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1,574,378

W. J. DOBINSON

COLLOTYPE PRINTING PLATE AND METHOD OF MAKING THE SAME

Filed Sept. 16, 1925

Fig. 1.



Fig. 2.

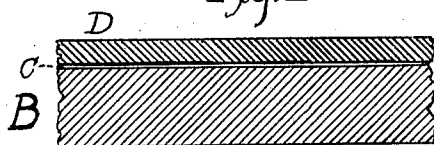


Fig. 3.

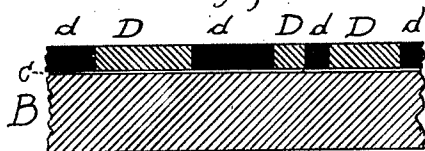


Fig. 4.

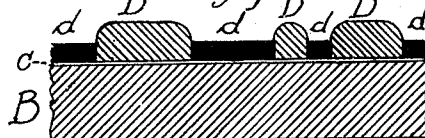


Fig. 5.

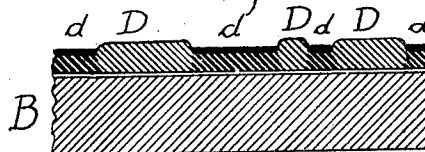


Fig. 6.

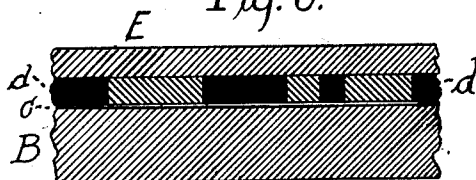


Fig. 7.

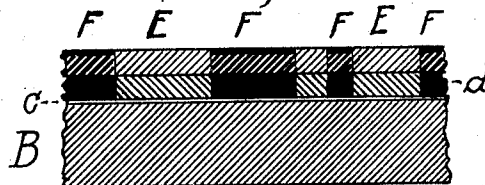


Fig. 8.

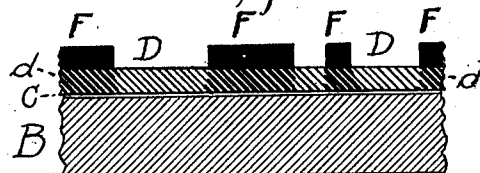
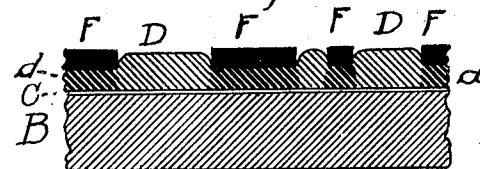


Fig. 9.



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COLLOTYPE PRINTING PLATE AND METHOD OF MAKING THE SAME.

Application filed September 18, 1925. Serial No. 56,636.

To all whom it may concern:

Be it known that I, WILLIAM J. DOBINSON, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Collotype Printing Plates and Methods of Making the Same, of which the following is a specification.

This invention relates to a printing plate having a printing surface formed by the action of light through a negative on a portion of the plate, which is so sensitized that it is hardened where it is acted on by light and left soft where light does not reach it. Such plates are known as collotype plates and are otherwise known as Lichtdruck and photo-gelatine plates. The hardened and soft portions collectively form a printing surface suitable for use in a printing press which alternately applies water and ink to the printing surface, the soft portions of the plate taking water and rejecting ink, while the hardened portions take ink and reject water. Heretofore, in many cases the soft portions which are swollen during the preparation of the plate, project considerably higher than the hardened portions, so that it is difficult to properly ink the relatively low hardened portions, and the higher soft portions are so injured by the pressure of a roller thereon that the usefulness of the plate is quite brief.

In other cases the projection of the soft portions has been minimized by reducing the time of exposure to light. This reduced exposure correspondingly reduces the resistance of the hardened portions to pressure, so that although the plate may be easily inked, it is not hard and durable enough to withstand a long run on a power-printing press.

My invention has for its object to provide a strong and durable printing plate of this character, in which the hardened and soft portions of the printing surface are practically flush with each other, so that the surface may be easily and properly inked, the plate being adapted to stand the wear of a

fast-running printing press and make a large number of sharp and desirable impressions.

I attain this object by the improvements hereinafter described and claimed.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is an enlarged sectional view of a portion of a photographic negative.

Figures 2, 3, 4 and 5 are enlarged sectional views, showing the base, the substratum, and the sensitized gelatine coating of an ordinary collotype plate, these figures illustrating different conditions of the plate.

Figures 6, 7, 8 and 9 are enlarged sectional views, showing the plate shown by Figures 2, 3, 4 and 5 with improvements in accordance with my invention.

The layers or coatings hereinafter described are shown much enlarged, their actual thickness being from about one one-thousandths of an inch to about thirty one-thousandths of an inch.

The negative shown by Figure 1 includes a transparent body A, the opaque portions *a'* deposited thereon and leaving unobstructed surface portions *a*.

B designates the base of an ordinary collotype printing plate, usually of glass, metal, celluloid or paper, coated on one side with a substratum C fixing the sensitized gelatine coating D to the base. The substratum may be composed of five ounces of albumen, two ounces of silicate of potash and five ounces of water. When the substratum is thoroughly dry, the coating D is applied thereto. This coating may be composed of one ounce of gelatine, fifty grains of bichromate of potash, thirty grains of bichromate of ammonium, and ten ounces of water. The coating is applied as shown by Figure 2, and allowed to dry. Figure 3 shows the coating D after exposure to actinic light through the negative, the solid black portions *d* being more or less hardened according to the length of the exposure.

Figure 4 shows the coating after soaking in cold water to remove the soluble chromate

salts, and, if exposed to the light long enough, to cause the portions *d*, *d*, *d*, *d* acted upon by the light to become thoroughly hardened down to the substratum C.

- 5 There will then be such a difference in the height of the hardened portions *d* and the unhardened and swollen portions D that it will be difficult to ink up the hardened portions, and the pressure of the roller on the soft portion D will soon destroy the plate.

Figure 5 illustrates the usual method in use to avoid this difficulty and minimize the difference in height between the hardened and soft portions. In the plate shown by Figure 5, the coating has been exposed to light as short a time as possible and yet have the hardened portions *d* take ink. In this case, while there is less difference in height between the hard and soft portions, and while the plate inks up easily, yet the plate is not hard enough to withstand a long run on a power printing press.

- In carrying out my invention, as shown by Figures 6 to 9, inclusive, I coat the plate B with a substratum C, apply to the latter an inner coating D of sensitive gelatine, and expose the inner coating to light under the negative A in the usual manner. I then apply to the inner coating an outer sensitized coating E, of a bichromated colloid, soluble in cold water, such as gum arabic, albumen, fish glue, sugar, starch, or partially decomposed gelatine. By preference I use a bichromated fish glue. A typical solution would be fish glue and water at 9 deg. Baumé, 18 ounces, and bichromate ammonia 250 grains. This coating is dried and exposed under the same negative A in exact register with the first coating of gelatine D. If desired, both the gelatine coating D and the colloid coating E may be exposed at the same time under the negative to actinic light.

The plate is then developed in cold water, which washes out the unaltered and soluble chromate salts and also the soluble fish glue composing the soft portions of the outer coating E, thus exposing portions of the coating D, as shown by Figure 8, but does not dissolve the gelatine coating D which is insoluble in cold water, absorbs cold water, and swells up, as shown by Figure 9. The plate is then thoroughly dried.

- Subsequently the plate may be moistened with water or soaked in a so-called etching solution of glycerine, salts, etc., to absorb moisture in the unhardened parts, which will then take water and reject ink, while the hardened parts will take ink and reject water.

It will be seen by reference to Figure 9, that the soft swollen portions of the inner coating D are substantially flush with the hardened portions of the outer coating, so that the printing surface may be easily and

properly inked, and the soft portions are protected against injurious pressure. It will also be seen that the hardened portions of the coatings impart a sufficient degree of strength and durability to the plate.

I claim:

1. A collotype printing plate comprising a base; an inner coating of sensitized gelatine fixed to the base and insoluble in cold water when unhardened; and an outer coating of sensitized colloid soluble in cold water when unhardened, the outer coating covering and adhering to the inner coating, the two coatings being conditioned by the action of light through a negative, to provide each with hardened portions and leave other portions soft, and developed by cold water to remove the soft portions of the outer coating and swell, but not remove, the soft portions of the inner coating, so that the plate has a printing surface composed of ink-taking and water-rejecting hardened portions of the outer coating, and water-taking and ink-rejecting swelled portions of the inner coating, substantially flush with the hardened portions of the outer coating.

2. The method of making a collotype printing plate which consists in fixing to a base an inner coating of sensitized gelatine which is insoluble in cold water when unhardened, fixing to the inner coating an outer coating of sensitized colloid which is soluble in cold water when unhardened, conditioning said coating by the action of light through a negative, and thereby providing each coating with hardened portions and leaving other portions soft, and developing the coatings by cold water, to remove the soft portions of the outer coating, and swell, but not remove, the soft portions of the inner coating, thereby producing a printing surface composed of ink-taking and water-rejecting hardened portions of the outer coating, and water-taking and ink-rejecting swelled portions of the inner coating which are substantially flush with the hardened portions of the outer coating.

3. The method of making a collotype printing plate which consists in fixing to a base, an inner coating of sensitized gelatine which is insoluble in cold water when unhardened, then conditioning said coating by the action of light through a negative to provide the coating with hardened portions and leave other portions soft, then removing the negative and fixing to the inner coating an outer coating of sensitized colloid, which is soluble in cold water when unhardened, then drying the outer coating, then conditioning the outer coating by the action of light through the same negative, to provide the outer coating with hardened portions registering with the hardened portions of the inner coating, and leave other portions soft, and finally developing the coat-

ings of cold water, to remove the soft portions of the outer coatings and swell, but not remove, the soft portions of the inner coating, thereby producing a printing surface composed of ink-taking and water-rejecting portions of the outer coating, and water-taking and ink-rejecting swelled portions of the inner coating, which are substantially flush with the hardened portions of the outer coating. 10

In testimony whereof I have affixed my signature.

WILLIAM J. DOBINSON.