

G. EASTMAN.  
 Method and Apparatus for Coating Plates for use in  
 Photography.

No. 226,503.

Patented April 13, 1880.

Fig. 1.

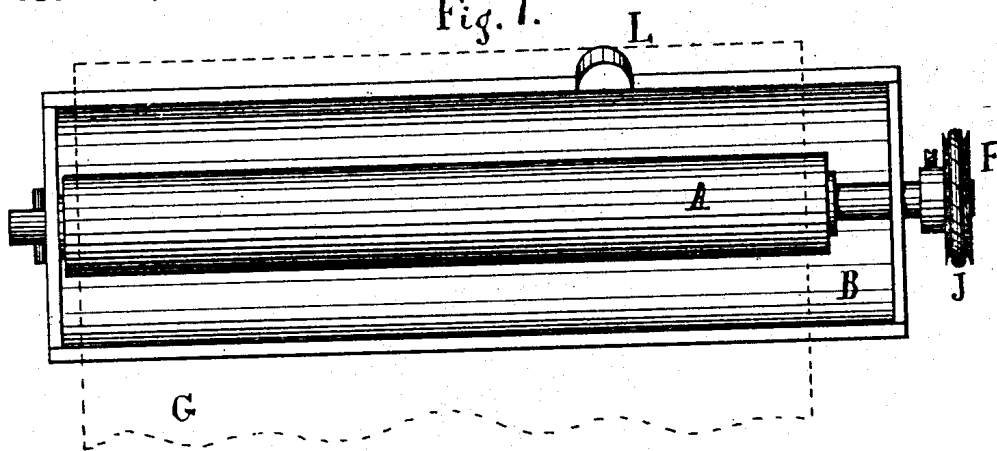


Fig. 2.

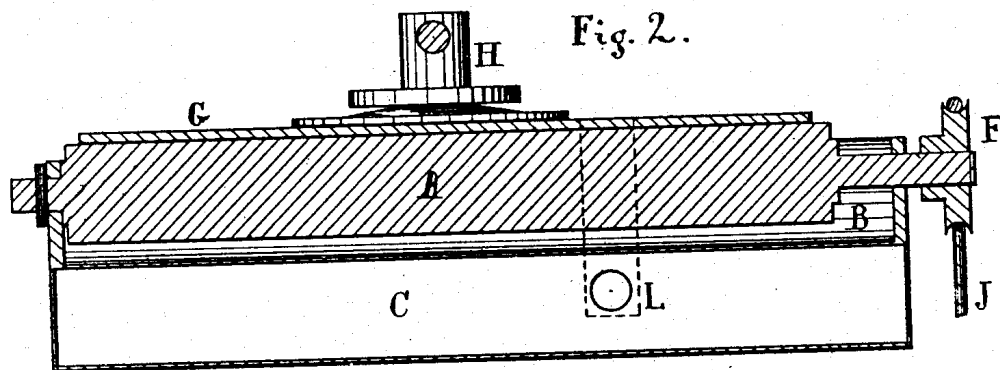
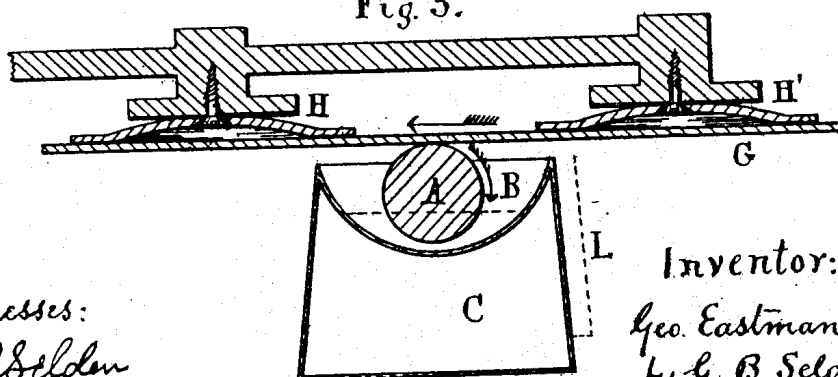


Fig. 3.



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# UNITED STATES PATENT OFFICE.

GEORGE EASTMAN, OF ROCHESTER, NEW YORK.

METHOD AND APPARATUS FOR COATING PLATES FOR USE IN PHOTOGRAPHY.

SPECIFICATION forming part of Letters Patent No. 226,503, dated April 13, 1880.

Application filed September 9, 1879.

To all whom it may concern:

Be it known that I, GEORGE EASTMAN, of Rochester, New York, have invented an Improved Process of Preparing Gelatine Dry-Plates for Use in Photography and in Apparatus therefor, of which the following is a specification, reference being had to the annexed drawings, in which—

Figure 1 is a plan view of my apparatus for coating glass plates with gelatine emulsion. Fig. 2 is a longitudinal section, and Fig. 3 a transverse section, of the same, showing the mode of applying the emulsion to the plate.

In the preparation of gelatine dry-plates great difficulty has heretofore been encountered in spreading the gelatine emulsion evenly over the glass. This has ordinarily been accomplished by a glass rod, the action of which was assisted by inclining the plates slightly in different directions, causing the emulsion to flow toward the edges. It has been found difficult by this means to cover the margins of the glass or to secure an even coating on the whole surface, while the process of coating the plates in this way was necessarily slow and tedious, and therefore expensive.

By my improved process plates are covered with a perfectly uniform coating of gelatine emulsion, extending entirely out to the edges of the plate, and this result is accomplished very much more rapidly than inferior plates are produced by the old method.

In the operation of my improved process of preparing gelatine plates I employ a bromide-of-silver gelatine emulsion prepared according to any well-known formula. I prefer to employ in the emulsion for use in my process an article of gelatine which sets readily, though any sample of gelatine suitable for making emulsions for coating in the old way can be employed.

My improved process consists in coating the plates from the lower side by means of suitable apparatus hereinafter described. The apparatus may be varied in construction, but in any case the operation remains the same, the plate being drawn over a device which covers its surface with a uniform supply of the emulsion, and being then immediately reversed and placed upon a level support to set. Apparatus suitable for carrying my improved pro-

cess into practice is represented in the accompanying drawings.

A is a roller, of any suitable material, supported in the trough B. C is a water-tank underneath the trough, which may be filled with hot water by the spout L.

A pulley, F, is placed on one of the journals of the roller A, over which a belt, J, runs, by which a rotary motion is transmitted to the roller from any suitable motor. G is the glass plate, which is applied to the roller A by any convenient device. A pneumatic plate-holder accomplishes this purpose, as represented in Fig. 2. In coating large plates I prefer to use two pneumatic holders, H and H', as represented in Fig. 3. Any other suitable plate-holder may be employed.

The roller A should be of a length slightly greater than the width of the largest plate designed to be coated by the apparatus. The upper surface of the roller rises sufficiently above the trough B to prevent the plate from coming in contact with the sides thereof.

In the operation of my improved apparatus for coating gelatine dry-plates the trough B is partially filled with the gelatine emulsion, as indicated in the dotted lines in Fig. 3. Motion is then communicated to the roller A by the belt J, a convenient source of power being a small water-motor. The motion of the roller should not be so rapid as to churn the emulsion and cause air-bubbles therein. A suitable speed for the rotation of the roller is from fifty to one hundred revolutions per minute, the greatest speed being suitable for the thinnest emulsion. The glass plate, having been cleaned in any usual manner, is held by a plate-holder and passed over the upper surface of the moving roller in a direction contrary to that in which the roller is turning, as indicated by the arrows in Fig. 3. This operation should be performed without unnecessary haste, but continuously, without stopping or varying the motion of the plate. The operation may be repeated in case a satisfactory coating of the glass is not attained at first. The roller brings up from the trough B a uniform supply of emulsion and applies it to the lower side of the plate in a perfectly even coating. The more rapidly the plate is passed over the roller the thicker will be the coating of emulsion on

the glass. This is explained by the fact that the excess of emulsion carried up by the roller does not have time to flow back into the trough when the plate is passed quickly over the roller. When the plate moves slowly this excess flows back down the roller into the trough. After having been coated the plate should be quickly reversed in position, so that the coated side will be uppermost. The holder is then removed and the plate placed on a level support to set, after which it is dried in any preferred manner.

It is unnecessary to remark that the operation of coating the plates must be performed in a sufficiently non-actinic light. In preparing very sensitive plates, which require a very subdued light, the advantages of my improved apparatus will be most appreciated, as the operation of coating the plates as herein described can be performed with rapidity and certainty in almost entire darkness.

The cleaned plates, having been stacked up in a pile, are lifted one after another by the holder, passed over the roller, and placed on a leveled table to set with great rapidity and certainty of securing uniformity of coating in the most faintly-lighted dark-room. The emulsion in the tray may be screened from any direct light.

The roller may be made of any material which will not injure the emulsion, but should have as smooth a surface as possible to prevent drawing bubbles into the emulsion.

I prefer to filter the emulsion into the trough to prevent air-bubbles and specks.

A roller composed of a composition of glue, glycerine, water, and chrome-alum covered with thin sheet or tube rubber may be used for the body of the roller, as well as any other flexible material, the journals at each end being plated with nickel or silver. I have also employed solid metallic rollers plated with nickel or silver. The trough or tray

may be made of sheet metal, nickel or silver plated on the inside, or it may be of well-glazed porcelain or glass. The journals of the roller may be supported by the sides of the tray, as shown in the drawings, or carried by standards outside of and at each end of the tray.

Satisfactory results may be attained by employing a roller driven by the friction of the plate as it moves over it; but I prefer to give the roller a motion independent of and in a direction opposite to that of the plate, as herein described.

Emulsions made with any other colloid soluble in water may be used in place of gelatine in my improved apparatus for coating plates.

One of the advantages of my invention is that large glass plates may be coated, and, after drying, cut into the required sizes without any loss whatever from margins imperfectly covered with emulsion.

I claim—

1. As an improvement in the art of photography, the method of coating glass plates with gelatine or other analogous emulsion, which consists in applying the same uniformly to the under side of the plate by means of a roller or equivalent distributing device supplied from a reservoir of emulsion, substantially as and for the purpose specified.

2. The combination, in an apparatus for coating glass plates with gelatine or other colloid emulsions, of the revolving roller A, stationary trough B, and plate-holder H, formed of materials unaffected by the chemicals in the emulsion employed, all said parts being adapted for operation substantially as described and shown.

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Witnesses:

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