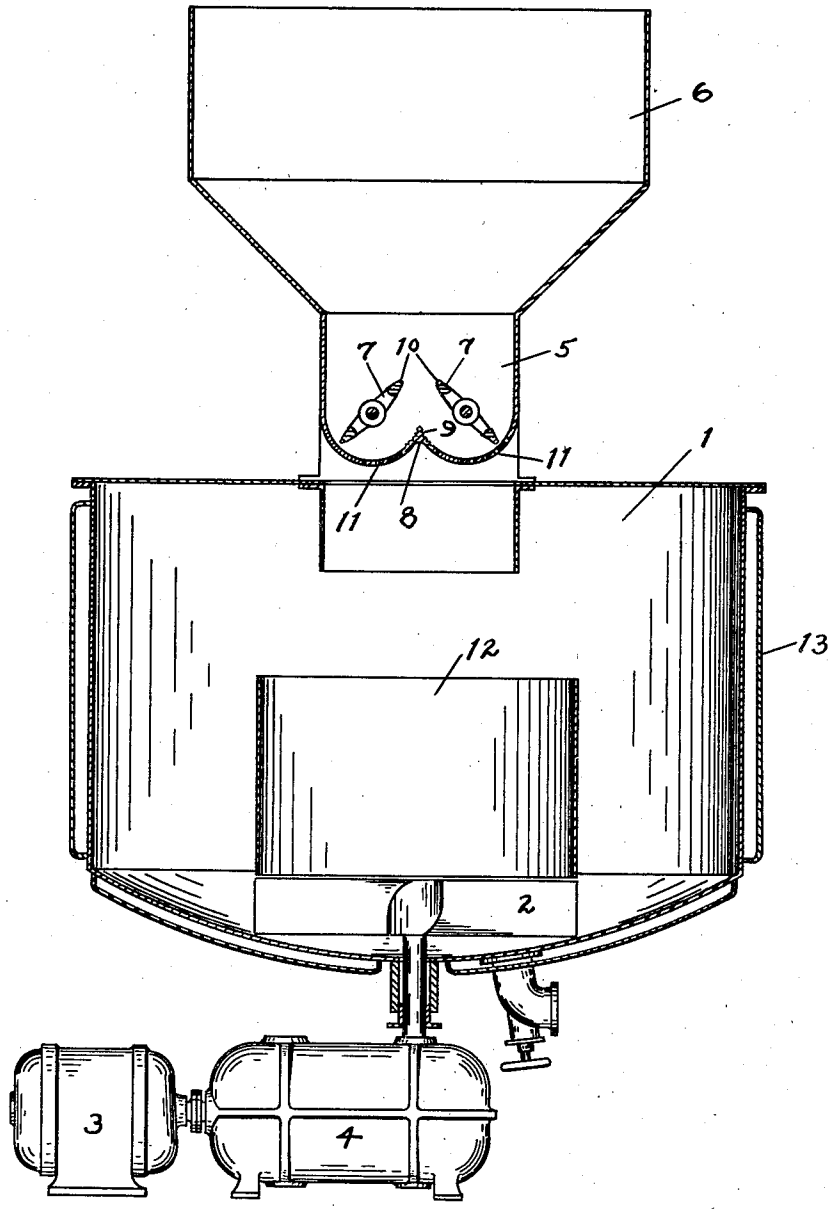
Oct. 13, 1936. T. EVANS 2,057,019

PROCESS FOR DISSOLVING CELLULOSE XANTHATE

Filed Nov. 30, 1934



THOMAS EVANS.
INVENTOR

BY

Carl Fletcher
ATTORNEY

Patented Oct. 13, 1936 2,057,019

UNITED STATES PATENT OFFICE

2,057,019

PROCESS FOR DISSOLVING CELLULOSE XANTHATE

Thomas Evans, Scarsdale, N. Y., assignor to Baker Perkins Company, Inc., Saginaw, Mich., a corporation of New York

Application November 30, 1934, Serial No. 755,409

2 Claims. (Cl. 106—40)

This invention relates to a process of dissolving cellulose xanthate to produce viscose from which rayon threads and transparent cellulose sheets may be manufactured.

Cellulose xanthate is a reaction product obtained by treating alkali cellulose with carbon disulphide. It is an orange-colored, sticky, amorphous mass which is soluble in water and/or a dilute caustic solution.

In the dissolving processes used heretofore, it was customary to take the cellulose xanthate from the xanthating drums, or barattes, place it in an agitator containing a dilute caustic dissolving fluid, and then rapidly agitate the mixture until the crumbs were dissolved. During the dissolving period the cellulose xanthate is surrounded with a coating of viscose which is practically a saturated solution. This coating adheres to the particles and prevents the fresher liquids from reaching the center of the particles and dissolving them. On the smaller particles the saturated solution can be washed away from the particle and then the solution can contact and complete the dissolving of the remainder of the particles. On the larger lumps, however, this problem is greatly intensified. The slowly-moving lumps, due to their mass and weight, do not readily give up their coating of saturated solution and a great deal of time is required to break down these particles until they are readily dissolvable.

Heretofore it has been customary to provide the dissolving apparatus with means for shearing or tearing these larger particles to present fresh surfaces to the eroding action of the solvent. Such processes were necessarily slow.

The present invention obviates the uncertainty produced heretofore by the former process, in that the cellulose xanthate is disintegrated while in a dry state and each particle of cellulose xanthate is then wetted with the solvent before they have a chance to contact with each other and again form insoluble lumps. By rapidly agitating the solvent, the coating of saturated solution which surrounds these particles is easily washed away and the solution can then reach the core and instantly dissolve it, and thus produce a viscose which is always uniform in consistency and which, by its uniform viscosity, may be spun into stronger threads of rayon or cast into clearer sheets.

It is an object of my invention to provide a process for dissolving cellulose xanthate which is rapid, economical, and certain and which will produce a consistently uniform product.

With these, and certain other objects in view which will appear later in the specifications, my invention comprises the process and method described and claimed and the equivalents thereof.

As an illustrative means of carrying out my process, please refer to the drawing of which the single figure represents, diagrammatically, a vertical cross section through one type apparatus in which my process may be successfully carried out.

In a preferred form, I provide a dissolver 1 of any type having therein an agitator 2, driven by the usual motor 3 and reduction gear 4. Above the agitator is a disintegrator 5 which may be driven by an individual drive or from the agitator drive. It is obvious that such a drive is necessary and no driving connection is shown on the drawing. Above the disintegrator is a hopper 6, preferably adapted to hold a batch of cellulose xanthate sufficient to make one batch of viscose.

Within the agitator tank 1 is then placed the proper amount of solvent, and the impeller blades 2 are rotated to create a violent agitation of the solvent.

As an illustrative method of dissolving cellulose xanthate, I prefer to use a shredder of the Werner and Pfleiderer type, having therein a pair of Duplex shredder blades 7, as described in U. S. Patent No. 1,953,733. The disintegrator 5 is formed with a double arcuate bottom, the adjoining edges of which form a saddle 8, and upon the saddle are projections 9, over which the teeth 10 of the shredder blades sweep, co-acting with the saddle to shred, cut, and break up the lumps of cellulose xanthate. The arcuate bottoms of the disintegrator trough are perforated as at 11, the size of the perforations being such that cellulose xanthate crumbs of a predetermined size can pass through. Thus any cellulose xanthate that is larger than the perforations will be carried around and further cut between the teeth on the shredder blades of the projections on the saddle.

As the disintegrated cellulose xanthate is fed gradually in a fine shower into the violently-agitated solvent, each particle, immediately upon striking the solvent, is surrounded with a slippery coating of dissolved cellulose xanthate, and the particles are thus prevented from adhering to each other and again forming lumps.

The dissolving apparatus, as shown, preferably has a central draft tube 12 which draws the solvent from the surface down to the bottom of the dissolver, thus causing the particles of cellulose xanthate to be washed down and immediately submerged in the solvent. The violent agitation of the solvent causes the saturated solution surrounding the particles to be instantly washed from

the core, thus permitting the solvent to constantly act upon a fresh surface of the cellulose xanthate and rapidly dissolve the particles to form viscose.

To maintain a proper temperature in the solution, the dissolver is jacketed as at 13, and means are provided for circulating a cooling medium through the space between the jacket and shell.

While I have described and illustrated diagrammatically a preferred form of apparatus which may be used for carrying out my process, it is understood that any one of several well-known disintegrators, or dissolvers, may be used without departing from the spirit of my invention.

By the above-described process I have produced a viscose which is free from lumps, is quickly made, inexpensive, and which eliminates much of the handling and filtering that has been required with previous processes.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A process for dissolving cellulose xanthate which consists in disintegrating the cellulose xanthate lumps into crumbs, showering the crumbs as soon as formed, into a solvent, agitating the solvent to prevent the cellulose xanthate crumbs from adhering to each other to form lumps, and continuing the agitation until the crumbs are all dissolved.

2. A process of dissolving cellulose xanthate which comprises the steps of disintegrating the cellulose xanthate lumps into crumbs, violently agitating a solvent, sprinkling the cellulose xanthate crumbs into the agitated solvent to prevent the crumbs from again joining each other, and continuing agitating of the solvent and crumbs until the cellulose xanthate is dissolved.

THOMAS EVANS.