

UNITED STATES PATENT OFFICE.

RICHARD U. PIPER, OF GIRARD, MICHIGAN, ASSIGNOR OF ONE-HALF HIS
RIGHT TO MONROE HEATH, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN FIRE-PROOF PAPER FOR ROOFS, &c.

Specification forming part of Letters Patent No. **135,153**, dated January 21, 1873.

To all whom it may concern:

Be it known that I, RICHARD U. PIPER, of Girard, in the county of Branch and State of Michigan, have invented certain new and useful Improvements in the Preparation of Fire-Proof and Water-Proof Paper for roofing and other purposes; and I hereby declare the following to be a full, clear, and exact description of the same sufficient to enable those skilled in the art to fully understand my invention.

The object of this my invention is to produce sheets of paper for roofing and other purposes which shall be both fire-proof and water-proof, and at the same time admit of a high degree of finish or smoothness being given to the same. To obtain sheets of this character I take sheets of common straw-board, Manila paper, or any other kind of paper which may be deemed desirable, and pass the same through a bath of hot liquid silica, or, as it is sometimes designated, liquid quartz, with which I have previously mixed paint or any suitable coloring matter.

I have found by experiment that the article produced is better when the solution is hot, as it dries quicker, and thereby much time is saved; but a fire-proof and water-proof paper might be made according to my method herein described, and the bath or solution be in a cold state when the paper is passed through it.

The sheets of paper may be treated to the bath above mentioned in any of the convenient or well-known ways in which paper is submitted to solutions or mixtures; for instance, the sheets may be drawn through the liquid silica and coloring matter by hand, or machinery may with like result be employed for such purpose. After I have passed the paper through the solution hereinbefore described, I run it through calender-rolls, taking care that a highly calendered or finished surface be given to the same. The paper may be taken from the solution by hand and carried to the calender-rolls, or suitable machinery may be employed for carrying on the entire operation.

I do not, therefore, confine myself to any special mode of coating sheets of paper with

the above-mentioned solution, or to any special method of carrying the sheets to the calender-rolls.

Although this solution which I have described renders the surface of ordinary paper both fire-proof and water-proof, thereby producing a superior article of trade, still I may use sheets of paper which have before been impregnated with solutions which have a tendency to resist the action of flame; for, by submitting such sheets to a bath of hot liquid silica or quartz and paint or suitable coloring matter, and then calendering the same, an article is produced which may in some instances be preferable.

Paper prepared according to my invention has a highly-finished appearance, is tough and flexible, thoroughly water-proof, and resists, to a great extent, the action of flame.

I am aware that liquid silica is a common article of trade, and that it has been applied to wood and stone; but I am not aware that paper has ever before been drawn through a bath of hot liquid silica or quartz with which a suitable quantity of paint or coloring matter has been previously mixed and then calendered.

The quantity of paint used must depend upon the kind, as some colors require a much larger quantity than others to be added to the liquid silica in order to give a perfect finish to the paper.

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

Submitting paper to a mixture of either hot or cold liquid silica or quartz and paint or suitable coloring matter, and then calendering the surface of the paper or otherwise suitably finishing off the surface of the same, as and for the purpose set forth.

In testimony whereof I have hereby signed my name this 3d day of January, 1873.

RICHARD U. PIPER.

Witnesses:

C. L. ROOT,
JNO. BERRY, Jr.