

# UNITED STATES PATENT OFFICE.

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## PROCESS OF PRODUCING ARTIFICIAL WOOD.

SPECIFICATION forming part of Letters Patent No. 652,144, dated June 19, 1900.

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*To all whom it may concern:*

Be it known that I, ANTON SKROBANEK, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Processes for the Production of Artificial Wood; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a process for the production of artificial wood capable of resisting heat, cold, and moisture and hardening when placed in moist soil. The said artificial wood can be treated like ordinary wood and can be dyed and is particularly appropriate for the production of paving-blocks, sidewalk-plates, or railway-sleepers.

This process is executed in the following manner: Peat is first cleaned from all earthy substances adhering to the same by treating it in a beating-opener, and then it is actually opened like sheep-wool in a carding-machine, whereupon the opened material is separated, by means of a sifting and sizing apparatus, into peat fiber and the short refuse or peat-mull. These two materials are thereupon treated quite separately from each other in the following manner: the peat in the form of fibers is placed in a bath of borate of soda and silicate of soda, the solution being in proportion of one part of the salts to sixty of water, the bath being heated to a temperature of about 40° centigrade. In the bath the fiber is left for forty-eight hours in order to enable the ulmic and humic salts adhering to the fibers to form borates and silicates and to separate gradually from the fibrous material. The fibrous substances cleaned and substantially consolidated in the above-described manner are then completely dried in drying-chambers at a temperature of about 30° centigrade. The dried fiber is then incorporated with the mass composed, as specified below, of peat-mull and sawdust or (instead of the latter) of a mineral composition which will be described farther on. To these materials the peat fiber is added either as loose fibers or in the shape of a thick fleece carded in a

wool-carding engine. The short material eliminated after the opening of the peat (the so-called "peat-mull") is intimately mixed in a malaxator with about an equal volume of wood-sawdust. To this mixture may be added for the production of some particular articles finely-comminuted waste paper in a proportion of about five to ten per cent. The material is then treated in vats provided with agitators for two to three hours with a boiling solution of Salzburg vitriol in a proportion of about one to thirty-five and of alum in a proportion of about one to fifty, and thereupon it is dried in centrifugal apparatus until it merely feels moist when touched with the hand. The dried mass is spread on sieves and saturated with a boiling solution of air-slaked lime in a proportion of about one to fifty and is then made to dry slowly in the air. After this mixture has been completely dried it is placed again into a malaxator and is there mixed either with ordinary Portland cement in any desired relative proportions, (in which case the ready-prepared mass before it is fed to the hydraulic press is moistened with a solution of borate of soda,) or to the above-named mixture when it has become quite dry instead of Portland cement a mineral mixture may be added, which will be specified below. This addition of the mineral mixture is particularly appropriate for the production of certain kinds of artificial-wood products—such as, for instance, railway-sleepers, with reference to which it is of importance that rivets, screws, or nails driven into the same should remain as solidly fixed as possible. The mineral mixture referred to is composed as follows: fifty parts of ground silicate of lime, twenty parts of pure pulverized arenaceous quartz, fifteen parts of ground burnt alumina, (potsherds or Dinas meal,) five parts of silica, (kieselguhr,) five parts of powdered borate of soda, and five parts of powdered silicate of soda, ( $\text{Na}_2\text{SiO}_3$ )

The relative proportions of the vegetable and the mineral mixtures are regulated at will according to the particular quality of the articles to be produced from the described artificial wood. During the mixing and kneading operations the said vegetable and mineral substances are moistened with water

until they form a dough-like mass. To this plastic mass are then added the long peat fibers which have been treated in the above-described manner or the fleeces produced after any desired manner from these fibers. The long loose fibers are simply incorporated in the dough-like mass in a kneading-machine, while when the fibrous substances are added in the shape of fleeces the pressing-mold first receives a thin coating of the dough-like mass, whereupon alternate layers of the fleece and the mass are arranged in the mold. For imparting to the artificial wood a more firm structure similar to the cellular structure of natural wood the successive layers of fleeces are arranged crosswise. When the pressing-molds are entirely filled, the charge is moistened with water and is left to set slowly in the molds for six to eight hours, whereupon it is pressed under high hydraulic pressure. The pressed large plates of artificial wood are then allowed to dry slowly under abundant admission of cold air. After the completed drying the plates can be employed for various purposes in place of natural wood. The material can be sawed, bored, nailed, turned, and polished exactly like natural wood and allows of being dyed in any desired color.

The articles produced after the said process are most perfectly resistant against the action of heat, cold, and moisture and possess, besides, the most important quality that when placed in moist soil they become more and more hard, this quality being easily explained by the formation of hydrosilicates of alumina and lime occasioned by the composition of the mineral mixture.

- I claim—
1. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic acid, mixing peat-mull with a filler and a hardening material and mixing the carded peat fiber therewith, substantially as described.
  2. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic acid, mixing peat-mull with a filler and a hardening material and forming alternate layers of the carded fiber and said mull, substantially as described.
  3. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic acid, mixing peat-mull with a filler and a hardening material and forming alternate layers therewith and with the carded fiber laid in different directions, substantially as described.
  4. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic and ulmic acids as borates and silicates, mixing the peat-mull with a filler and a hardening material, placing in

the mixture intermediate layers of the carded fiber, and moistening the resulting product with a solution of sodium borate, substantially as described.

5. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic and ulmic acids as borates and silicates, mixing the peat-mull with a filler and a hardening material, forming alternate layers therewith and with the carded fiber laid in different directions, molding the compound and moistening the same with a solution of sodium borate, substantially as described.

6. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic and ulmic acids, treating the mull with a hot solution of sulfuric acid and alum, mixing the resulting product with slaked lime, drying, adding a filler and a hardening material, mixing therewith the carded peat, saturating the mixture with borate-of-soda solution and molding, substantially as described.

7. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic and ulmic acids, treating the peat-mull and a vegetable filler with a hot solution of sulfuric acid and alum, mixing the resulting product with slaked lime, drying, and adding a hardening material composed of silica, alumina, and sodium borate and silicate, substantially as described.

8. The process of making artificial wood, which consists in cleaning and carding peat, separating the humic and ulmic acids, treating the peat-mull and a vegetable filler with a hot solution of sulfuric acid and alum, mixing the resulting product with slaked lime, drying, adding lime, quartz, alumina, borate and silicate of soda, disposing the mixture in molds with layers of the carded peat fiber, moistening with sodium-borate solution and allowing the product to set and then pressing, substantially as described.

9. An artificial wood, composed of peat-mull, a filler, and a hardening material, with layers of carded peat fiber disposed through the mixture, substantially as described.

10. An artificial wood, composed of cellulose formed from peat-mull and a vegetable filler, lime, silica, alumina, and sodium borate and silicate mixed, with interspersed layers of carded peat fiber laid in different directions, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANTON SKROBANEK.

Witnesses:  
 HERNANDO DE SOTO,  
 PAUL ARRAS.