

1

2,760,883

## PHOTOGRAPHIC FERROTYPING PROCESS

Roy L. Pickett, Pine Bluff, Ark.

No Drawing. Application October 12, 1953,  
Serial No. 385,707

10 Claims. (Cl. 117—64)

The present invention relates to a new and improved photographic ferrotyping process and more particularly to a ferrotyping process which provides photographic prints having a highly glazed surface and possessing enhanced flexible texture.

The art of ferrotyping or plating as it pertains to photographic processing is well known. The process involves the rolling or "squeezeing" of a wet photographic print against a polished plate or drum of stainless steel, chrome, nickel, copper, enamel or any other suitable surface. In this rolling of a print it is necessary that the print be in perfect contact (to the exclusion of all air bubbles) with the polished surface being used. Upon being completely dried, the prints of themselves should loosen from the plate and take on a gloss from the process. To facilitate a quicker drying action, heat in a controlled form is usually employed.

There are many solutions available to facilitate this ferrotyping process. Prints are commonly soaked in these solutions before being applied to the ferrotyping plate or drum. However, none of the solutions on the market today are entirely satisfactory in every respect. It is well known that glycerin and some members of the glycol family offer various advantages in giving a finished photographic print with a high gloss and great flexibility. Glycerin and the glycols, however, have the disadvantage of being prohibitive in cost as well as having a tendency to stain the prints. Moreover, the stability and keeping properties of such materials leave much to be desired.

It is, accordingly, one of the objects of the present invention to provide a new and improved ferrotyping process capable of producing a finished photographic print which has a uniform, smooth and glazed surface and which has the appearance of great optical depth.

Another object of the invention is to provide a ferrotyping process giving rise to prints which have enhanced flexibility and reduced tendency to curl.

A further object is to eliminate problems usually arising due to humidity.

A still further object is to provide a new and improved solution adaptable for use in the ferrotyping process which will eliminate the sticking of photographic prints to the ferrotyping plate or drum surfaces.

Another object is to provide a solution useful in the ferrotyping process presenting a minimum of danger of spoiling, deterioration, or becoming rancid as is the case with glycerin or glycol solutions.

Another object is to provide a new and improved solution for use in ferrotyping processes which produce prints free from stain and which is non-inflammable, non-poisonous and non-toxic in nature either externally or internally.

Another object is to provide a solution of the foregoing nature which will enable the use of higher heat on the ferrotyping plates or drums without danger of the photographic surface scorching or becoming brittle and cracking, thus permitting quicker drying of the prints and

2

consequently the speeding up of the number of prints processed per unit time period.

Other objects and advantages of the invention will be apparent by reference to the following description, in which preferred details and embodiments are described.

It has now been discovered, in accordance with the present invention, that the above-enumerated objects may be achieved and that the foregoing and other disadvantages attending known ferrotyping processes may be obviated through the use of a dilute aqueous solution containing a water-soluble cellulose ether.

Any water-soluble cellulose ether may be employed in the practice of the present invention such as an alkyl cellulose, an aryl cellulose or an aralkyl cellulose. Exemplary are methyl cellulose, ethyl cellulose, propyl cellulose, isopropyl cellulose, normal butyl cellulose and benzyl cellulose. Also contemplated within the scope of the present invention are carboxyalkylcelluloses such as carboxymethylcellulose (sodium salt) and carboxyethylcellulose (sodium salt). Likewise contemplated are hydroxyalkyl celluloses such as hydroxymethyl cellulose and hydroxyethyl cellulose, as well as mixed cellulose ethers containing one or more alkyl, carboxyalkyl or hydroxyalkyl substituent groups, or mixtures thereof.

The amount of water-soluble cellulose ether employed in the aqueous solution is not critical and it depends, firstly, upon the water-solubility of the particular cellulose ether employed, and secondly, upon the glaze desired. Naturally, the more concentrated the solution the increased glaze of the finished print. The final ferrotyping solution may conveniently contain 0.25% to 1.5%, by volume, of any of the foregoing cellulose ethers. Preferably, the solution contains 0.4% to 0.7%, by volume, of cellulose ether.

Preferably, although not necessarily, the aqueous solution of water-soluble cellulose ether may contain a wetting or dispersing agent which serves to decrease the immersion time of the prints in the solution. Aerosol OT—100%, which is dioctyl sodium sulfosuccinate, is preferred, although other sodium sulfosuccinate derivatives, such as Aerosol AY, diamyl sodium sulfosuccinate, Aerosol IB, dibutyl sodium sulfosuccinate and Aerosol MA, dihexyl sodium sulfosuccinate may be used. Also found useful are alkylated mono sodium benzenesulfonate, sodium salt of an alkyl naphthalene sulfonic acid, sodium salt of tetrahydronaphthalene sulfonic acid, calcium glycerin phosphate, alkylphenyl polyethylene glycol, oleic acid ester of hydroxyethane sulfonic acid and sulfonated higher molecular weight primary or secondary aliphatic, aromatic and cyclo-aliphatic carboxy acids. It is to be understood, however, that any commercially available, substantially non-residual wetting agent may be employed. The nature of the wetting agent is immaterial so long as it possesses wetting, dispersing and emulsifying properties, and its aqueous solutions are colorless.

The amount of wetting agent employed is, of course, comparatively small. Usually an amount comparable to about 1% of the final solution has been found suitable although any concentration of a wetting agent ranging from 0.05% to 5.0% in the finished solution may be employed.

The following specific examples, wherein all parts and amounts are by volume, will serve to illustrate the practice of the present invention, although it will be distinctly understood that the invention is in no way limited thereto:

### Example I

A solution was prepared by dissolving 2 ounces (dry) of methyl cellulose in 8 ounces of water at a temperature of 212° F. which was then diluted to 32 ounces by the addition of water at 33° F. The resulting solution, which

## 3

is herein and hereinafter referred to as "the concentrated solution," was further diluted 2 parts to 16 of water at 70° F. No wetting agent was added. Prints were soaked in this solution for a period of approximately three minutes, removed, drained, excess solution was sponged off, and then rolled on an electrically heated ferrotyping drum. Prints were dried at a temperature of approximately 180° F. These prints came from the drum with a high gloss surface and great apparent optical depth, but with more flexibility than is generally desirable.

*Example II*

The concentrated solution as prepared in Example I, was diluted with water at 70° F. at a ratio of one to sixteen. No wetting agent was added. Prints were immersed for a period of three minutes and then dried on the ferrotyping drum at a heat of about 180° F. These prints possessed substantially the same smooth, high gloss surface and had the flexibility that is generally desired.

*Example III*

The concentrated solution of Example I was diluted in the same ratio as in Example II and prints were immersed for the same period of time and rolled onto the ferrotyping drum, except this time the heat temperature of the drum was increased to approximately 200° F. The prints dried faster yet still retained their high gloss and great flexibility.

*Example IV*

The concentrated solution of Example I was diluted 1-16 with water and then about 1% Aerosol OT—100% was added to the solution. Prints were then immersed for a period of only one minute and dried on the ferrotyping drum at about 200° F. The same results were had as in Example III.

*Example V*

The process of Example II was carried out except that carboxymethylcellulose (sodium salt) was used instead of methylcellulose.

*Example VI*

The process of Example IV was carried out except that methyl sodium benzene sulfonate was used instead of Aerosol OT—100%.

While there are herein disclosed preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, since it will be readily apparent to those skilled in the art, that the precise proportions of the materials utilized may be varied and other materials having equivalent chemical or physical properties may be employed if desired without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

What is claimed is:

1. A photographic ferrotyping process comprising im-

## 4

mersing a flexible paper photographic print in a dilute aqueous solution of a cellulose ether and then contacting the thus treated print with a ferrotype surface.

2. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of a cellulose ether and a wetting agent, and then contacting the thus treated print with a ferrotype surface.

3. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of a cellulose ether and then contacting the thus treated print with a heated ferrotype surface.

4. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of a cellulose ether and a wetting agent, and then contacting the thus treated print with a heated ferrotype surface.

5. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of methyl cellulose and then contacting the thus treated print with a ferrotype surface.

6. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of sodium carboxymethylcellulose and then contacting the thus treated print with a ferrotype surface.

7. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution of methyl cellulose and a wetting agent, and then contacting the thus treated print with a heated ferrotype surface.

8. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution containing 0.25% to 1.5% of a cellulose ether and then contacting the thus treated print with a heated ferrotype surface.

9. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution containing 0.25% to 1.5% of a cellulose ether and 0.05% to 5.0% of a wetting agent and then contacting the thus treated print with a heated ferrotype surface.

10. A photographic ferrotyping process comprising immersing a flexible paper photographic print in a dilute aqueous solution containing 0.4% to 0.7% of methyl cellulose and approximately 1% dioctyl sodium sulfosuccinate, and then contacting the thus treated print with a ferrotype surface heated to approximately 180° F. to 200° F.

## References Cited in the file of this patent

## UNITED STATES PATENTS

|            |        |                |
|------------|--------|----------------|
| Re. 18,192 | Boyce  | Sept. 15, 1931 |
| 2,096,973  | Munch  | Oct. 26, 1937  |
| 2,656,286  | Fisher | Oct. 20, 1953  |