SUPERCOATED TRANSFER ELEMENTS
AND PROCESS FOR PREPARING AND
USING SAME

Inventors: Albert E. Brown; Allan T.
Schlotzhauer; Douglas A. Newman,
all of Glen Cove, N.Y.

Assignee: Columbia Ribbon and Carbon
Manufacturing Co., Inc., Glen Cove,
N.Y.

Filed: Oct. 18, 1973

Appl. No.: 407,459

Related U.S. Application Data

Continuation-in-part of Ser. No. 294,880, Oct. 4,
1972, abandoned.

U.S. Cl. ............... 428/411; 427/146; 428/422;
428/484; 428/488

Int. Cl. 3. ............... B41C 1/06; B41M 5/02

Field of Search ....... 117/36.4, 216; 161/DIG. 5

References Cited

UNITED STATES PATENTS
3,017,297 1/1962 Newman et al. ................. 117/216
3,169,880 2/1965 Strauss ......................... 117/36.4 X
3,328,190 6/1967 Mathieu ....................... 117/36.4 X
3,628,979 12/1971 Newman et al .................. 117/36.4

Primary Examiner—Thomas J. Herbert, Jr.
Attorney, Agent, or Firm—Thomas L. Tully; Arthur A.
Johnson

ABSTRACT

Process for producing novel pressure-sensitive transfer
elements capable of producing sharp, clear images on a
variety of surfaces. The transfer elements are pro-
vided with a supercoating which is clean, non-adhesive
to the touch so as to avoid sticking and blocking, and
which has the ability to adhere to a variety of surfaces
under the effects of imaging pressure and to carry with
it an underlying imaging layer even though the latter
may be so hard, for smudge-resistant purposes, as to
have normally poor pressure-transferability per se.
The present supercoatings comprise a combination of
a normally tacky synthetic thermoplastic resinous
binder material and a multiplicity of discrete micro-
spheres of a synthetic resin which is inert with respect
to the binder material and insoluble in the volatile sol-
vent used to apply the supercoating.

8 Claims, 3 Drawing Figures
SUPERCOATED TRANSFER ELEMENTS AND PROCESS FOR PREPARING AND USING SAME

This application is a continuation-in-part of parent application Ser. No. 294,680, filed Oct. 4, 1972, now abandoned.

The present invention relates to the production of novel carbon papers, carbon films, transfer ribbons, correction tapes, and the like. Certain types of transfer elements are required to have exceptional properties with respect to the production of images which are sharp and complete and which do not smudge or smear during handling of the copy or processing of the copy such as in equipment designed to automatically sense the copy. Generally an imaging layer which is relatively soft will have good transfer properties so as to produce relatively sharp, complete images but such images will have poor smudge- or smear-resistance. Conversely, an imaging layer which is relatively hard will have poor transfer properties but will be resistant to smudging or smearing.

It has been proposed to overcome these problems by using a hard imaging layer and providing thereon an adhesive supercoating having good adhesion with respect to the imaging layer and with respect to the sheet to be imaged, whereby the supercoating pulls the imaging layer over to the imaged sheet in the form of sharp and complete images. Reference is made, for instance, to U.S. Pat. No. 3,017,297. However transfer elements of this type have the disadvantage that the supercoating is sticky under normal conditions, particularly at warmer ambient temperatures, causing packaged stacked sheets of such material to stick together and causing spooled ribbons of such material to block when the ribbon is unwound from the spool, i.e. the supercoating sticks to the rear surface of the foundation against which it is wound and remains stuck thereto and carries with it the imaging layer when the ribbon is unwound from the spool.

In a related area, it is known to produce correction tapes and ribbons which comprise a flexible foundation carrying a pressure-transferable layer of opaque white masking composition adapted to be transferred over an erroneous image to mask or hide the same on a white paper. Such compositions generally comprise a high content of titanium oxide, zinc oxide or other porous white masking material and a minor amount of resinsinous binder material sufficient to bind the masking material as a unitary layer. Such coatings are generally brittle because of the high filler content and have poor transfer properties unless the resinous binder is one having high adhesive properties. As such the masking layer will tend to stick to adjacent tapes, sheets or ribbon convolutions during storage and will tend to transfer or block over in unintended areas during separation or unwinding.

Another disadvantage of such materials is the tendency of the masking fillers to gradually absorb oil and colorant from the images being masked whereby the masking composition gradually becomes discolored and the masked image gradually reappears through the masking composition.

In yet another area, it is known to produce so-called carbonless copy papers comprising copy sheets having a pressure-transferable imaging layer on the back surface wherein several such copy sheets can be superposed and the imaging pressure used to type or write images on the front surface of the top sheet will cause the transfer of the imaging layer from the back surface of each copy sheet to the front surface of each copy sheet in contact therewith in areas corresponding to the imaging pressure to produce several copies without the necessity of interposing carbon papers between each set of sheets. Such carbonless copy papers objectionable if the imaging layer, which forms a permanent part thereof, is either so soft that it stains the hands of the person using the copy sheet or if it is so hard that, while it resists transfer to the hands, it also resists transfer in the pressure-imaging process. Also in many cases the color of the imaging layer is objectionable to the person using the copy sheet since it contrasts sharply with the white color of the front side of the copy paper.

In the case of carbonless copy papers used for forms work such as in salesbooks, credit card forms, and the like, it is conventional to print the imaging transfer composition in only selected areas of the underside of the sheets so that only some of the information impressed upon the original or top sheet will be reproduced on the underlying copy sheets. Such "spot" printing requires special printing rolls and equipment to insure perfect registration, and results in sheets of objectionable appearance due to the difference in appearance between the areas which contain the transfer composition and those areas which are free of such composition.

In still another area it is desirable to provide pressure-applied images which are permanent and cannot be picked-off by known lift-off adhesive correction tapes. For instance, in the case of stocks, bonds, checks, identification documents, and the like, the ability to remove original images completely and cleanly and to replace such images with fraudulent information is completely unsatisfactory and has created a demand for transfer elements capable of providing permanent images which in some cases must also be automatically scannable such as by magnetic or optical means.

It is the principal object of the present invention to provide a novel supercoating for a variety of pressure-transferable imaging layers, the supercoating being one having affinity for a variety of receptor surfaces and being nonadhesive to the touch but having adhesive properties under the effects of imaging pressure.

It is another object of this invention to provide transfer elements having an imaging layer which, per se, has poor pressure-transfer properties and which is provided with a supercoating which is non-adhesive to the touch, but actually has a slip-permitting surface, but which becomes adhesive in impacted areas to cause the imaging layer to transfer sharply and cleanly under the effects of imaging pressure.

It is yet another object of this invention to provide correction transfer elements having a normally brittle, absorbent masking layer which will not flake from the foundation, or adhere to block over to other surfaces in unintended areas, and which will not absorb oil or colorant from a masked image.

It is still another object of this invention to provide a supercoated transfer element on which the supercoating contains a material which is non-adhesive to the touch but which is capable of being heat-fused, either before use of the transfer element to render selected portions of the imaging layer nontransferable, or after use to fuse the transferred images to the copy sheet and prevent their removal by conventional pick-off correction means.
These and other objects and advantages of the present invention will be apparent to those skilled in the art in the light of the present disclosure including the drawings, in which:

FIG. 1 is a diagrammatic cross-section, to an enlarged scale, of an image-forming transfer element according to one embodiment of the present invention in association with a copy sheet imaged therewith,

FIG. 2 is a diagrammatic cross-section, to an enlarged scale, of a correction-type transfer element, according to another embodiment, in association with a copy sheet carrying an image masked by means thereof, and

FIG. 3 is a diagrammatic cross-section, to an enlarged scale, of an image-forming transfer element according to another embodiment of the present invention in association with a copy sheet imaged therewith and subsequently treated to render the image permanent.

The present invention relates to the discovery of novel supercoating compositions for pressure-sensitive transfer layers of a variety of types, such compositions having a strong affinity for such pressure-sensitive layers and providing supercoatings which are non-adhesive to the touch, actually have a slip-permitting surface, but become adhesive under impact pressure so as to have a strong affinity for a variety of receptive surfaces.

The novel supercoating compositions of the present invention comprise a tacky, adhesive binder material and at least about 10 percent by weight of an inert synthetic organic polymer in the form of spheres having an average particle size between about 1 and 40 microns. The polymer spheres are inert with respect to the other ingredients of the supercoating so as to be present in their discrete spherical form in the supercoating. Similarly their spherical form must be undisturbed by the method of application, requiring that they be insoluble in the coating solvent, in the case of solvent applications, and non-melting at coating temperatures, in the case of hot-melt application.

The method of operation of the present supercoatings is not completely understood, but it appears that a substantial portion of the polymer spheres comes to the surface of the supercoating, prior to its solidification, to form a surface stratum of the smooth inert spheres which overlies the adhesive binder material. Thus the surface of the supercoating has the slippery, non-sticky feel of the polymer spheres. However under the effects of localized imaging pressure, such as caused by typing or writing, the polymer spheres permit the underlying soft adhesive binder material to exude around and between adjacent spheres and/or the spheres are pressed below the surface of the binder material whereby the adhesive binder contacts and bonds to the surface against which it is pressed and carries with it the corresponding portions of the imaging layer when the surfaces are separated.

The binder material for the present supercoatings comprises a soft adhesive material which may be a tacky wax such as beeswax, paraffin wax, or the like, alone or in combination with an adhesive resinous material such as a polybutene elastomer or the like. Such compositions may be applied as hot-melt coatings. The soft adhesive may also be a synthetic thermoplastic elastomer, in which case the supercoating is applied by means of a volatile solvent. The preferred elastomers are the polybutenes, polybutadiene, butadiene copolymers with styrene and/or acrylonitrile, polyvinyl ethers, polyisoprene, polyisobutylene, and the like. Suitable preferred materials are the Indopol polybutenes available from Amoco Chemicals Corporation and having an average molecular weight ranging from 300 to 2600, and the Vistanex polyisobutenes available from Enjay Company and having an average molecular weight ranging from 8700 to 11,700. These materials are preferably used in combination with secondary resinous binder materials, preferably those with which they are compatible, at least at elevated temperatures, and which are less adhesive so as to provide a blend having the desired degree of adhesiveness. Such other resins include polyolefins such as polyethylene and polypropylene, polystyrene, acrylic and methacrylic polymers and copolymers, polyvinyl butyrate, nylon, and the like. The preferred secondary binder materials are the polyethylene emulsions available from Allied Chemical Company under the trademark A-C Polyethylene. Polyethylene A-C 6 has an average molecular weight of 2000 and a softening point of 222° F.

The binder material, comprising the synthetic thermoplastic resin or adhesive wax or mixtures thereof, generally constitutes the major ingredient of the present supercoatings. The other essential ingredient, namely the polymer spheres, is present in a weight ratio relative to the binder material of from about 1:20 up to 3:1, the preferred ratio being about 1:2 in the case of solvent coatings and about 1:10 in the case of hot-melt wax coatings.

Basically it appears that the identity of the polymer spheres may be varied widely depending upon the identity of the resinous or wax binder material and whether volatile solvent or heat is used to apply the coating. Spheres suitable for use in one system may be compatible with or plasticized by the resins, or soluble in the solvent used, in another system. Preferred because of their inertness and insolubility with respect to most resinous binder materials and volatile solvents are the high melting point polymer spheres commercially available under the trademarks Polymist (Allied Chemical Company) and Fluon (Imperial Chemical Industries). Polymist A12 comprises polyethylene spheres having an average sphere size of 12 microns, a melting point of 284° F and a specific gravity of 0.99. Fluon F 170 comprises polytetrafluoroethylene spheres having an average sphere size of less than 5 microns, a melting point greater than 600° F and a specific gravity of 2.28. Polymist 5 is a similar material having an average sphere size of 4 microns and a melting point of about 660° F. All of these materials are available in the form of dry powders which can be conveniently mixed with the solution of the resinous binder material or the molten wax composition with which they are to be used.

The present transfer elements comprise a flexible foundation which may be paper or plastic film such as polyethylene terephthalate polyester, propylene, cellulose acetate, or the like, a frangible or squeeze-out type imaging layer supported directly or indirectly thereby, and the supercoating. The imaging layer may be based upon conventional synthetic thermoplastic resinous binder materials, applied by means of solvent coating techniques, or upon conventional wax binder materials applied by hot-melt techniques. The imaging layer contains pigment which may be an automatically sensible pigment such as magnetic iron oxide or optically sensible carbon black, or may be a solid undissolved dyestuff in the case of hectograph transfer
sheets, or a masking pigment such as titanium dioxide or zinc oxide in the case of correction sheets and tapes or ribbons.

The imaging layer may be a friable layer formulated in known manner, such as by the use of hard waxes or resins and/or by the use of smaller amounts of plasticizing oils, so as to be relatively hard and highly smudge- and smear-resistant and so as to provide transferred images having these properties. The relatively poor frangibility of such hard layers is overcome by the present supercoatings.

The following examples are given as an illustration of the present invention and should not be considered limitative.

EXAMPLE 1

A magnetic transfer element is produced by coating an 0.5 mil polyethylene terephthalate polyester film (Mylar) with the following composition:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Parts by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl hydroxyethyl cellulose</td>
<td>10</td>
</tr>
<tr>
<td>Lard oil</td>
<td>4</td>
</tr>
<tr>
<td>Refined rapeseed oil</td>
<td>7</td>
</tr>
<tr>
<td>Magnetic iron oxide</td>
<td>24</td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td>55</td>
</tr>
</tbody>
</table>

The coating is dried by evaporation of the solvent to leave a solid residue having a weight of 8 pounds per ream (3300 sq. ft.).

Next a supercoating composition is provided having the following composition:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Parts by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene Resin A-C 6 (Allied)</td>
<td>5.6</td>
</tr>
<tr>
<td>Polybutene Resin H 1900 (Amoco)</td>
<td>5.6</td>
</tr>
<tr>
<td>Polyethylene Spheres A 12 (Allied)</td>
<td>5.6</td>
</tr>
<tr>
<td>Mineral spirits</td>
<td>83.2</td>
</tr>
</tbody>
</table>

The composition is prepared by dissolving the polyethylene A-C 6 resin and the polybutene resin in 30 grams of the mineral spirits solvent at a temperature of 220° F, using agitation, to form a clear solution. The balance of the solvent is then added and the solution is cooled to room temperature. The solution passes through a cloud point and turns white and increases in viscosity due to the A-C 6 resin coming out of solution on cooling. Then the polyethylene (Polymist) spheres are added with agitation to form a uniform mixture which is coated onto the magnetic transfer layer.

The coated sheet is heated to a temperature of about 185° F to evaporate the solvent and form the dried supercoating which weighs about 2 pounds per 3300 square feet and which is translucent and therefore is inconspicuous over the magnetic transfer layer. It is preferred to heat the dried supercoating to an elevated temperature above the softening temperatures of the binder material but below the melting point of the polymer spheres, i.e. from about 225° F to 250° F, to produce improved supercoatings. This is particularly true when the supercoating contains a particulate binder such as Polyethylene A-C 6, the heating causing fusion of the particles to form a more stable supercoating.

The coated film may be cut into sheets or ribbons. The sheets have excellent slip properties and may be shifted in registration with a copy sheet and inserted into a typewriter without any difficulty. The ribbons may be wound tightly on a spool and unwound without any sticking or blocking occurring. In all cases the supercoating has a slippery feel and is clean to the touch, and the magnetic layer is pressure-transferable to a variety of surfaces such as paper, plastic film, glass, leather, and the like, in the form of sharp, clear images.

Referring to FIG. 1 of the drawings, the transfer element 10 of this Example comprises the film foundation 11, the magnetic transfer layer 12 and the polymer sphere supercoating 13. When the transfer element is positioned against a copy sheet 20 to be imaged, such as a paper sheet 21, and the superposed sheets are subjected to imaging pressure, the layers 12 and 13 are stripped from the film 11 to leave a void 14 thereon and transfer to the copy sheet in the form of an image 22.

EXAMPLE 2

A correction tape is produced by coating a glazed paper foundation with the following composition:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Parts by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl cellulose N-7</td>
<td>1.3</td>
</tr>
<tr>
<td>Polystyrene</td>
<td>1.2</td>
</tr>
<tr>
<td>Polybutene resin</td>
<td>0.5</td>
</tr>
<tr>
<td>Lanolin</td>
<td>1.0</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>19.0</td>
</tr>
<tr>
<td>Methyl isobutyl ketone</td>
<td>15.0</td>
</tr>
<tr>
<td>Toluene</td>
<td>62.0</td>
</tr>
</tbody>
</table>

The composition is dried by evaporation of the solvents to form a white masking layer having a weight of about 10 pounds per ream (3300 sq. ft.).

Next a hot-melt supercoating composition is provided having the following composition:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Parts by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraffin wax</td>
<td>5.0</td>
</tr>
<tr>
<td>Polybutene resin</td>
<td>4.0</td>
</tr>
<tr>
<td>Polyethylene Spheres A 12</td>
<td>1.0</td>
</tr>
</tbody>
</table>

The supercoating composition is heated to a temperature of about 160° F and is coated over the masking layer in a weight of about 2 pounds per 3300 square feet. Then the coated paper web is cut into sheets, tabs or ribbons, as desired.

The supercoating is translucent and inconspicuous over the white masking layer. It has a smooth, slip-permitting surface which facilitates the positioning of the correction tab over a sheet carrying an erroneous image to be masked. The supercoating also shields the white masking layer on the correction tab against contamination during handling.

The correction element is used in conventional manner by retyping the error through the element over the erroneous image on the copy sheet to provide a stable, uniform mask thereafter. The mask is stable against deterioration with age because the supercoating provides a non-absorbent barrier between the image being masked and the masking layer which, per se, is absorbent of oils and colorants.

Referring to FIG. 2 of the drawings, the correction transfer element 30 comprises a paper foundation 31 supporting the masking layer 32 and the polymer sphere supercoating 33. The copy sheet 40 to be corrected comprises a paper sheet 41 carrying an erroneous typed image 42. The masking of the erroneous image is accomplished by the pressure-transfer of the
layers 32 and 33 from the correction element in area 34 in registration over image 42 to form masked image 43.

Referring to the embodiment of FIG. 3 of the drawings, the novel transfer elements of the present invention may be treated with sufficient heat to fuse the polymer spheres of the supercoating in order to destroy the normal pressure-transferability of the supercoating and the imaging layer and/or in order to fuse the frangible transferred images to the copy sheet and prevent removal of such images by conventional pick-off correction means such as through the use of latent adhesive correction ribbons and heat-adhesive correction devices.

The transfer element 50 of FIG. 3 may be of the type produced according to Example 1 hereof wherein the polymer spheres of the supercoating have a melting point of 284°F. Thus the foundation 51 carries the frangible magnetic imaging layer 52 and the supercoating 53. Selected portions of the layers, shown as 55 and 56, are rendered non-transferable by heating such areas to a temperature of about 290° F for a sufficient period of time, normally a few seconds, to melt the polymer sphere particles and fuse the layers 55 and 56 together to some extent. This is preferably accomplished by exposure to infrared radiation using a reflective mask to protect the areas of the supercoating 53 which are not to be heated and which are to remain pressure-transferable.

The appearance of the heated transfer element is fairly uniform with little difference in appearance between the heated and unheated areas of the supercoating, particularly in cases where the supercoating contains minor amounts of white opaque filler such as titanium dioxide or clay. Thus it is not readily apparent to the customer or user that portions of the information impressed upon the face of the foundation sheet 51, such as paper, are not duplicated on the copy sheet 60, which fact is quite apparent in the case of conventional spot carbons.

In use, image 57 typed upon the face of foundation 51 is duplicated on copy sheet 60, which comprises a paper sheet 61, whereas image 58 is not duplicated. Thus the portions of the layer 52 and supercoating 53 transfer from area 54 whereas the heat-fused areas 55 and 56 underlying the image 58 are no longer pressure-transferable.

The image produced on copy sheet 60 is subsequently heated to a temperature of 290°F for a few seconds in order to melt the polymer sphere particles in area 64 of the image 62 and fuse area 64 to pigmented area 63 of the image and also to the surface of the paper foundation 61. The heat-fused image 62 is firmly bonded to the paper foundation 61 and resists removal by conventional lift-off correction means whereas a corresponding unfused image has good adhesion for the paper foundation but can be removed by such correction means.

It should be understood that the novel slip-permitting supercoatings of the present invention are suitable for use over transfer layers of all types. In some cases the transfer layer may have normally poor frangibility, as in the case of those transfer layers disclosed in aforementioned U.S. Pat. No. 3,017,297 as well as U.S. Pat. No. 3,595,683, and this will be overcome by the present polymer sphere supercoatings. In other cases the transfer layer will have good frangibility, per se, with respect to certain surfaces such as paper and the polymer sphere supercoating will provide improved transfer properties with respect to all receptor surfaces such as plastic film, glass, and the like. In still other cases, the polymer sphere supercoating will function mainly as a protective surface coating, as in the case of hectograph transfer layers, having good slip properties and good affinity for a variety of receptor surfaces. In the case of non-frangible squeeze-out type ink layers, it appears that the adhesive binder material of the supercoating transfers along with the ink which is exuded from the non-transferable microporous binder network of the imaging layer. As in the case of frangible imaging layers, the polymer spheres of the supercoating appear to be pressed aside by the imaging pressure to permit the adhesive to contact the copy sheet and to form a receptive surface for the exuded ink. The non-frangible ink layers comprise a non-transferable microporous network of synthetic thermoplastic resin containing within the pores thereof a pressure-exudable ink comprising an oily vehicle which is incompatible with the binder material and the pigment and/or dyestuff.

Finally, it is pointed out that the present supercoating compositions preferably are applied as solvent coatings which contain 1 part by weight of the polymer spheres in association with from about 0.1 to 5 parts by weight of a resinous binder material which preferably is present in discrete particulate form as a dispersion or emulsion. Preferred are the polyethylene dispersions such as the A-C 6 of Example 1. The dispersed particulate binder renders the polymer spheres easier to uniformly disperse throughout the composition and reduces the penetration of the solvent-applied composition into the transfer layer to which it is applied, particularly in cases where the latter is porous or contains a large amount of porous filler or the like. However the dispersed particulate binder does not function in the same manner as the polymer spheres, and the composition is so tacky as to be inoperative if the polymer spheres are omitted. The polymer spheres function because of their size, smoothness and inertness. Polymer particles which have a smaller size, or rough surface or which are plasticized or dissolved by the other ingredients of the supercoating composition do not provide the results critical to the present invention, namely slip properties under normal pressure and adhesive properties under localized imaging pressure.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

We claim:

1. Pressure-sensitive transfer element comprising a flexible foundation supporting a pressure-sensitive imaging layer comprising binder material and pigment and having thereon a supercoating containing a major amount by weight of a binder material comprising a pressure-exudable, normally-adhesive material and a minor amount equal to at least about 10 percent by weight, based upon the weight of the binder material, of an inert synthetic thermoplastic polymer in the form of spheres having an average sphere size within the range of from about 1 to 40 microns, said supercoating comprising said spheres present as a surface stratum over said normally-adhesive material to provide a supercoating having a surface which is slip-permitting and which is non-adhesive to the touch but which exudes said normally-adhesive material around said spheres and becomes adhesive in areas subjected to imaging pressure whereby said normally-adhesive material and corresponding underlying areas of said imaging
layer transfer to a copy sheet under the effects of imaging pressure.

2. Transfer element according to claim 1 in which the polymer spheres are selected from the group consisting of polyethylene spheres and polytetrafluoroethylene spheres.

3. Transfer element according to claim 1 in which the normally-adhesive material of the supercoating is a synthetic thermoplastic resin.

4. Process for producing a pressure-sensitive transfer element comprising the steps of coating a flexible foundation with an imaging composition comprising binder material and pigment to form a pressure-sensitive imaging layer and coating said imaging layer with a supercoating composition containing a major amount by weight of the solids in the form of a binder material comprising normally-adhesive material and a minor amount by weight of the solids equal to at least about 10 percent by weight, based upon the weight of the binder material, of an inert synthetic thermoplastic polymer in the form of spheres having an average sphere size within the range of from about 1 to 40 microns to form a supercoating containing said polymer spheres as a surface stratum over said normally-adhesive material, said supercoating having a surface which is slip-permitting and which is non-adhesive to the touch but which exudes said normally-adhesive material around said polymer spheres and becomes adhesive in areas subjected to imaging pressure whereby said normally-adhesive material and corresponding underlying areas of said imaging layer transfer to a copy sheet under the effects of imaging pressure.

5. Process according to claim 4 in which the imaging composition comprises a resinous binder material and is applied by means of a volatile vehicle, and said vehicle is evaporated to form said imaging layer.

6. Process according to claim 4 in which the supercoating composition comprises at least one synthetic thermoplastic resin binder material and a volatile vehicle which is a non-solvent for said polymer spheres, and said solvent is evaporated to form said supercoating.

7. Process according to claim 6 in which said resin binder material comprises a combination of resins, one of which is soluble in said volatile vehicle and one of which is dispersed in particulate form in said vehicle.

8. Process according to claim 4 in which said supercoating composition comprises wax binder material and is applied as a hot-melt composition at a temperature below the melting temperature of the polymer spheres.

* * * *