UNITED STATES PATENT OFFICE.

CHARLES O. GARRISON, OF NEW YORK, N. Y.

IMPROVEMENT IN PROCESSES OF MANUFACTURING GLUE.

Specification forming part of Letters Patent No. **191,132**, dated May 22, 1877; application filed March 30, 1877.

To all whom it may concern:

Be it known that I, CHAS. O. GARRISON, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Processes for Making Glue; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it.

My invention relates to an improvement in the process of manufacturing glue; and consists in subjecting the gelatine obtained by treating bones, horn-pith, and similar gelatinous matter with phosphoric or other acid, to the action of lime-water, whereby all residue of acid remaining in the glue-stock may be effectually removed, and the latter rendered clear and free from any tendency toward acidulous action.

In the process of obtaining gelatine from bones, horn-pith, and other analogous organic substances productive of glue, by treating them to the action of phosphoric acid, with or without other acid or acids, it is found that the glue-stock thus obtained is not thoroughly cleansed or freed from the acid by the processes now in use for washing the same.

This acidulous residue renders the glue inapplicable for many uses. It both makes it dark-colored, and also has a tendency to retard its drying; but the most serious objection is, that when the glue is used in the manufacture of wall-paper, the acid destroys the colors, changing almost all colors from a bright to a dull hue, turning blue to red, and, in general, displaying all the usual incidents of chemical reactions from acid. In the manufacture of white glue, also, the acid destroys the zinc used in coloring the same, thus making it of a dirty ash color, while if the glue is left uncolored and without the zinc, still the acid will render the glue, when dry, quite dark-colored.

My object is to effectually neutralize all residue or taint of the acid so objectionable, and thus make the glue so that it may be indifferently used in any manufacture without injury to the latter, and be freed from all the disadvantages formerly incident to it.

In manufacturing glue as above set forth, the bone or horn-pith, being first broken or ground to a suitable size, is soaked in phosphoric acid until it becomes porous and open, and of a spongy appearance. It is then washed by revolving the cylinder of the bath-tub, or in any other suitable way, as well as is possible without reducing it to a powder, when it will be found that almost every individual piece of bone will have stored away in its central body more or less acidulous matter. This results, first, from the fact that it is impossible to grind or break up the bone into pieces of a suitable size, which shall be uniform and all of a constant dimension; and, secondly, because different portions of the bone are of different degrees of density, some part of the bone being harder or softer than other parts, and hence it requires correspondingly different durations of time for the acid to act in an equal manner upon all the several pieces.

This causes more or less lime to be left in the different pieces unattacked by the acid, and since the latter has not united with the lime, it is left upon some remaining portion of it, and its acid strength is still reserved.

To digest this residue of acid with a proper alkali base, so as to neutralize all its tendency toward acidulous action, is the object of my invention, and I accomplish it as follows: I take ordinary slaked lime, diluted with water to a suitable degree, and with it treat the glue-stock while the latter is still in a liquid state, before it has settled or has been run off to cool. Only just sufficient lime is used to digest the acid, overcoming its strength and neutralizing its tendency to affect the glue with its acidulous action. Litmus-paper is occasionally used as test, so as not to render the resulting product of an alkali tendency, while the phosphoric-acid and lime solution is precipitated as phosphate of lime, thus leaving the glue clear and free from acid. In this way the acid is removed from the glue, and is the only possible method known to me. It cannot be washed out from the bone, since the action of washing would grind or triturate the broken pieces into an impalpable powder, and thus the gelatine would float off with the water. Neither can it

be soaked out in a less active manner of agitation, as the length of time necessary for such a passive process would thoroughly decompose the gelatinous substance, while by subjecting the glue when boiling, or in liquid state subsequent to its boiling, to the action of lime-water, as above set forth, the acid is removed or neutralized.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The process of manufacturing glue, consisting in treating bone, horn-pith, or other gelatinous substance, with phosphoric acid, and then subjecting the same to the action of lime-water, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of March, 1877.

CHARLES O. GARRISON.

Witnesses:
E. D. STIMSON,
R. COTTON.