# UNITED STATES PATENT OFFICE.

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## PAPER FILLER.

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*To all whom it may concern:*

Be it known that I, WILLIAM HOSKINS, a citizen of the United States, residing at 2009 Harris Trust Building, Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Paper Fillers, of which the following is a specification.

In accordance with the present invention a material suitable for use as a filler in paper manufacture is prepared by applying to an inert material which is insoluble or has only a slight solubility in water (such as that of calcium sulfate) a superficial coating of an insoluble soap, such as calcium, aluminum, magnesium, nickel, etc., soaps of olein, palmitin, stearin, or resinates, or mixtures thereof. In the case of insoluble materials, or slightly soluble materials which do not react with soluble soaps to form insoluble soaps, the coating with insoluble soap may be effected by washing the material with a soluble salt of the metal of the insoluble soap and with a soap solution in succession in any desired order, the material being dried after each washing. In the case of slightly soluble materials capable of reacting with a soap to form an insoluble soap, it is sufficient to wash the material with a soap solution and dry it.

The following specific examples illustrate my invention: (1) Clay, of the character ordinarily used for a paper filler, may be washed with a solution of calcium chloride, of 3 to 15% concentration, sufficient solution being used to supply from 1 to 5% of dry $CaCl_2$ on the clay. The clay is then dried, and the clay is then washed with an excess of a solution of a suitable soap, for example, a 5% solution of a resinate, or stearate or mixed fatty acid soap. A fatty acid soap is preferred. An insoluble soap is formed as a superficial coating on the clay particles, its proportion to the clay being determined by the proportion of calcium salt. The treated clay is drained or filter pressed, dried and, if lumpy, may be ground. I have found 2% of insoluble soap a desirable proportion.

(2) Calcium sulfate, for example, dead burned gypsum or "pearl filler" is washed with a soap solution of the character above set forth, for example, of 5% concentration. Owing to the slight solubility of the sulfate, a superficial coating of calcium soap is formed on the particles of calcium sulfate. The treated sulfate is then drained or filter-pressed and dried. If necessary it may be reground. When thus treated the insoluble soap coating forms about 2% of the whole.

It is readily apparent that the invention may be readily applied to other fillers. The treated filler may be incorporated in the pulp in the engine or may be applied to paper wet in the tub. They may likewise be used as a filler for preparing coated paper, even in the case of the slightly soluble fillers, such as calcium sulfate, not hitherto usable in such manner. In the case of calcium sulfate and similar slightly soluble fillers the treated filler is found to have a higher retentivity than the untreated. In any case the use of the treated filler increases the water resistant and water repellant properties of the paper.

A filler prepared in accordance with the present invention is preferably incorporated into a pulp or into a tub size or coating by initially suspending it in a dilute soap solution.

I claim:

1. As an article of manufacture, a powdered paper filler having a superficial coating of an insoluble soap the proportion of the soap being not over 5% of the whole.

2. As an article of manufacture, a powdered paper filler having a superficial coating of an insoluble soap, the proportion of the soap being 1 to 5% of the whole.

3. As an article of manufacture, powdered clay having a superficial coating of an insoluble soap upon its particles.

4. As an article of manufacture, a pulverulent material having a slight solubility in water, said material being capable of forming an insoluble soap and having a superficial coating of insoluble soap upon its particles.

5. As an article of manufacture, powdered calcium sulfate provided with a superficial coating of calcium soap on its particles.

6. As an article of manufacture, powdered calcium sulfate provided with a superficial coating of calcium soap on its particles, the proportion of soap being 1–5% of the whole.

7. The process of preparing a paper filler which comprises washing an insoluble mineral filler material with a solution of a soluble salt of a metal capable of forming an insoluble soap and with a soap solution, the washings being in desired order and the material being dried after each washing.

8. The process of preparing a paper filler which comprises washing clay with a solution of a calcium salt, drying it, washing the dried material with a soap solution and again drying the material.

9. The process of preparing a filler material which comprises washing a pulverulent material having a slight solubility and capable of forming an insoluble soap with a soap solution, thereby forming a coating of insoluble soap upon its particles.

10. The process of forming a filler material which comprises washing calcium sulfate with a soap solution and drying it.

11. The process of forming a filler material which comprises washing calcium sulfate with a 3–15% soap solution.

12. In the process of applying a paper filler material having a superficial coating of insoluble soap to paper, the preliminary step which consists in suspending the filler in dilute soap solution.

WILLIAM HOSKINS.