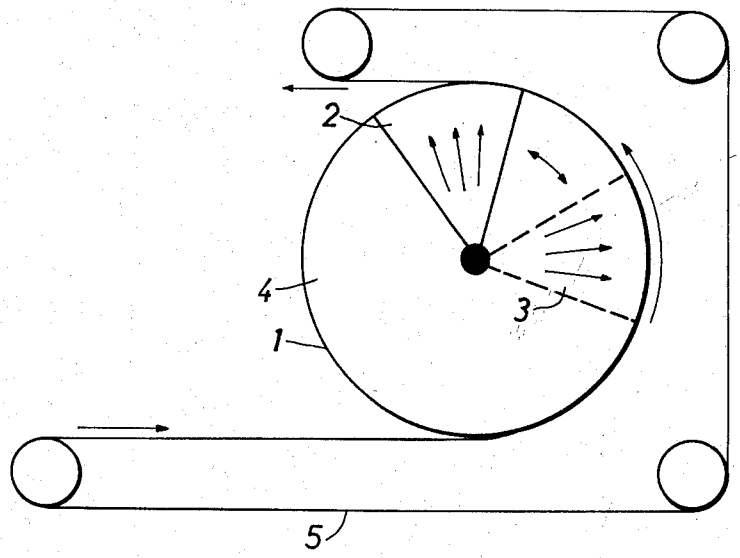
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APPARATUS FOR THE HIGH-GLOSS DRYING OF PHOTOGRAPHIC PAPERS

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APPARATUS FOR THE HIGH-GLOSS DRYING OF PHOTOGRAPHIC PAPERS

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1 Claim. (Cl. 34—123)

The present invention relates to an improved process and apparatus for the high-gloss drying of photograpic papers, according to which the papers are pressed uniformly with their layer sides on to polished heated surfaces. When operating in accordance with these known methods, a satisfactory high-gloss is certainly formed in the middle of the papers, but not at the margins thereof. Depending on the dimensions of the paper, matt margins with a width of about 1–5 mm. are formed. These matt margins necessitate hand-trimming or machine-trimming after the high-gloss drying.

It has now been found that the matt margins are not formed and the pictures hav a high-gloss over their entire surface if the drying of the papers, which are pressed uniformly with their layer sides onto the polished heated surfaces, is so carried out and the drying temperature is so controlled in dependence on the moisture of the picture that this temperature is below the melting range of the emulsion whent he emulsion layers have high water contents, whereas the melting range is so exceeded when the water contents are low that a melting of the uppermost layer plane or of the protective coating thereby is obtained.

The invention is based on the discovery that, during the drying on water-impervious surfaces, a moisture gradient is set up transversely of the image plane. The effect thus obtained is that the melting point zones of the individual emulsion layers (for example gelatine emulsions), or of the individual layer planes of a single emulsion are at always higher temperatures with increasing distance from the heating surface. Consequently an increase in temperature during the drying causes a melting or a lowering of viscosity of the emulsion layer bearing on the heated surface to produce the high gloss effect, while the melting point and in turn viscosity of the other emulsion layers therebehind remain so high that no running of the picture is possible.

The high-gloss drying may be carried out as illustrated in the drawing on a polished drum **1**, which is heated in a regulatable manner in zones by means of the rotatable heat dampers **2** and **3** and is cooled at **4** so that the temperature course on this drum can be adjusted to the best possible drying conditions of the different photographic papers passed by belt **5** in contact with the drum **1**.

One particularly advantageous form of the process according to the invention consists in that the control of the temperatures is effected in a drying cycle. The temperatures of the surfaces on which the layer sides of the papers are firmly pressed are controlled (as regards level and duration) depending on the image moisture, from an initial temperature up to a final temperature and then, after removal of the picture, by cooling to the initial temperature. The temperatures in the individual temperature ranges can be regulated in a gradual manner or in

stages. The temperatures can be so regulated that they increase steadily or suddenly in the regions from initial temperature to final temperature and then decrease by cooling. Furthermore, each range or zone can be regulated separately. The cooling determines substantially the initial temperature of the first heating zone.

Advantageously, the papers are dried on a polished rotating drum, the non-rotatable inner portion of which is provided with heating and cooling devices arranged in zones. The drum is successively guided over the heat dampers, which can be adjusted from zone to zone as desired by rotation or pivoting about a fixed axis, and which heat the peripheral wall of the drum at certain areas or zones. After the final drying and delivery of the papers, the peripheral drum wall is guided over the cooling device, which again cools the peripheral wall to the initial temperature, so that the drying process can recommence.

The following examples serve to explain the process:

Example 1

The drying of a color card on a drum having regulatable heating means arranged in zones and a cooling zone:

The initial temperature of the surface, i.e. the entry temperature, of a peripheral surface of the revolving drum is about 50° C. After the surface has been rotated through an angle of about 50°, the surface enters a zone which is heated to about 80° C. After further rotation through an angle of 50°, the surface will leave the said zone and enter a hot zone which is heated to a temperature of 150° C. This is the temperature necessary for drying the material in accordance with the invention. The surface remains in this zone until it has been further rotated through an angle of 170°. The drying of the card is then complete and the card leaves the drying arrangement. The partial surface of the peripheral drum wall is now conveyed past a cooling zone during the rotation thereof through the remaining angle of 90°, this cooling zone cooling the surface to the initial temperature of about 50° *C*. The temperature control cycle is thus completed and can be repeated. The cards dried in this way do not have any matt margins, so that the trimming of the margins, necessary with the former drying methods, becomes unnecessary.

Example 2

Black-and-white paper is dried on the rotating peripheral wall of the drum in the following manner:

The initial temperature on the peripheral surface of the drum, on which the paper is situated, is about 80° C. After rotation through an angle of 100°, the paper passes through a hot zone at about 120° C. and leaves this zone after being rotated through an angle of 130°. The paper then enters a zone which is heated at the final temperature of 180° C. It remains in this zone while rotating through an angle of 50°. The paper is then completely dry and can be removed. That section of the peripheral wall surface on which the paper was formerly disposed is cooled to the initial temperature of 80° C. while travelling through the remaining angle of 80°.

The black-and-white pictures dried in this way do not have any matt margins. Therefore they do not have to be trimmed by hand, as was the case with the hitherto usual drying processes, which operate with constant temperatures over the entire drum periphery.

We claim:

An apparatus for carrying out the high-gloss drying of photographic papers having a photographic emulsion portion, consisting of a rotatable drying drum having a photographic paper conveying belt running in pressing contact along a part of its periphery, characterized in that the drum is moisture impervious and provided with regulatable heating and cooling means which are arranged in zones corresponding to peripheral portions of the drum, said means being capable of position adjustment with respect to any particular portion of the drum periphery.

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