Feb. 15, 1927. 1,617,704

W. COLDITZ ET AL

PROCESS AND APPARATUS FOR MOISTENING PAPER

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Fig. 1.

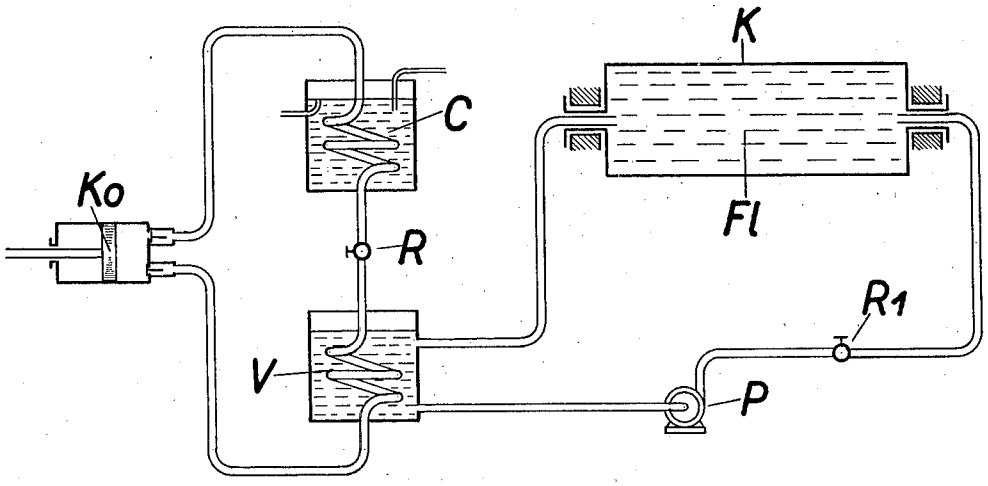


Fig. 2.

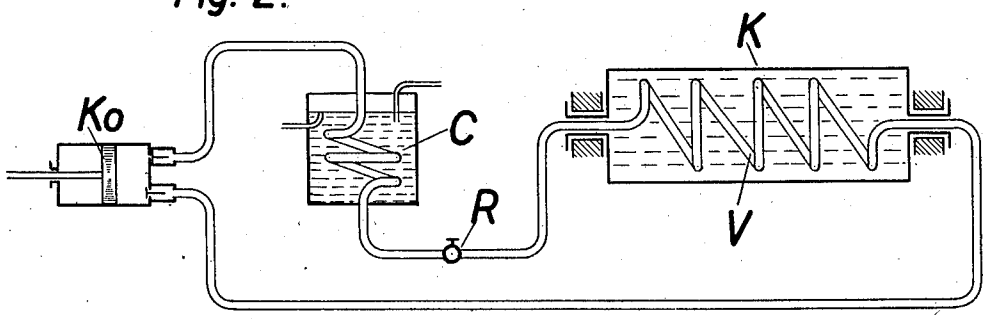
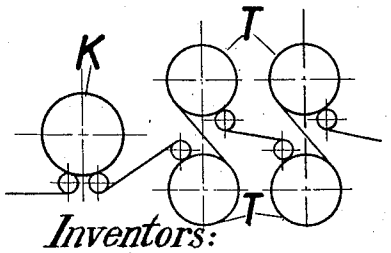


Fig. 3.



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PROCESS AND APPARATUS FOR MOISTENING PAPER.

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This invention relates to the moistening of paper which operation must precede the glazing or satining process. Up to the present the moistening of the paper has generally been effected by passing the same through special moistening devices in which the required amount of moisture was applied to one or both sides of the endless paper, for instance by shattering it with water by means of brushes or spraying it with water by means of nozzles or by blowing steam on it, or by passing the paper over one or between two moistened felt strips. Another method consists in condensing steam on a cooling cylinder over which the paper is run whereby the condensed water is transferred from the cylinder jacket to the paper which is moistened thereby to a certain degree.

These known processes are disadvantageous in that the paper is not uniformly moistened and therefore a long time is required for uniformly distributing the moisture over the paper surface and to the interior of the paper, such preparatory treatment forming the principal condition for obtaining a perfect satining of the paper. Therefore with these old processes one was obliged to store the moistened paper during more or less time to allow the moisture tc penetrate the paper through in a uniform manner. In many cases it was also necessary to rewind and to remoisten the paper. During the storing it is unavoidable that parts of the paper coming in contact with the air, especially the edges, become dry.

These drawbacks are avoided by the process forming the object of the present invention. We have found that a uniform penetration of the paper with moisture can be obtained by precipitating on it moisture out of the surrounding air. This is effected by cooling the conveying cylinders by means of a cooling machine to such a degree that the paper is cooled to a temperature below that of the surrounding air, preferably below its dew-point, and moisture is precipitated on the paper. Of course the precipitation takes place in an extraordinarily uniform manner. By supplying air containing a suitable degree of moisture and by adjusting the temperature of the paper it is easily possible to control the degree of moisture in the paper. Therefore it is not necessary to rewind the paper and to ripen it by storing, but the paper may be prepared for the satining process in one single operation.

The cooling of the cylinders is effected by means of a cooling machine, for instance by passing through them a cooling fluid such as brine which is cooled down by a separate cooling machine, or by placing the evaporator of a cooling machine immediately in the interior of the cooling cylinder.

An apparatus for carrying out our invention is illustrated in a diagrammatic form in the accompanying drawing. Fig. 1 is a vertical section through the apparatus. Fig. 2 is a vertical section through a modified form of the apparatus. Fig. 3 a diagram showing the manner in which the paper web is led over the cooling roll and the glazing rolls of the paper machine. In Figs. 1 and 2 K designates the cooling cylinder of the paper-machine, K^0 the compressor, C the condenser, V the evaporator, R the control-valve of a cooling machine. In Fig. 1 F^1 designates the cooling fluid, for instance brine which is supplied by the pump P to the cooling cylinder, the temperature of the cylinder K and the paper thereon being regulated by means of the valve R^1. In Fig. 2 the evaporator V is shown arranged in the interior of the cooling cylinder K. Fig. 3 is a diagram showing the disposition of the paper-machine, K designating the cooling cylinder and T the drying cylinders.

We claim:—

1. A machine for moistening paper comprising a hollow cylinder, means for passing the paper over substantially the whole surface of the said cylinder, and means for evaporating a fluid in the interior of the said cylinder.

2. Process for moistening paper consisting in leading the paper around a cooled hollow cylinder, in contact with substantially the whole surface of said cylinder, and then passing the paper through moist air.

3. Process for moistening paper consisting in leading the paper around a cooled hollow cylinder, in contact with substantially the whole surface of said cylinder, then passing the paper through moist air and adjusting the temperature of the cylinder in accordance with the degree of moisture in said moist air.

In testimony whereof we affix our signatures.

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