H. M. FRENCH.

Appliance for Printing Upon and Sizing Paper and other Fabrics.

No. 218,120. Patented Aug. 5, 1879.

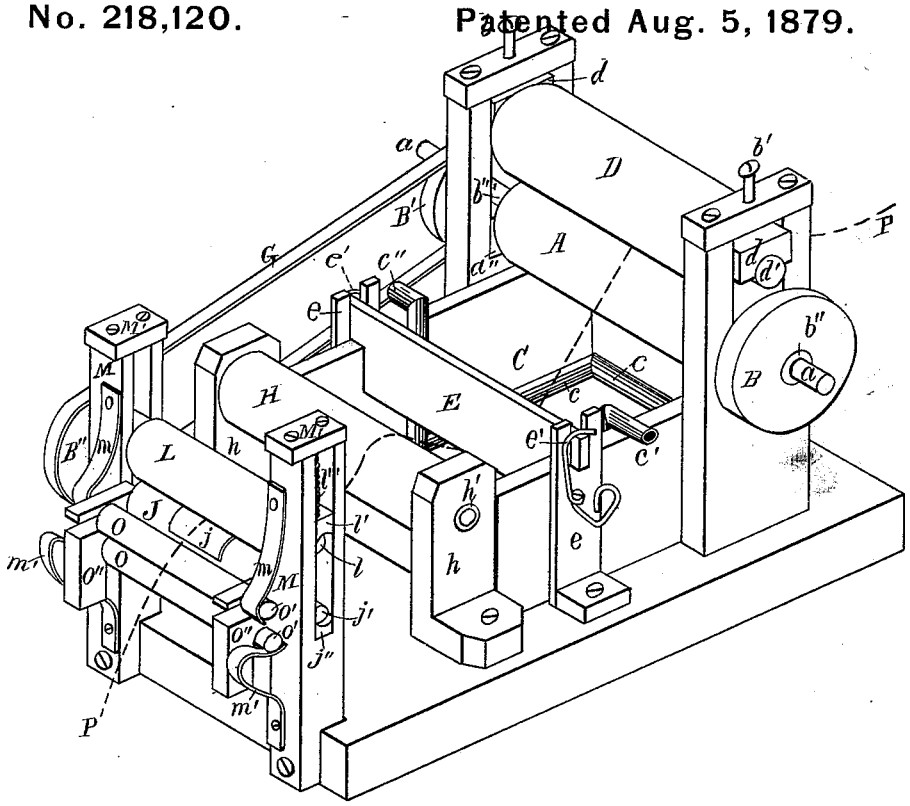


FIG. 1.

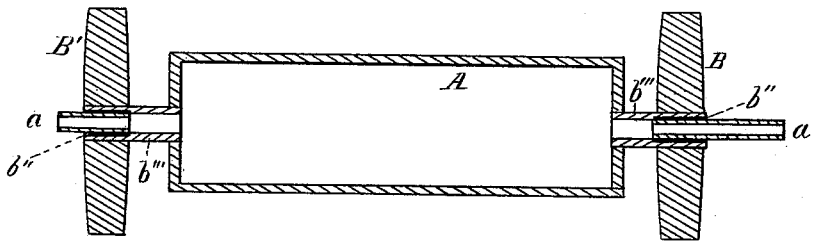


FIG. 2.

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## IMPROVEMENT IN APPLIANCES FOR PRINTING UPON AND SIZING PAPER AND OTHER FABRICS.

Specification forming part of Letters Patent No. **218,120**, dated August 5, 1879; application filed April 30, 1879.

*To all whom it may concern:*

Be it known that I, HIRAM M. FRENCH, of Boston, county of Suffolk, and State of Massachusetts, have invented a new and useful Improved Appliance for Printing Upon and Sizing and Permeating Paper or other Fabrics with Paraffine, all in and by one and the same operation, which appliance is fully illustrated by the accompanying drawings, which form part of this specification, like letters indicating like parts in the different figures thereof.

A represents a hollow metallic roll, with the surface thereof highly polished over the entire circumference of the roll, said polished surface to cover a proportion of the length of the roll at the center thereof sufficient to accommodate the width of the fabric to be treated.

Figure 2 of the drawings shows a section of the hollow roll A and sections of the pulleys or wheels B and B′. (Shown in Fig. 1.) In the ends of the two hollow journals $b'''$, at each end of the roll A, are ordinary packing-boxes, sections of which are shown by $b''$ in Fig. 2, the like letter in Fig. 1 indicating the end of one of the boxes.

A pipe connecting with a steam-boiler, and shown by $a$ in the drawings, shall enter the packing-box $b''$ and the hollow journal $b'''$ at the end of the roll A, best suited to the convenience of the operative, and a current of steam entering therein shall find exit by means of the corresponding pipe set in the same manner at the opposite end of the roll, as shown in the drawings. Heat imparted to the roll A by means of the current of steam passing through the same is, in turn, imparted to the metallic roll D by contact, the latter roll being provided with a polished surface corresponding with that upon the roll A.

The bearings of the hollow journals $b'''$, before described, are shown by $a''$ in Fig. 1, and $d$ indicates the bearings of the journals $d'$ of the roll D. The screws $b$ and $b'$ are for the purpose of regulating the degree of pressure between the rolls A and D.

C represents a tank, made of iron or other suitable metal, in which paraffine is placed. A steam-pipe (shown by $c$ in Fig. 1) passes completely around upon the bottom of said tank, and bears against the inside surface of each of the four walls of the tank, as shown in the drawings.

A pipe connecting with a steam-boiler may be coupled to either of the openings in the steam-pipe $c$, (indicated by $c'$ and $c''$, respectively,) the opposite opening to serve as an exit for the steam that has passed around through the pipe $c$.

It will be readily seen that by admitting a current of steam into the pipe $c$ the metallic bottom and sides of the tank C will become heated, so that paraffine placed in said tank will be melted, and not only melted, but heated to a high degree by contact with the heated steam-pipe $c$, and with the bottom and sides of the tank, all of which are heated from the contact with said steam-pipe before described.

E represents a movable and adjustable bar, of wood or any other suitable material, set in the two forked standards $e$, as shown in Fig. 1, and held in its position by means of the metal hooks $e'$ or their mechanical equivalents. The office of said bar E is to hold the paper or other fabric below the surface of the melted paraffine.

The object in making the bar E movable is so that in case the paper or other fabric breaks while passing under said bar the bar can be immediately and easily removed and the damage repaired, while if the bar were permanently fixed in its position it would be very difficult to repair any damage with the fabric immersed in the melted paraffine.

H represents a roll, (or bar, if desired,) of wood or other suitable material, set in the two standards $h$ by inserting the two journals of the roll in the standards, $h'$ indicating the end of one of the journals.

L and J represent the rolls of an ordinary printing-press, $j$ indicating the space on the lower roll occupied by the type. The journals and bearings of the rolls L and J are shown by $l$ and $l'$ and $j'$ and $j''$, respectively.

M illustrates two standards, in which are placed and held the journals and bearings of the two rolls L and J, before described. Two metallic springs, $l''$, and the two covers M′, held in place by screws, produce an elastic pressure between the rolls L and J.

O illustrates two ink-rolls, the journals of

which, O′, are set in the two frames O″, as shown in Fig. 1, the springs *m* and *m′* holding the ink-rolls in their proper positions.

The dotted line P indicates the course of the fabric through the different parts of the appliance.

A belt is carried from the source of power to and over the pulley B, and the belt G is placed over the pulleys B′ and B″.

The roll D is carried down upon the surface of the heated roll A with as great pressure as possible by means of the two screws *b* and *b′*, so that when the roll A is set in motion by means of its connection with the source of power, in the manner and by the means described, the roll D will be made to revolve, and the printing-press being connected with the roll A by means of the belt G, in the manner before described, the rolls A and D and the printing-rolls L and J will be set in motion simultaneously.

Having placed a suitable quantity of ink between the rolls O, I place one end of the roll of paper or web of any other suitable fabric to be treated between the printing-rolls L and J, and upon the appliance being set in motion whatever is desired is printed upon the surface of the fabric, which is then carried over the roll or bar H, which roll or bar is set so that the top of the same shall be nearly or about on a line with the top of the bar E, so that the fabric will be carried down under the bar E and into the melted paraffine smoothly and evenly, and not be drawn over the side of the tank C, which, in the absence of the roll or bar H, must inevitably happen. The fabric then passes between the two heated polished rolls A and D, and is there subjected to the most powerful pressure possible to produce by means of the screws *b* and *b′*. This powerful pressure, together with the heat from the two rolls, produces three distinct results: first, all surplus paraffine is removed from the fabric and falls back into the tank below; secondly, the paraffine is forced into all the pores and cells of the fabric, rendering the same impervious to moisture; and, lastly, the polished heated surfaces of the two rolls A and D produce, when the fabric is subjected to the powerful pressure described, a hard polished surface upon both sides of the fabric, rendering the adhesion of what are commonly known as "sticky" substances very difficult, if not impossible.

It is obvious that the two rolls A and D, running face to face, and subjected to pressure by means of the screws *b* and *b′*, as described and shown, are and constitute the propelling force by which the paper or other fabric is carried through the appliance.

A fabric may be carried through this appliance and operated upon in the manner described at the rapid rate of one hundred and twenty feet per minute, or more.

My appliance is of special value in treating paper. For instance, in the case of wrappers to be used in the sale of confectionery or other adhesive substances, the merchant's advertisement or trade-mark is printed, the paper rendered impervious to moisture, and a hard smooth surface imparted to both sides thereof, as described, and all accomplished at the very rapid rate of one hundred and twenty linear feet per minute, or even with greater speed, if desired.

As will be readily seen, a cutter can be placed in a convenient position, so that after the paper or other fabric leaves the rolls A and D it may be cut into pieces of any length desired.

It is obvious that the printing-press may be removed at any time, and the paper or other fabric treated with the paraffine merely, in which is involved the vital and most important part of this invention.

I claim as my invention—

1. In combination, the heated metallic roll A, with highly-polished surface and steam-pipe *a*, the metallic roll D, with highly-polished surface, and heated by contact, as described, the tank C, with steam-pipe *c*, the movable and adjustable bar E, and the roll or bar H, constructed and arranged substantially in the manner described, and for the purpose specified.

2. In combination, the printing-press constructed and arranged substantially in the manner described, with the roll or bar H, the movable and adjustable bar E, the tank C, with steam-pipe *c*, the heated metallic roll A, with highly-polished surface, with the steam-pipe *a*, the metallic roll D, with highly-polished surface, and heated by contact, as described, and the two pulleys B′ and B″, with the belt G, constructed and arranged substantially in the manner described, and for the purposes specified.

3. In combination, the devices for printing upon and treating paper or other fabric with paraffine, all by one continuous process, substantially in the manner described and shown.

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