No. 689,055. Patented Dec. 17, 1901.

P. BERGSOE.

PROCESS OF MAKING MATCHES.

(Application filed May 29, 1900.)

(No Model.)

Fig. 1.

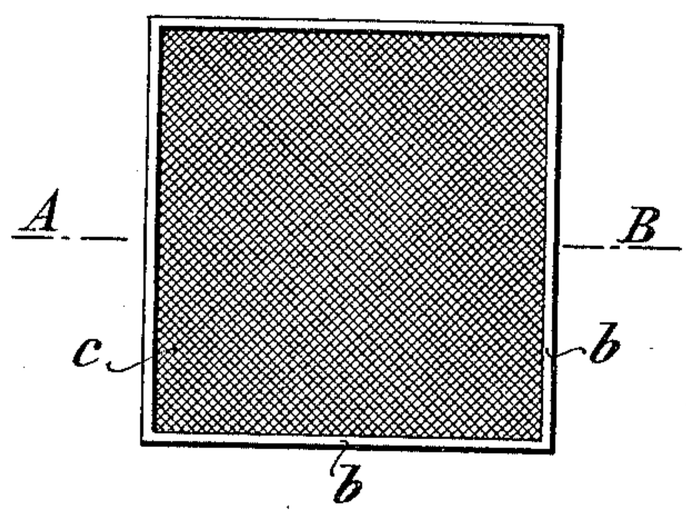
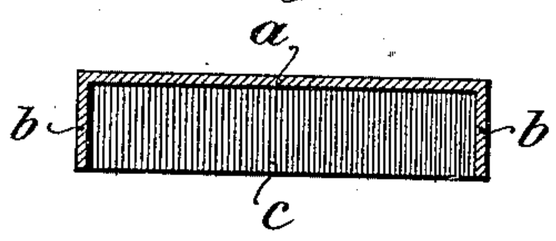


Fig. 2.



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UNITED STATES PATENT OFFICE.

PAUL BERGSOE, OF COPENHAGEN, DENMARK.

PROCESS OF MAKING MATCHES.

SPECIFICATION forming part of Letters Patent No. 689,055, dated December 17, 1901.

Application filed May 29, 1900. Serial No. 18,410. (No specimens.)

To all whom it may concern:

Be it known that I, PAUL BERGSOE, a subject of the King of Denmark, residing at Copenhagen, in the Kingdom of Denmark, have invented certain new and useful Improvements in Processes of Making Matches, of which the following is a specification.

The present invention relates to a process for making headless matches from wood, cellulose, or other porous combustible materials with which a soluble ignitible salt is incorporated by impregnation.

According to the processes hitherto employed the splints from which the matches were to be made were placed together to form a block and the one end surface was then dipped into the hot saturated solution of the ignitible salt. In the process that forms the subject-matter of this application the evaporation of the water is utilized to bring the quantity of salt necessary for producing a good match into one or both ends of the splints. As an example of ignitible salts, chlorates of barium, of potash, &c., may be named. With the more ignitible salts weaker solutions may be used. When a splint is fully impregnated and the evaporation of the water is prevented at all parts with the exception of one end by a covering or the like, the water will then only be able to evaporate at this exposed part. The ignitible salt which was previously contained in the splint will thus be caused to settle in the wood at the exposed part in a concentrated form. The action is analogous to what takes place in the formation of wall-saltpeter.

In carrying out this invention in one form it is first necessary to fully impregnate the fire-maintaining material, by which I mean the material of which the splints are made, which after the ignition-surface has been ignited by friction holds or maintains the fire from which the splints are made with a hot or cold solution of the ignitible salt and to then dry the same by causing the water to evaporate exclusively at the end surface or end surfaces.

The invention can be carried out in various ways.

The ready-cut splints of wood, cellulose, or other material may be dipped into the solution of the ignitible salt and then after they are fully impregnated so secured in a frame that the water can only evaporate at the end surface or end surfaces of the splints, or the splints (of wood, cellulose, or other material) can first be placed together to form a block, which is dipped into the solution of salt and then dried as above, or the material (wood, cellulose, or other material) can be dipped into the solution of salt in its original form—that is, in unformed pieces—then cut into splints while still wet, secured in blocks, and dried, as above, or, finally, the material (wood, cellulose, or other material) can be dipped into the solution of salt in its original form—that is, in unformed pieces—then dried by exposing one or both surfaces, and cut into splints that constitute the finished matches.

This process may be carried out in many different ways, and in the accompanying drawings one method is shown.

Figure 1 is a plan view of a frame; and Fig. 2, a cross-section of the same on the plane A B, in which the individual splints may be placed for drying after being impregnated or the whole mass of wood may be dried before being cut up into splints.

In impregnating the splints after placing them in the frame *a b* the frame is held in the position shown in Fig. 2, the open side being downward, so that the exposed portions of the splints can be dipped into the surface of the impregnating solution. It is also an advantage to support the frame in the same position while the superfluous solution drips from it or even throughout the drying process, in which event gravity tends to assist somewhat in drawing the evaporating solution to the exposed ends of the splints.

The advantages of this process for making matches consist, first, in the fact that it is not necessary to use hot saturated solutions as hitherto, and, secondly, that a number of ignitible salts can be used which were not hitherto utilizable, because a hot saturated solution of the same could not be formed in consequence of dissociation commencing.

It was absolutely necessary to use a hot saturated solution in the processes hitherto employed, as only by dipping the ends of the splints into such a solution could sufficient salt be absorbed. These disadvantages are overcome by the present invention, inasmuch

as all the ignitible salt present in the splint after the impregnation is brought to the surface at which the water is evaporating, so that there is at this surface a plentiful quantity of salt.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The process of making matches which consists in drawing and concentrating the ignitible salt in the required quantity toward the ignition-surface of the fire-maintaining material, by impregnating the said material of the match with a solution of said ignitible salt and evaporating the solvent from the ignition-surface to a greater extent than elsewhere, substantially as set forth.

2. The process of making matches which consists in steeping the whole fire-maintaining material in a solution of ignitible salt, and then evaporating the solution by exposing alone that part which is to form the ignition portion of the match, substantially as set forth.

3. The process of making matches which consists in dipping the whole fire-maintaining material of the match-splint into a solution of an ignitible salt and then partially inclosing the said splint to prevent evaporation from the inclosed portions and evaporating the solvent from the ignition-surface, and then drying, substantially as set forth.

4. The process of making matches which consists in steeping the whole fire-maintaining material of the match-splints in a compact form, at any stage of their production, into a solution of an ignitible salt and then drying them in such compact form by exposing only the ignition-surface, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

PAUL BERGSOE.

Witnesses:
E. BETZ,
L. GOSSOW.