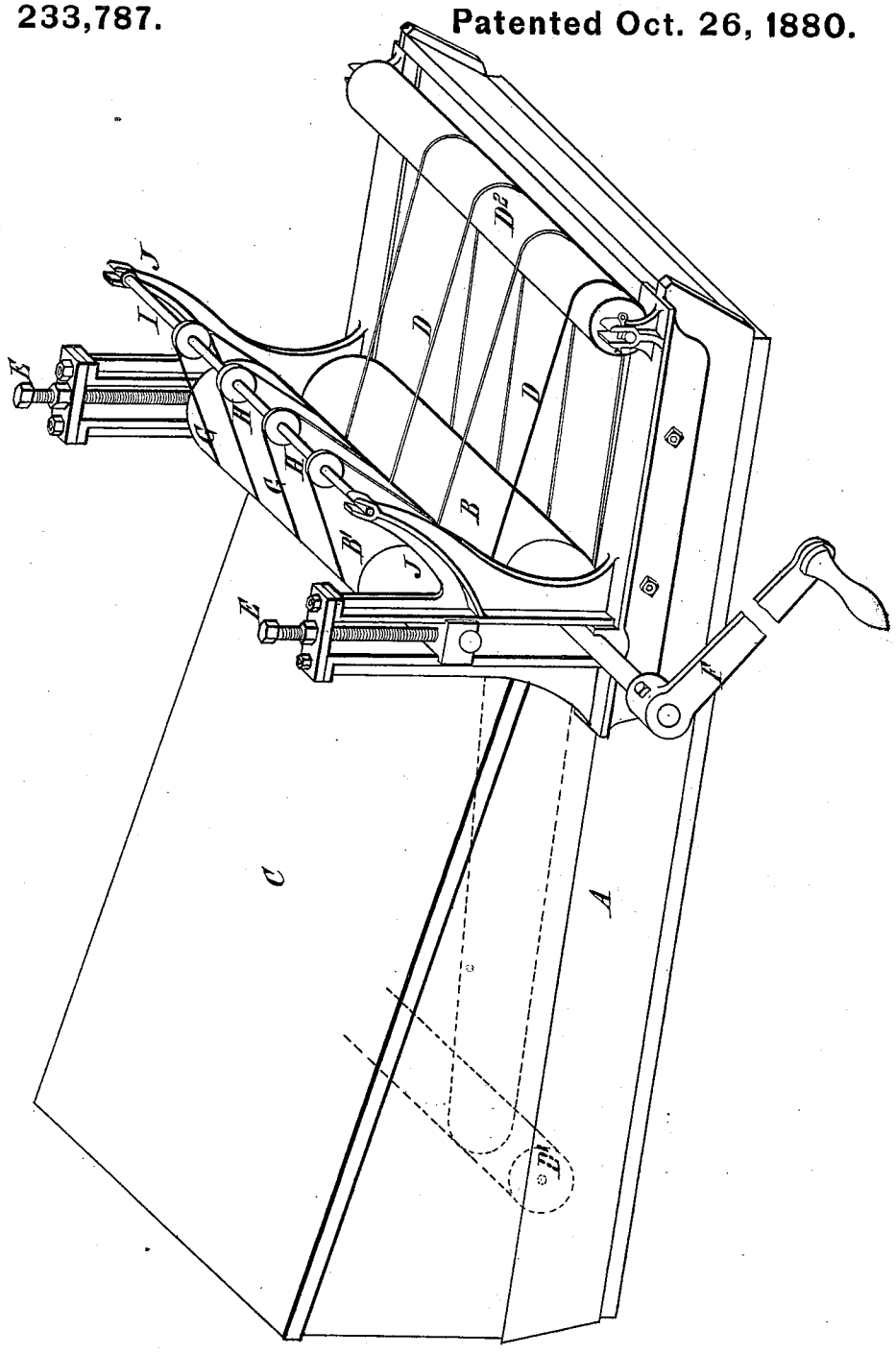
(No Model.)

A. McCAW, J. STEVENSON & J. P. ORR.

Manufacture of Transparent or other Paper and Cloth, &c.

No. 233,787. **Patented Oct. 26, 1880.**



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UNITED STATES PATENT OFFICE.

ALEXANDER McCAW, JOHN STEVENSON, AND JAMES P. ORR, OF BELFAST, IRELAND.

MANUFACTURE OF TRANSPARENT OR OTHER PAPER AND CLOTH, &c.

SPECIFICATION forming part of Letters Patent No. 233,787, dated October 26, 1880.

Application filed June 14, 1880. (No model.) Patented in England May 7, 1880.

To all whom it may concern:

Be it known that we, ALEXANDER McCAW, JOHN STEVENSON, and JAMES PORTER ORR, all of Belfast, Ireland, have invented new and useful Improvements in the Manufacture of Transparent or other Paper or Cloth, and of labels, tablets, or sheets for advertising, decorative, and other purposes, and in machinery therefor, (for which we have obtained a patent in Great Britain, No. 1,874, bearing date May 7, 1880,) of which the following is a specification, reference being had to the accompanying drawing.

Our invention relates to the manufacture of transparent and other labels, tablets, or sheets, chiefly designed for advertising or decorative purposes.

It also relates to the production of transparent paper, to imitate thin sheets of gelatine, for wrapping or inclosing "bonbons" or confectionery, or for similar purposes.

It also relates to machinery or apparatus to be employed in the manufacture of the said labels, tablets, sheets, or paper.

In carrying the said invention into practice we select very thin hard-glazed paper, such, for instance, as the paper known in the trade by the terms or names "manila tissue," "glazed copying," or "cream-wove bank"—that is to say, paper which has been glazed by high pressure, and which does not contain much size.

The words, characters, drawings, or devices which are to appear on the tablet or label are prepared on stone, as in the ordinary process of lithographic printing, or they may be cut upon wood or prepared upon electro or stereo type plates, or in any other suitable manner. If the impression is to be taken from stone, we cover the cylinder of a lithographic machine with a non-absorbent material, such as oil-cloth, and take one impression thereon from the stone. Then one of the sheets of paper is introduced, and the next impression from the stone is taken on this paper, the latter receiving at the same time an impression on its rear face from the oil-cloth.

When manufacturing transparent labels or tablets the red, blue, green, or other colored printing must be effected with transparent pigments, and we prefer to arrange the apparatus or machinery used for printing the labels or tablets in such a manner that the color will be impressed on both sides of the paper at one operation, although in most cases the texture of the paper being very thin, the color penetrates through the same, even when applied only on one side. When the color is not applied on both sides we prefer to employ two coats on one side.

The letters, words, or other parts which are required to be protected from the action of the varnish and designed to show by reflected light are, according to our invention, printed with Kremnitz white or white lead, or similar material, affording a white enameled appearance. This is an important feature of our said invention, and enables us to render such parts of the label or tablet very distinct, which is not the case when the effect of whiteness is produced merely by leaving the paper without color. In the latter case the white portions can scarcely be seen, unless there is a good light behind the label or tablet, whereas labels or tablets manufactured according to our invention are very distinct, whether the light is behind or in front of them.

The sheets of paper, having been printed with the desired words, characters, or devices, and with groundwork of a suitable color or colors, are dried, and when dry are passed through an apparatus or machine, hereinafter described, which contains a bath of copal, carriage, or spirit varnish. The printed sheets are thus coated on both sides with a film of the said varnish, which gives to them a smooth, glossy, glass-like appearance. After this operation the sheets are again dried, preferably by being suspended in racks and subjected to a gentle heat. They are then passed through an apparatus similar to the one above mentioned, and containing a solution of gum-arabic and sulphate of aluminum or other suitable adhesive compound, to provide the surfaces with means for securing them to a glass window or the like. The sheets are again dried and then cut or punched, by any ordinary and suitable apparatus, into the different shapes to form the tablets or labels. These transparent sheets are chiefly designed to be

attached to the windows of shops, tram-cars, railway-carriages, refreshment and waiting rooms, or the like, whether the light be reflected or otherwise. They supply the place of expensive glass tablets, and are not attended with any risk of breakage. Being furnished with an adhesive coating over the whole surface on both sides, as above explained, they are always in a condition to be attached to the glass in any position, merely requiring to be damped with cold water; or the glass may be damped and the label or tablet placed upon the damp portion.

If the labels or tablets are not required to be transparent, we employ exactly the same process as above described, merely substituting opaque pigments for transparent ones, and in some cases the labels or tablets may be partly transparent and partly opaque.

We may also make use of our said invention for the manufacture of paper or cloth to imitate wood of various kinds, inlaid work, stained glass, or the like, in which case we print the paper with opaque or semi-opaque pigments, passing the sheets subsequently through the varnishing-bath, as above described, to give the surfaces the required gloss and luster. They may also be passed through the bath of adhesive material or not, according to circumstances.

The bath of adhesive material is prepared as follows—that is to say: eight and one-half ounces of fluid gum-arabic are added to thirty grains of sulphate of aluminum dissolved in two-thirds of an ounce of water, the mixture being strained through wire and muslin several times to remove all impurities. The quantity of sulphate of aluminum may be somewhat varied, and may even be omitted altogether; but we prefer to employ it for the reason that we thus obtain a much stronger adhesive power than could be obtained by the use of gum-arabic alone.

In preparing an imitation of gelatine sheets we employ the same paper and process as above described, excepting that the printing is entirely dispensed with, and it is not necessary to apply the adhesive coating. The varnish may, however, be tinted with any desired pigment, so as to produce colored paper, or may be left uncolored.

We may in some cases employ fine silk, linen, or cotton fabrics instead of paper.

One form of the apparatus or machine forming part of this invention for facilitating the coating of the sheets with varnish or with adhesive material is shown in perspective in the accompanying drawing, and is constructed as follows—that is to say:

A represents a trough or vessel designed to contain the varnish or adhesive material. The said trough is fixed upon a stand or base, and there is a wooden table or bench at one end, serving to support conveniently the sheets of paper which are ready to pass through the machine.

B B′ represent two rollers, of india-rubber or composition, which are placed one above the other and extend across the trough. The lower roller, B, works or turns in the varnish or adhesive compound, as the case may be, and as it revolves constantly brings up some of the material. The sheets are fed, one at a time, by an attendant to the india-rubber rollers B B′, and are supported in their passage through the machine upon thin silk or other threads, D. The sheets pass through these rollers, between which there is continually a quantity of varnish or adhesive material, as the case may be, and thus receive a coating of the same on both sides. The upper roller, B′, is made adjustable by means of the screws E E, to provide for varying the distance between it and the lower roller, B, for the purpose of regulating the quantity of material to be applied to the sheets. If the two rollers are pressed tightly together, a very thin coating will be applied to the sheets, and the less pressure there is the thicker will be the said coating.

The silk or other threads, D, form carriers for the sheets, and are at one end of the machine passed around a roller or pulley at D′, the said pulley being capable of adjustment, and at the other end around a roller or pulley, D^2, which may be provided with a handle for giving motion to the various parts; or motion may be imparted to the roller B by a crank, F, upon the shaft of the said roller B, as shown, and through suitable gearing to the roller D^2. Silk or other threads, G, also pass around the upper india-rubber roller, B′, and around other rollers, H, upon a shaft, I, supported in bearings or brackets J. The object of these threads G is to prevent the sheets from curling around the upper india-rubber roller, B′, as they pass from between the two rollers B B′. The upper and lower rollers are geared together by toothed wheels, so as to revolve at the same speed. On turning the handle F motion is communicated to all the wheels and to the india-rubber rollers, through which the sheets pass.

C represents an inclined feed-board, which extends from the aforesaid table nearly to the rollers B B′, and the sheets pass down this board on their way to the said rollers.

Instead of the crank-handle F we may furnish the machine with a pulley or other suitable device for driving it by steam or other power.

The said machine may be of various sizes, and is constructed in precisely the same manner, whether it is to be used for varnishing the sheets or for applying the adhesive material.

Prior to our invention paper has been prepared for cards, tablets, labels, &c., by printing thereon designs or characters in one or more colors, then sizing the sheet or tablet, and finally glossing the same by a surface coating of varnish.

We are also aware that paper has been pre-

pared for similar purposes by first coating it with opaque pigments, then calendering or smoothing by pressure, and finally ruling on the prepared and calendered surfaces designs of various characters. So also has glass been ornamented by securing to the same paper on which there is printed, painted, or stamped opaque lines in dark colors, or "light-absorbent" pigments and in transparent colors, the opaque pigments being in representation of the leaden sash of stained-glass windows. The state of the art also shows that cards have been prepared with designs imprinted in ordinary inks upon the face, to be viewed by reflected light, and with a responsive picture beneath its face, to be viewed by transmitted light, and we do not therefore claim the production of such articles, nor the processes by which they are produced, as they differ in substantial matters from our invention, which consists, essentially, in the following distinguishing characteristics: first, in the manufacture of an adhesive tablet of transparent fabric by first printing upon the same with transparent pigments, then passing the fabric through varnish, and then through an adhesive solution; and, second, in the manufacture of paper or cloth to imitate mosaic, inlaid, or similar work, or stained glass, by printing with opaque or semi-opaque "light-reflecting" pigments in representation of the various enamels under reflected light, in contradistinction to the employment of opaque light-absorbing pigments, which have been heretofore employed in representation of the leaden sashes used in colored-glass windows.

What we claim is—

1. The manufacture of adhesive transparent paper or cloth sheets, labels, or tablets for advertising or decorative purposes, by first printing, with transparent pigments upon sheets of paper or cloth, the desired words, characters, or devices, and then passing the sheets through copal, carriage, or spirit varnish, and subsequently through an adhesive solution, substantially as above described.

2. The manufacture of transparent paper, by passing sheets of ordinary thin hard-glazed paper through copal, carriage, or spirit varnish, which sheets may or may not be subsequently passed through an adhesive solution, substantially in the manner above described, and for the purposes specified.

3. The manufacture of paper or cloth to imitate mosaic, inlaid, or similar work or stained glass, by printing with opaque or semi-opaque light-reflecting pigments, and subsequently passing the paper or cloth through copal, carriage, or spirit varnish, substantially as specified.

4. In the manufacture of transparent sheets, labels, tablets, or the like, the employment of Kremnitz white or white lead, substantially in the manner and for the purpose above described.

5. As a new manufacture, a transparent or translucent sheet, label, or tablet composed of highly-sized and highly-glazed paper painted or printed with designs in transparent or translucent colors and saturated with varnish, substantially as specified.

6. A sheet, tablet, or label composed of paper or cloth printed with designs in opaque or semi-opaque light-reflecting pigments, and saturated or coated with varnish, as a new manufacture, substantially as specified.

7. As a new manufacture, a label or tablet composed of paper or other material, printed in part in transparent or translucent colors, and in part with opaque light-reflecting colors, and coated or saturated with varnish, substantially as specified.

8. A machine for facilitating the coating or impregnating of labels, tablets, or sheets of paper or cloth with copal, carriage, or spirit varnish, to render them transparent, or with a suitable solution to render them adhesive, which machine consists of a trough or vessel, A, rollers B B′, the gear-wheels, the rollers D′ D^2 H, threads D G, brackets J, crank-handle F, the table, and the feed-board C, all combined and operating substantially as above described, and as shown in the drawing.

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Witnesses:
SAML. M. WILLIAMS,
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