

UNITED STATES PATENT OFFICE.

GEORGE R. SHERWOOD, OF CHICAGO, ILLINOIS.

PROCESS OF MANUFACTURING PRODUCTS FROM CORNSTALKS OR ANALOGOUS PLANTS.

SPECIFICATION forming part of Letters Patent No. 720,850, dated February 17, 1903.

Application filed October 9, 1901. Serial No. 78,094. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE R. SHERWOOD, of the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Process for the Manufacture of Products from Cornstalks or Analogous Plants, whereby I obtain new and useful products, of which the following is a specification.

My invention relates to the manufacture of products from the stalks of Indian corn and plants having an analogous structure; and its object is to produce from the pith of such stalks a cellulose product adapted to numerous uses, including, among others, the manufacture of parchment and various articles commonly made of celluloid, paper-stock, wood, and other substances; also, to combine such cellulose product with the fibrous product separately digested, forming a composite product of superior utility for many purposes.

It has been found that where the pith and fibrous portion of the cornstalk are treated together in a digester or a boiler for the purpose of disintegrating or dissolving and conversion into paper-stock the pith (which absorbs water much more rapidly than the fibrous portion and is also more sensitive to the action of the chemical agents) obstructs the proper treatment of the fibers and undergoes such conversion as to be injurious to the product. Hence it is important to separate the pith from the fibrous portion of the stalk before subjecting either to such chemical treatment or disintegration. I have discovered that the pith when thus separated can be treated in the digester or boiler under conditions suitable to it, so as to produce a cellulose product possessing properties quite different from any obtainable by treating the pith and fibers together and peculiarly adapted to numerous useful purposes—such, for instance, as have already been specified. It can also after such digestion be reunited in any desired proportion (according to the properties desired in the product) with the paper-stock obtained by separately treating the fibrous portion of the stalk, producing a composite product possessing valuable properties not obtainable by dissolving the pith and fibrous portions together. It is also useful as a sizing for papers made from various stocks.

I separate the pith from the fibrous portion

or outer wall of the stalk by any suitable means—such, for instance, as that illustrated in United States Patent No. 627,882, granted me (then a resident of Kearney, county of Buffalo, Nebraska) June 27, 1899, for a “Machine for pithing stalks,” or the improved mechanism upon which I am about to make application for Letters Patent—then treat the pith in any suitable digester until it is so far dissolved or digested that it will form a glutinous or parchment-like film in drying. This may be done by using a solution of caustic soda in about the following proportions, viz: to twenty-five pounds of pith two pounds of caustic soda, mixed in from forty to fifty gallons of water, boiled for about two hours under a pressure of from fifty to seventy pounds. If less heat is used, more time will be required or a stronger solution, and the conditions or agents for effecting the digestion may be varied, provided care is taken to have sufficient water in proportion to the pith and to prevent the digestion being carried so far as to injure the product, while having it carried far enough to obtain the desired plastic and adhesive or glutinous condition, in which it will when spread thin form a parchment-like film in drying. It will be observed that the proportion of water above mentioned is several times that which would be required in digesting the fibrous portions of the stalk, while the treatment is gentler than that required for the proper digesting of the fibrous portion. When beaten and washed, it can be rolled into a substance resembling parchment or more nearly transparent than parchment and so tough and flexible and so far impervious to oil and moisture as to be superior to paper-stock for many purposes for which such stock is used and valuable for numerous purposes—such, for instance, as forming receptacles, wheels, and a great variety of articles. By uniting it in suitable proportions with the paper-stock obtained from the fibrous constituents of the corn-plant after both have been treated in separate digesters appropriate to each I produce a strong product less pervious than that produced from the fiber alone and much superior to ordinary paper or wrapping for packages and for many other purposes. So much of the invention as relates to the uniting of these separately-treated

products for such purposes is made the subject of a separate application. It is to be observed that whether the pith is to be used separately or subsequently united with the fibrous product it is essential that it should be subjected to a milder treatment for the purpose of digestion than that required for the fibrous products. While a digester suitable for applying heat under pressure may be used to advantage, it may be dispensed with and the proper digestion obtained by increasing the time or strength of the solution as the amount of heat applied is decreased. I include under the term "digester" any suitable receptacle in which a proper disintegration of the pith may be effected. The stalk of Indian corn or maize is especially adapted for such manufacture; but other plants of the cane species or having analogous structure may be used when conveniently and economically obtainable.

I claim as new and desire to secure by Letters Patent—

1. The process of manufacturing cellulose products from the stalks of Indian corn or

analogous plants, consisting in mechanically severing the pith from the shell before cooking or chemical disintegration, and thereafter separately digesting the pith until it reaches a plastic and adhesive or glutinous condition, substantially as herein described.

2. The improvement in the manufacture of cellulose products, consisting in removing the pith of Indian corn or analogous plants from the shell before cooking or chemical disintegration, and thereafter digesting the pith by boiling in a suitable chemical solution, such digestion being substantially milder than that required for the disintegration of the fibrous constituents, for the purpose described.

3. The improved cellulose product composed of the pith of Indian corn or analogous plants digested separately from the fibrous portion to a plastic and adhesive or glutinous condition, substantially as described.

GEORGE R. SHERWOOD.

Witnesses:

ROBERT CATHERWOOD,
CHARLES L. HINE.