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METHOD OF DRYING FILMS

Louis Veyret, Paris, France, assignor to La Cellophane, Paris, France, a French company

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8 Claims. (Cl. 18—57)

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This invention relates to a process for drying films in a plurality of superimposed layers and more particularly to a process for drying simultaneously a plurality of films of regenerated cellulose.

An object is to prevent such films from adhering together during the drying operation.

Other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

In the early days of the manufacture of films of regenerated cellulose or the like it was suggested that the output of the industry could be increased by simultaneously producing two and even more films by means of two or more extrusion orifices immersed in the coagulating bath, superimposing the several films after their coagulation, and subjecting the composite film to all the finishing treatments usually applied to films of regenerated cellulose. Unfortunately, the process in question was found to be unsatisfactory because the double or multiple film produced under these conditions could not in practice be separated into its initial elements, that is, it was not possible to separate the layers as they left the drier in order that the individual layers might be separately wound, without numerous tears occurring. During the drying, the different layers of film material are brought into direct contact and the molecular attraction between the contacting surfaces of two adjacent films is very strong, as in the case of two optically plane glass plates, which adhere together very strongly.

The invention hereinafter described avoids the aforesaid disadvantages and provides a method of readily separating on discharge from the drier, extruded films which are separately or simultaneously treated in all the baths.

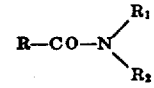
The process consists in momentarily separating the films at least for a very short time, before they enter the drier, and in treating them while separated with a dispersion or a solution of a substance capable of preventing adherence between the dried films.

The substance coats or impregnates the films to an extent such that they are prevented from adhering together while being dried in contact. Hence the dried films are readily separated and rolled individually without tearing.

Various substances having the required properties may be used. For example, solutions of alkaline silicate, such as sodium silicate, sodium carbonate or bicarbonate, alkaline oxalates, sodium aluminate, or colloidal dispersions of cer-

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tain mineral materials, as set forth in French Patent No. 727,408 filed June 23, 1931, or insoluble organic amides having the formula:



where R is a saturated aliphatic hydrocarbon group containing from 11 to 17 carbon atoms. R_1 and R_2 are hydrogen or a saturated aliphatic hydrocarbon group containing 2 to 18 carbon atoms with or without hydroxyl, for example, stearic amide, as described in French Patent No. 849,720 filed February 1, 1939.

The films are individually passed into a suitable bath of the above materials, for example a bath of dilute glycerine containing 0.5 g. of sodium silicate per liter, the films are then brought together and the composite film is dried by means of a drier of normal type. After drying the films are separately wound on individual rolls.

Although the invention has been more particularly described as applied to the drying of films of regenerated cellulose, it is obvious that it is also applicable to all hydrophilic film-like materials.

What is claimed is:

1. The method of drying a plurality of superimposed films of non-fibrous hydrophilic material, which comprises applying to the individual films while wet a liquid containing a material capable of reducing the adherence between films, superimposing the wet treated films, drying the superimposed films and then separating the dried films.

2. The method of drying a plurality of superimposed films of non-fibrous hydrophilic material, which comprises applying to the individual films while wet a liquid containing a material capable of reducing the adherence between films, superimposing the wet treated films, passing the superimposed films through a drying zone and separating the dried films after leaving said zone.

3. The method of drying a plurality of superimposed films of regenerated cellulose which comprises applying to the individual films while wet a liquid containing a material capable of reducing the adherence between films, superimposing the wet treated films, drying the superimposed films, and then separating the dried films.

4. The method of drying a plurality of superimposed films of regenerated cellulose which

comprises applying to the individual films while wet a liquid containing a material capable of reducing the adherence between films, superimposing the wet treated films, passing the superimposed films through a drying zone and separating the dried films after leaving said zone.

5. The method of drying a plurality of superimposed films of hydrophilic material, which comprises applying to the individual films while wet a material capable of reducing the adherence between films, superimposing the wet treated films, said material being selected from the group consisting of alkaline silicates, alkaline carbonates, alkaline bicarbonates, alkaline oxalates, alkaline aluminates and insoluble organic amides, drying the superimposed films, and then separating the dried films.

6. The method of drying a plurality of superimposed films of hydrophilic material, which comprises treating the individual films while wet with a solution of sodium silicate, superimposing the wet treated films, drying the superimposed films, and then separating the dried films.

7. The method of drying a plurality of superimposed films of regenerated cellulose, which comprises treating the individual films while wet with a solution of sodium silicate, superimposing the wet treated films, drying the superimposed films, and then separating the dried films.

8. The method of producing films of regenerated cellulose which comprises simultaneously extruding a plurality of films into the same coagulating bath, superimposing the coagulated films, subjecting the superimposed films to finishing treatments, momentarily separating the wet treated films, treating the individual films while thus separated with a substance capable of preventing adherence between the dried films and selected from the class consisting of alkaline silicates, alkaline carbonates, alkaline bicarbonates, alkaline oxalates, alkaline aluminates and insoluble organic amides, superimposing the wet treated films, passing the superimposed films through a drying zone for drying and separating the dried films.

LOUIS VEYRET.

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