

UNITED STATES PATENT OFFICE.

MONTGOMERY WADDELL, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO SILAS W. PETTIT, OF PHILADELPHIA, PENNSYLVANIA.

MANUFACTURE OF VISCOSE.

No. 855,213.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed July 7, 1904. Serial No. 215,879.

To all whom it may concern:

Be it known that I, MONTGOMERY WADDELL, of New York, in the county and State of New York, have invented certain new and useful Improvements in the Manufacture of Viscose, whereof the following is a specification.

My invention is especially valuable in the manufacture of viscose, (cellulose xanthate), which is particularly adapted to form the filaments commercially known as lustracellulose or artificial silk, and I would refer to Letters Patent of the United States No. 622,087, dated March 28th, 1889, and No. 716,778, dated Dec. 23rd, 1902, as containing descriptions of typical and convenient methods of obtaining such filaments.

To form such filaments, the viscose is forced through spinnerets into a bath capable of gelatinizing the viscose, whereby the filaments thus produced are set in the form given to them by the spinnerets.

It is to be understood that a viscose absolutely free from any traces of undissolved fibers is highly desirable in the manufacture of such filaments, for, of course, any such fiber particles in the viscose tend to block the small openings of the spinnerets, thereby break the filaments and prevent their formation in continuous lengths.

It is the principal object of my invention to produce a cellulose which is of uniform character and consistency and free from any undissolved fiber particles.

A further object of my invention is to control the noxious vapors liberated during the process of manufacture and prevent their escape into the atmosphere.

The ordinary method of producing viscose, for the manufacture of films, filaments and other well known products, is to immerse pulp, in sheet form, in an excess of sodium hydrate for twenty-four hours. Thereafter, the excess of sodium hydrate is removed by pressure and the alkali cellulose is allowed to stand for forty-eight hours "aging" in order that the remaining sodium hydrate may diffuse uniformly throughout the mass. The alkali cellulose is then subjected, in a closed rotating vessel, to the action of about twenty per cent of its weight of carbon bisulfid, which converts the cellulose into cellulose xanthate and incidentally vaporizes. There is always a residue of carbon bisulfid va-

pors which cannot be condensed on account of their admixture with air, and, it has been the practice to permit said vapors to escape into the atmosphere regardless of the fact that they are prejudicial to health.

I have found that during the time when the alkali cellulose is being treated as above described, it is particularly susceptible to the action of air, by which the first formed portions of cellulose xanthate are likely to be partially or wholly reverted while the remainder of the cellulose is being converted into xanthate.

My invention is intended to avoid the objectionable features aforesaid, and to that end I proceed as follows:—I submerge alkali cellulose in carbon bisulfid, in a vessel which is maintained hermetically sealed until the treatment is completed. I then drain off as much as possible of the carbon bisulfid and cover the remaining cellulose xanthate with an aqueous solution of sodium hydrate, of the strength and proportion required to render said xanthate of the required consistency for forming filaments. During the treatment of the mass with sodium hydrate, the excess of carbon bisulfid, remaining from the draining operation aforesaid, is removed by means capable of forming a partial vacuum within the closed vessel. The vapors thus liberated and removed from the mass within said vessel, being entirely free from air, can be readily condensed and prevented from issuing into the atmosphere.

During the treatment of the mass with sodium hydrate as above described, I find it advantageous to agitate the same and this may be conveniently effected by rotary agitation.

My invention is advantageous in that viscose produced in accordance therewith is more uniform than viscose produced in accordance with the aforesaid process of the prior art, because it is at all times immersed in a liquid which excludes the cellulose from contact with air, and, as above noted, the present process permits complete control of the noxious vapors liberated from the mass under treatment.

I have also found that, when alkali cellulose is treated by the old method above described, the first formed xanthate tends to form into large dense masses preventing the complete treatment of the interior until after

the exterior is overtreated; whereas, in my process, the alkali cellulose is entirely surrounded by the liquid, which prevents such agglomeration, and, the xanthate so formed is more readily dissolved in the sodium hy-
5 drate necessary to render it of the required consistency for forming filaments.

Having thus described my invention, I claim:—

10 1. The hereinbefore described improvement in the manufacture of viscose, which consists in submerging a mass of alkali cellulose in carbon bisulfid until it is converted
15 into cellulose xanthate while secluding the same from the atmosphere; draining the free carbon bisulfid from the mass; then covering the xanthate with an aqueous solution of a solvent; and removing the surplus carbon
20 bisulfid as vapor, substantially as set forth.

20 2. The hereinbefore described improvement in the manufacture of viscose, which consists in submerging a mass of alkali cellulose in carbon bisulfid until it is converted
25 into cellulose xanthate while secluding the same from the atmosphere; draining the free carbon bisulfid from the mass; then covering the xanthate with an aqueous solution of a solvent; and removing the surplus carbon
30 bisulfid as vapor, by producing a partial vacuum adjacent to said mass, substantially as set forth.

3. The hereinbefore described improve-

ment in the manufacture of viscose, which consists in submerging a mass of alkali cellulose in carbon bisulfid until it is converted
35 into cellulose xanthate while secluding the same from the atmosphere; draining the free carbon bisulfid from the mass; then covering the xanthate with an aqueous solution of sodium hydrate; agitating the mass during
40 said treatment; and, removing the surplus carbon bisulfid as vapor, by producing a partial vacuum adjacent to said mass, substantially as set forth.

4. The herein described improvement in
45 the manufacture of viscose which consists in submerging a mass of alkali cellulose in carbon bisulfid, until it is converted into cellulose xanthate while secluding the same from
50 the atmosphere, draining the free carbon bisulfid from the mass, then covering the xanthate with an aqueous solution of a solvent until of the required consistency for forming filaments, and then removing the
55 surplus carbon bisulfid, substantially as set forth.

In testimony whereof, I have hereunto signed my name, at Lansdowne in the State of Pennsylvania this twenty-eighth day of June 1904.

MONTGOMERY WADDELL.

Witnesses:

WILLIAM H. KETTRA,
JOS. A. O'DONNELL.