2 Sheets—Sheet 1.

J. JEFFS.

Machinery and Apparatus for Glazing or for Coloring and Glazing the Surface of Paper or other Fabric.

No. 231,585. Patented Aug. 24, 1880.

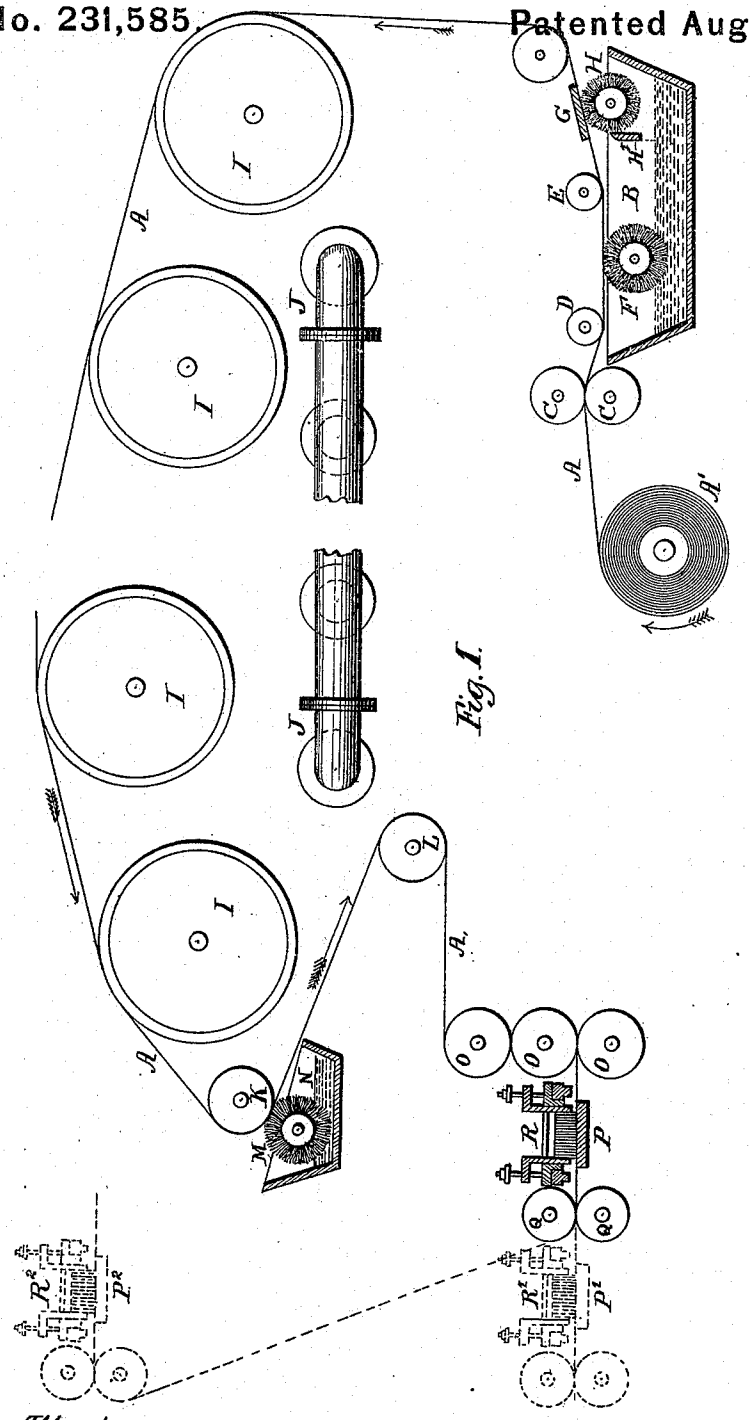


Fig. 1.

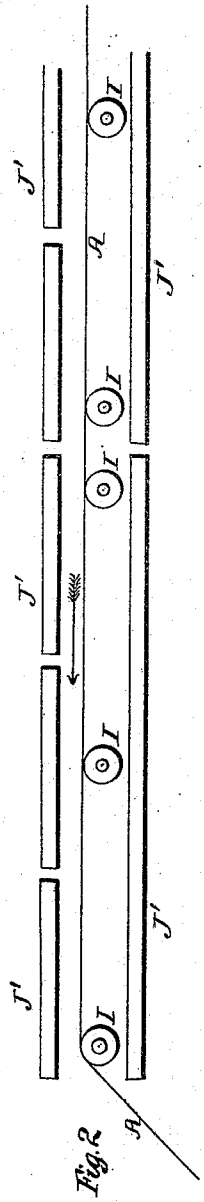


Fig. 2.

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2 Sheets—Sheet 2.

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FIG. 3

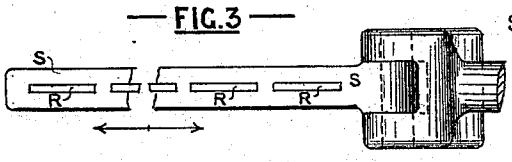


FIG. 4

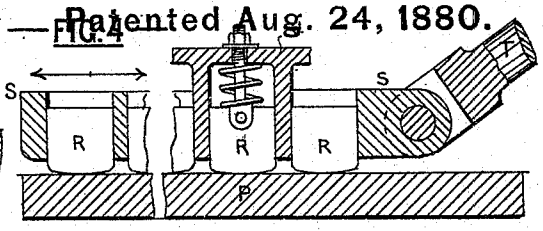


FIG. 5

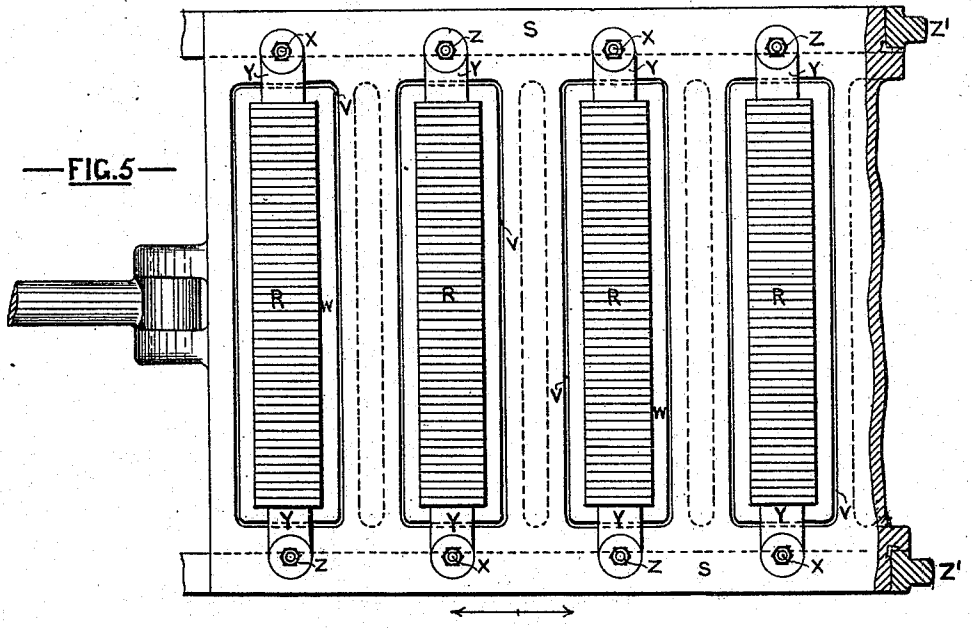


FIG. 6

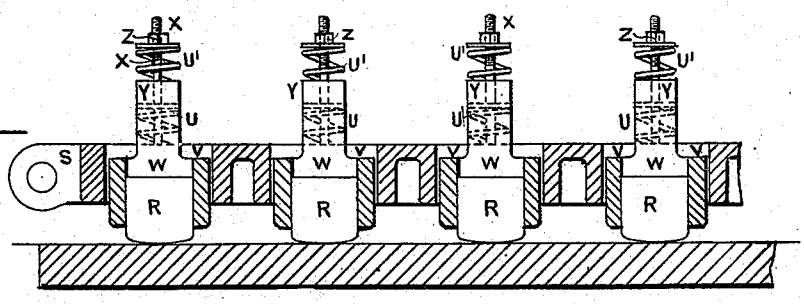
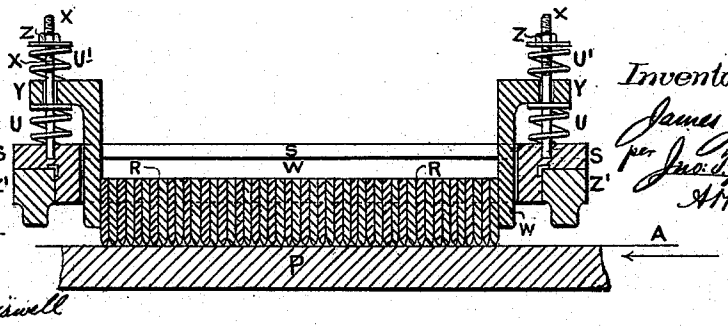


FIG. 7



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UNITED STATES PATENT OFFICE.

JAMES JEFFS, OF No. 43 HANOVER STREET, COUNTY OF MIDDLESEX, GREAT BRITAIN.

MACHINERY AND APPARATUS FOR GLAZING OR FOR COLORING AND GLAZING THE SURFACE OF PAPER OR OTHER FABRICS.

SPECIFICATION forming part of Letters Patent No. 231,585, dated August 24, 1880.

Application filed January 15, 1880. Patented in England June 9, 1879.

To all whom it may concern:

Be it known that I, JAMES JEFFS, of No. 43 Hanover Street, in the county of Middlesex and Kingdom of Great Britain, have invented Improved Machinery or Apparatus for Glazing or for Coloring and Glazing the Surface of Paper or other Fabric, of which the following is a specification.

The object of my invention is to color, prepare, and glaze paper or other fabrics, or to glaze the same only on one or both sides while it is running off in the web from the paper-making machine, or from rolls or reels of such material previously manufactured. In order to effect this object my improved machinery may, in the case of paper, be connected with a paper-making machine producing the paper in a continuous web in such manner that the said paper may be run direct through my machinery to be colored, prepared, and glazed as it is made; or, if preferred, my machinery may be employed separately from the paper-making machine and the paper or other fabric run through it from rolls or reels.

In the drawings, Figure 1 illustrates, in longitudinal section, but in part diagrammatically, a convenient arrangement of my machinery applicable to the treatment of paper, and suitable either for connecting direct to a paper-making machine or for use separately from such machine. In the figure the framing and all other parts not necessary for the illustration of my invention are not shown, it being understood that all such parts may be of any suitable construction and arrangement.

The machinery, when combined as illustrated in the drawings, Fig. 1, consists of coloring, drying, chalking, (or preparing,) and glazing apparatuses; but certain of such apparatuses may, in some cases, be omitted, as will be hereinafter explained.

In the figure, A represents the web of paper, which may be either taken from the roll or reel A′ or drawn direct from the paper-making machine.

B is a trough or cistern to contain the colors, which are mixed with water or other suitable liquids in the usual way.

C C are a pair of feeding-rollers, between which the paper is passed. D and E are two rollers placed at a suitable distance above the color in the trough, the paper or fabric to be colored passing below them, and being thereby kept tight. Below these rollers is placed one or more revolving cylindrical brushes, F, the lower part or parts of which dips or dip into the color in the trough, the upper part supplying the said color to and spreading it upon the under side of the paper A; or, if preferred, instead of cylindrical brushes, flat reciprocating or oscillating brushes may be employed. The paper A is then carried under other rollers, or under a plain smooth block, G, of wood, stone, metal, or other suitable material.

H is a revolving cylindrical brush, similar to F, (or a flat reciprocating or oscillating brush may be employed, if preferred,) for the purpose of removing the superfluous color from the surface of the paper, a "doctor" or scraper, H′, being provided to remove the waste color from the brush H, whence it drops back into the color-trough. The paper A is then passed over any required number of drying rollers or drums, I I I, preferably (but not necessarily) arranged in a curved or pyramidal form. These rollers or drums may be hollow, and heated by steam or otherwise in the usual way, or they may be heated by steam-pipes J J; or, if preferred, the paper may be passed over rollers I I, placed between two hot plates or hot water or other heated tanks, J′ J′. (See Fig. 2.) The paper A then passes around two rollers, K L, presenting its colored side to a cylindrical brush, M, revolving in a box or case containing French chalk, wax, soap, or other substances, N, adapted to produce a smooth surface on the colored paper. The brush M works against the said colored surface of the paper, removing the rough surface of the color and applying the said substance so as to smooth the surface and prepare it for the subsequent glazing. The paper A then passes between two or more rolls, O O, of metal, glass, paper, or other suitable material, which may act either as feed-rollers or as ordinary frictional glazing-rolls. In the latter case the colored surface of the paper is partially glazed thereby. The paper then passes over a flat or other suitably-formed table, P,

of stone, metal, hard wood, pressed paper, or other hard and smooth material. It is then strained tight and drawn away by the rollers Q Q and passed on to the printing or cutting machine, or again wound into rolls or on reels; but while passing over the table P the colored surface of the paper is subjected to the glazing or burnishing action of a series of small stones, agates, flints, pieces of glass, hard metal, or other sufficiently hard and smooth material, R R, caused to reciprocate backward and forward while bearing with the requisite pressure upon the said colored surface. This part of the process is known as "flint-glazing," and so far as I am aware has heretofore been successfully accomplished by hand-labor only.

Fig. 3 is a plan, and Fig. 4 a sectional elevation, of a simple arrangement for carrying and actuating the aforesaid small stones, agates, flints, or other pieces of hard material, hereinafter called, for shortness and distinction "agates."

S represents an arm, rod, or holder, into the slots or openings of which the said agates R R are secured by cementing or otherwise. These agates may each be of the form and dimensions usually employed in the hand process, and they may be spaced about three inches apart, more or less, center to center, (but I do not confine myself to that particular distance,) and in sufficient number to extend across the width of paper to be glazed, and their lower rounded working-faces are to be set truly, so as to bear evenly and with uniform pressure on the surface of the paper passing over the table P.

T is the end of a connecting-rod, which, receiving a reciprocating motion from an eccentric, crank, cam, or other suitable mechanical device, imparts the required to-and-fro motion in the direction of the arrows to the arm, rod; or holder S, or the said to-and-fro motion of the arm, rod, or holder S may be effected by other mechanical means which may be adopted, according to circumstances. The extent of this motion should be somewhat in excess of the distance from center to center of the agates R R, in order to insure all parts of the surface of the paper being acted upon by them, and for the same purpose the number of reciprocations in a given time should be proportioned to the speed at which the paper passes over the table P. The arm, rod, or holder S may be guided in a grooved bar or by other suitable means, and may be caused to traverse at right angles across the direction of motion of the paper or fabric, or more or less obliquely thereto, and the pressure of the agates upon the surface may be regulated by weighting or otherwise pressing down the arm, rod, or holder S, if it is not itself heavy enough, or, if it be too heavy, by relieving a portion of its weight by springs or counterbalance-weights, as may be required.

Fig. 5 is a plan, Fig. 6 a longitudinal section, and Fig. 7 a transverse section, all to enlarged scale as compared with that of Fig. 1, of the glazing apparatus shown at R in that figure. In this apparatus the arm, rod, or holder S of Figs. 3 and 4 is extended into a frame, S, adapted to carry a larger number of agates placed in sets side by side. This frame S, which may be of cast-iron or gun-metal, for example, is formed with a series of openings, V, in which are fitted the smaller frames W, (which may also be of cast-iron or gun-metal, for example,) adjustable vertically therein. These frames W are of a size adapted to receive any convenient or suitable number of agates R R, cemented, say, with shellac or plaster-of-paris, or otherwise secured therein, with their lower or working faces adjusted truly to correspond to the surface of the table P. The frames W are preferably arranged so that each set of agates shall be, say, three inches (more or less) distant from each other, center to center, and the traverse of the main frame S, and consequently of the smaller frames W W, with the agates R R, in the direction of the arrows will be as already described in reference to the arm or rod S, Figs. 3 and 4, somewhat in excess of that distance.

The frames W may be adjusted vertically in the openings V of the frame S by such an arrangement, for example, as that shown in Figs. 5, 6, and 7, in which X X are screwed pins or studs fixed in the frame S, passing through lugs Y, cast on the ends of the frames W and furnished with adjusting-nuts Z.

U are spiral springs bearing between the frame S and the lugs Y of the frames W, and adapted to support more or less of the weight of the latter.

U′ are other springs bearing between the lugs Y and the adjusting-nuts Z, for transmitting the pressure of the latter to the frames W, and thereby to the agates R R. By these means the pressure of the said agates on the surface of the paper can be regulated to the greatest nicety.

The frames S may be guided in fixed slides Z′, and made to reciprocate by means similar to those described in reference to the arm, rod, or holder S in Figs. 3 and 4, and its speed of reciprocation should be proportioned to that of the paper or other fabric passing below it in a similar manner.

Instead of the agates being cemented or otherwise rigidly secured in the holders or frames, they may be fitted loosely therein, and each one adjusted separately by nuts and springs taking onto screwed stems fixed to the agates and passing through holes in the upper part of the holder or frame, as at S′ in Fig. 4.

In some cases a second glazing apparatus, R′, and table P′ (shown in dotted lines, Fig. 1,) may be arranged behind the first to act still further upon the paper, or any further number of glazing apparatuses may be added as required, and when it is required to glaze both

sides, as in the case of writing-papers, the web of paper may be passed under another table and an inverted glazing apparatus adapted to act on the under side of the paper, or another glazing apparatus, R^2, and table P^2, with suitable rollers, may be arranged as shown in dotted lines above or below those shown at R, the paper being so guided as to present its under unglazed side to the action of the glazing apparatus R^2.

When the glazed paper finally leaves the glazing apparatus it may be led direct to the printing-rolls—as, for example, for paper-hangings—or it may be led to the cutting-machine to be cut up into sheets and counted into quires or reams in the ordinary way, or it may be rolled onto reels or folded in readiness to be subsequently printed, cut, or otherwise operated upon to suit the various purposes for which it is applicable.

As hereinbefore stated, the combined machinery consisting of the coloring, drying, chalking, (or preparing,) and glazing apparatuses may be employed together, as described, in connection or not with the paper-making machine. In some cases the chalking or preparing apparatus may be omitted, and in cases where the paper has been previously manufactured, colored, dried, and prepared, and in the case of writing-papers, the glazing apparatus would alone be employed, and in that case the web of paper would be delivered direct thereto from the roll or reel.

The machinery and apparatus above described are also applicable to the coloring, drying, preparing, and glazing, or glazing alone, of other fabrics besides paper, such as those of woven cotton and linen.

I am aware that attempts have been made to effect flint-glazing by machinery; but to the best of my knowledge and belief the agates have in these cases been caused to reciprocate the full width from side to side of the paper or fabric, the result being the puckering and tearing thereof. By employing several rows or series of agates, one behind the other, at comparatively short distances apart, and causing them to reciprocate to an extent only somewhat in excess of such distances, so that the action of one set of agates shall slightly overlap that of the next, the aforesaid puckering and tearing are obviated by reason of each agate acting only upon a comparatively narrow strip of paper instead of the full width.

I am also aware that the coloring, drying, and chalking (or preparing) apparatuses have before been used; but I make no claim to them when employed alone without the glazing or burnishing apparatus hereinbefore described, and I would have it understood that I do not confine myself to the precise arrangements, dimensions, and details described and shown in the drawings, as they may be varied without departing from my said invention.

I claim—

1. The general arrangement and combination of machinery, consisting of the coloring, drying, and glazing apparatuses, with or without the chalking or preparing apparatus, operating together so as to color, dry, and glaze the paper or fabric in a continuous web, either as it comes from the paper-making machine or as supplied in rolls or reels previously manufactured, substantially as hereinbefore described, and illustrated in Figs. 1 and 2 of the drawings.

2. The construction and use of glazing apparatus consisting of several agates, flints, pieces of glass, or other sufficiently hard and smooth glazing material or series thereof disposed behind one another across the width of the paper or fabric to be glazed and reciprocated backward and forward across the same in such manner that the glazing action of each agate or other piece of glazing material is confined to a portion only of the width of the surface to be glazed, substantially as hereinbefore described, and illustrated in Figs. 3 to 7 of the drawings.

3. The arrangements of the holders or frames for carrying the agates or other pieces of glazing material and of springs and nuts for adjusting the same in the said holders or frames, substantially as hereinbefore described, and illustrated in Figs. 3 to 7 of the drawings.

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