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PHOTOGRAPHIC FILM FORMING IMAGE TRANSFER COMPOSITION

Filed Feb. 17, 1947

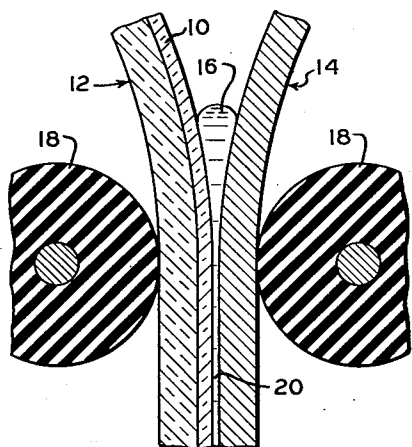


FIG. 1

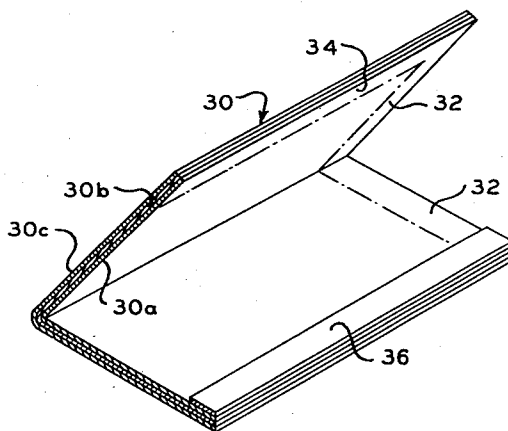


FIG. 2

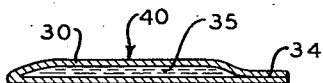


FIG. 4

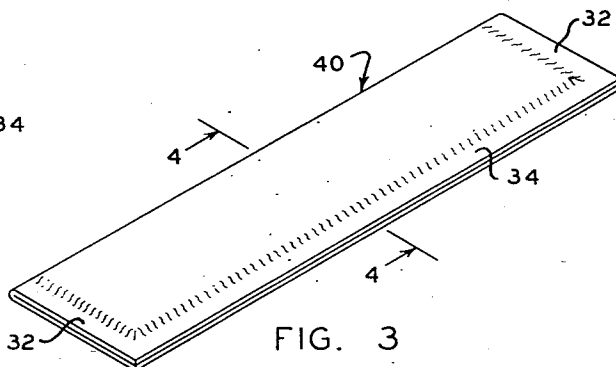


FIG. 3

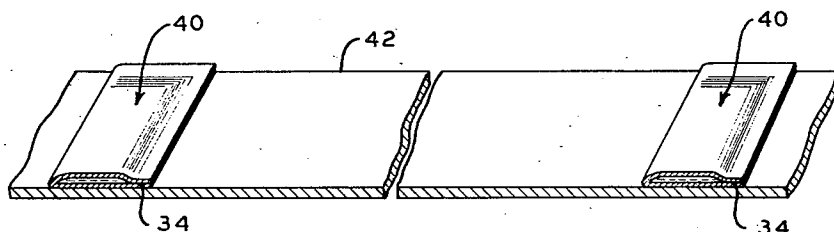


FIG. 5

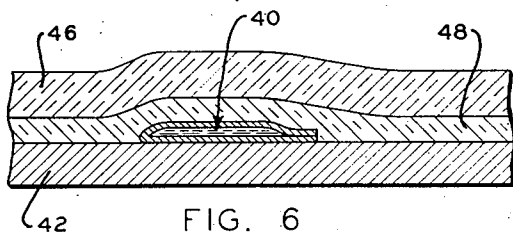


FIG. 6

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PHOTOGRAPHIC FILM FORMING IMAGE
TRANSFER COMPOSITIONEdwin H. Land, Cambridge, Mass., assignor to
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13 Claims. (Cl. 95—88)

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This invention relates to photography, and more particularly to processing agents or compositions useful in the processing of a photosensitive emulsion.

This application is a continuation-in-part of my copending application Serial No. 576,254, filed February 5, 1945, for Photographic Process, Apparatus and Product (now abandoned).

One object of the present invention is to provide a novel liquid processing agent or composition capable, when spread over a photosensitive emulsion, of developing said emulsion and forming adjacent said emulsion a substantially solid film.

Another object of the present invention is to provide a novel film-forming composition of the above character which is capable, when spread over a photosensitive emulsion, of providing in the solid film obtained therefrom or in or on a base associated with said film a positive image of the subject matter to which said photosensitive emulsion was exposed.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the composition of matter possessing the features, properties and the relation of components which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing wherein:

Figure 1 is an enlarged, fragmentary, sectional and somewhat diagrammatic view illustrating the novel composition of the invention in use in the processing of a photosensitive emulsion;

Fig. 2 is a fragmentary, enlarged perspective view illustrating the construction of the container which comprises part of the novel composite product of the present invention;

Fig. 3 is a perspective view of the composite product;

Fig. 4 is a sectional view taken substantially along line 4—4 of Fig. 3;

Fig. 5 is an enlarged, fragmentary, sectional view in perspective illustrating another form of composite product embodying the liquid composition of the invention; and

Fig. 6 is a longitudinal sectional view showing still another composite product embodying the liquid composition of the invention.

The present invention comprehends as a novel photographic processing agent a film-forming

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liquid composition so composed that when the same is applied in a predetermined relatively thin layer over a photosensitive silver halide emulsion, the liquid content thereof permeates said emulsion to subject the same to a predetermined processing and, with the evaporation and/or absorption of the liquid content of the composition, the film-forming ingredient thereof provides a solid film throughout the area of application of the composition. The composition is particularly adapted for use in a camera for subjecting a photosensitive silver halide emulsion to a desired processing shortly after exposure thereof. By distributing the composition between the exposed film and another sheet of material, it is possible to confine all of the liquid to the lamination comprising said film and sheet material, the amount of liquid in the composition being such that there is no appreciable wetting of the outer surfaces of the lamination so obtained. The liquid composition is thus ideally suited to carrying out what is tantamount to a dry processing of a photosensitive emulsion in a camera.

One example of the novel processing agent or composition of the invention for use in connection with silver halide emulsions comprises a water solution of a developer, an alkali for imparting to the solution a sufficiently high alkalinity to permit the developer to carry out its developing function, a substance for forming a soluble complex with silver halide, and a film-forming material. Upon application of the composition to a silver halide emulsion, the developer in the composition acts to develop any latent image in the emulsion and the silver halide solvent forms a soluble complex with the unexposed silver halide during the development, which complex may be transported from the emulsion to another stratum of material to form therein a positive image comprising silver of the subject matter of the developed image in the emulsion. The film-forming material, which is preferably a high molecular weight polymer, imparts to the composition a predetermined high viscosity and is of such character as to retain its viscosity-imparting and film-forming properties in an aqueous alkaline solution so that the processing agent, once its ingredients have been mixed and have attained an equilibrium, remains uniformly viscous for any given temperature for long periods of time.

The film-forming material is preferably one of the class of high molecular weight polymers which include in their chemical structure such groups as, for example, the ether, alkyl, hydroxyl, carboxyl and acetyl groups that are stable to alkalis and

which contain none of the chemical groups, such as the ester and acid chloride groups, that are unstable to alkalis. The polymers also contain groups such as the hydroxyl and/or carboxyl groups which tend to solubilize in aqueous alkaline solutions. Suitable examples of such polymers are the alkali-inert and water-soluble cellulose derivatives such as sodium carboxy-methyl cellulose, and hydroxyethyl cellulose, and other alkali-inert and water-soluble polymers such as the sodium salts of polymethacrylic acid and polyacrylic acid.

Examples of developers useful in the foregoing composition are hydroquinone, monomethyl-p-aminophenol sulfate (Elon, Metol), a mixture of hydroquinone and monomethyl-p-aminophenol sulfate, p-aminophenol hydrochloride (Kodolon), p-hydroxyphenylaminoacetic acid (Athenon, Glycin), p-phenylenediamine, o-phenylenediamine, pyrocatechin (pyrocatechol, catechol), diaminophenol dihydrochloride (Amidol), diaminophenol hydrochloride (Acrol), pyrogallol, chlorohydroquinone, dichlorohydroquinone, tetrachlorohydroquinone, bromohydroquinone, toluhydroquinone, xylohydroquinone, o-aminophenol, 2-amino-5-diethylaminotoluene hydrochloride, p-tertiary butyl catechol, hydroquinone disulfonic acid (potassium salt), 2,5-ditertiary butyl hydroquinone, and p-aminodiethylaniline.

Examples of materials which may be used in the composition for the purpose of forming a soluble silver complex with the undeveloped silver halide of the photosensitive layer are sodium thiosulfate, sodium thiocyanate, ammonium thiosulfate, ammonia and sodium cyanide. Where a compound is toxic such as sodium cyanide, precautions should be taken in the use thereof.

Examples of suitable alkalis are sodium hydroxide, potassium hydroxide, sodium carbonate, borax, sodium metaborate, or trisodium phosphate.

The composition may also contain sodium sulfite which acts in part as a preservative and may also function as a silver halide solvent. Citric acid may also be added to the composition to provide a buffer.

The spreading of the processing composition in a substantially uniform layer over a predetermined area of a photosensitive emulsion 10 of a photographic film 12 may be accomplished by introducing between said emulsion and a suitable base or image-carrying layer 14 (Fig. 1) a predetermined quantity of said processing composition 16, said composition being originally disposed adjacent one edge of said predetermined area in a mass extending parallel to said edge over a length substantially coextensive with said edge. After the introduction, image-carrying layer 14 and film 12 are squeezed together as, for example, by being advanced between a pair of pressure-applying elements such as squeegee rollers 18 or plates to cause the composition to be spread as a liquid layer 20 between the inner surfaces of said image-carrying layer and emulsion 10, layer 20, upon the drying and/or absorption of the liquid content thereof, forming a solid layer of plastic. The thickness of layer 20 will be subject to control by variations in the pressure applied by the pressure-applying elements to the lamination comprising image-carrying layer 14 and film 12 as said lamination is drawn through said pressure-applying elements. The thickness of layer 20 will also be in part a function of the spreading characteristics of the liquid composition, the rigidity of the photosensitive film and the other sheet material between which the composition is spread and the

permeability of the surfaces of the layers of material in contact with the composition.

The presence of the plastic in the composition insures that the surfaces of emulsion 10 and image-carrying layer 14 are immediately wetted with the composition as the layer 20 thereof is formed. The plastic additionally serves as a spacer between layers 10 and 14, holding them far enough apart to provide an adequately large reservoir and sink for the ions and molecules that must enter and leave it while keeping the surfaces near enough together so that the image-forming particles precipitated in it are made up from dissolved components that have arrived along a very short radius of diffusion. Film 12 and layer 14, as they emerge from the pressure-applying elements, are bonded together by means of layer 20 just tightly enough so that they do not separate spontaneously during the time of processing and yet when they have imbibed most of the liquid from said layer 20 they can be peeled apart.

It is to be understood that by a suitable selection of the film-forming material in composition 16, the solid film or layer 20 which is formed therefrom may be caused to adhere to either the photosensitive emulsion 10 or the surface of image-carrying layer 14 when and if the latter are peeled apart subsequent to the processing. For example, if the film-forming material is the plastic sodium carboxymethyl cellulose and base 14 is a paper such as a baryta paper, the solid film of sodium carboxymethyl cellulose, when formed, will have a greater affinity for the surface of layer 14 than for the gelatin of emulsion 10, provided, of course, that the latter is an ordinary emulsion comprising the usual partially but not fully hardened gelatin and the liquid in the composition does not complete the hardening thereof. As a result, the solid plastic film 20, when formed, will adhere to the image-carrying layer when the latter is stripped from film 12. In general, for example, the sodium carboxymethyl cellulose film will adhere to the harder of two layers of gelatin between which it is spread. Accordingly, if the surface of any image-carrying layer is provided with a thin coating of a substantially fully hardened gelatin, the film of sodium carboxymethyl cellulose will adhere to said image-carrying layer in preference to the relatively softer gelatin layer of the photosensitive emulsion.

It is, of course, possible to increase the adhesion between the solid film 20 and either emulsion layer 10 or the surface of layer 14 by surfacing one of said layers with a coating of other materials which have a desired high affinity for the solid plastic film. For example, by subcoating layer 14 with a coating of the same high molecular weight polymer which is the film-forming material in the processing agent, the solid layer 20, when formed, will be caused to strongly adhere to layer 14.

In the event the image-carrying layer 14 is surfaced with a subcoating of the same material as the film-forming material in the reagent or where the film-forming material is sodium carboxymethyl cellulose and the base is a baryta paper, the image-forming component is ordinarily precipitated in part in said subcoating or the surface stratum of paper so that the positive image is formed in part in the plastic film 20 and in part in or on layer 14 and/or said subcoating. Control of the stratum wherein the positive image components are predominantly precipitated may also be achieved by the suitable use of material which attracts and ag-

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gregates the image-forming ions as by distributing such material in the stratum wherein the image is to be formed. Moreover, if a plurality of strata are permeated by the liquid composition, the protective colloidal action of these strata upon the soluble complex whose precipitation gives the positive image will control to an appreciable extent the stratum within which the image-forming ions are ultimately precipitated to give the positive image. For example, by having the surface stratum of image-carrying layer 14 formed of a partially hardened gelatin and by employing hydroxyethyl cellulose as the film-forming material in composition 16, the image-forming silver ions may be caused to almost entirely precipitate in the stratum of gelatin.

Although image-carrying layer 14 is preferably a baryta paper, it may be formed of such other materials as, for example, regenerated cellulose, a polyhydroxy alkane such as polyvinyl alcohol, sodium alginate, cellulose ethers such as ethyl cellulose, or their derivatives such as sodium carboxymethyl cellulose, aluminum carboxymethyl cellulose and hydroxyethyl cellulose, other papers, proteins such as gelatin and carbohydrates such as gums and starch, and mixtures of these materials where the latter are compatible. If said layer is formed of a transparent material, it may be provided with a white opaque base or in the alternative the normally transparent material of said layer may be rendered opaque by the incorporation of a suitable pigment such, for example, as titanium dioxide.

Photosensitive emulsion 10 preferably comprises a silver halide or a mixture of silver halides or a silver mixed halide in a suitable carrier, preferably gelatin. Suitable materials for providing the photosensitive layers for the practice of the invention are the commercially available photographic films and papers such as Eastman Kodak Verichrome film, Super XX film, and Contrast Process Ortho film.

A high viscosity for the processing agent is very desirable since it makes possible the relatively uniform spreading of the composition and insures a complete coverage of the desired area by said composition. The film-forming material is preferably contained in the composition in suitable quantities to impart to the composition a viscosity in excess of 1,000 centipoises at a temperature of approximately 24° C. and preferably of the order of 1,000 to 200,000 centipoises at said temperature. These high viscosities are important for any commercial application of said composition in view of the order of nonuniformity of commercially available materials and pressure-applying means to be used in connection therewith.

It is to be understood that thixotropic effects may cause an apparent change in viscosity in the composition as when the composition, after being confined in a space of predetermined configuration without appreciable disturbance for a relatively long period of time, is agitated.

Examples of suitable film-forming compositions capable, when spread between a photosensitive emulsion and an image-carrying layer, of developing a latent image in said emulsion and of forming a positive image in a stratum of the lamination other than said photosensitive emulsion are given below, but it is to be expressly understood that they are merely illustrative.

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Example 1

	Grams
Water	1860
Sodium carboxymethyl cellulose	117
Sodium sulfite	78
Sodium hydroxide	74.6
Sodium thiosulfate	14.5
Citric acid	38.5
Hydroquinone	52.0

The sodium carboxymethyl cellulose, for example the commercially available Hercules 1362 medium viscosity type, is dissolved in the water in a mixer at room temperature and the solution is mixed therein for approximately one hour. Thereafter, the sodium sulfite, the sodium hydroxide, the sodium thiosulfate and the citric acid are added to the solution, the addition being effected in an inert atmosphere, for example of nitrogen. Upon dissolution of these materials, the hydroquinone is added and the solution is further mixed for an hour at approximately room temperature in a nonoxidizing atmosphere of nitrogen. This composition, when spread between a photographically exposed photosensitive emulsion such, for example, as the emulsion of Eastman Kodak Contrast-Process Ortho film and baryta paper in a layer, for example, of a thickness between .002" and .003", is capable of producing a positive image of the subject matter of the latent image in said emulsion in approximately one minute. At the end of approximately one minute, the photosensitive film and the baryta paper are stripped apart, leaving a finished positive image of good contrast on the baryta paper. If the liquid composition is spread in a thickness approximating the foregoing thickness, there is no appreciable wetting of the outer surfaces of the photosensitive film or the baryta paper during this processing, the liquid being present in sufficiently small quantities to be substantially completely absorbed by the sheets. Faster film such, for example, as Eastman Kodak Verichrome or Super XX may be used, but it is preferable, when these films are used, in order to assure the formation of substantially black images, to increase the sodium thiosulfate content of the composition as, for example, by doubling the amount thereof specified above. A good quality image can also be obtained when using these faster films without increasing the sodium thiosulfate content by spreading on the image-carrying layer or baryta paper a thin coating of the following mixture of materials:

40% aqueous solution of neutral lead acetate	cc. 192
Silica aerogel (Santocel C)	g. 30
1% aqueous solution of sodium sulfide	cc. 60
1% aqueous solution of copper acetate	cc. 66
15% aqueous solution of ascorbic acid	cc. 36

Example 2

In the composition of Example 1, any one of the following developers may be substituted in substantially the same quantity as the hydroquinone:

- P-aminophenol hydrochloride; bromohydroquinone; chlorohydroquinone; diaminophenol hydrochloride; diaminophenol dihydrochloride; toluhydroquinone; monomethyl-p-aminophenol sulfate; a mixture consisting by weight of one-half hydroquinone and one-half p-hydroxyphenylaminoacetic acid; and a mixture consisting by weight of one-fourth hydroquinone and three-fourths p-hydroxyphenylaminoacetic acid.

Example 3

Water	cc.	1000
Sodium sulfite	g.	70
Hydroquinone	g.	33
Sodium thiosulfate	g.	14
An aqueous solution of Hercules or Dow carboxymethyl cellulose, sodium salt, medium viscosity, consisting of 200 g. of the latter compound in 1000 cc. of water	g.	50
Sodium hydroxide, 10% solution	cc.	112

The foregoing materials may be mixed in the same way as the materials of Example 1, or in the alternative, the sodium sulfite, hydroquinone, and sodium thiosulfate are dissolved in the water, and the sodium carboxymethyl cellulose solution is then added and thoroughly mixed therewith. The solution thus obtained is cooled to a temperature between 65° to 75° F. and thereafter the sodium hydroxide solution is added thereto.

Example 4

Water	cc.	1500
Hydroquinone	g.	28
Sodium sulfite	g.	200
Metol	g.	15.5
Sodium thiosulfate	g.	100
Aqueous solution of medium viscosity sodium carboxymethyl cellulose consisting of 200 g. of the latter compound in 1000 cc. of water	g.	1000
Sodium hydroxide	g.	56

Example 5

Water	cc.	2400
Sodium sulfite	g.	90
Sodium hydroxide	g.	87.5
Hydroxyethyl cellulose	g.	21.31
Sodium thiosulfate	g.	5
Hydroquinone	g.	9

Example 6

500 grams of hydroxyethyl cellulose, for example the product sold by Carbide and Carbon Chemical Corp. and identified as hydroxyethyl cellulose (71.2 cps.), are dissolved in 1000 cc. of water and 200 cc. of this solution are mixed with 500 cc. of a solution comprising the following:

Sodium sulfite	g.	180
Sodium hydroxide	g.	37.5
Hydroquinone	g.	180
Sodium thiosulfate	g.	50
Water to make	cc.	1500

Example 7

	Grams	
Sodium sulfite	78	
Sodium hydroxide	110	
Sodium thiosulfate	15	
Citric acid	39	
Hydroquinone	52	

are dissolved in 2860 cc. of distilled water and there are added to this solution 102 g. of high molecular weight polymethacrylic acid. The resulting mixture is preferably treated in a vacuum pump to exclude oxygen and to remove the air content thereof, and comprises as its film-forming material the sodium salt of polymethacrylic acid, the polymethacrylic acid being neutralized in the alkaline solution.

If a relatively white and nontransparent film is to be formed by the liquid composition, there may be incorporated in any one of the foregoing compositions a suitable pigment such as titanium dioxide or mixtures of titanium dioxide and magnesium oxide or magnesium carbonate. The ad-

dition of titanium dioxide equivalent to from 10% to 20% by weight of the composition has given good results. These pigments also serve as fillers for increasing the viscosity of the composition.

The film-forming composition is particularly adapted for use with a container wherein it may be kept in quantities just sufficient to take care of a predetermined area of a photosensitive emulsion. The container is preferably inexpensive and disposable and so constructed as to be capable of retaining the processing composition therein for relatively long periods of time without vapor loss or oxidation.

The container is preferably constructed so as to be mounted, adjacent the area which the contents thereof are to process, for ready release of its contents throughout said area. To this end it is preferably elongated in shape, the length thereof being equal at least to the width of the image area over which its contents are to be spread. It is also preferably relatively flat so that it may be embodied in a composite film without unduly increasing the overall thickness thereof.

One example of a suitable container of this type is formed from a single multilayer sheet of material 30 (Fig. 2) comprising three layers 30a, 30b, and 30c. Layer 30a, which provides the internal surface layer of the container, is formed of a material which is chemically inert to the processing agent and which is impervious to the liquid of the agent. One class of materials suitable for this purpose is the polyvinyl acetals; and of the acetals polyvinyl butyral is a preferred species. A composition comprising 60% to 72% by weight of polyvinyl butyral, 10% to 23% by weight of 1/2" nitrocellulose, and approximately 5% by weight of dibutyl sebacate is particularly satisfactory as inner coating 30a. Layer 30b contiguous to layer 30a is preferably impervious to the vapor of the processing agent and is formed, for example, of a metallic foil, such as lead or silver foil. Backing layer 30c, for example of kraft paper, is provided and makes possible the use of thinner layers 30a and 30b.

The container 40 (Fig. 3) is preferably formed by taking the single sheet of material 30 and folding the same medially as shown in Fig. 2 and thereafter securing the end marginal portions 32 and the longitudinal marginal portions 34 of the two fold faces to one another, providing a central space or cavity 35 (Fig. 4) for containing the processing agent.

To fill the container, it is possible, for example, to adhere together the opposite longitudinally extending marginal portions 34 and the end marginal portions 32 at one end only of the container, the container being thereafter filled through the other end.

It is desirable that the container be capable of releasing its contents throughout substantially its entire length so that by mounting the container with its longitudinal edge 34 adjacent the image area opposite one edge thereof, the contents may be uniformly spread throughout substantially the entire width of the image area. To this end, the longitudinal seal between marginal portions 34 is such that upon application of a predetermined compressive force to the walls of the container there may be created within the container a sufficient hydraulic pressure to separate the marginal portions 34 throughout substantially their entire length. To insure this result, the bond securing together said marginal portions 34 is somewhat weaker than the bond which secures

together end marginal portions 32. For example, the end portions may be secured by pressing the two polyvinyl butyral inner surfaces together and applying heat thereto while a sealing strip 36 may be inserted between the longitudinal marginal portions, which sealing strip is adapted to adhere the the inner layers of polyvinyl butyral with a lesser affinity than said layers adhere to one another in a direct polyvinyl butyral to polyvinyl butyral bond. Strip 36 may be formed of a material such as ethyl cellulose or a mixture of ethyl cellulose and paraffin.

One or more containers 40 may be associated with the sheet material to provide a sheet-like product capable of subjecting one or more areas of a photosensitive film to a predetermined processing. One such sheet-like structure is shown in Fig. 5 and comprises a plurality of containers 40 mounted on the surface of an image-carrying layer 42 as by being adhered thereto with their longitudinal axes extending transversely of said layer. The containers 40 are spaced apart a predetermined distance and each container is adapted to release its contents over at least a predetermined portion of the area separating it and the next container. Layer 42 is preferably a paper such as a photographic baryta paper. The composite sheet-like structure thus obtained is capable, when pressed into engagement with the surface of a photosensitive emulsion, of subjecting a predetermined area of said emulsion to a desired processing, said predetermined area being a portion at least of that area of the emulsion which is in contact with the surface of sheet 42 between containers 40. The processing may be carried out by applying a sufficient compressive force to container 40 to cause the separation of the sealed portions 34 thereof and by continuing the application of this compressive force in sufficient magnitude to effect the spreading of the released liquid throughout the area of contact of sheet 42 and the photosensitive emulsion. This provides adjacent the photosensitive emulsion a relatively thin uniform layer of the processing agent. The latter may act to develop and fix a latent image in the photosensitive emulsion and it may also serve to provide layer 42 with a thin, solid film of plastic. The plastic film may serve as an image-receiving layer or may cooperate with layer 42 to so function.

The sheet-like product comprising layer 42 may comprise a part of a composite photographic film (Fig. 6), which includes as a part of its unitary structure a transparent film base 46, a photosensitive emulsion 48 mounted on said film base and one of image-carrying layers 42. Containers 40 are thus located between said photosensitive emulsion and said image-carrying layer and are capable of discharging their fluid content throughout the interface area of said layers. This composite photographic film may be provided as a roll film, in the form of a film pack comprising a plurality of interconnected frames, or in single frames.

When the film-forming agent carried by container 40 is released therefrom and spread between a photosensitive emulsion such as emulsion 48 and an image-carrying layer such as layer 42, the two layers in contact with the thin layer of composition therebetween prevent the latter from oxidizing. It becomes possible, therefore, to employ higher concentrations of materials subject to oxidation in the processing agent when used in this manner than can be employed in compositions when used, for example, in the

ordinary developer bath which have a substantial surface thereof exposed to oxygen when in use.

Moreover, the presence of the film-forming material in the liquid composition carried by the container 40, whereby the viscosity of the latter is substantially increased, acts to insure an unsealing of the longitudinal edge 34 of the container throughout substantially the entire length thereof, when sufficient compressive force is applied to the container faces, thereby insuring the provision of a mass of the composition throughout said length free for spreading over the desired area.

While it is preferable to spread the liquid composition over the photosensitive emulsion by introducing the same between said emulsion and another sheet material and squeezing together said sheets, the spreading may also be accomplished without the use of said other sheet material as, for example, by means of an applicator roll which engages and spreads the composition over the photosensitive emulsion and which preferably is so surfaced as not to adhere to the composition. In the latter event the composition may be of the type adapted to form a white, opaque solid film when dry and may contain a sufficient quantity of silver halide solvent to cause the formation of a positive image in silver in the white layer, which image is visible from the surface of said white layer remote from the photosensitive layer. The white layer serves as an opaque barrier obstructing the negative from view and provides the highlight portions of the positive image.

The term "over said emulsion" as used herein is to be understood to include the application of the liquid composition to a photosensitive emulsion so that the same is in direct contact with the surface of the emulsion and also to include the application of the composition so that the same is spaced a slight distance from the emulsion, as by an intervening coating, which coating is permeable to the liquid of the composition so that the liquid may readily permeate from the point of original application to the photosensitive layer.

Since certain changes may be made in the above composition of matter without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. As a new composition, a viscous film-forming processing agent comprising, in aqueous solution, hydroquinone, sodium thiosulfate, an alkali, and sodium carboxymethyl cellulose in sufficient quantity to impart to said solution a viscosity of the order of 1,000 to 200,000 centipoises at a temperature of approximately 24° C.

2. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, an alkali, a water-soluble silver halide solvent and a water-soluble, film-forming high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being water-soluble hydroxyethyl cellulose and

retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

3. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, alkali metal hydroxide, alkali metal thiosulfate, and a water-soluble, film-forming high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being a water-soluble hydroxyethyl cellulose and retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

4. The composition of claim 1 wherein the alkali is sodium hydroxide.

5. As a new composition, a viscous film-forming processing agent comprising in aqueous solution a silver halide developer, an alkali metal thiosulfate, an alkali metal hydroxide and a carboxymethyl cellulose of an alkali metal, said carboxymethyl cellulose being in sufficient quantity to impart to said solution a viscosity in excess of 1,000 centipoises at a temperature of approximately 24° C.

6. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, an alkali, a water-soluble silver halide solvent, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being a water-soluble carboxymethyl cellulose and retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship

during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

7. The composition of claim 6 wherein the water-soluble carboxymethyl cellulose is sodium carboxymethyl cellulose.

8. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, an alkali, a water-soluble silver halide solvent, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being a water-soluble salt of polymethacrylic acid and retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

9. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, alkali metal hydroxide, alkali metal thiosulfate, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being sodium carboxymethyl cellulose and retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

10. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, alkali metal hydroxide, alkali metal thiosulfate, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being the sodium salt of polymethacrylic acid and retaining its viscosity-im-

parting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion 5 containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the 10 print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

11. A photographic processing liquid composition for forming transfer prints of latent images 15 contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, an alkali, a water-soluble, silver halide solvent, and a water-soluble, film-forming, high molecular 20 weight polymer from the class consisting of the carboxymethyl and hydroxyethyl celluloses and the salts of polyacrylic and polymethacrylic acids, said polymer being in the composition in 25 sufficient quantity to impart thereto a viscosity in excess of 1,000 centipoises at a temperature of approximately 24° C. and retaining its viscosity-imparting and film-forming properties in the alkaline composition.

12. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, an 35 alkali, a water-soluble silver halide solvent, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition 40 in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being a salt of polyacrylic acid and retaining its viscosity-imparting and film-forming properties for prolonged periods in 45 the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

13. A photographic processing composition for forming transfer prints of latent images contained in silver halide emulsions, which composition comprises a silver halide developer, a solvent including water for said developer, alkali metal hydroxide, alkali metal thiosulfate, and a water-soluble, film-forming, high molecular weight polymer, said polymer forming a solid film upon removal of the liquid content of said composition and being in the composition in sufficient quantity to impart thereto a viscosity of the order of 1,000 to 200,000 centipoises at 24° C., said polymer being the sodium salt of polyacrylic acid and retaining its viscosity-imparting and film-forming properties for prolonged periods in the alkaline solution, said composition, when spread in a layer of the order of several thousandths of an inch in thickness between a photosensitive silver halide emulsion containing a latent image and a print-receiving layer, being capable of forming a transfer print of said latent image, of maintaining said emulsion and print-receiving layer in spaced laminated relationship during the formation of the print and of forming a solid film throughout the spread area when the liquid content of the composition has been absorbed and evaporated therefrom.

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