

UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

MANUFACTURE OF A FACTITIOUS MATERIAL TO IMITATE IVORY.

SPECIFICATION forming part of Letters Patent No. 239,794, dated April 5, 1881.

Application filed January 5, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful
5 Improvement in the Manufacture of Factitious Material to Imitate Ivory, of which the following is a specification.

The invention pertains to an improved process and product having relation to the manufacture of articles having the appearance and
10 many of the characteristics of ivory.

It consists in the production of such articles by the employment of known substances and agents, in new proportions and relations, where-
15 by a result heretofore unknown in the arts is effected.

Perhaps the principal difficulty heretofore experienced in the use of adhesive agents in the manufacture of articles in imitation of
20 ivory has been that to accomplish a proper adhesion it has been thought to be necessary to use a very considerable percentage of the adhesive agent, which has necessarily had the effect of causing the resultant material to be
25 discolored, which has rendered it comparatively valueless in the production of articles which are required to be white.

By means of my invention I produce an article in which a very small percentage of
30 gum or other adhesive agent is successfully employed in effecting a complete adhesion, the resultant material being without discoloration, of exceptionally beautiful appearance, and which may be utilized in the manufacture of
35 nearly all classes of articles usually made of ivory and analogous substances.

The objects of the invention are accomplished by the employment of a suitable solvent of any kind, in which the adhesive agent is dissolved.
40 The inert material is then added to the solution, and the mixture thus formed subjected to the action of a mill, after which the solvent is discarded, and the elements, in a dry state, by preference, ground a second time to reduce
45 them to an impalpable powder. The powder thus produced is then treated in heated dies or molds of any appropriate nature to form the completed article.

I include within the term "inert material,"
50 as employed herein, any and all substances which are not fusible or weldable under heat,

and which may be effectually comminuted by the means described. By preference I use an oxide of zinc as possessing especial advantages.

The adhesive agent may consist of any substance which approximates in character to the known vegetable gums. I prefer, however, to employ shellac, or some similar vegetable gum.

The solvent may be varied according to circumstances, its exact nature and the quantity employed being matters of judgment dependent upon the character of the adhesive agent and other circumstances. I have used an ammoniacal liquor with satisfactory results, as
65 hereinafter set forth; but other solvents in which ammonia is not introduced may be made use of, if desired.

The preferred method of practicing the invention is as follows: I first make a solution
70 consisting of eight parts of powdered shellac and thirty-two parts of aqua-ammonia of a specific gravity of, say, .995. These ingredients are placed in a revolving cylinder, and agitated continuously for a period of, say, five
75 hours, the temperature being kept as near 100° Fahrenheit as may be practicable. At the end of this time it will be found that they have been thoroughly dissolved. While I recommend this particular method of effecting a
80 solution of the ingredients, it is obvious that other methods may be practiced, although my experience leads me to believe that any departure from that which I have described will involve unexpected difficulties. The solution
85 thus formed will be of about the consistency of thin molasses. Having placed a suitable quantity in an appropriate vessel, I introduce, say, forty parts of a good quality of zinc oxide, stirring it in and mixing it by hand as far as
90 practicable. The zinc oxide having been added, the solution will consist of eight parts of shellac, thirty-two parts of ammoniacal water, and forty parts of zinc oxide. The proportion of the zinc oxide may, however, be somewhat in-
95 creased or diminished, if preferred, without endangering the result, and the same is true of the other ingredients. The shellac, ammoniacal water, and zinc oxide, having been brought together, are next introduced into a
100 mill, by preference of the class known as "paint-mills," in which they are thoroughly ground.

The next step is to effect a separation of the ammoniacal water, which has now performed the offices for which it is used. This is accomplished, by preference, by evaporation by means of heat, the mixture being dried upon glass, so as to effect as complete and thorough a desiccation as is possible; but the desiccation may be effectuated in other ways without difficulty. It is very desirable, however, that the mixture be constantly exposed to the air, without which it will be found to be difficult to completely deprive it of its moisture. A thorough desiccation is of great importance, as there will be danger of an unsatisfactory result if any of the aqueous particles remain when the material goes into the mold.

The desiccation having been performed, only the zinc oxide and shellac—the elements out of which the article is to be formed—remain, being in a dry state and in such condition that they may be introduced into the molds and the article completed, as hereinafter set forth. The result thus produced will be a satisfactory one; but in order to produce an article of exceptional excellence, instead of introducing the desiccated elements into the molds, I subject them to a second grinding in a perfectly-dry mill of appropriate construction, the effect of which is to reduce them to a fine flour. The elements being in this form are ready to be introduced into the molds.

The molds will be of any appropriate construction, and the heat and pressure such as are usually employed—say about a ton to the square inch—the heat being about from, say, 250° to 275° Fahrenheit, greater or less, according to circumstances.

If it is desired to color the article, a coloring material or pigment will be added to the solution before it is subjected to the first grinding, or to the elements after the desiccation has taken place, and before the second grinding, as may be preferred.

If it be desired to use other inert substances than zinc oxide, the preferred material will be substituted for it without departing from the method described when zinc oxide is employed. The proportion of inert material will, however, be varied, if necessary, according to its spe-

cific gravity, by which the quantity to be used will be determined when the proportions are ascertained by weight.

I do not limit my claim to any particular solvent, nor to any particular manner of effecting the essential steps of my process; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process hereinbefore described of forming articles from an inert material and an adhesive agent, which consists in, first, combining the inert material and adhesive agent, in the proportions specified, with a solvent; second, subjecting the mixture thus formed to the action of a mill; third, desiccating the solid elements of the mixture; and, fourth, subjecting the desiccated elements to the action of heated molds.

2. The process hereinbefore described of forming articles from an inert material and an adhesive agent, which consists in, first, combining the inert material and adhesive agent, in the proportions specified, with a solvent; second, subjecting the mixture thus formed to the action of a mill; third, desiccating the solid elements of the mixture; fourth, subjecting the desiccated elements to a second grinding, in a dry state; and, fifth, forming the article of the resultant powder by compression in heated molds.

3. A process of forming articles by the compression of material, in powdered form, in heated molds, in which the elements are, first, combined with a liquid and ground; second, desiccated; and, third, subjected to a second grinding in a dry state.

4. An article consisting of zinc oxide and an adhesive agent, combined in the proportions specified, and solidified by compression in a heated mold.

In testimony that I claim the foregoing improvement in the manufacture of factitious material, as above described, I have hereunto set my hand this 4th day of January, 1881.

JOHN W. HYATT.

Witnesses:

WM. R. SANDS,
CHAS. C. GILL.