UNITED STATES PATENT OFFICE.

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PROCESS OF TREATING ASBESTOS.

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To all whom it may concern:

Be it known that I, EDWARD H. GARCIN, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Processes of Treating Asbestos, of which the following is a full, clear, and exact description.

The object of my invention is to produce asbestos fiber from raw mineral asbestos and to so separate the fibers and bring them into such a condition that they shall be adapted for spinning into yarn, thread, etc., without the use of other strengthening material, such as cotton. Asbestos fibers which have been separated and treated according to my process are not only cleaned and rendered more pliable, but their tensile strength is materially increased, adapting them not only to be spun into yarn, but to be woven into fabrics and used in the manufacture of other material in the arts where a strong and pliable, as well as a heat and flame resisting fiber is required.

Briefly stated, my improved process comprises treating the crude asbestos with water and steam, in connection with the mechanical treatment thereof, in such a manner as to allow the fibers to be easily separated without causing impairment of the quality of the fibers by breaking or otherwise injuring them. Heretofore it has been considered that the application of moisture to asbestos would cause injury to the same by weakening the fibers and affecting its chemical composition, but I have found after considerable research and investigation that when treated according to my improved process, the asbestos is not only purified and cleaned but its tensile strength is increased in addition to being made more pliable and soft so that it is rendered more nearly like cotton and wool fibers in that respect.

For a detailed description of one example of my improved process which I at present deem preferable, reference may be had to the following specification. My improved process comprises the following steps:

(1) The raw or crude asbestos is soaked in a bath of water which is preferably hot, for such a length of time as to allow the water to be absorbed and to thoroughly penetrate interstices of the material.

(2) While still wet the asbestos is crushed and opened by passing the same between crushing rolls of any preferred form known in the arts, and with sufficient pressure to separate the fibers without injuring their structure.

(3) The asbestos is then soaked in an aqueous solution of an acid for the purpose of strengthening the fiber and neutralizing any alkaline material that may be retained therein. This acid solution may be of any preferred kind depending upon the character and the chemical composition of the asbestos as determined by its source or the place where mined.

(4) The asbestos is then washed in hot water and with jets of steam. The apparatus which I prefer to use for this purpose is what is known as a "bowl washer" in which the material is agitated or stirred by paddles.

(5) The asbestos is then transferred to other vats where it is further washed with hot water alone; this removes the last traces of the acid.

(6) The fibers are then passed through a machine in the form of press rolls which squeeze substantially all the moisture out of the fiber.

(7) The fibers are then opened up in a machine known in the textile trade as a "wet picker" by which the fibers are loosened or further separated and put in a condition for efficient and quick drying.

(8) The drying is accomplished by use of the usual drier employed in the textile trade for drying wool, etc., and is preferably a continuously operating machine from which the fibers are expelled by a blast of air after being subjected to the heat of suitable steam coils or other heating means.

The asbestos fiber is then in a condition to be packed or baled and transported to the manufacturers of yarn, cloth or other fibrous material, as in the case of other fibers for making textile fabrics, etc.

Having thus described one example of my invention, I do not wish to be understood as being limited to the details of procedure thereof as set forth nor to the specific order in which the steps of the process are carried out, for various changes may be made by those skilled in the art without departing from the spirit and scope of my invention.

What I claim and desire to protect by Letters Patent is:

1. The process of treating asbestos for separating and strengthening the fibers thereof which comprises, subjecting the as-

bestos to moisture in the form of water and steam and causing the fibers to be disassociated by mechanical means.

2. The process of treating asbestos for separating and strengthening the fibers thereof which comprises, subjecting the fibers to hot water and to an acid solution and disassociating the same by mechanical means.

3. The process of treating asbestos for separating and strengthening the fibers thereof which comprises, subjecting the asbestos to a bath of hot water, crushing, then subjecting the fibers to an acid bath, washing the fibers, and disassociating the same by mechanical means.

4. The process of treating asbestos for separating and strengthening the fibers thereof which comprises, crushing the asbestos between suitable rolls, subjecting the fibers to an acid solution, washing with steam and hot water, pressing the same, disassociating the fibers by means of a wet picker, and then drying.

5. The process of treating asbestos for separating and strengthening the fibers thereof which comprises, subjecting the fibers to a bath of hot water for a sufficient time to soften the fibers, passing the same through crushing rolls, treating the same with an acid solution to strengthen the fibers and to neutralize any alkali therein, washing with steam and hot water, passing the fibers through squeeze rolls for expelling moisture, subjecting the fibers to the action of a wet picker for disassociating the same, and then drying.

Signed at New York, N. Y., this 3rd day of December, 1919.

EDWARD H. GARCIN.