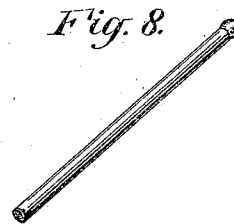
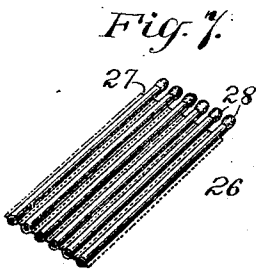
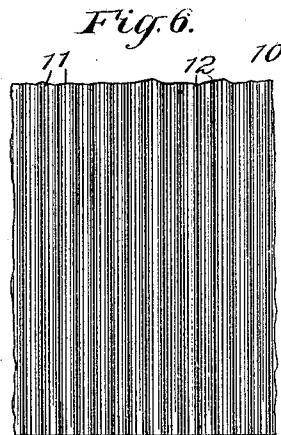
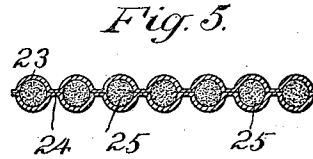
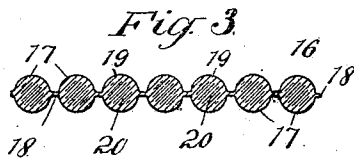
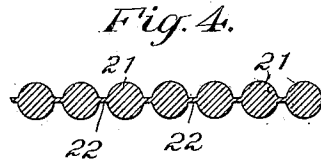
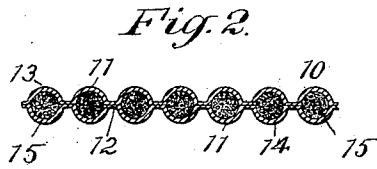
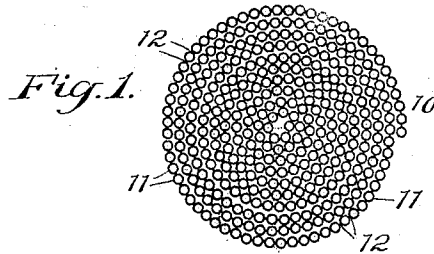


J. A. E. CRISWELL.
MANUFACTURE OF MATCHES.
APPLICATION FILED JUNE 13, 1905.

988,252.

Patented Mar. 28, 1911.



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MANUFACTURE OF MATCHES.

988,252.

Specification of Letters Patent. Patented Mar. 28, 1911.

Application filed June 13, 1905. Serial No. 265,096.

To all whom it may concern:

Be it known that I, JAMES A. EKin CRISWELL, of New York, county of Kings, and State of New York, have invented certain
5 new and useful Improvements in the Manufacture of Matches, of which the following is a full, clear, and exact description.

This invention relates more particularly to the manufacture of matches composed of
10 different materials.

The main object of the invention is to provide a sheet or web of distinctive match bodies which are united together by a thin flexible part integral with the bodies but of
15 less thickness, so that the bodies may be made up in a large roll for shipment to have the web made into matches at a distant place; and to provide a ready means for making and holding the bodies together
20 during their treatment to complete the matches.

A further object of the invention is to provide means whereby matches may be made of cheap and inexpensive material;
25 and which may be sold in a roll connected together by a part of the material of which they are made, or as separate and independent matches.

The invention will be hereinafter more particularly described with reference to the accompanying drawings which form a part of this specification, and will then be pointed out in the claims at the end of the description.

30 In the drawings, Figure 1 is an end view of a roll of the match bodies. Fig. 2 is an enlarged transverse section of one form of match web. Figs. 3 to 5 are enlarged transverse sections of other forms of match
40 bodies. Fig. 6 is a fragmentary plan of a web of match bodies. Fig. 7 is a fragmentary perspective view of several of the complete matches united together; and Fig. 8 is a perspective view of a single match.

45 The sheet, web or strip 10, Figs. 1 and 2, comprises the match bodies 11 and a connecting portion or film 12 of less thickness than the match bodies and integral therewith. The web 10 may be formed of two
50 opposed corrugated sheets 13 and 14 of paper united together by glue, paste or otherwise so as to form tubes connected together. These tubular parts are filled with suitable material to form an inner core 15. The inner
55 core may be made of shredded wood or other woody fiber, such as straw, bagasse, excelsior,

or any suitable vegetable fiber forming long strands or filaments, united with paper or wood pulp, and a suitable binder such as glue, rosin, flour, starch or paraffin. This
60 core may be made of various materials, and is intended as a strengthening means for the match bodies; and the cores may be covered by the paper while the latter is either wet or dry and the composite elements united to-
65 gether to form a substantially homogeneous match body. The strands or filaments of the cores extend lengthwise of the match bodies and may or may not be united with the other elements, though in many cases it is desirable
70 to use a suitable binder. By this means the greater part of the match bodies may be made of cheap material, and the whole put up in compact form for shipment.

In Fig. 3 the web 16 comprises the match
75 bodies 17 and the connecting film or part 18. Each body comprises an outer coating 19 and an inner core of similar but denser material 20. The core 20 may be of paper-making pulp combined with other materials
80 or compressed to a greater degree than the outer surface 19. The part 20 may be of the very cheapest of paper-making material, and the coating or cover 19 of a better quality of paper-making materials, the two united
85 to form homogeneous match bodies.

The match web shown in Fig. 4, comprises the match bodies 21 and the connecting part or film 22. In this case the entire web may be made of paper-making pulp, or the pulp
90 may be mixed with suitable hardening substances during or before being formed. The entire web or match bodies are made of the same material.

Fig. 5 shows a web having the match
95 bodies 23 united by the part or film 24 similar to Fig. 2. The cores 25 are of such materials as may be made plastic, the long strands of filaments of woody or vegetable fiber being dispensed with. Fibrous ma-
100 terial as mineral wool, paper-making pulp or wood pulp, united with a suitable binder as flour, starch, or glue may be used if desired.

It will be understood that various mate-
105 rials may be used in forming the match bodies, and that paraffin or any of the oils, sulfur, saltpeter, or other substances may be used at any stage of manufacture, and by running the web through melted paraffin
110 a very effective and cheap wax match is produced.

Ordinarily the webs of match bodies are made in widths varying up to twelve feet, when it is desired to ship rolls of the match bodies to distant places where they are then cut into narrow strips just the length of the finished matches, and the matches completed in the usual or in any preferred manner. Instead of the match bodies being round they may be of any desired shape, and instead of the match bodies extending transversely of the web or sheet, they may extend longitudinally thereof.

In Fig. 7 the strip, sheet or web 26 of match bodies may be cut away, as at 27, to provide a space between the bodies at one end, and an igniting head 28 applied to the ends of the bodies to form complete matches. The match strip may be sold in the form of a roll of matches, or the match bodies may be separated before or after heading and sold as individual matches as in Fig. 8. The distance between the match bodies will vary according to the method of manufacture in heading the matches.

It will be seen from the foregoing that various materials of a cheap character may be used in the manufacture of matches, and many materials that ordinarily go to waste may be utilized for this purpose. It will be seen further that the match bodies may be made near the source of supply of the raw materials and shipped in such shape, convenient for handling, that the complete matches may be readily made; or the matches may be made and sold complete in rolls.

Where "paper-making pulp" is used, it

is in its broadest sense and includes any of the materials that may be used in paper making, such as wood pulp, old paper, particularly newspaper, scraps, manufactured pulp; and where the word "paper" is used, it is also employed in its broadest sense and may be of any thickness.

The web of match bodies or the materials comprising the same may be impregnated with the usual chemicals to prevent glowing; and the web or the materials may be colored. When desired advertising matter may be placed on the match bodies.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. As an article of manufacture, a match sheet or web having distinctive bodies each provided with an inner core of paper-making pulp and a combustible cover, the said bodies united lengthwise thereof between the same by the cover which incloses the inner core.

2. As an article of manufacture, a sheet of matches having distinctive match bodies each provided with a head of igniting composition and consisting of an inner core of paper-making pulp, and a tubular covering of paper for each core entirely inclosing the same and united to the core, the said covering for the match bodies serving also as the means to unite the match bodies together lengthwise thereof.

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