

# UNITED STATES PATENT OFFICE.

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## SIZE FOR WALLS.

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*To all whom it may concern:*

Be it known that we, MAXIMILIAN MAYER, residing at Orange, Essex county, in the State of New Jersey, JOSEPH N. WIGGIN, residing at East Orange, in said Essex county, New Jersey, and ROBERT W. CORNELISON, residing at Bloomfield, Essex county, New Jersey, and all being citizens of the United States, have invented certain new and useful Improvements in Sizes for Walls, and hereby declare the following to be a full, clear, and exact description of the invention.

This invention relates more particularly to an adhesive coating composition put up in powdery form, and adapted to be used for coating or sizing or pasting on surfaces covered by paint, enamel, or varnish, glass or glazed or other similar surfaces, to which the common pastes of the various kinds heretofore known will not adhere satisfactorily.

The object of our invention has been to make a size for walls having, among others, the advantages hereinafter recited.

In order that fabric, paper, or other sheet wall covering may be successfully pasted on a wall to meet commercial requirements, the following conditions must be provided for: The wall must not be too absorbent, because it will otherwise absorb the water in the paste too much and too rapidly and leave the paste in such condition that it will not hold the paper or other covering. To prevent such absorption of the water from the paste so that the paper or other covering will hold indefinitely, it is necessary that most walls should be sized. As a commercial proposition, it is necessary that all walls should be sized, because it frequently does not become evident for months afterward that the paste has an insufficient hold, and therefore it is necessary to make certain that the covering will not come off, and for this purpose the wall should be sized. The most desirable size would be one that will adhere to a painted or varnished wall. Heretofore there has been no sizing that would satisfactorily adhere to such a wall,

and the custom has been to remove the paint or varnish, as by the application of an alkali, after which the excess of alkali on the wall has been neutralized and the sizing applied. If the sizings previous to ours were applied to the painted or varnished walls and a wall covering pasted thereon, the covering would frequently and usually loosen under changes in temperature or during moist weather. The sizes heretofore used, frequently fail to hold the wall covering under marked changes in humidity or temperature. A commercially desirable size would be one that could be depended upon to hold the covering notwithstanding such changes. The sizes heretofore used have presented a more or less polished surface for the paste to adhere to in fastening the covering to the wall. The most successful sizing would be one which would present a rough surface to give the paste a mechanical hold. The most desirable sizing would be one in powdered form that could be shipped as a powder to the place of use and there put in condition for use by a mere solution in water. The most desirable binder for a size would be one whose thickness or viscosity could be readily changed according to the kind of a wall to which it was to be applied.

We have devised a size which extensive use has proven to possess the desirable qualities above indicated and to overcome the faults pointed out. Our size is capable of composition with many different proportions and with a number of the elements hereinafter mentioned omitted; but as an example of the composition embodying our invention which produces very satisfactory results, we give the following:—one hundred and fifty pounds of plaster of Paris, sixty pounds of whiting (sometimes called Paris white), forty pounds of the prepared starchy substance below described, twenty-one pounds of finely ground glue, three pounds of glycerin, one-half to one pound of beta naphthol, four pounds of powdered gum tragacanth, eight ounces of an essential oil, such as sassafras. This composition is

the most successful composition embodying our invention with which we are familiar, but it is only to be regarded as one embodiment of our invention.

- 5 The starchy substance referred to above is a thickening binder of a starchy nature, which may be ground to a powder, yet when mixed with water, either hot or cold, will form a paste, the thickness or viscosity of  
10 which may be varied as desired. Starch in its natural condition would not answer our purpose, inasmuch as it does not form a paste without boiling. The material which we use is, therefore, not starch in its natu-  
15 ral condition, but it is made by thoroughly expanding the starch granules (from whatever source obtained) either in the presence of water or by the aid of heat, or by other methods. However the preparation may  
20 have been manufactured, the granules are to be thoroughly expanded so as to form a paste when brought in contact with water, and so that by the addition of water in proper quantity a pasty mass will be pro-  
25 duced without the application of heat or a chemical agent. Having thus prepared the starchy substance, the mass so formed is dried and the residue ground to powder. In addition to the starchy substance above de-  
30 scribed, we use for body a gritty or granular substance, such as fine sand or pumice stone, plaster of Paris, or other crystalline, gritty or granular substance, which is insoluble, or nearly so, in water. The pur-  
35 pose of the glycerin is to retain a certain percentage of moisture and thus soften the size and prevent its drying too hard. The same purpose may be accomplished by the use of syrup or molasses.
- 40 In addition to the starchy substance, ground glue is used as an adhesive material. Gelatin or casein may also be used, the latter preferably in soluble form, that is, containing sufficient alkali, borax or the  
45 equivalent to bring it into solution. We also use a powdered gum which becomes soft in water, such as gum tragacanth. Our size having the gritty substance would "pull" on the brush and not be easily and smoothly  
50 applied, if it were not for the gum tragacanth or its equivalent. This gum becomes viscous, thick and mucilaginous on being mixed with water, and while it permits the water to evaporate (contrary to glycerin)  
55 it will only part with its water slowly. It gives a good "slip" to the brush. The gum tragacanth having adhesiveness, adds to the strength of the size.

As a preservative to prevent possible fermentation, a small quantity, say half of one per cent., of an antiseptic substance may be used, such as beta naphthol. For some commercial purposes it is desirable also to per-

fume the composition, and when this is the case sassafras, bitter almond, or other per- 65 fuming oil may be used.

In the preparation of the composition, the solid materials are reduced to the form of a powder and thoroughly mixed, the glycerin and perfuming oil added, and in this form 70 the composition is placed on the market. It is a substantially dry powder, and to be used needs only to be mixed with water. To prepare it for use, it is sufficient to take two pounds of the powder and stir it into three 75 or four pounds of water, according as it is desired to make a thinner or thicker mixture. The powder is carefully stirred into the water, which latter may be hot if desired, but can be used cold. The mixture 80 should be well stirred, and it is advisable to strain it before using. The strained mixture may then be applied directly to an ordinary wall, and to walls or woodwork when covered with enamel, paint or varnish and to 85 glazed surfaces. It may be applied with a brush as paint is applied, and then allowed to dry.

It will be observed that our size comprises the following principal elements:—First:— 90 A glue. This glue is any animal material forming an emulsion with water, which when it dries contracts and therefore adheres to the substance to which it is applied. Second:—Our size comprises the prepared 95 starchy substance which gives it body and adhesiveness. Third:—Our size comprises ingredients to give it a mucilaginous quality. This permits the size to work smoothly under the brush and such ingredients also 100 prevent the size from freely and immediately giving up its moisture. This prevents the glue from drying too rapidly and hence from contracting too violently. It also prevents the size from showing laps 105 and streaks where the successive strokes of the brush overlap each other. This is also an advantage in working on a porous wall. The substance by which this quality is chiefly given to the size is the gum tragacanth, which 110 gum has a further advantage in that it has adhesiveness in itself. Fourth:—Our size comprises the inert matter. When glue alone is put on a surface, it not only dries with a glazed surface affording no mechanical hold 115 for the paste, but it dries in a film under tension, so that comparatively large sections may crack and curl up the moment the film is broken at any one point. The inert matter in the glue of our size breaks up the continuity 120 of the adhesive matter or glue, so that each particle of the latter adheres to the adjacent surface or particles of inert matter, and no great body of adhesive matter is formed. The inert matter diffused through the glue 125 has its particles touching each other, so that

the glue cannot contract because of the mechanical bearing of the particles of inert matter on each other. Thus, when glue and inert matter alone are used, a size which is a considerable improvement over the prior art is produced. By the use of the inert matter in glue, it is possible to make a size in which but little or no glycerin is required.

Using the glue, inert matter and the starchy substance, and omitting the other ingredients, makes a still more desirable size, and one which is useful notwithstanding the absence of the other ingredients.

The use of glue, the starchy substance, inert matter and plaster of Paris, makes a desirable size without the use of the other ingredients.

In each one of the three sub-combinations of ingredients of our size above stated, the gum tragacanth can be substituted for the glue or used with it.

The addition of glycerin to each of the above stated sub-combinations of ingredients, but without the remaining elements of our complete formula, makes a desirable size.

After a surface coated with our size is dry, it will be found that paste will readily adhere to it, and that ordinary flour paste may be successfully used for hanging wall paper or other similar sheet covering thereon, and will adhere perfectly thereto.

Our size has among others the following advantages:—It may be applied to a porous wall, and yet, because it does not readily give up its moisture, the wall will not take from it sufficient moisture to interfere with its capacity to form a good foundation upon which to paste a wall covering. It is so tenacious of its moisture that when mixed with any given proportion of water it will properly size walls of widely different degrees of porosity, and thus it forms such a safe foundation upon which to paste wall coverings that there is little danger that the wall covering will subsequently come loose. Our size successfully adheres to a painted or varnished wall, and thus the usual necessity of removing the paint or varnish is avoided. Our size is so little deliquescent that no ordinary moisture or heat affects it. It will necessarily hold a wall covering through wide changes in humidity and temperature. Our size presents a rough or "corn" surface or mat surface, which affords a good mechanical hold for the paste of the wall covering. Our size, being in the form of a dry powder, can be readily shipped, and it does not lose its qualities under any ordinary circumstances. Our size being soluble in cold water is convenient for use under all circumstances. If

a house which is not occupied or in which the heating apparatus is not completed is being papered, the requirement that a size be mixed with hot water may be serious. Our size is not subject to any such inconvenience. The thickness or viscosity of our size can be readily changed according to the kind of wall to which it is to be applied. In brief, our size has been found to conveniently and satisfactorily comply with all of the varying requirements of a commercially successful size, so that when applied under the widely differing conditions which are commonly met with by paper hangers, and when applied by workmen of varying degrees of skill, substantially uniformly good results are obtained. Our size can be applied to glass and other substances to which ordinary paste will not adhere, and on such surfaces makes a perfect binding surface for the paste, and a surface which will also receive and retain a coat of paint, varnish, etc.

Various changes may be made in the above-described composition which will be within the spirit of our invention. China clay may be added to give covering power. Paris white, barium sulfate, oxid of zinc, basic carbonate of lead or other suitable substance may also be used for the same purpose.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is:

1. A size for walls in the form of a powder, comprising glue, a starchy substance, soluble in cold water, gritty filling material, and a slip-giving substance.

2. A size for walls in the form of a powder comprising glue, a desiccated starchy paste, soluble in cold water, gritty filling material, and a slip-giving substance.

3. A size for walls in the form of a powder, comprising glue, a desiccated starchy paste, soluble in cold water, gritty filling material, and gum tragacanth.

4. A size for walls in the form of a powder, comprising glue, a starchy substance soluble in cold water, gritty filling material, a slip-giving substance, and glycerin.

5. A size for walls in the form of a powder, comprising glue, a desiccated starchy paste, soluble in cold water, gritty filling material, a slip-giving substance, and glycerin.

6. A size for walls in the form of a powder, comprising glue, a desiccated starchy paste, soluble in cold water, gritty filling material, gum tragacanth, and glycerin.

7. A size for walls in the form of a powder, comprising glue, a starchy sub-

stance, soluble in cold water, gritty filling material, a slip-giving substance, and an antiseptic.

8. A size for walls in the form of a powder, comprising glue, a starchy substance soluble in cold water, gritty filling material, a slip-giving substance, glycerin, and an antiseptic.

9. A size for walls in the form of a powder, comprising glue, a desiccated

starchy paste, soluble in cold water, gritty filling material, gum tragacanth, glycerin, and an antiseptic.

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