UNITED STATES PATENT OFFICE.

ALBERT SCHLOSS, OF STETTIN, GERMANY, ASSIGNOR TO FÜRST GUIDO DONNERS MARCK'SCHE KUNSTSEIDEN & ACETATWERKE, OF SYDOWSANE, NEAR STETTIN, GERMANY.

MANUFACTURE OF OBJECTS FROM CELLULOSE ACETATE.

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Application filed March 12, 1909. Serial No. 482,950.

To all whom it may concern:

Be it known that I, ALBERT SCHLOSS, a subject of the King of Prussia, residing in Stettin, Prussia, Germany, have invented certain new and useful Improvements in the Manufacture of Objects from Cellulose Acetate.

The solvents now generally used in the manufacture of articles from cellulose acetate are acetylene-tetrachlorid, chloroform, acetone and alcohol. These have not been practicable for commercial manufacture however, principally because their utility as solvents is limited to certain acetyl derivatives of cellulose and by reason of their high cost. Even the cheapest of the solvents hitherto used, namely, glacial acetic acid, is hardly practicable commercially for various reasons, of which perhaps the most important is the fact that the solutions are very sensitive to the presence of water—a very small proportion of the latter being sufficient to render the solutions useless by partially precipitating the cellulose-acetate.

I have discovered in formic acid a solvent for cellulose acetate which overcomes all the objections mentioned and provides a commercially successful process. As a solvent formic acid at least equals the expensive solvents above mentioned and is much superior to glacial acetic acid. Furthermore the formic acid solution is not at all sensitive to the presence of water and can stand a large percentage without being unfavorably affected. Furthermore formic acid is very volatile and is readily decomposed, so that it may be used in practically all the industrial processes in which a cellulose-acetate solution may be employed, for instance, for producing coatings, impregnations and all sorts of solids, especially textile fibers.

An unexpected and marked advantage in the use of formic acid as a solvent has been discovered, namely that a thread (in the spinning process, for example) of sufficient strength is at once produced when the solution is squirted into an aqueous precipitating bath of suitable character. The rapid action in the present case is believed to be due to the fact that the skin formed upon the surface of the filament as soon as it enters the precipitating bath is readily penetrated by formic acid and water, so that the coagulation process rapidly extends into the interior of the thread thus imparting the necessary strength almost at once. Filaments so spun may be subsequently twisted, reeled and submitted to any appropriate treatment.

In point of economy the present formic acid process is the equal of any of the others, since the formic acid used may be recovered as readily as acetic acid. Furthermore, the initial cost is slight, inasmuch as formic acid is low priced—and indeed by recently developed processes, it may be obtained at even less expense than acetic acid.

A suitable solution may be readily made in accordance with the present invention by adding dry cellulose acetate to formic acid and stirring until the acetate is dissolved. But the solution may be produced equally well by substituting formic acid for acetic acid, for instance, as a diluent or solvent in any of the known processes for the acetylization of cellulose (hydro-, oxy-, cellulose etc.), by means of acetic anhydrid in the presence of sulfuric acid or other stimulant. Thus a formic acid solution containing a certain quantity of acetic acid, is directly obtained in the acetylizing process. It follows from this that one or more other diluting agents may be mixed with the formic acid as circumstances or desired effect may require. Similarly any other appropriate ingredients may of course be used for softening the products to be made of the solution or for any other purpose whatever.

I claim as my invention:

1. In the manufacture of objects from cellulose acetate, the subjection of the cellulose acetate to the action of formic acid as a solvent, substantially as described.

2. In the manufacture of objects from cellulose acetate, the subjection of the cellulose acetate to the action of formic acid as a solvent and the introduction of the solution so formed into an aqueous precipitating bath, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT SCHLOSS.

Witnesses:
P. ERSBACH,
W. MANSHE.