UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SIZING PAPER, &c.

Specification forming part of Letters Patent No. 127,858, dated June 11, 1872.

To all whom it may concern:

Be it known that I, JAMES M. DORLAN, of East Brandywine township, in the county of Chester and State of Pennsylvania, have invented a new and useful Improvement in Sizing; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand and use the same.

My invention consists of a new and useful ingredient (in compounds or compositions of other ingredients) called chloride of lime, bleaching-powder, or bleaching-salts, or its equivalent, to be made use of in any suitable quantity or quantities, as and for an improvement in creating or forming a poreless or water-proof gum size in paper stock and paper pulp for gum-pulp sizing-paper of any or all kinds, but more particularly for gum-sizing paper stock and paper pulp for making pulp-sized hanging or house-wall and other wall-papers of all qualities, when one, two, three, or more, or all of the ingredients, such as the resins, soaps, starches, oils, and alums, or any other sizing ingredients whatsoever, are or shall be put in conjunction or combination with the said chloride of lime, or its equivalent, in any place, at any time, or in any manner whatever, for the aforesaid pulp-sizing purposes; the invention being equally applicable as and for sizing any other article whatsoever that requires or may require any degree of a water-proof character imparted thereto or therein. Again, the aforesaid ingredient may be compounded, combined, or conjoined with certain other ingredients or materials, for the purpose of making pulp-sized papers of all kinds and qualities, and of any and all degrees, of a gum-sized or of a water-proof character whatsoever, whether made from any kind of raw paper-stock material whatsoever, or made from rag fiber, raw paper-stock material alone, or a mixture of rags and any kind of textile or fibrous material, or clay paper stock of any kind, combined or conjoined in any manner, or made from any kind of prepared straw, wood, grass, barks, clays, vegetable fiber, or any mixture or combination of said materials or any of them, or other like materials for making paper pulp.

By my invention both bleached and unbleached paper-stock material may be treated. If it is applied to bleached paper stock the stock may have been previously bleached with chloride of lime or its equivalent. Then, for one quality of paper, the chloride of lime must be entirely washed out of said stock and a full quantity of fresh chloride of lime, or its equivalent, must be added to the bleached and washed paper stock. For another quality of paper, the chloride of lime or its equivalent may be partly washed out by the washing-engines, or elsewhere or otherwise washed out, and a corresponding quantity of fresh chloride of lime be added to the washed stock as the basis of the sizing process. Again, for another quality of pulp-sized paper, all of the chloride of lime or its equivalent (after the bleaching is finished) must be allowed to remain in the bleached stock material for the sizing basis, and, if desired or necessary, some of the fresh chloride of lime may be added thereto.

I will here describe one of the processes for sizing paper stock and paper pulp for making pulp-sized papers; but various processes or combinations of some or all of the said ingredients will be necessary to work the different kinds of raw paper-stock material used, and to make the different kinds of paper and other articles, and the different degrees of size or water-proof character required in connection with my invention.

For making one of the qualities or grades of the hard or strongly pulp-sized papers of all kinds or descriptions, but more particularly making the hanging or house wall and other wall-papers, take, say, five hundred (500) pounds, more or less, of good rag fiber raw paper-stock material, or a mixture of a portion of the said rag paper stock-material with a portion of any other kind of the commonly-known and used raw paper-stock materials, and after the said rag fiber paper-stock material shall have been bleached with chloride of lime, or its equivalent, or with any other kind of bleaching ingredient or material, in any place, or at any time, or in any manner whatsoever, and after the bleaching ingredient or material made use of for bleaching the said paper-stock material, together with all of the dirty water therein has been or shall be thoroughly washed out of said bleached paper-stock-material by the paper-stock washing-engines, or by the paper-stock or pulp-grind-

ing engines, or eleswhere or otherwise washed out of said bleached paper-stock material, then add to said bleached and washed paper-stock material, say, forty (40) pounds, more or less, of the chloride of lime or its equivalent, or any substitute for the same that will produce its effect as a size or a sizing ingredient for the aforesaid sizing purposes. The said chloride of lime is to remain in said bleached and prepared paper stock, in the engines or elsewhere, to saturate said paper stock thoroughly with the chloride of lime to form there the basis or the principle of the new and improved process of sizing throughout the entire new mode of sizing paper stock and paper pulp to make pulp-sized papers the most insoluble or water-proof in character; and if China or other kinds of clay is intended to be made use of as paper-stock material, (it being old for such purpose,) then, two hours, more or less, after adding the chloride of lime to the rag fiber or other fibrous paper-stock material, add, say, three hundred (300) pounds, more or less, of the clay paper-stock material; then, one hour, more or less, after adding the clay, add to the mass of paper-stock material and the chloride of lime, say, eighteen (18) pounds, more or less, of good hard soap, or its equivalent for sizing purposes, dissolved in boiling water, or otherwise prepared for use, and applied in the engines, pulp-tubs, or elsewhere; then, one hour, more or less, after adding the soap, add to the mass, say, thirty (30) pounds, more or less, of starch for sizing purposes, it being old for such purpose; then, one hour, more or less, after adding the starch, may be added to the mass five (5) pounds, more or less, of hyposulphite of soda to neutralize or render inert the chlorine gas, or the peculiar properties of the chloride of lime, it being old for such purpose; then add to the mass, within one hour, more or less, say, one (1) pint, more or less, of sperm oil, or its equivalent; and then add, say, one-half (½) pound, more or less, of ultramarine blue to tint the paper or impart the different colors to the same, it being old for such purpose. Now dissolve slowly, in hot or cold water, say, fifty (50) pounds, more or less, of lump alum, or its equivalent for the purpose, and run the said alum-water gradually into the pulp-dressers' machine-vats or elsewhere with the pulp and the other sizing ingredients therein, as or immediately before the whole mass of sized-paper stock and pulp and all the said sizing ingredients are or shall be made or worked into pulp-sized paper by the paper-making machine.

For making one kind of soft or mellow pulp-sized paper, or of the medium pulp-sized paper, take, say, five hundred (500) pounds, more or less, of rags or other fiber or fibrous paper-stock material, in the engines or elsewhere; add thereto, say, fifty (50) pounds, more or less, of the chloride of lime, or its equivalent for sizing purposes, as aforesaid, which ingredient must remain as or for the basis of the sizing process throughout—that is to say, no part thereof is to be washed out of either the paper-stock material or out of the paper pulp at any time, or place, or in any manner, before adding the other sizing ingredients thereto—and then working the whole mass into pulp-sized paper; then, two hours, more or less, after adding the chloride of lime to the paper-stock material, as aforesaid, add to that mass, say, three hundred (300) pounds, more or less, of China or other kinds of clay as an additional and unbleached paper-stock material, it being old for that purpose; and one hour, more or less, after the clay has been added, add fifteen (15) pounds, more or less, of hard soap, or its equivalent for sizing purposes, (it being old therefor,) said soap to be dissolved in boiling water or otherwise prepared for use, and applied in the engines or elsewhere. When the pulp is ready to brush then add one (1) pint, more or less, of sperm oil, or its equivalent, and then to the whole mass add, say, fifty (50) pounds, more or less, of porous or pulverized alum, in the engines or elsewhere, for sizing purposes, the alums being old for that purpose.

It will be found that the aforesaid pulp-sized papers, especially the house-wall and other wall papers, having had in their sizing composition of ingredients a large quantity of the chloride of lime, or its equivalent for said sizing purpose, become sanitary in character, inasmuch as they are made disinfectants by passing through the said sizing process. These papers become poreless soon after being made, and will not allow dampness to penetrate them; therefore they neither swell nor shrink when placed on the walls. They preserve the paste and keep it pure, dry, and wholesome, and make both the paste and paper stick and adhere firmly to the walls for a long time without exhibiting signs of becoming loose. No vermin will breed, harbor, or live in the paste between these papers and the walls to create disease, which is prevented by poreless pulp-sized papers.

I do not confine myself in any way whatsoever to any particular process of or for said sizing purposes; nor to the proportions, conjunctions, or combinations of either the paper-stock materials or the sizing ingredients, separately or collectively, as to quantity, quality, time, place, use, mode of preparation, or application for use for the aforesaid sizing purposes, since these may be greatly varied without departing from the principle and nature of my invention.

The invention is equally applicable for sizing or imparting a water-proof character to cotton, linen, hemp, flax, and other raw textile or fibrous substances; to muslin, linen, silk, and other fabrics; and to mineral, vegetable, and animal substances generally.

I do not claim the exclusive use of the chloride of lime, or its equivalent, for bleaching the raw paper-stock materials or any other articles, it being old for such purpose; neither

do I claim the exclusive use of the China or other clays as paper-stock material; nor the hyposulphite of soda to neutralize or render inert the chlorine gas or the peculiar properties of the chloride of lime; nor the ultra-marine blue to impart the different tints or colors to the papers—they being old for their respective purposes, as above mentioned; but

What I do claim is—

1. As a sizing ingredient, chloride of lime, or its equivalent, substantially as and for the purpose set forth.

2. Chloride of lime, or its equivalent, in quantities large or small, as a new and essential sizing ingredient or material, and as a basis or principle in any composition of other sizing ingredients in and for sizing paper-stock materials, or paper pulps to make pulp-sized papers, and for sizing any other article that has required or may require any degree of a poreless gum-size, or of a water-proof character, imparted thereto or therein, substantially as and for the purpose described.

3. The process of sizing paper-stock materials and paper pulps to make pulp-sized papers when chloride of lime, or its equivalent, shall compose a constituent part of the composition or mass of other sizing ingredients or materials, substantially as and for the purpose described.

4. Chloride of lime as a sizing ingredient, in combination with the resins, soaps, starches, oils, tallows, and alums, separately or collectively, substantially as and for the purpose set forth.

The above signed by me this 23d day of May, 1872.

JAMES M. DORLAN.

Witnesses:
JOHN A. WIEDERSHEIM,
W. READ.