July 27, 1926.

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M. DONAUER

PHOTOGRAPHIC POSITIVE MATERIAL

Original Filed Oct. 20, 1922

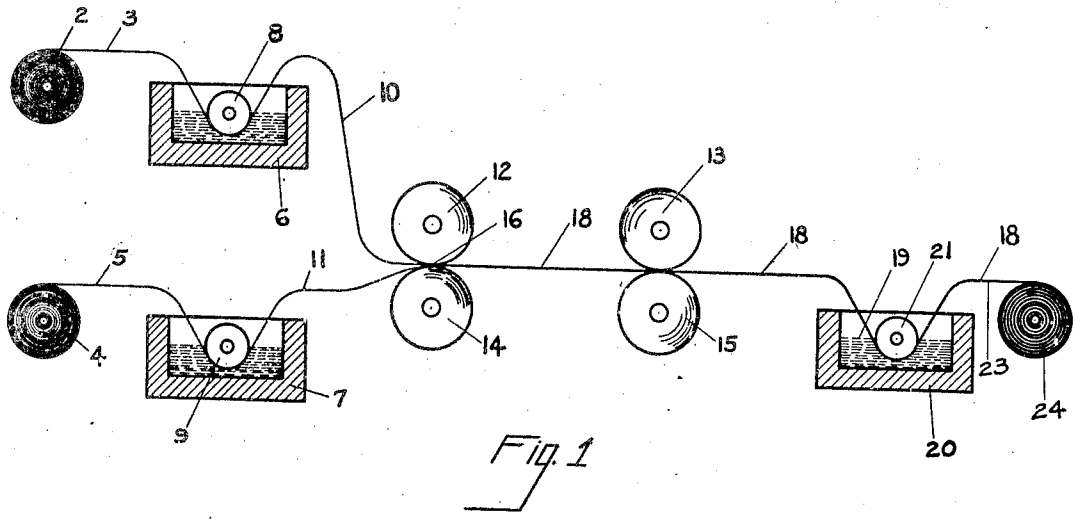


Fig. 1

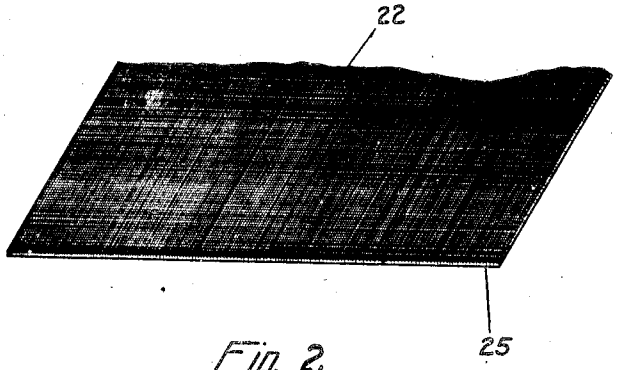


Fig. 2

MAX DONAUER *INVENTOR.*

BY Richey, Slough + Watts

HIS *ATTORNEYS*

Patented July 27, 1926. 1,593,652

UNITED STATES PATENT OFFICE.

MAX DONAUER, OF ELYRIA, OHIO, ASSIGNOR OF FORTY PER CENT TO FRANK M. SLOUGH, OF ELYRIA, OHIO.

PHOTOGRAPHIC POSITIVE MATERIAL.

Application filed October 20, 1922, Serial No. 595,856. Renewed May 28, 1926.

My invention relates to photographic positive materials, and more particularly to photographic sheet materials which are adapted to be sensitized, and upon which a shadow is cast by exposure to the light which is generally projected through a transparent drawing, tracing, negative plate, film or other photographic negative material, and forms a print of whatever is desired to be printed, and which print may be thereafter fully developed by immersing the same in a suitable subsequent developing bath.

An object of the present invention is to produce a photographic-print material which presents a very beautiful surface and upon which photographic prints may be made which will exhibit a picture having greater so-called "depth" or roundness, and giving more of a three-dimensional atmosphere effect upon the eye.

Another object of my invention is to produce a photographic material which does not substantially alter its dimensions after being sensitized, or during the sensitizing thereof, or during the subsequent bathing or development of the print, thereby preserving the correct scale or dimension of the drawing or object produced thereon.

Another object of my invention is to produce a photographic-print material which will lie flat, and which will not draw together irregularly as soon as moistened thereby causing a tendency for the emulsion applied to the material to run from the high spots down into the valleys, thereby producing a print material which will be irregular in photographic results.

Another object of my invention is to produce a photographic-print material comprising cloth backed by a material such as paper, whereby the above and other useful results not heretofore attained may be secured.

Another object of my invention is to produce a photographic material comprising silk or other fabric material, being backed by a material such as paper which may be light in color and which will improve the detail of the picture produced on the print material considerably because of its ability to reflect light through the portions of the picture contained in the fibers of the silk or other cloth material used, and particularly through the less dense areas of such portions of the picture.

Another object of my invention is to provide a photographic-print material which does not partake of permanent set or have a tendency to roll up when opened out after having been kept rolled for sometime.

Another object of my invention is to evolve a process whereby photographic-print material comprising a layer of silk or other cloth material and a backing layer of paper or equivalent material for the purpose, may be produced, and which will have the qualities above mentioned, and which are desirable in photographic-print material.

The appeal of photographic portraits may vary greatly depending somewhat on the style of the picture and folder but actually depending mainly on the details of the portrait itself. Such things as the position, the lighting arrangements producing highlights, etc., are of course important, but these depend on the technique of the photographer. The picture should have good detail. That is, no area of the face or person should be an even black or an even white, but should have variations showing all the differences in contour. A good clear negative is required, but most negatives have good detail. It is then a matter of the paper, the character of the emulsion used, the nature of the surface whether dull or shiny, and how it reflects light. A good portrait possesses a certain roundness, that is the figure stands out as a three dimensional object instead of being flat. Detail in the paper assists this roundness materially in that a paper which produces only outline is necessarily flat.

A negative usually possesses good roundness or a lantern slide made therefrom does because it is viewed by transmitted light and there is an opportunity for depth. It is this roundness or three dimensional atmosphere produced by transmitted light which makes the actors appear so lifelike in moving pictures. A painted portrait also presents more of a lifelike atmosphere than a photograph and is therefore more highly prized.

Efforts to procure better photographic positives have been directed along various lines such as the following.

The silver emulsions have been improved so as to permit better detail. As far as the usual paper coating are concerned, efforts along this line have probably reached the limits.

Buff colored and other light colored papers have been used to produce softer effects.

The surface of the paper has been given a soft dull finish, a linen-like finish, or a rough dull finish.

Fine linen cloth has been coated with a sizing to fill the pores and then coated with emulsion. This linen product is no longer on the market owing to the great tendency for the picture to curl up due to the sizing and emulsion being on one side and also because irregularities caused black spots to appear frequently on development.

A recent innovation has been to make miniature lantern slide positives from portrait negatives. These are painted on the back with gold leaf and then covered with paper so as give the appearance of a framed picture. The detail and lifelike appearance of these pictures is very good.

There is on the market a so-called Japanese tissue print. This consists of a fine silk coated with emulsion. The picture is printed on the silk. Later the back of the silk is painted with gold leaf or the silk without the gold leaf is mounted on a stiff backing.

One manufacturer is putting out pillow tops coated with an emulsion for picture printing but in this case the emulsion is such that only outline photographs are produced.

The material of the present invention is different from any of the above. It is made in a different way, but more important than this, the results made possible are quite different from those heretofore obtained.

My improved material is made as follows:

A fabric material such as china silk cloth is glued over a suitable paper backing, using the same grade of gelatine for the adhesive as is used in making the photographic emulsion. Only a very little of a dilute solution of gelatine is used so that the fibre does not become soaked up with gelatine. The cloth and paper are passed through rolls such that every portion of the cloth is glued in place. This cloth covered paper is then coated with a sensitized photographic emulsion in the regular way, namely; by passing it under a roll dipping into the emulsion. In so doing the emulsion saturates the fibre and also sinks down in to the surface of the paper. Any type of cloth or similar material can be used. The paper backing can be white or gold or any light color. The color of the backing can be later selected so that it harmonizes with the atmosphere of the photograph.

This cloth and paper combination sensitized for photographic work, simple though it may seem, permits several new results which have not heretofore been attained. It is a photograph on silk which presents a very beautiful surface and is well suited for color work. The coating of silk backed with paper is a simple problem whereas the coating of silk alone and getting a uniform coating is exceedingly difficult. The combination can be coated by being run under a roll dipping into the emulsion, then over chilling rolls and then dried in the usual way. With silk alone, the emulsion soaks right through and the rolls cause irregularities in coating.

Referring now to the drawing accompanying this specificaton and forming a part thereof—

Fig. 1 illustrates diagrammatically the process involved in the production of the photograhic-print material of my invention, the apparatus involved in such production being indicated in vertical section.

Fig. 2 shows a view in perspective of a portion of a sheet of the photographic-print material of my invention, and as may be produced as shown in Fig. 1.

Referring now to the drawings, in Fig. 1 at 2 is shown a roll of paper 2 and at 4 is shown a roll of fabric such as china silk, which material I find to be well adapted for the purpose of my invention, the silk being shown as passing from the roll at 5. At 6 and 7 are shown containers which contain a dilute solution of gelatine, rolls 8 and 9 for the container 6 and 7 respectively adapted to dip into the solution, the paper 3 and paper 5 being adapted to pass around the rolls 8 and 9 respectively, and to emerge therefrom at 10 and 11.

Rolls 12, 13, 14 and 15 are provided in the subsequent path of the paper 10 and the cloth 11 after passing out of the containers 6 and 7 respectively, the paper 10 and the cloth 11 entering between rolls 12 and 14 as shown at 16 being pressed closely together at this point so that every portion of the cloth is glued in place uniformly, being held uniformly in contact by the adhesive quality of the gelatine solution. The paper-cloth print material 18 united by the gelatine is then preferably passed through other rolls 13 and 15 to improve the uniformity of adherence between the paper and the cloth after which the cloth-paper print material 18 passes through a bath 19 which comprises a photographic emulsion, the gelatine used in the photographic emulsion being preferably of the same grade of gelatine as the adhesive used in gluing the paper 10 and the cloth 11 together as before described.

The bath 19 is contained in a vessel 20 having a roll 21 dipping therein around which roll 21 the cloth-paper print material 18 passes, preferably in such a way that the cloth side 22 of the material only is exposed to the direct contact with the emulsion contained in the vessel 20.

The photographic cloth-paper material 18 is then dried at 23 prior to being rolled on a roll shown at 24, and then packaged ready for use.

In Fig. 2 the resultant product is illustrated in perspective, a portion of a sheet being shown lying flat as when ready to be exposed to make a photographic print, the top side 22 being the cloth side of the material, and the bottom side 25 being the paper side of the material. It will be noted that the cloth side of the material 22 is the side which is exposed to and coated with the photographic emulsion.

I have found that in coating the cloth 5 with the gelatine, only a very little of a dilute solution of gelatine should be used so that the fibre does not become soaked up with gelatine; also that the paper 3 need not be coated with gelatine as before described in connection with its immersion in the gelatine bath of the vessel 6 as the gelatine coating on the cloth 5 as a result of being passed through the gelatine solution of the vessel 7 is sufficient for the purpose of gluing together the cloth and the paper when pressed between the rolls such as 12 and 14.

Any type of cloth or similar material can be used, and the backing material, preferably of paper, can be white or gold, or any suitable color. I have found that light colored paper is preferable as a backing, and that the color of the backing can be selected so that it harmonizes with the atmosphere of the photograph, it being found that tinted photographs may be produced by proper selection of paper backing of the proper color to give very beautiful effects, that is a reddish tinted paper backing producing a very desirable effect where a photograph of a fire-side scene is to be printed on the print material, this being given merely as an example.

I have found that the coating of silk with the photographic emulsion is a simple problem when the silk is backed with paper as herein described, whereas the coating of silk alone and getting a uniform coating is exceedingly difficult. The combination can be coated by being run under a roll dripping into the emulsion and then over chilling rolls and dried in the usual way. With silk alone the emulsion soaks right through and the rolls cause irregularities in coating. Whether this is the cause of the spots in sized linen previously described is rather hard to say. Their appearance seems to me to indicate that some of the heavier threads were not thoroughly covered with the sizing and the emulsion soaked down into the thread, whereas for the most part, the emulsion was on top of the size.

The combination of fabric, such as silk, and paper has many advantages. The freshly coated product lies perfectly flat. It does not draw together irregularly as soon as moistened causing a tendency for the emulsion to run from the high spots down into the valleys, as is the case with cloth alone. There is no irregular stretching causing the strands of fibre to run in crooked lines across the print. With cloth, especially a thin silk, after printing and developing the picture, there is a possibility for the features to become distorted because the cloth was stretched or placed irregularly while drying. All these things are entirely avoided using silk-print paper.

The manipulating of the silk covered paper is much simpler than other cloth prints. No special developing or printing facilities are required. It can be dried the same as ordinary photo paper, and has practically no tendency to curl, whereas there is a very marked tendency with most coated cloth products. The mounting of the finished picture is a very simple problem.

The combination of silk and paper presents a new means of obtaining a photographic print with more detail, and greater roundness or three dimensional atmosphere than is possible with present photographic papers.

I find also that putting a white background closely under the silk improves the detail of the picture considerably because it reflects light back through the less dense areas. Cloth, and especially silk is quite transparent and is subject to much greater light penetration than paper. The quality of a picture made on the silk depends largely on how the backing reflects the light back through the silk. Also silk or cloth being made up of interwoven strands it consists of a net work of open areas. If silk were coated, the picture printed and then mounted or painted with gold leaf on the back, these open areas would be void of detail. Coating the cloth with a filler to fill up these pores destroys the best qualities of the cloth surface. Also the penetration of the fibre by light is prevented. In the silk-print paper of my invention, the backing which reflects the light is in the nature of a picture on paper behind the silk picture, the former thus emphasizing all the minute variations in detail which the negative has recorded.

By covering paper with silk or other cloth and then sensitizing the combination, it has thus been made possible to obtain greater detail and more roundness in a photograph.

The light coming through the silk film presents a condition similar to motion picture positives viewed by reflected light. The picture on the combination material therefore has greater depth and more of a three dimensional atmosphere than is possible with the picture printed on the ordinary paper surface. In the ordinary photographic paper, the emulsion is exceedingly thin and consists of a layer on top of the paper surface.

A picture on paper under the picture on silk also means that the myriad of open areas between the interwoven strands of the cloth are not void of detail, but the variations are all clearly recorded by the sensitized paper underneath. This is not possible if the silk picture is first made and then backed. In either case the silk surface which is considered so very desirable is obtained.

The idea of coating a combination of silk and paper permits many interesting possibilities. The silk can be backed with paper of various light colors and tinted pictures harmonizing with the atmosphere of the setting can be obtained. A paper covered with gold leaf would also be possible.

Having thus described my invention in a specific embodiment, and employing specific materials, I am aware that my invention may be embodied in photographic-print material employing different materials, but which are the equivalent for the purpose, and that although I have described a specific arrangement of bath rolls, and the like for producing the photographic-print material of my invention, I am aware that many variations may be made in such an arrangement without departing from the novel method herein set forth and claimed, it being understood that the method of producing the paper may be varied and the materials entering into the paper varied without departing from the spirit of my invention.

I claim:—

1. A photographic-print material comprising superposed layers of cloth and paper and a photographic emulsion applied to the cloth and penetrating the same, portions of the emulsion coating the surface of the paper next the cloth.

2. A photographic-print material comprising superposed layers of cloth and paper and an emulsion applied to the cloth side of the material.

3. A photographic-print material comprising a layer of cloth and a backing layer of light reflecting material, said cloth adhering closely to a surface of the light reflecting material and a photographic emulsion applied to the cloth.

4. A photographic-print material comprising a layer of cloth and a backing layer of light reflecting material, said cloth adhering closely to a surface of the light reflecting material and a photographic emulsion applied to the cloth, said photographic-material penetrating the fibers of the cloth and coating the surface of the said light reflecting material,

5. A photographic-print material comprising superposed layers of cloth and paper and a photographic emulsion applied to the cloth and penetrating the same, portions of the emulsion coating the surface of the paper next the cloth, said emulsion comprising gelatine, said layer of cloth and said paper being glued together by gelatine of substantially the same grade as employed in the photographic emulsion.

6. A photographic-print material comprising superposed layers of cloth and paper and an emulsion applied to the cloth side of the material, said emulsion comprising gelatine, said layer of cloth and said paper being glued together by gelatine of substantially the same grade as employed in the photographic emulsion.

7. A photographic-print material comprising a layer of cloth and a backing layer of light reflecting material, said cloth adhering closely to a surface of the light reflecting material and a photographic emulsion applied to the cloth, said emulsion comprising gelatine, said layer of cloth and said paper being glued together by gelatine of substantially the same grade as employed in the photographic emulsion.

8. A photographic-print material comprising a layer of cloth and a backing layer of light reflecting material, said cloth adhering closely to a surface of the light reflecting material and a photographic emulsion applied to the cloth, said photographic-material penetrating the fibres of the cloth and coating the surface of the said light reflecting material, said emulsion comprising gelatine, said layer of cloth and said paper being glued together by gelatine of substantially the same grade as employed in the photographic emulsion.

9. A photographic-print material comprising superposed layers of silk and paper and a photographic emulsion applied to the silk and penetrating the same, portions of the emulsion coating the surface of the paper next the silk.

10. A photographic-print material comprising superposed layers of silk and paper and an emulsion applied to the silk side of the material.

11. A photographic-print material comprising a layer of silk and a backing layer of light reflecting material, said silk adhering closely to the surface of the light reflecting material and a photographic emulsion applied to the silk.

12. A photographic-print material comprising a layer of silk and a backing layer of light reflecting material, said silk adhering closely to a surface of the light reflecting material, and a photographic emulsion applied to the silk, said photographic-material penetrating the fibers of the silk and coating the surface of the light reflecting material.

In witness whereof, I have hereunto signed my name this 16th day of October, 1922.

MAX DONAUER.