

UNITED STATES PATENT OFFICE.

FREDERICK HEDLEY JOBBINS, OF NEW YORK, N. Y., ASSIGNOR TO THE ALBA MANUFACTURING COMPANY, OF SAME PLACE.

PROCESS OF UTILIZING WASTE PORTIONS OF PRINTERS' INK-ROLLERS.

SPECIFICATION forming part of Letters Patent No. 649,169, dated May 8, 1900.

Application filed August 12, 1898. Serial No. 688,431. (No specimens.)

To all whom it may concern:

Be it known that I, FREDERICK HEDLEY JOBBINS, a citizen of the United States, residing in New York city, in the borough of Manhattan and State of New York, have invented a certain new and useful Improvement in Processes of Utilizing the Waste Composition of Printers' Rolls and Similar Materials, of which the following is a specification.

10 Printers' rolls are formed of suitable compositions applied to a metal or wooden shaft. The compositions used consist generally of glue, to which is added a saccharinous material—such as molasses, glucose, or sugar—
15 and in the better quality of printers' rolls glycerin is also used as an additional or substitute ingredient in the composition. These rolls after continuous use for several months, depending upon the quality of the material
20 used and the severity of the work to which they have been subjected, gradually become unfit for further use. The composition is then stripped from the shaft to which it was molded and is remodeled and recompounded
25 by the further addition of such of the original ingredients as may be necessary to restore to the compound its desired character, when it is again remodeled and again used. This recompounding is repeated so long as the desired characteristics can be restored to the
30 composition; but in the course of time these rolls become utterly worthless and now constitute a waste product. The plates or sheets of the same or analogous compositions which
35 are now used in transferring or duplicating processes, such as hectographing, also become worthless after protracted use.

The object of my invention is the utilization of the wastes by separating them into
40 products of utility and value.

In the case of printers' rolls consisting of glue, glycerin, and a saccharinous material—such as glucose, molasses, or sugar—I prefer to proceed substantially as follows: The material
45 is first cut into pieces varying from one-fourth to one-half of an inch in diameter, which operation may be carried out by any desired form of cutting or tearing mechanism. If desired, this preliminary reduction of the
50 material into small pieces need not be carried out, although the subsequent operations will

be facilitated by the reduction of the material into pieces. The material, whether it has been cut into pieces or not, is now placed in a suitable vessel and covered with water, 55 preferably, but not necessarily, cold, the best proportions being about two pounds of water and one pound of the composition. This soaking of the material is allowed to continue for from twenty-four to thirty-six hours, according to the character of the composition. 60 The action of the water upon the composition results in the extraction of most of its soluble constituents—such as glucose, sugar, and glycerin—and a sweet solution is thus formed. 65 I prefer, as stated, to soak the material in cold water, so as not to dissolve the glue; but I will refer later on to a modification of my process, wherein hot water is used and by which the entire composition, including the 70 glue, is dissolved. The dissolving of the soluble material will be facilitated by agitation. By adding a small proportion of a metallic or other suitable salt, such as the salts of alumina or iron, to the water the insolubility of the glue will be increased and the 75 resulting sweet solution will be much clearer than if such salts are not used. The proportion of metallic or other suitable salt which may be employed will vary very largely, according to the amount and character of impurities contained in the components of the mass. These proportions may in practice 80 vary from one ounce to five pounds per each ten gallons of water. The glutinous portion of the composition from which the glucose, sugar, or glycerin has been dissolved absorbs sometimes as much as forty per cent. of the water and constitutes a gelatinous fragmentary mass. If desired, the glutinous or insoluble 85 matter may now be separated from the solution, such as by filter-pressing. Although the water treatment referred to will remove a large part of the soluble constituents from the composition, the gelatinous portion still contains 95 varying quantities of soluble matter. I therefore prefer to treat the glutinous mass with a further quantity of water after the glutinous mass has been separated from the solution of the first treatment either by filter- 100 pressing or by decantation or in any other way. As it is desirable to avoid as much

evaporation of the liquid as possible, the solution resulting from the second water treatment can be used as the first water of the solution of a subsequent batch of the original material. After the second water treatment the glutinous mass is separated from the sweet water in any suitable way, but preferably by filter-pressing, so as to result in obtaining practically a clear solution. This in the present case will be a solution of glycerin and a saccharinous material, such as molasses, glucose, or sugar. I now separate the saccharinous material from the glycerin in the solution by fermentation, which may be either alcoholic or acid. To effect fermentation, yeast, mold, or bacteria can be employed, and by the action of fermentation the glucose and sugars will be transformed into alcohol or acids, depending on the character of the ferment. If an alcoholic fermentation is desired, a small portion of marbledust or similar alkali should be added to the liquid to neutralize any small proportion of acid which may be produced in them other than carbonic-acid gas, which is generated by the fermentation. I prefer to use marbledust for this purpose, as it is insoluble and any excess forms a readily-separable precipitate. It will be understood that instead of adding an active ferment to the solution, as explained, the solution may be spontaneously fermented by exposure to the air. In case any insoluble products of fermentation are produced by this operation they may be separated by further filtration. If preferred, the fermentation of the saccharinous matters in the composition may be carried out at the commencement of the operation by adding the desired ferment with the water of solution. The purified liquid, which has now been obtained, is subjected to a distillation carried on at a temperature of less than 100° centigrade, whereby the alcohol, in the case of alcoholic fermentation, or acid, in the case of acid fermentation, will be distilled off from the dissolved glycerin. The alcohol or acid which is thus distilled from the solution may be purified in any suitable way, such as by further fractional distillation. I prefer to carry on the distillation of the alcohol or acid from the solution by the use of steam, although manifestly the distillation may be performed in other ways. The concentrated solution, which remains in the still, contains whatever glycerin may have been dissolved from the original composition. Should this glycerin solution contain extractive and coloring matters and require any further purification, this may be done by any of the well-known methods. The glycerin solution may then be evaporated to drive off the water, the residuum in the evaporator being crude glycerin, which may be then refined by any preferred method, such as by distillation. The gelatinous material from which the soluble matters have been dissolved may be dried and used as an ammoniate fertilizer, owing to its

richness in nitrogen, even containing as high as sixteen to eighteen units of ammonia. Such gelatinous material being practically a very pure glue jelly can, if desired, be transformed into gelatin or glue by any of the well-known methods of treating this class of stock.

It will be understood that where the original composition of the wastes contains no glycerin the process will be carried out as above indicated, except that no further treatment of the solution will be necessary after the alcohol or acid resulting from the fermentation has been distilled off. If, on the other hand, the composition of the wastes contains no saccharinous material, but is composed, essentially, of glue and glycerin, the fermentation of the solution need not be performed; but the solution obtained from the first or second water treatment may after evaporation for the production of crude glycerin be treated as by distillation for obtaining the refined glycerin therefrom.

Instead of dissolving the soluble materials from the composition and wastes in the water, as above explained, the glycerin may be dissolved out of the glue in alcohol, whereby an alcoholic solution of glycerin is obtained and from which the alcohol may be recovered by distillation and in low temperature. The alcohol thus recovered may be reused for extracting fresh quantities of glycerin from the wastes. The glycerin may now be concentrated when necessary and refined in the usual way. The saccharinous material left in the waste can now be separated from the nitrogenous material and be fermented and the alcohol or acid resulting from this fermentation may be distilled off and purified by fractional distillation.

Instead of treating the wastes with cold water or with alcohol to dissolve only the soluble glycerin or saccharinous matters, the entire waste, including the glue, may be dissolved in hot water, after which the glue will be precipitated by tannin or tannic acid, the precipitated glue being separated by filtration and the solution obtained being treated in the way as above indicated.

I do not claim, broadly, the process of treating the described wastes, which comprise glue and one or more soluble materials, consisting in treating the wastes with water, either hot or cold, to dissolve the glycerin and saccharinous material, in separating the solution from the glue, in fermenting the liquid to convert the saccharinous material into a product of fermentation, in distilling off such product of fermentation, in evaporating the residuum of such distillation, in distilling the evaporated solution for the recovery of the glycerin, and in drying the glue formed in the process; but,

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. An improved process of treating wastes substantially as described, comprising glue

and a material soluble in cold water, which consists in treating the material with water, in adding thereto a metallic salt, in dissolving the soluble material, in separating the
5 solution from the glue, and in recovering the soluble material from the solution, substantially as set forth.

2. An improved process of treating wastes substantially as described, comprising glue
10 and a material soluble in cold water, which consists in treating the material with water, in adding thereto a salt of alumina, in dissolving the soluble material, in separating the solution from the glue, and in recovering
15 the soluble material from the solution, substantially as set forth.

3. The improved process of treating wastes substantially as described, comprising glue,

glycerin, and a saccharinous material, which consists in treating the wastes with cold wa- 20
ter to dissolve the glycerin and saccharinous material, in separating the solution from the glue, in fermenting the liquid to convert the saccharinous material into a product of fermentation, in neutralizing the small propor- 25
tion of acid thus formed, in distilling off such product of fermentation, and in recovering the glycerin from the residuum of such distillation, substantially as set forth.

This specification signed and witnessed this 30
5th day of August, 1898.

FREDERICK HEDLEY JOBBINS.

Witnesses:

FRANK L. DYER,
JNO. R. TAYLOR.