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54 An apparatus for developing and transferring an image.

57 The present invention is directed to an apparatus
 for developing and transferring an image comprising
 an overlaying section having overlaying means for
 overlaying said thermally developable photosensitive
 material with an image receiving material; a ther-
 mally developing/transferring section having a heat-
 ing drum for heating the thermally developable pho-
 tosensitive material and image receiving material
 overlaid one on another and wound around said
 heating drum, thereby carrying out development and
 transfer processes simultaneously.

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AN APPARATUS FOR DEVELOPING AND TRANSFERRING AN IMAGE

The present invention relates to an apparatus for developing and transferring an image.

In recent years, thermal developing photosensitive paper was developed, which a color sensitive paper and which is employable with an apparatus according to the present invention. Such a color sensitive paper is disclosed by the Japanese patent application 15 77 98-1981, which has European equivalent EP-A-76 492. This document is prior art under Article 54 (3) EPC.

The sensitive paper contains a dye, (in the following referred to as "pigment")

carrier which reduces at least photo-sensitive silver halide, organic silver salt oxidizer, hydrophilic binder and pigment expelling agent. As a result of a chemical reaction, the photo-sensitive paper expels a hydrophilic pigment. When the thermal developing color photo-sensitive paper is subjected merely to thermal developing after exposure of the image, a silver image is formed in the exposed portion of the paper while the mobile hydrophilic pigment is provided in the portion thereof which corresponds with the silver image. The photo-sensitive layer is thus composed of negative photo-sensitive material. In other words, the thermal developing color photo-sensitive paper is subjected to image exposure and then to thermal developing, and an oxidation-reduction reaction takes place between the organic silver salt oxidizer and the reduceable pigment carrier with the exposed photo-sensitive silver halide acting as a catalyst. The silver image is formed in the exposed portion of the photo-sensitive paper. In this step, the pigment carrier is oxidized into an oxide by the organic silver salt oxidizer. The oxide is excised under the presence of the pigment expelling agent, as a result of which the mobile hydrophilic pigment is expelled. Accordingly, the silver image and the mobile hydrophilic pigment are provided in the exposed portion, and a color image can be obtained by transferring the hydrophilic pigment onto the print paper.

In the case where the photo-sensitive layer is made of positive photo-sensitive material, the silver image and the mobile hydrophilic pigment are provided in the portion of the material which is not exposed.

It is the task underlying the present invention to provide an apparatus able to record images under use of a photo-sensitive paper as described above. This task is solved with an image recording apparatus as specified in the claim.

The invention will now be described with reference to the drawing, which shows a side view of essential components of an embodiment according to the invention.

The Fig. is a side view of a thermal developing and transferring apparatus operated according to a method in which a melting diffusion agent is applied in advance to a print paper or a thermal developing photo-sensitive paper. After a print paper and an exposed photo-sensitive paper are arranged in layers, the layers are led around a hot drum so that a developing step and a transferring step are simultaneously carried out.

The apparatus comprises: a hot drum 70 which turns in one direction; a supply roll 71 on which a print paper P is wound; a pair of feed rollers 72 and 72 for feeding exposed thermal developing photo-sensitive paper N in roll form; a guide roller 74 cooperating with a back-up roller 73 to put the photo-sensitive paper N and a print paper P in layers and to abut the layered paper against the hot drum 70; a guide roller 75 and a back-up roller 76 for peeling off the print paper P, onto which the image has been transferred; from the photo-sensitive paper N; a winding roll 77 which is operated with a frictional drive to rewind the used photo-sensitive paper N; and a guide roller 78 for guiding the used photo-sensitive paper N from the hot drum 70 to the winding roll 77.

The leader of the exposed photo-sensitive paper N, which has been passed through the pair of feed rollers 72 and 72, is laid on the print paper P coming from the supply roll 71. Then, these papers are passed between the rollers 73 and 74 and are then wound around the hot drum 70 in such a manner that the paper P is passed between the rollers 75 and 76. The leader of the photo-sensitive paper N is passed between the drum 70 and the roller 78 and is then rewound on the winding roller 77. As the hot drum 70 is turned clockwise, the photo-sensitive paper N is heated, so that the exposed part thereof expels a pigment. At the same time, the print paper P is also heated, so that a hydrophilic melting paper such as urea, water of crystallization or a micro-capsule is melted to allow a diffusion agent to ooze out. As a result, a pigment image is transferred onto the print paper P. The print paper P onto which the image has been transferred is removed from the photo-sensitive paper N and is discharged as a hard copy passing between the guide roller 75 and the back-up roller 76. The photo-sensitive paper N which has been used is wound on the winding roll 77.

The hot drum 70 has a silicone rubber heater as a heat source. In this type of heater, the heater wattage density is made high enough to maintain the peripheral temperature substantially uniform.

Claims

1. An apparatus for developing and transferring an image comprising:
an overlaying section having overlaying means for overlaying said thermally developable photo-sensitive material with an image receiving material;
a thermally developing/transferring section having a heating drum (70) for heating the thermally developable photo-sensitive material (N) and image receiving material (P) overlaid one on another and wound around said heating drum, thereby carrying out development and transfer processes simultaneously.

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