UNITED STATES PATENT OFFICE.

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ASBESTUS MATERIAL AND PROCESS OF MANUFACTURING THE SAME.

SPECIFICATION forming part of Letters Patent No. 248,324, dated October 18, 1881.

Application filed April 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. JOHNS, a citizen of the United States, and resident of the city, county, and State of New York, have invented a new and Improved Asbestus Material and Method of Making the same, of which the following is such a full, clear, and exact description as will enable others skilled in the art to make and use and carry on the same.

Heretofore and before this my invention asbestus had been made into paper sheathing-sheets, mill-board, and other manufactured material by being reduced to fiber, mixed with hair, wool, or similar material, and felted or ground in an engine into short fibers, either mixed with paper-pulp and made into paper, or pulped alone and made into sheets of paper, mill-board, sheathing, &c., as ordinary paper-pulp is treated. The old processes of grinding into pulp in a paper-engine necessarily render the fibers so short that the product does not possess the requisite strength. The sheets thus made are thin, and many layers are required to make thick sheathing, heavy mill-board, &c., which, being composed of many thin sheets, is liable to be separated into the thin sheets, so that the sheet thus made has very little adhesive strength. Wads, bats, or sheets of pure asbestus fiber have heretofore been made by me, and are described in Letters Patent No. 230,946, of August 10, 1880; but such bats are held together by the glutinous or binding material applied to the surface thereof, and do not form a solid compact material as is made by my invention herein described.

This my invention consists of the method of making fibrous asbestus into a sheet, sheathing, or material in which the length of the asbestus fiber is kept unbroken, the whole thickness of the material, however thick it may be made, being made practically in one layer, so that it is not liable to become separated, as is the case when made in different layers, thus making the material much tougher and more serviceable. The asbestus is reduced by ordinary methods into fine fibers, and preferably carded, and the fiber deposited so as to form a wad or batting, the fibers of which are intertwined with one another, wetting the wad or batting so made with water or a glutinous solution, and afterward subjecting it to pressure, so that the intertwined fibers will by being compressed become bent, interlocked, and fastened together. The fibers of asbestus, chrysotile, and similar fibrous minerals are without barbs, and when felted alone make a felt too weak to hold together, and it has been found necessary to overcome this difficulty by sizing, &c., as described in my former patent or to mix other holding matter with it.

My improved method is as follows: The asbestus or other fibrous mineral is separated into fibers, preferably as long and fine as practicable. The fiber is then thrown or deposited evenly over the surface of a table or apron to any required thickness, forming a mat or bat, the fibers of which are crossed and interlaced. The bat thus made of pure asbestus fiber is now subjected to a spray or sprinkling of water or glutinous solution, and the bat thereby wetted is afterward subjected to pressure, so that the interlaced fibers which are bent about one another are made thereby to hold together, and form a compact material of almost any desired degree of solidity.

To properly carry out my method I prefer to use a wire-netting-covered table or drum from the under or inside of which there is an air-exhaust, so as to make a current of air toward the table or drum. Near this table or drum a box or table with a revolving picker-drum or other suitable mechanical appliance is arranged to hold the fibrous asbestus, through which an air-current is passed so as to blow a regulated portion of the asbestus out of the box or table into the air-current which is going toward the table or drum covered with wire-netting, against which it is held by the ingoing air-current, and may be so deposited to any desired thickness, depending upon the quantity of fiber blown from the box and the rate at which the wire-netting-covered table or drum is moving.

The fibers may be spread in a bat or mat by any other means without departing from my invention. A jet of steam or spray of water or other suitable liquid is thrown upon the fibers as they are drawn against the wire-netting, so that the bat or mass will be impregnated with dampness throughout; or, if desired, the water may be mixed with glue or other glutinous or adhesive matter, or such mixture of water may be sprayed upon the bat by a jet of steam or

otherwise, instead of pure water, or the glutinous matter may be otherwise applied during the process of forming the bat. The moisture may, if desired, be applied to the bat after it is formed, the air-current carrying the moisture into the bat. The bat thus prepared is run between rollers or otherwise subjected to heavy pressure, with or without heat, which, by compressing the bent or interlaced fibers together, makes a tough and hard board, sheet, mat, sheathing, or form.

Through the bat as it is formed may be introduced wires or cords, running in various directions, to give strength to the bat when formed. These wires or cords become embraced in the bat and become a part of it, adding greatly to the strength of the material when finished. The bat thus treated becomes under pressure a hard, firm, tough material, composed of asbestus fiber alone, excepting the fastening material sometimes introduced. It may be made in sheets of any desired thickness—from a very thin tissue or paper-like sheet to a thick board or block, depending upon the quantity of fibrous asbestus deposited in the bat.

The bat may be made into various forms, according to the mold on which the fiber is deposited, or it may be pressed into any desired form by proper molds afterward applied to it.

The perforated screen may, if desired, be made of sheet or cast metal, perforated to allow the passage of the induction-currents, and capable of being used as one of a pair of dies to properly press the bat formed on its surface into any desired shapes or forms. The material thus formed is capable of being made very hard by pressure, molded to various shapes, and of receiving a high polish by the application of heated irons to its surface, is tough, firm, not liable to warp, may be colored with dyes or pigments, and is indestructible by fire.

The bat may have waterproofing material introduced in it, so as to form, when finished, a water-proof material, or the finished material may be waterproofed by a coating of waterproofing. Glue, india-rubber, silicate of soda, oils, or resinous matter may be introduced in the mat or bat or applied to the material when finished, to give it greater strength and stability.

The bat or material may also be impregnated with glycerine or other non-volatile liquid, and thereby made pliable for special purposes. The material may be fastened to the surface of wood, metal, or like material as a veneering, and will protect against fire the surface to which it is so applied. It may be applied to various other uses—for example, when made in sheets as a covering for roofs, steam-boilers, and pipes, applied as paper or felt is now applied. When thicker, it may be used as slates, sheathing-boards, panels, partitions, and in all places where boards are now used. When still thicker, it will form solid blocks for fire-brick, fire-walls, or like uses. It may be formed in molds into pails, tubs, bowls, door-knobs, moldings, or like articles.

What I claim as new, and desire to secure by Letters Patent, is—

1. The method herein described of making a sheet, sheathing, or material by reducing asbestus to fine fibers, forming a wad, bat, or mass of asbestus fiber, moistening the same, and subjecting it to pressure, substantially as directed.

2. As a new article of manufacture, the hereinbefore-described material formed of asbestus fiber, formed in a bat or mass, afterward moistened and pressed into a solid and compact form, substantially as specified.

3. The combination, with the material formed of asbestus fiber, as above described, of strengthening wires or cords, either woven or placed therein during manufacture or afterward attached, substantially as specified.

4. The combination, with the material formed of asbestus fiber, as above described, of glycerine or like material, to render it pliable.

5. The combination, with the material formed of asbestus fiber, as above described, of a waterproofing substance, substantially as specified.

6. The material formed of asbestus fiber, as above described, as a veneering for wood or metal, and in combination therewith, as specified.

HENRY W. JOHNS.

Witnesses:
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