

UNITED STATES PATENT OFFICE.

CHARLES HASLWANTER, JR., OF BROOKLYN, NEW YORK, ASSIGNOR TO
HARWOOD HUNTINGTON, OF NEW YORK, N. Y.

HEADLESS MATCH.

SPECIFICATION forming part of Letters Patent No. 673,537, dated May 7, 1901.

Original application filed July 14, 1899, Serial No. 723,853. Divided and this application filed January 2, 1900. Serial No. 190. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES HASLWANTER, Jr., a citizen of the United States, and a resident of Brooklyn, Kings county, State of New York, have invented new and useful Improvements in the Manufacture of Matches, of which the following is a specification.

This invention relates to improvements in headless safety - matches free from phosphorus and which are intended to ignite by striking against a suitably-prepared surface.

For many years there have been attempts made to produce a non-hygroscopic match which will not be affected injuriously by hygrometric changes of the atmosphere, and the match herewith brought forward possesses the desirable antihygrometric properties to a high degree. In my invention I use potassium antimoniate with alkali or alkaline earth chlorates. I impregnate several times, preferably in hot solutions, drying either partially or wholly between the impregnatings. The potassium antimoniate and the potassium chlorate used must be sufficiently pure to avoid hygroscopicity by reason of impurities.

To illustrate my invention, I give the following example, not limiting myself strictly to the proportions and temperatures given: twenty-three (23) parts of potassium chlorate, one (1) part of potassium antimoniate, and one hundred (100) parts of water. The parts given are parts by weight. The solution is used hot, a temperature of about ninety (90) degrees centigrade being employed. The splints or match ends may be dried previous to the first impregnation. After the splints or match ends have been dipped in the mixture of chlorate and antimoniate the splints or match ends are dried, either partially or wholly, at a temperature preferably between forty-five (45) or fifty-five (55) degrees centigrade. The splints or match ends are then dipped again in the mixture of the chlorate and the antimoniate and dried again either wholly or partially. I find that it is advantageous to repeat this dipping or impregnating several

times, so that enough of the material is introduced into the points of the splints or match ends. Either or both ends of the splints or match ends may be dipped or impregnated. The splints or match ends may also be dipped in paraffin or similar substances, which act as flame-carriers or flame-continuers. The splints or match ends may now be covered with a varnish, so that the crystals on the exterior of the surface of the splints or match ends may not be rubbed off in the later processes of manufacture, boxing, or transportation. I am aware that gum-arabic has been used as a binding material. I am also aware that spirit or oil varnishes have been used to try to make a match waterproof, but not as in my invention to form a cover to protect from attrition or rubbing off. The varnish may be put on preferably by spraying, and I use a solvent which will not dissolve the chemicals already in the match end. I dissolve the rosin in petroleum spirit, one (1) part of resin to four (4) parts of the solvent. The splints or match ends are lastly dried again and a temperature of about ninety (90) degrees centigrade is desirable. I do not limit myself to these proportions and temperatures; but I have found them advantageous, and will enable any one skilled in the art to produce the match.

Having now described my invention and the manner in which the same can be performed and the product obtained thereby, what I claim, and desire to protect by Letters Patent, is—

A headless safety-match impregnated with chlorates and potassium antimoniate, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 30th day of December, 1899.

CHARLES HASLWANTER, JR.

Witnesses:

GEORGE B. HALSEY,
HARWOOD HUNTINGTON.