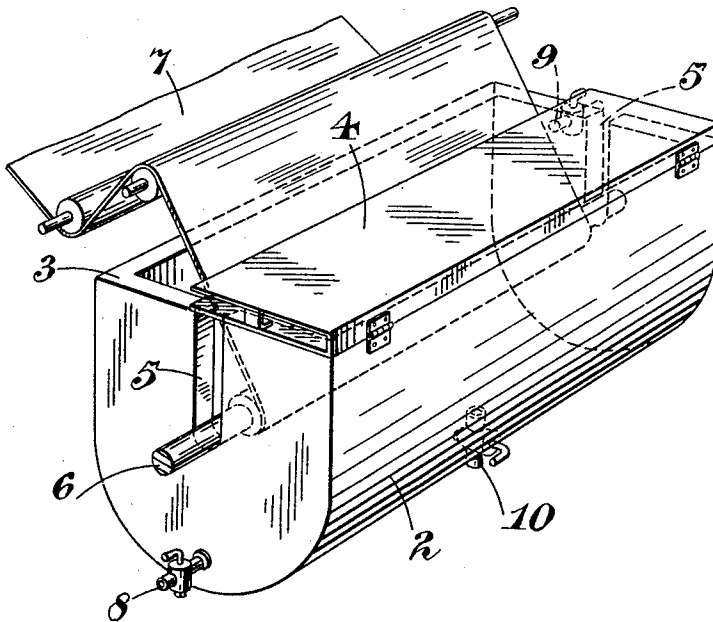


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MANUFACTURE OF SHEETS OR FILMS OF COMPOSITIONS
CONTAINING CELLULOSE ESTERS OR ETHERS
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MANUFACTURE OF SHEETS OR FILMS OF COMPOSITIONS CONTAINING CELLULOSE
ESTERS OR ETHERS

Application filed November 18, 1931, Serial No. 575,938, and in Great Britain December 22, 1930.

This invention is for improvements in or modifications of the invention contained in the specification of H. J. Hands, No. 238,150 filed 6th December 1927. That specification describes a method of treating sheets or films of compositions containing esters or ethers of cellulose which consists in passing the sheet or film, after it leaves the surface on which it is formed through a space maintained charged with water-vapour at a temperature considerably above room-temperature.

This treatment, which is hereinafter referred to as the maturing treatment, is for the purpose of removing electrostatic charge and traces of solvent from the film. The maturing temperature is of the order of 100° F., and I have found that if the film is wound at the actual maturing temperature, it takes several hours to cool down, owing to its low thermal conductivity. Further the film is in a comparatively soft condition as a result of the maturing treatment, and it is found that when the film is subsequently unwound in order to trim it, the edges of adjacent convolutions tend to stick together, and the action of parting them causes an electrostatic charge to be imparted to the film, which is highly undesirable. It is among the objects of the present invention to provide means whereby these disadvantages may be overcome.

This invention provides an improvement in or modification of that contained in the specification of H. J. Hands No. 238,150 filed 6th December, 1927, which consists in winding the film, immediately after the maturing treatment, in a space which is maintained at a temperature considerably below the maturing temperature.

The film is wound at a temperature which is approximately 40° F. below the maturing temperature. Alternatively the winding of the film may be effected in two stages, the temperature of the film being first of all reduced by winding at a temperature about 15° F. below the maturing temperature and then by a further 25° F. by rewinding at the appropriate temperature.

The invention also provides apparatus for

winding the film after the maturing treatment, which comprises a trough, means for winding the film on a spindle contained in said trough, and a cooling jacket surrounding the trough. The jacket may conveniently be constituted by pipes through which cooling water is circulated.

A practical embodiment of the apparatus according to the invention will now be described by way of example, with reference to the accompanying diagrammatic drawing. The apparatus consists of a semi-cylindrical trough 2, provided with a jacket through which cooling water may be circulated. The cooling water may be run directly through the jacket or alternatively pipes may be provided within the walls of the trough for the circulation of the water. The trough is provided with a hinged lid 4. The lid 4 is not provided with cooling pipes, as otherwise vapour would tend to condense thereon and drip on to the film. The lid is therefore conveniently formed of two members having an air space between them. The end walls of the trough are provided with vertical slots 5, extending from the top of each wall to approximately half-way down the trough. These slots form bearings for a longitudinal spindle 6 on which the film 7 is wound, the spindle thus being easily removable from the trough.

The spindle may conveniently be driven mechanically, either by a belt and pulley or by suitable gearing.

The cold water inlet 8 for the jacket 3 is arranged at the bottom of the trough, and the outlet 9 from the jacket is at the top. By suitable adjustment of the rate of flow of the cooling water, the temperature within the trough is maintained at about 65° F. A draw-off cock 10 is provided at the bottom of the trough to enable any condensate forming thereon to be removed.

By winding the film in the apparatus according to the invention, it is changed from the comparatively soft and unstable state in which it leaves the maturing process to a hard cool condition.

When the whole of the film has been wound on the spindle, the latter may be removed

from the trough and may immediately be unwound. There is, therefore, no need for the film to be left for any length of time to cool, as was heretofore the case; nor is there
5 any tendency for adjacent convolutions of the film to stick together when it is wound up or for electrostatic charge to be generated when it is unwound.

It is to be understood that it is sometimes
10 preferable to wind the film after maturing in two stages. In this case two cooling troughs of the kind illustrated in the drawing are employed. In the first trough the cooling water is arranged to be at a temperature such that
15 the film is reduced from the maturing temperature of 105° F. to a temperature of about 90° F. The film is then rewound in a second cooling trough in which the temperature of the cooling water is such that the temperature of the film is reduced to about 65° F.

I claim:—

1. A method for the manufacture of films of compositions containing an organic derivative of cellulose which comprises in combination the steps of applying to a travelling
25 surface a solution of the aforesaid composition, effecting evaporation of the solvent from said solution, stripping from the surface the film of composition left thereon by the evaporation of said solvent, maturing the
30 film by leading it through a space maintained charged with water vapour at a temperature considerably above room temperature, and immediately thereafter winding the film in a
35 space which is maintained at a temperature considerably below that of the space in which the aforesaid maturing treatment is carried out.

2. A method for the manufacture of films
40 of compositions containing an organic derivative of cellulose which comprises in combination the steps of applying to a travelling surface a solution of the aforesaid composition, effecting evaporation of the solvent
45 from said solution, stripping from the surface the film of composition left thereon by the evaporation of said solvent, maturing the film by leading it through a space maintained charged with water vapour at a temperature
50 considerably above room temperature, and immediately thereafter winding the film first at a temperature of about 15° F. below the temperature of the space in which the aforesaid maturing treatment is carried out and
55 then rewinding it at a temperature of about 40° F. below the maturing temperature.

In testimony whereof I affix my signature.

ALFRED ROBERT WICKHAM.