set forth.

3. The method herein described of printing, consisting in distributing a color over a printing-surface, redistributing the color thereon to produce in the color a pattern by contacting same with a corresponding pattern-surface, and transferring the pattern thus produced directly to a sheet or other surface, as set forth.

4. The method herein described of printing, consisting in applying a color to a printing-surface, producing a pattern in the color on the printing-surface and simultaneously therewith removing a portion of the color of the pattern produced, and transferring the pattern thus produced to a sheet or other surface, as set forth.

5. The method herein described of printing, consisting in applying a color to a printing-

surface, subjecting the colored surface of the printing-surface to impressions of a pattern-surface to produce a pattern in the color on the printing-surface, and transferring the pattern thus produced to a sheet, web or the like, as set forth.

6. The method herein described of printing, consisting in applying a color to a printing-roller, producing in the color on the printing-roller a pattern, and transferring the pattern thus produced to another surface, as set forth.

7. The method herein described of printing, consisting in applying a color to an elastic printing-roller, subjecting the colored surface of the printing-roller to impressions of a pattern-roller to partially remove the color from portions of the printing-roller to produce a pattern upon the same, and transferring the pattern thus produced on the printing-roller to a sheet, web or the like, as set forth.

8. The method herein described of printing, consisting in inking a printing-surface, applying a pattern-surface to the inked surface of the printing-surface to produce a pattern thereon and to ink the pattern-surface, and transferring the patterns upon the printing and pattern surfaces to separate surfaces, as set forth.

9. The method herein described of printing, consisting in applying a color to a printing-surface, applying a pattern-surface to said colored surface, whereby to ink the pattern-surface, and produce a pattern upon the printing-surface, and printing by the aid of the printing-surface and pattern-surface upon separate sheets, as set forth.

10. The method herein described of printing, consisting in applying ink to an elastic printing-roller, subjecting the inked surface of the printing-roller to impressions of a pattern-roller, whereby to ink the pattern-roller and produce a pattern on the printing-roller, and printing by the printing-roller and pattern-roller upon separate sheets or webs, as set forth.

EDUARD SCHOENING.

Witnesses:

JACOB SCHOENING,

EDUARD LAKOSCHUS.