

UNITED STATES PATENT OFFICE.

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PROCESS OF PRODUCING TERPENES AND RESINOUS SUBSTANCES.

No. 800,905.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, GEORGE P. CRAIGHILL and GEORGE A. KERR, of Lynchburg, in the county of Campbell and State of Virginia, have invented certain new and useful Improvements in Processes of Producing Terpenes and Resinous Substances; and we 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 object of this invention is to produce a process by which the terpenes may be extracted from wood with greater economy and in much less time than has heretofore been required by known processes and which when recovered will be in a pure colorless state.

A further object is to effect the recovery of rosin and other resinous substances free from the tarry and oily products usually present therein when the extraction is effected by destructive distillation or by excessive digestion with a strong chemical reagent.

A further object is to provide a process for producing in one operation pure and colorless terpenes, whereas by processes heretofore known the terpenes are carried off in a crude state, rectification thereof being necessary before they can be commercially employed; and a further object is to effect the volatilization of the terpenes and the extraction of the rosin and other resinous substances separately and at different stages of the process without destructive distillation of the wood, the wood being left in such condition that the fiber is unimpaired.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

The wood after being reduced to chips or shavings is placed in a suitable digester, wherein it is thoroughly saturated with an alkaline solution of one per cent. The solution has the effect of dissolving the resinous contents of the wood and of opening up the cells thereof, so that upon the application of steam the terpenes are liberated with great freedom and rapidity. The alkaline solution has also the property of fixing the various volatile acids and oils, which would otherwise pass off with the terpenes. For this purpose we preferably use a solution of sodium hydroxid, (NaOH,) although a solution of sodium carbonate (Na₂CO₃) may be employed. After the wood has been thoroughly saturated

with the alkaline solution steam is admitted to the mass, and in this way the terpenes are volatilized and made to pass off with the steam from the top of the digester. The mass is heated to a temperature of from 100° to 110° centigrade, since any temperature in excess will not result in the production of good turpentine, the best results being secured by subjecting the mass to a low temperature. The acids and oils of the wood being fixed, the volatilized terpenes are recovered from the condenser in a pure and colorless state. They may while volatile be passed through a bone-black filter to secure terpenes of a high grade.

By reason of the fact that prior to volatilization or vaporization of the terpenes the volatile acids and oils have combined with the alkaline solution and been fixed, thereby preventing their volatilization, we are enabled to volatilize the terpenes free of these impurities and recover them either with or without passing the vapors through a bone-black filter. Filtration is not essential to our process, as we are enabled without it to produce pure and colorless terpenes. By the use of the filter, however, we obtain terpenes of a higher grade free from all foreign odors, as well as being pure and colorless, all of which we accomplish in one continuous process.

After the steam-supply is discontinued a sufficient quantity of water is added to submerge the wood, and the solution containing the rosin is drawn off. The rosin, free from tarry and oily products, is subsequently recovered from this solution, that in suspension by precipitation, and that in solution either by neutralizing the alkali or by evaporation. When the extraction of the wood is effected by destructive distillation or when digested with any strong chemical reagents, the recovered resinous substances are not free from these tarry and oily products.

By subjecting the wood to the action of the alkaline solution prior to volatilizing the terpenes and then extracting the terpenes and rosin the wood is left in such condition that its fibers are unimpaired. Complete volatilization of the terpenes and recovery of both terpenes and rosin are effected in about two hours, this being about one-third of the time heretofore required for the extraction of terpenes alone.

We claim as our invention—

1. The herein-described process of producing terpenes from wood, which consists, first,

in chemically treating the wood, to fix the volatile acids and oils and liberate the terpenes, and then carrying off and collecting the terpenes.

5 2. The herein-described process of producing terpenes from wood, which consists, first, in saturating the wood with an alkaline solution, to fix the volatile acids and oils and liberate the terpenes, and then passing steam
10 through the wood to volatilize the terpenes and carry them off in a pure and colorless state.

3. The herein-described process of producing terpenes from wood, which consists, first, in saturating the wood with an alkaline solution, to fix the volatile acids and oils and liberate the terpenes, and then passing steam
15 through the wood to volatilize the terpenes, and then filtering them while volatile.

4. The process herein described, consisting, first, in saturating wood with an alkaline solution, to fix the volatile acids and oils and liberate the terpenes, then passing steam through the wood for volatilizing the terpenes and carrying them off, then, after adding a suitable quantity of water, drawing off the
20 solution to recover the rosin, free from tarry and oily impurities. 25

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

GEORGE P. CRAIGHILL.
GEORGE A. KERR.

Witnesses:

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