

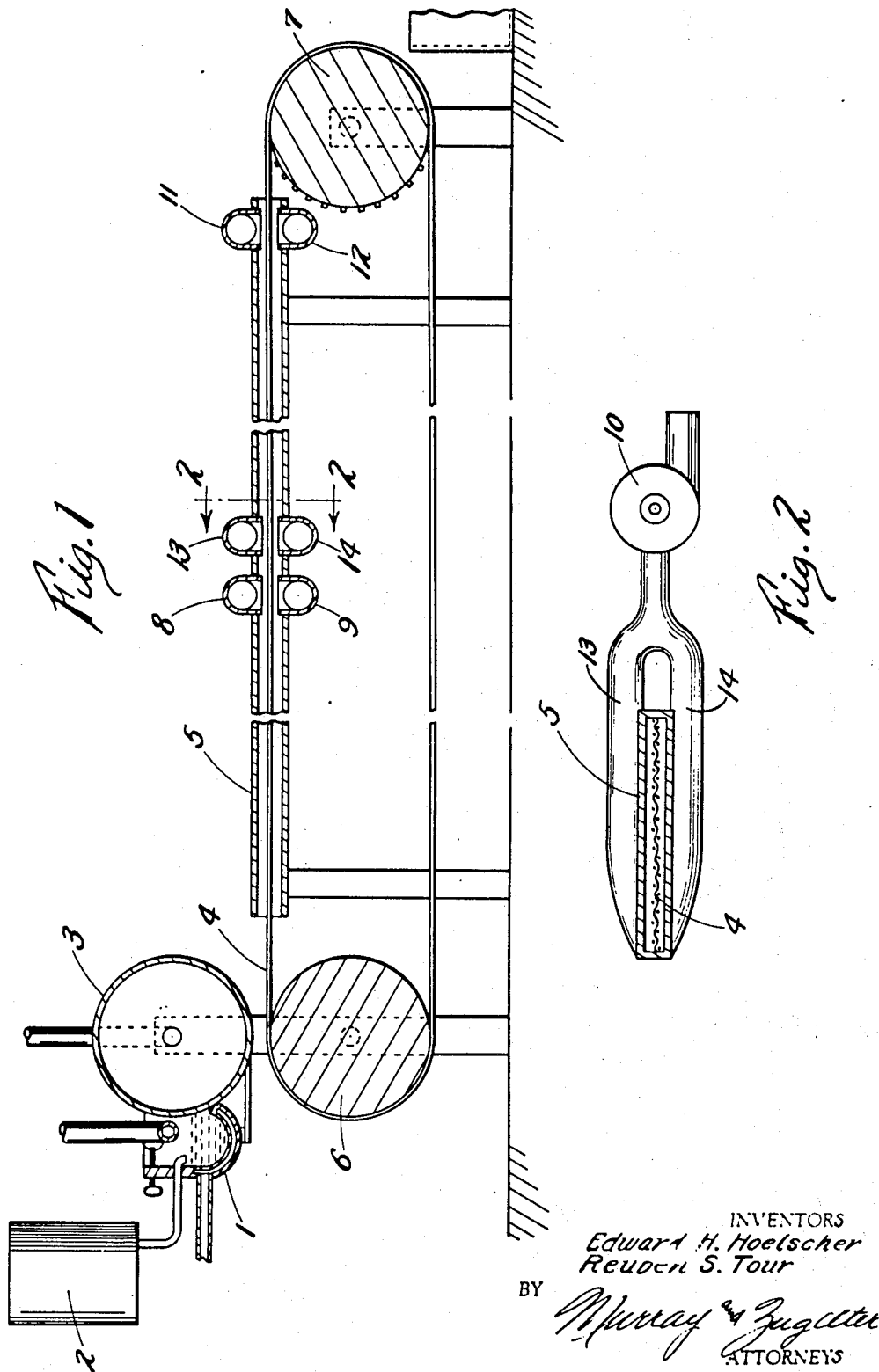
April 30, 1940.

E. H. HOELSCHER ET AL

2,198,617

PROCESS FOR DRYING GLUE

Filed June 25, 1936



INVENTORS
Edward H. Hoelscher
Reuben S. Tour
BY *Murray & Ziegler*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,198,617

PROCESS FOR DRYING GLUE

Edward H. Hoelscher and Reuben S. Tour, Cincinnati, Ohio, assignors to Chemical Products Corporation, a corporation of Ohio

Application June 25, 1936, Serial No. 87,252

8 Claims. (Cl. 260—118)

An object of our invention is the drying of glue by a process that can be completed in less time and more efficiently than prior processes, and that can be performed by means of a much simplified apparatus.

The steps of our process are taken after the glue liquor has been drawn from the crude materials. The quality of the glue in the liquor will vary with the kinds of raw material used and with the methods of extraction. The temperatures and details of operation that are maintained in the successive steps of our process, will depend somewhat on the quality of glue liquors being used.

In Fig. 1 we have shown a vertical longitudinal section of an apparatus by means of which our process may be carried on.

Fig. 2 is a cross-sectional view taken upon line 2—2 of Fig. 1.

The steps of our process comprise first continuously picking up the glue liquor in a thin sheet and chilling this continuous sheet to produce a jelly which is to be carried forward; second, placing this thin sheet of jelly upon a continuously moving conveyor and subjecting it to a current of air at moderate temperature so as to form a "skin" upon the jelly; and third, carrying the "skinned" sheet by means of a continuous conveyor through a stream of hot air to evaporate the moisture and dry the glue.

The first step of our process is to draw off a thin sheet of glue liquor and cool it below its melting temperature so as to jellyify it. This may be done by the means shown in the drawing, in which 1 is a glue trough into which the glue liquor is led from a kettle 2, and maintained at a temperature sufficient to keep it liquid, which may range from 100° F. to 150° F. The glue liquor in the trough is in contact with a rotating roll 3, the surface of which is kept at a temperature low enough to jellyify the liquor, this temperature ranging between 25° to 40° F. The roll 3 takes up from trough 1 a sheet of glue liquor of a thickness between one-thousandth and one-tenth of an inch, depending on the results desired. The surface speed of the chill roll should be such that jellyification of glue liquor picked up by the roll will be effected in less time than that of one revolution of the roll.

The next step in our process is to strip the sheet of glue jelly from the roll and deliver it to a conveyor which is moving continuously at the same surface speed as that of the chill roll just described. On the conveyor this sheet of glue jelly is subjected to a continuous current of air

at such a temperature as to put a "skin" upon the surface of the jelly. This will ordinarily be air at atmospheric conditions.

The conveyor 4 is made of a continuous wire net that is carried through a shallow drying chamber 5 by continuously revolving rollers 6 and 7. Air for skinning the glue jelly is drawn into the entrance end of the chamber by means of a blower 10 connected with the air exhaust channels 8 and 9, these being so located as to draw the air into contact with both top and bottom of the sheet of glue jelly as the latter is being advanced through the chamber on conveyor 4.

The next step of our process is that of evaporating the moisture from and drying the sheet of glue jelly. This we do by subjecting both surfaces of the sheet to a continuous current of air moving at high velocity and at a temperature which is high compared to present practice. We have used velocities as high as 6000 feet per minute, with temperatures up to 200° F. This is accomplished in the apparatus shown wherein the drying chamber 5 is made so as to leave little free air space between the conveyor and the walls of the chamber, and by sucking the hot air into the glue exit end of chamber 5, from hot air supply pipes 11 and 12, by means of air exhaust apparatus 13 and 14. This subjects both sides of the sheet to the heated air.

The thinness of the sheet of glue jelly permits the water in the sheet to diffuse to the surface thereof, very rapidly and to be as rapidly taken up by the fast moving current of hot air. By virtue of the thinness of the glue sheet and the resulting increased surface as produced in our process, the use of high temperature air is made possible in the drying section, due to the rapid evaporation of water and resultant self-cooling at the surface of the thin sheet; whereas the use of air in present practice is limited to much lower velocities and temperatures, because of the low rate of diffusion of water through the thicker glue sheets.

Throughout this specification we have used the term glue, but it is to be understood that this term includes the term gelatine.

What is claimed is:

1. A process for drying glue comprising forming a thin sheet of glue liquor, bringing the sheet to a temperature that will convert it to a jelly, subjecting the sheet to a current of air at a velocity exceeding ½ mile per minute to form a skin upon the sheet, and then subjecting the skinned sheet to a current of hot air at a velocity

exceeding $\frac{1}{2}$ mile per minute to evaporate the moisture from the sheet and dry the glue.

2. A process for drying glue comprising forming a sheet of glue liquor of less than one-tenth of an inch in thickness, cooling the sheet to convert it to a jelly, delivering the sheet to a continuously moving conveyor, subjecting the sheet on the conveyor to a current of air at a velocity exceeding $\frac{1}{2}$ mile per minute and of a temperature to form a skin upon the sheet, and then subjecting the skinned sheet to a current of hot air at a velocity exceeding $\frac{1}{2}$ mile per minute to evaporate the moisture from the sheet and dry the glue.

3. A process for drying glue comprising forming a continuous thin sheet of glue liquor, continuously chilling it to form a thin sheet of jelly, continuously feeding the sheet onto a continuously moving conveyor, subjecting the sheet while in continuous motion on the conveyor, to a current of air to form a skin thereon, and then subjecting the skinned sheet while still in motion to a current of hot air to evaporate the moisture therefrom.

4. A process of drying glue that comprises forming and jellifying a sheet of glue liquor of a thickness less than $\frac{1}{8}$ inch so as to give a very large surface area for evaporation of moisture, and subjecting this surface area to the action of a current of air.

5. A process of drying glue that comprises forming and jellifying a sheet of glue liquor of a thickness less than $\frac{1}{8}$ inch so as to permit of

very rapid diffusion of moisture to the surfaces and subjecting these surfaces to the action of a current of air.

6. A process of drying glue that comprises forming and jellifying a sheet of glue liquor of a thickness less than $\frac{1}{8}$ inch so as to give very large surface areas and to permit very rapid diffusion of moisture to these surfaces, then subjecting the aforesaid surfaces to the action of a current of air of a velocity exceeding $\frac{1}{2}$ mile per minute.

7. A process of drying glue that comprises forming and jellifying a sheet of glue liquor of a thickness less than $\frac{1}{8}$ inch so as to give very large surface areas and to permit very rapid diffusion of moisture to these surfaces, then subjecting the aforesaid surfaces to the action of a current of air at a velocity exceeding $\frac{1}{2}$ mile per minute and of a temperature exceeding 150° F.

8. A process of drying glue that comprises forming and jellifying a sheet of glue liquor of a thickness less than $\frac{1}{8}$ inch so as to give very large surface areas and to permit very rapid diffusion of moisture to these surfaces, then subjecting the aforesaid surfaces to the action of a current of air at a velocity exceeding $\frac{1}{2}$ mile per minute to form a skin upon the surface of the glue jelly, and then further subjecting the jelly to the action of a current of air at a velocity exceeding $\frac{1}{2}$ mile per minute and of a temperature exceeding 150° F.

EDWARD H. HOELSCHER.
REUBEN S. TOUR.