Patented Dec. 10, 1935

2,024,131

UNITED STATES PATENT OFFICE

2,024,131

PREPARATION OF GLUE

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No Drawing. Application June 12, 1935, Serial No. 26,240

7 Claims. (Cl. 87—7)

This invention relates to a method of drying glue in small subdivisions and to the product resulting from the practice of the method.

One of the objects of the invention is to provide a method for the rapid drying of glue stock irrespective of weather conditions.

Another object of the invention is to provide a glue product of the pearl type which is not case hardened and which will dissolve readily.

Other objects of the invention will be apparent from the description and claims which follow.

The method of drying glue which has been so widely used as to have become traditional is to form the glue stock in jelled sheets which are dried on screens in tunnels through which warm, relatively dry air is circulated.

The next most important glue drying method from the standpoint of commercial use is the conventional pearling method. By the pearling method the glue stock is formed into small drops which are jelled in a chilled petroleum liquor which permits each pearl to jell and to acquire a coat of petroleum which prevents coherence among the pearls and adherence in the drying equipment. Pearls so formed are dried very carefully at first until a skin is formed after which the drying is speeded up by increasing the heat of the air being circulated in the drying equipment.

It has also been proposed, in the patent to Eckerbom, No. 1,759,737, to coat the pearls with powder such as talc, chalk, boric acid, pulverized glue or starch.

The present invention contemplates the formation of pearls coated with granulated glue as distinguished from petroleum or powder.

Dried glue pearls formed by the process of dropping glue liquor into a chilled petroleum liquor, followed by drying, have the property of absorbing moisture more slowly and to a lesser extent than sheet dried glue, thus making the pearls more difficult to dissolve in practice.

A powder coating gives the pearl an undesirable chalky appearance not characteristic of glue and requires careful control of the temperature and humidity of the air to prevent coherence of the pearls due to solution of the thin coating of powder in the glue liquor which would result in a sticky surface.

Neither petroleum nor powder give the high drying rate obtained by the present invention which results in the formation of a pearl coated with jagged pieces of appreciable size which extend out from the surface of the wet glue drop a considerable distance, protecting the drop and obviating coalescence. The jagged edges of the granules projecting from the pearl surface allow a free flow of air between pearls and provide a substantially increased evaporation area. It will be readily appreciated that moisture in the wet pearl will pass to the jagged, protecting granules by capillarity and thus increase the drying rate of the pearl by increasing the surface from which the evaporation takes place.

The method of the present invention may be carried out by continuously dropping glue liquor upon a bed of granular glue upon a moving conveyor and covering the pearls resting upon the granular glue on the conveyor with granular glue fed from a hopper over the conveyor. The pearls may then be recovered from the mass of granular glue by screening and dried in any desired manner.

The use of granular glue permits a very high pick-up of dry glue for a given weight of glue liquor. The later stages of drying glue are much more efficient than the early stages, due to the fact that much higher temperatures can be used, and a high pick-up of dry glue, resulting in the distribution of moisture to the dry granules, brings the material to a stage of dryness similar to that of the latter part of the normal drying period. This results in shortening the drying time and increasing the capacity of the equipment as well as decreasing the degradation of the glue during drying.

It will be seen that the high pick-up secured by the use of granular glue as against powdered glue results in a higher melting point of the partially dried glue. The moisture in the glue liquor, when distributed from an individual drop into the solid dried glue picked up by that drop, produces a final mixture which has a much higher solids content and therefore a much higher melting point. Since the stickiness of a partially dried glue depends to a large extent upon the melting point of the glue mixture and the degree to which this melting point is approached, it will be seen that the tendency for the various granular drops to cohere is directly related to the melting point of the mixture.

It will be seen from the foregoing that due to the size and shape of the dried glue granules, substantially all of the granules adherent to the individual drops will be in direct communication with the outer atmosphere and that each individual granule serves to increase the evaporating surface and to form a capillary track to facilitate drying.

The pearls, when dried, present a jagged ir-

regular surface appearance of the typical glue color.

After drying the pearls may be disintegrated by passing between two rollers as a more effective grinding machine is not needed.

The lower the grade of the glue as measured by jelly strength or viscosity the coarser must be the subdivisions of the granulated dried glue. In the case of a low grade glue, for example, if finely divided particles are used the pearls formed are sticky or gummy and form large masses of coated drops which have lost their individuality to such an extent that the drying surface is greatly decreased and that the free flow of air around the individual particles is inhibited.

We have found that there is a very marked difference in the pick-up of dry glue when powdered glue is used to coat the drops as compared to granular glue. The difference runs from 50% or less in the case of powder up to 1200% to 1400% in the case of granular glue, the percentages being based upon the glue solids in the liquor. We have found in practice that the drying time is greatly reduced by the use of granular glue as against powdered glue. For example, we have found that pearls dried in accordance with the present invention with the employment of granular glue between 8 and 14 mesh will dry in 160 minutes, whereas powdered glue consisting of particles substantially all of which are of the fineness of from 100 to 200 mesh permits a pick-up such that the drying time is 240 minutes, all other factors being constant. For the purpose of these determinations, the glue was considered as having been dried when it reached such a state that there was no further weight lost in 24 hours, which would be equivalent to a moisture content of from 8% to 10%. It will be seen, therefore, that the use of the granular glue in accordance with the present invention is a marked improvement in the art.

If desired the glue liquor may be extruded in threads or rods upon a bed of granulated dried glue and treated in the same manner as the pearl form. Similarly, other shapes may be assumed by the glue liquor but the pearl is the preferred form.

The term "granular glue" is used in this specification and in the claims which follow to designate dry glue subdivided to a degree of fineness coarser than that which would pass a 30 mesh screen.

The term "particles" is used in the claims to designate shapes of relatively small volume in relation to the surface area such as pearls, threads or rods.

We claim:

1. The method of drying glue which comprises forming drops of glue liquor and coating each individual drop with granulated dried glue such that substantially all the granules adhering to individual drops of glue liquor are each in contact with the glue liquor and with the outer atmosphere whereby drying by capillary action is facilitated.

2. The method of drying glue which comprises forming drops of glue liquor, coating each individual drop with granulated dried glue, such that substantially all the granules of dried glue adhering to the individual drops of glue liquor communicate with the outer atmosphere and form a capillary track whereby the evaporating surface is increased and drying is facilitated and thereafter drying the drops of glue.

3. The method of drying glue which comprises dropping glue liquor in the form of drops upon granulated dried glue, covering the drops with granulated dried glue, such that substantially all the granules of dried glue adhering to the individual drops of glue liquor communicate with the outer atmosphere and form a capillary track whereby the evaporating surface is increased and drying is facilitated maintaining the individuality of the drops and thereafter drying the drops of glue.

4. The method of drying glue which comprises dropping glue liquor drop by drop upon a moving bed of granulated dried glue, thereafter covering the pearls so formed with granulated dried glue, separating the granule covered pearls from the mass of granulated dried glue, the granule covered pearls being thus formed presenting a surface of dried glue granules, substantially all of the granules adherent to the surface of the pearl communicating with the outer atmosphere increasing the evaporating surface and forming capillary tracks whereby drying is facilitated and thereafter drying the pearls.

5. A glue product consisting of glue pearls, each pearl presenting a surface of jagged glue granules.

6. The method of drying glue which comprises dropping glue liquor in the form of particles such as drops, threads or rods upon granulated dried glue, covering the surface of the particles of liquid glue with granulated dried glue, such that substantially all the granules of dried glue adhering to the individual particles of glue liquor communicate with the outer atmosphere and form a capillary track whereby the evaporating surface is increased and drying is facilitated, maintaining the individuality of the particles and thereafter drying the particles.

7. A glue product consisting of glue particles, each particle presenting a surface of jagged glue granules.

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