UNITED STATES PATENT OFFICE.

ALFRED JEFFERY, OF LLOYDS STREET, PENTONVILLE, COUNTY OF MIDDLESEX, ENGLAND.

IMPROVEMENT IN CEMENTS FOR PREPARING MASTS, SPARS, &c.

Specification forming part of Letters Patent No. **3,027**, dated April 6, 1843.

To all whom it may concern:

Be it known that I, ALFRED JEFFERY, a subject of the Queen of Great Britain, and now residing at Lloyds Street, Pentonville, in the county of Middlesex, gentleman, have invented or discovered a new and useful Composition or Glue, which I designate a "Vegetable Glue;" and I, the said ALFRED JEFFERY, do hereby declare the nature of the invention and the manner in which the same is to be performed are fully described and ascertained in and by the following statement thereof—that is to say:

The nature of my invention consists in making a composition or glue which is insoluble in water and more elastic than glue in ordinary use.

My said composition or glue may be used for various purposes; but I have found it more particularly applicable to the purposes of preparing masts and spars, of joining or cementing together several pieces of wood or stone, of strengthening such pieces of timber as are usually called "shaky pieces," of paying the seams, defending the sheathing, and protecting the sides and bottoms of ships, and of protecting wood or stone work which is to be exposed to the action of water.

I shall now describe the manner in which I make my said composition or glue; but I wish first to observe that I prefer to make it with a proportion of caoutchouc, and that I make it without using any caoutchouc, or with a less proportion of that article where it is to be applied in situations exposed to great atmospheric action, in which cases the caoutchouc would have a tendency to contract.

To make my said composition or glue with caoutchouc I use a solution which I call my "crude naphtha caoutchouc solution," and to make this solution I mix caoutchouc of good quality (giving the preference to East India caoutchouc) with coal-naphtha, commonly called "crude" or "rough" naphtha, in the proportion of one pound of the caoutchouc to four gallons of the naphtha. I cut the caoutchouc into thin shreds before I use it, and I stir the mixture of caoutchouc and naphtha occasionally by any convenient means until the caoutchouc is so dissolved as to bring the mixture to a thickness about the same as thick cream. I generally find that the caoutchouc is sufficiently dissolved in about ten or twelve days.

To proceed to make my said composition or glue with caoutchouc I then take one part, by weight, of my said crude naphtha caoutchouc solution, and two parts, by weight, of gum-lac or shellac; but I give the preference to shellac. I put these materials into an iron vessel having a tap in the lower part to provide for drawing off the composition or glue, as hereinafter mentioned, and I heat this vessel for the amalgamation of the said materials. Hot water, steam, or fire may be applied in any convenient manner for the purpose of heating the vessel; but if fire is applied care should be taken to avoid the mixture being brought in contact with it. During the application of heat to the vessel I stir the mixture occasionally, and I continue to apply heat until the solution and the lac are thoroughly amalgamated. This mixture is my composition or glue made with caoutchouc. I draw it from the vessel in which it has been made, while heated, as aforesaid, through the tap provided for that purpose, and pour it upon the slabs to cool it, and when it has been cooled it may be cut into pieces for use.

To make my said composition or glue without caoutchouc I mix one part, by weight, of coal-naphtha, called "crude" or "rough" naphtha, as aforesaid, and two parts, by weight, of gum-lac or shellac, (giving the preference to shellac,) and I proceed with these ingredients in the same manner as hereinbefore mentioned in respect to the process when I use caoutchouc, substituting only the coal-naphtha for the before-mentioned solution, and this makes my said composition or glue without caoutchouc.

I have stated the proportions in which I use the ingredients which I have described in making my said composition or glue; but these proportions may be varied, and on the one hand a larger proportion of lac may be used either to produce greater hardness in the said composition or glue or when the article or material to which it is intended to be applied is to be exposed to great atmospheric action, or, on the other hand, a larger proportion of the caoutchouc solution (when the said composition or glue is made with caoutchouc) or of the naphtha (where made without caoutchouc) to produce greater softness or elasticity.

I use my said composition or glue to prepare masts and spars by applying it to fix or join together the parts of masts or spars, and when

I use it for any of these purposes which are hereinbefore mentioned I put it into an iron vessel and heat it, by applying fire to the vessel, to a temperature above 250° of Fahrenheit, and I apply it while it is thus heated. In applying my said composition or glue to fix or join together the parts of masts or spars, or to join or cement together pieces of wood or stone, I spread it as evenly as possible by means of a stiff brush upon the surfaces which I propose to fix or join or cement together; but care should be taken that the surfaces are dry when the composition or glue is applied to them, and they must be completely coated or covered with it. After the surfaces have been thus coated or covered they must be joined or put together and pressed together by any convenient means; but it will be found that the temperature of the composition or glue is reduced very quickly after being spread upon the surfaces, and if the temperature be reduced so that the composition or glue becomes stiff the composition or glue must be warmed again by applying a heat of about 140° Fahrenheit until it becomes soft and liquefied. This may be done by applying hot irons or by any other convenient means, and while the composition or glue is in this soft or liquefied state the masts or spars or pieces of wood or stone are to be joined or put together and pressed, as above pointed out in the first instance, and the parts or pieces of wood or stone may then be wedged or bolted together in any ordinary manner, as may be required. If the surfaces which are to be fixed or joined or cemented together are even, I prefer a thin coating of the composition or glue to each surface; but if any such surface contain inequalities, then its coating must be sufficiently thick to fill up the cavities and to leave an even surface of the composition or glue.

In applying my said composition or glue to make good such defective pieces of wood as are commonly called "shaky pieces," I fill up the crevices with it while it is at a temperature of about 250° Fahrenheit by pouring it into them or by any other convenient means.

When I use my said composition or glue for paying the seams of ships I prefer that the seams shall be first calked with oakum or in any other ordinary manner, and after they have been thus calked I cover the calking and fill up the seams with composition or glue in a hot state in the same manner as pitch is usually applied for the same purpose, and after the composition or glue has become cold I dress and clean off the seams in the usual way, and I afterward plane the decks.

In applying my said composition or glue to defend the sheathing and protect the sides and bottoms of ships, or to protect wood or stone work which is to be exposed to the action of water, I coat or cover the sheathing and the sides and bottoms of ships and such wood and stone work, as aforesaid, in the following manner, viz: Several coats of my composition or glue must be applied until the coating or covering is of the thickness of about the eighth of an inch, and such coating should be laid on at intervals of about a week in order that each preceding coat may be sufficiently dry before the succeeding coat is applied, and sufficient time should be allowed for the last coat to become dry before the ship is floated or the wood or stone work is exposed to the action of water.

In coating or covering those parts of the sheathing or the sides or bottoms of ships which are below the water, or such wood-work as is to be exposed to the action of water, I use composition or glue which has been impregnated with corrosive sublimate for every coat subsequent to the first.

The composition or glue may be thinned, if required to make it work freely, by adding such coal-naphtha, as before mentioned, in small quantities. When the last coat has been applied I smooth the surface by the application of heat; but care should be taken not to apply a greater degree of heat than will be sufficient for this purpose.

In covering metal sheathing the adhesion of the composition or glue would be increased by slightly roughening the surface of the sheathing, and by warming the sheathing immediately before the composition or glue is applied sufficiently to remove any damp or moisture.

To impregnate my said composition or glue with corrosive sublimate I use a solution which for reference I call the "solution of corrosive sublimate," and to make this solution I mix two parts, by weight, of corrosive sublimate (which is first to be reduced to a state of fine powder) with three parts, by weight, of white naphtha in a glazed earthenware vessel, and cover the vessel. I then stir the mixture occasionally to facilitate the dissolving the sublimate, and so soon as the sublimate is dissolved I add six like parts, by weight, of such coal-naphtha, as aforesaid, and stir the whole until the several ingredients are well mixed. I then take twelve parts, by weight, of my said composition or glue, and dissolve it in an iron vessel by heating it in such a manner as I have hereinbefore described in reference to the manner of using my said composition or glue, and I then add to it one part, by weight, of my said solution of corrosive sublimate, and stir the mixture with any wooden instrument until the ingredients have been well mixed.

I have described the materials with which I make my said composition or glue, and the proportions in which I use such materials, but do not confine myself thereto, so long as the character of the glue be retained; but

What I claim is—

1. The composition or glue of caoutchouc and shellac or gum-lac in solution.

2. The composition or glue composed of shellac or gum-lac in solution.

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