

UNITED STATES PATENT OFFICE.

CHARLES HOWARD, OF NEW YORK, N. Y., ASSIGNOR TO NATIONAL WOOD-VULCANIZING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PROCESS OF VULCANIZING WOOD.

No. 900,017.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES HOWARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Processes for Treating Wood, of which the following is a specification.

My invention relates to an improved process for treating wood, and it consists in the steps and processes herein described and claimed.

An object of my invention is to provide an improved process whereby a thorough drying and vulcanization can be obtained uniformly throughout the entire thickness of wood of any size.

A further object of my invention is to provide an improved process of vulcanizing wood, which eliminates all danger of disrupting the fibers, and furnishes a product of maximum strength and uniformity of condition throughout.

In the preferable operation of my invention, the wood to be treated is placed in an unheated condition in any suitable receptacle, and subjected to a vacuum of approximately 20" to 28" for a sufficient time for evaporating any water which may have been absorbed by the wood and also the readily volatile aqueous matters which will pass off as vapor under the reduction of pressure. This operation places the wood in a very efficient condition for the thorough penetration thereof by the steam employed in the next step. Saturated steam slightly above atmospheric pressure, preferably at 220° F. to 230° F., is then forced into the vacuum, and maintained in contact with the wood for a sufficient time to thoroughly penetrate the latter. This step moistens and softens all the wood fibers, causes a partial removal of the aqueous constituents of the wood, and heats the wood throughout to the temperature of the steam. The steam is then exhausted, and the wood subjected to the combined action of a vacuum and of a relatively high degree of dry heat, preferably below 380° F., for a sufficient time to drive off the moisture absorbed during the previous steam-heating together with all aqueous and other constituents of the wood volatilizable at the temperature employed. In this step, the steam previously absorbed by the wood is driven off, and its passage from the interior

of the wood through the outer layers produces a progressive drying from the interior outwards and prevents premature hardening of the outer layers of the wood before such action is completed throughout the interior portion thereof. By the above described steps, the wood is brought to a very uniform condition throughout, and is freed from a maximum quantity of deleterious constituents of the wood, which are dissolved during the step of steam-heating. A satisfactory and practical way for carrying out the last described step, is by circulating superheated steam at approximately 1200° F. to 1500° F. through coils in the containing vessel while maintaining a vacuum in the latter.

The supply of dry heat is then cut off, and the wood gradually cooled off under a vacuum. In this step, the previously relatively highly heated and thoroughly dried wood is subjected to a progressively decreasing uniform temperature throughout its entire mass, thereby furnishing an improved product of uniform vulcanization and condition throughout, and efficiently preventing the disadvantages occurring in previous processes through excessive hardening of the outer layers of the wood.

I have illustrated and described preferred and satisfactory steps and processes, but, obviously, changes could be made within the spirit and scope of my invention.

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

1. The herein described process of vulcanizing wood, which consists in subjecting the unheated wood to a vacuum, treating the wood with moist heat, subjecting the wood to the combined action of dry heat and a vacuum, and gradually cooling the wood while maintaining said vacuum.

2. The herein described process of vulcanizing wood, which consists in subjecting the unheated wood to a vacuum, treating the wood with moist heat at a pressure above that of the atmosphere, subjecting the wood to the combined action of dry heat at an increased temperature and a vacuum, and gradually cooling the wood while maintaining said vacuum.

3. The herein described process of vulcanizing wood, which consists in subjecting the unheated wood to a vacuum, treating the wood with saturated steam at approximately 230°

F., subjecting the steamed wood to the combined action of dry heat at an increased temperature and a vacuum, and gradually cooling the wood while maintaining said vacuum.

4. The herein described process of vulcanizing wood, which consists in subjecting the unheated wood to a vacuum, treating the wood with saturated steam at a pressure above that of the atmosphere, subjecting the steamed
10 wood to the combined action of a dry heat below 400° F. and a vacuum, and gradually cooling the wood while maintaining said vacuum.

5. The herein described process of vulcanizing wood, which consists in subjecting the

unheated wood to a vacuum, treating the 15 wood with saturated steam at a pressure above that of the atmosphere, subjecting the steamed wood to the combined action of a dry heat of approximately 380° F. and a vacuum, and gradually cooling the wood below the boiling temperature of water while
20 maintaining said vacuum.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES HOWARD.

Witnesses:

GEO. E. TERRY,
G. AYRES.