UNITED STATES PATENT OFFICE.

ANDREW J. BARTHOLOW, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN THE PROCESSES OF TREATING ASBESTUS.

Specification forming part of Letters Patent No. **151,345**, dated May 26, 1874; application filed May 5, 1874.

To all whom it may concern:

Be it known that I, ANDREW J. BARTHOLOW, of Baltimore city and State of Maryland, have invented certain new and useful Improvements in Treating Asbestus for use in the arts; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In the treatment of asbestus or amianthus, the crude article has been reduced to pulp and fiber by disintegration to render it available for a variety of purposes, and various processes of treatment have been employed for the purpose, all of which, as far as the state of the art discloses, have been wholly of a chemical nature, to effect the preliminary reduction and disintegration of the crude article. Again, all these processes involve subsequent operations of washing to produce a thorough separation of the fibers from the earthy matters, and to rid it of the chemical matter under which it is first treated. Especially is this the case in the employment of coal-oil, benzine, or other hydrocarbons, whether cold or in the condition of heated liquids or vapors.

Compounds of alum, chloride of lime, and boiling in lye have been used for chemically treating the crude mass, while sulphuric and other acids in solution have been employed for both reducing and bleaching the rocky substance.

My invention differs from all these processes, and especially avoids the use of expensive chemicals, or any chemical treatment whatever, in reducing the crude mass either to pure fiber or pulp for use in the arts.

To this end my invention consists in treating the crude mass by boiling it a suitable length of time in pure water, and then transferring it to a cold bath, wherein the cold water is kept running, by which sudden transition from heat to cold the mass is first heated and softened under the action of boiling, and then by the action of the cold its fibers are separated from the earthy and metallic portions, the cold bath, in effect, forming a separating-bath. The boiling causes the material to swell and soften, while the action of the cold bath produces a contraction of the hard and metallic particles, and the sudden shrinkage of these loosens their hold upon the fiber, leaving the stick free to be separated into fiber. When taken from the boiling water the mass will break off in short pieces by reason of its brittleness, but the sudden effect of the cold immersion destroys this brittleness, and converts the mass into separate and distinct fibers, holding together in strands, which may be easily torn and stripped apart, as the cold bath makes them stronger and more tenacious as fiber, and thereby renders them more flexible so that they can be more perfectly separated when crushed in a press.

The crude asbestus is boiled in pure water, in covered vessels, to obtain the softening effect of the steam. This boiling is of greater or less duration, according to the quantity of the mineral, and whether it is desired to produce pulp or long fiber. For pulp, the fragments and short pieces are used and boiled from four to eight hours. I have obtained from the sticks, however, long fine fiber after boiling it for about an hour and a half, but the duration of such boiling is always determined by the quality and condition of the material treated—that is, whether fragmentary or in stick, its color, and the extent to which it may be mixed with foreign matters. When it has boiled the required time it is taken out by forks, or other means, and thrown into the cold bath and allowed to remain until it is perfectly cold—about an hour and a half—and for this purpose I have found it to be much better, more economical, and a very great saving in expense to employ a tank, or a series of tanks, through which the cold water is kept constantly running. This sudden immersion of the hot material into the cold water produces the best results upon the mineral, making it more easy to disintegrate it in long fiber, taking out the brittleness which it still possessed in the hot condition, and giving it a condition whereby it will readily yield under the pressure of a press, which mashes it and forces out the water, after which it is dried in any suitable way, for the subsequent opera-

tion of disintegration into fiber or pulp. But the distinguishing feature of the process is the sudden change from boiling to cold water, for I have found that the action of the cold water gives control over the fiber to such an extent, and in such a manner, as to render it easy to be separated, to be stripped from the stick in long tough fiber, and the short pieces readily yielding its fiber for pulping. Nor is any separate bleaching process necessary, as the boiling and cold water penetrate the pores of the mass, and the fiber is made white, so that when properly disintegrated it may be used for any purpose for which it may be adapted, whether as a long fine white fiber, or as fine white pulp, rendered strong and flexible by the controlling or separating action of the cold water. The disintegrating process may be effected in any suitable way, but under the previous action of a press, which completely crushes it, this operation is made easy in stripping the fiber, and leaving it in a condition to be combed, carded, and treated for any special use.

I claim—

The process herein described of treating asbestus, by subjecting it from boiling heat to sudden immersion in a cold bath, to give control of the fiber, as stated.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ANDREW J. BARTHOLOW.

Witnesses:

A. E. H. JOHNSON,

J. W. HAMILTON JOHNSON.