

(No Model.)

2 Sheets—Sheet 1.

J. W. FRIES.
PRINTING ROLL.

No. 587,953.

Patented Aug. 10, 1897.

Fig. 1.

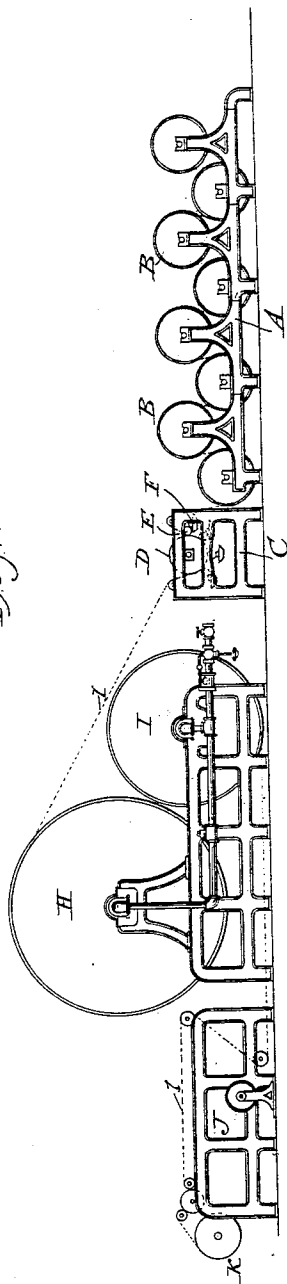
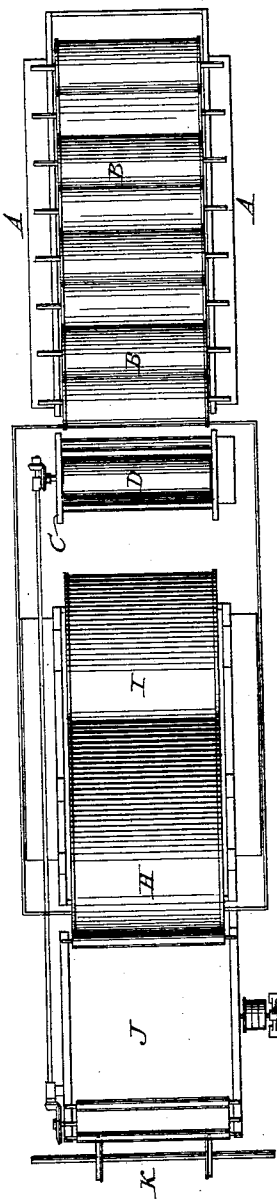


Fig. 2.



Witnesses;
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(No Model.)

2 Sheets—Sheet 2.

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PRINTING ROLL.

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Fig. 3.

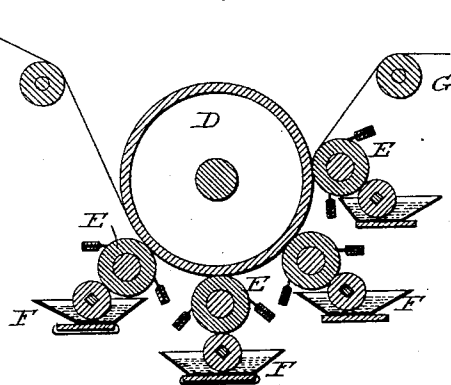


Fig. 4.

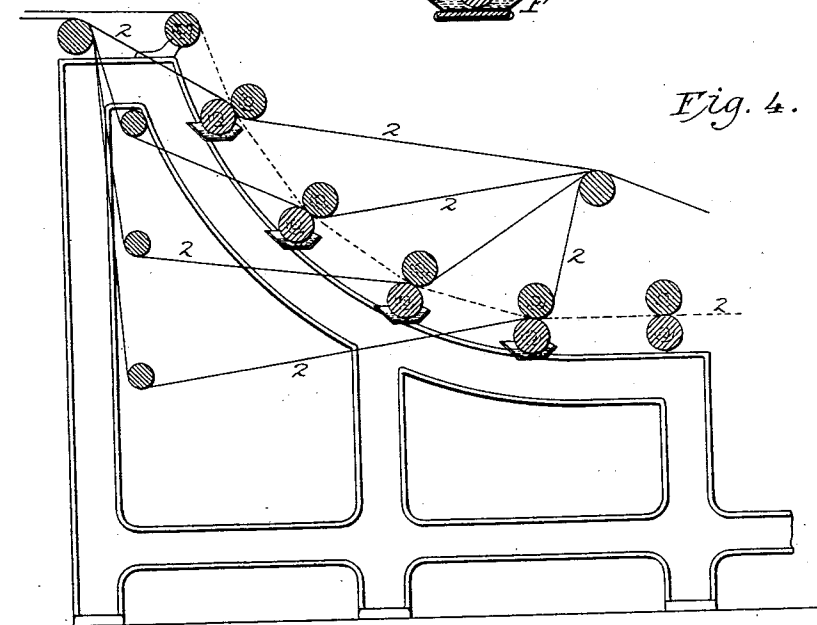


Fig. 5.

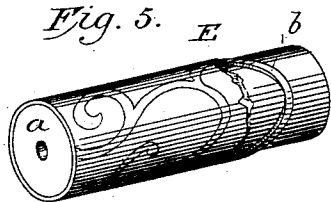
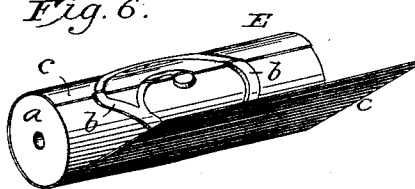


Fig. 6.



Witnesses;
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UNITED STATES PATENT OFFICE.

JOHN W. FRIES, OF SALEM, NORTH CAROLINA.

PRINTING-ROLL.

SPECIFICATION forming part of Letters Patent No. 587,953, dated August 10, 1897.

Application filed June 27, 1896. Serial No. 597,145. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. FRIES, a citizen of the United States, residing at Salem, in the county of Forsyth and State of North Carolina, have invented certain new and useful Improvements in Printing-Rolls, of which the following is a specification.

My invention relates to improvements in rolls for printing, designed more especially for use in printing warp-yarn.

In carrying out the operation of printing it is my aim to print and beam the warp at one operation, and thus to do away with the handling of the material which is necessary under the methods now employed. Under the present practice it is usual to send the warp from the mill (either on beams, in balls, or in chain) to the dye-house or print-works, where it is subjected to varied processes, involving much handling, expense, and danger of damage to the warps. These steps require the rebeaming of the warp, a step which it is desirable to obviate, owing to the difficulty of handling. I also size, print or color, and beam the warp at one operation. This does away with the necessity of passing the warp through the dye-house or print-works and the step of rebeaming, with the attendant expense and labor.

With the construction hereinafter set forth I combine in one machine the parts necessary to carry out the steps above recited and have them in such relation to one another that the undyed warp or threads enter the machine at one end, pass through the stages or steps of printing and sizing and drying, and finally beam the warp upon a loom-beam, so that it may be used at once without the necessity of any further steps being taken.

Under the construction of the machine set forth I am enabled to produce any desired design upon the warp-threads in a cheap and efficient manner. I also find I can so print the warp that what is now so commonly known as the "Persian effect" may be readily and cheaply produced.

Referring to the accompanying drawings, Figure 1 is a side elevation of a cylinder-slasher designed especially for the carrying out of my method; Fig. 2, a top plan view of the same, and Fig. 3 a detail vertical sectional view of the printing mechanism. Fig. 4 is a

view illustrating a modified form of printing mechanism, and Figs. 5 and 6 perspective views illustrating the construction or formation of one of the printing-rolls.

A denotes the section-beam stand, and B the section-beams mounted therein. The warp-yarns are indicated by the line 1, passing from the beams, thence through the various mechanisms connected with the slasher to the loom-beam.

C indicates the framing or standards upon which the printing or the combined printing and sizing mechanism is mounted.

The printing mechanism may be of any desired or approved form capable of performing the functions necessary to the proper carrying out of the method or process.

Fig. 3 illustrates one form similar to that commonly used in calico-printing machines. It comprises a rotary impression-cylinder D and a number of printing-rolls E, each roll being provided with its separate color-box F. Devices for regulating the supply of ink and mechanism for causing the proper rotation of the printing-rolls will of course be present in the construction of the complete machine. In this arrangement engraved rolls will be used to print the desired pattern.

Fig. 4 illustrates another form of printing mechanism intended to print the yarns in solid colors, in which smooth-faced or felt-covered rollers are employed, the yarn being passed through the machine, as shown by the lines marked 2. This form will be mainly used for the production of striped or checked goods. For pattern-work on the mechanism shown in Fig. 4 the lower rolls will have raised printing-surfaces. After much experimenting I find that a printing-roll with raised printing-surfaces may be satisfactorily and cheaply made in the following manner and as illustrated in Figs. 5 and 6.

First, I coat the smooth surface of a metal roll *a* with shellac or similar waterproof varnish. On this I place a continuous layer of hard paraffin-wax—say one-sixteenth inch or more in thickness—and turn this paraffin to a smooth uniform surface in a good lathe. Then from a full-sized drawing of the desired pattern I make an outline tracing of the particular color in question, apply this tracing to the paraffin surface, and cut out what is

necessary. This leaves the desired pattern *b* in relief in paraffin-wax, which is too slick to give a good inking-surface and too soft and fragile to stand service. I therefore
 5 cement over it a cover of cloth or paper *c* and coat the covering with shellac varnish. This makes a serviceable roller having the desired impression-surface. Substances other than paraffin may be used—such, for instance,
 10 as sulfur. The paraffin or sulfur may be applied to the roll by dipping it into a melted mass of either substance, whether the roll be first treated with shellac or not. By using different colors and by the proper deflection
 15 of the warp-yarns various patterns and designs may be produced, and the same result may be effected by the configuration of the printing-rolls, or the deflection of the yarns and the configuration of the roll may be both
 20 utilized in producing varied effects or patterns. Figures or solid stripes may be produced, or the warp-yarns may be all of one color.

The desired or necessary quantity of starch
 25 or albumen or tannin will be mixed with the ink and applied directly to the yarn.

The standard or frame *C* is provided with guiding-rollers *G*, over which the warp-yarn passes into the printing mechanism. The
 30 warp as it issues from the printing mechanism travels over the drying-drums *H* and *I*, as indicated, or equivalent drying apparatus and thence to the winding mechanism *J*, where it is finally wound upon a loom-beam
 35 *K*. The warp-yarn thus wound upon the beam may be placed in the loom and used without the necessity of any further handling or rebeaming.

By using a filling-thread of solid color various effects may be produced in solid grounds,
 40 stripes, checks, and figures; but the process set forth is specially applicable in the production of the Persian effect now so popular.

By the above method and treatment of the
 45 warp-yarn much handling and labor are saved and the yarn itself is placed on the loom-beam in much better condition than if it had been subjected to the severe and dangerous handling incident to the usual methods.

50 The method may be employed with any of

the well-known and appropriate inks and concentrated dyes, and, when desirable, fixing agents or processes may be used on the woven goods in subsequent "finishing" operations.

Suitable mechanism is employed whereby
 55 the various parts of the slasher and printing mechanism are driven and properly timed in their operations.

Having thus described my invention, what
 I claim is— 65

1. A printing-roll comprising a core or body; a raised figure or design applied to the surface thereof; and a covering sheet or layer of textile material placed over the design and secured between the raised portions of the design. 65

2. A printing-roll comprising a core or body; a raised figure or design formed of a comparatively soft substance applied thereto; and a covering sheet or layer of textile material placed over the design and secured between the raised portions thereof. 70

3. A printing-roll comprising a core or body; a raised figure or design formed of paraffin applied thereto; a covering sheet or layer of textile material placed over the design and secured between the raised portions thereof. 75

4. A printing-roll comprising a core or body, treated with a coat of waterproof varnish; a raised figure or design formed of paraffin applied thereto; and a covering sheet or layer placed over the design and secured between the raised portions thereof, the surface being finished off with a coating of waterproof varnish. 80

5. A printing-roll comprising a core or body, treated with a coat of waterproof varnish; a raised figure or design formed of paraffin applied thereto; and a textile covering sheet or layer placed over the design and secured between the raised portions thereof, the surface being finished off with a coating of waterproof varnish. 85

In witness whereof I hereunto set my hand in the presence of two witnesses.

JOHN W. FRIES.

Witnesses:

JAS. E. REICH,
 C. T. FROHL.