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METHOD OF AND APPARATUS FOR THAWING PULPWOOD PRIOR TO DRUM BARKING

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Fig. 1

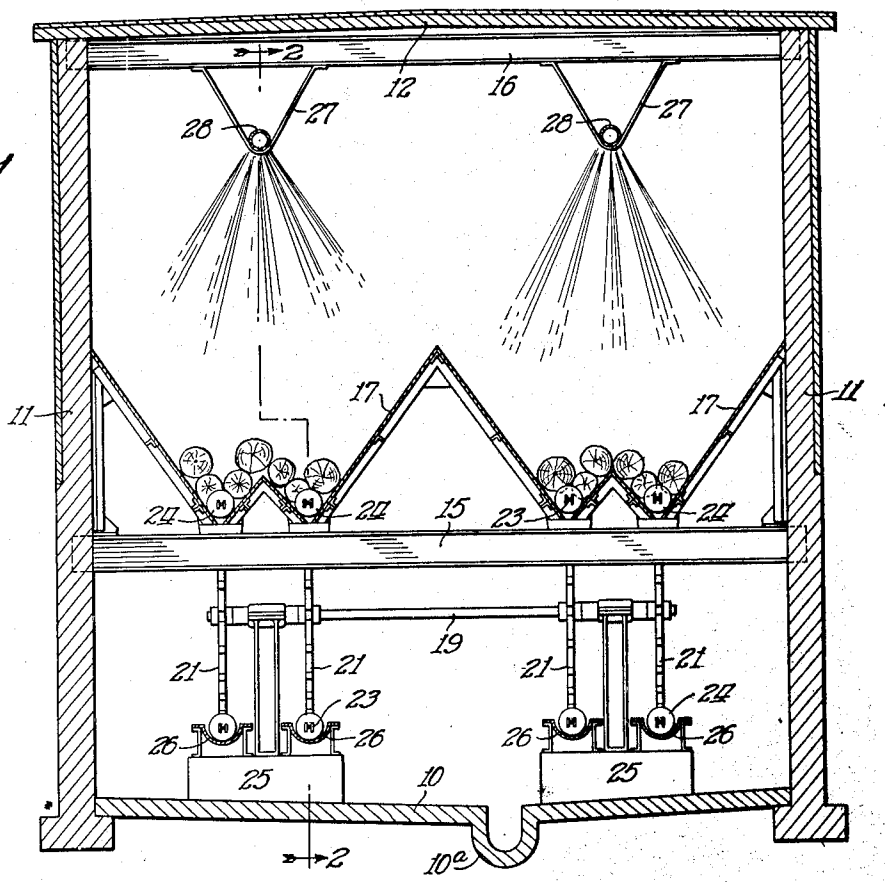
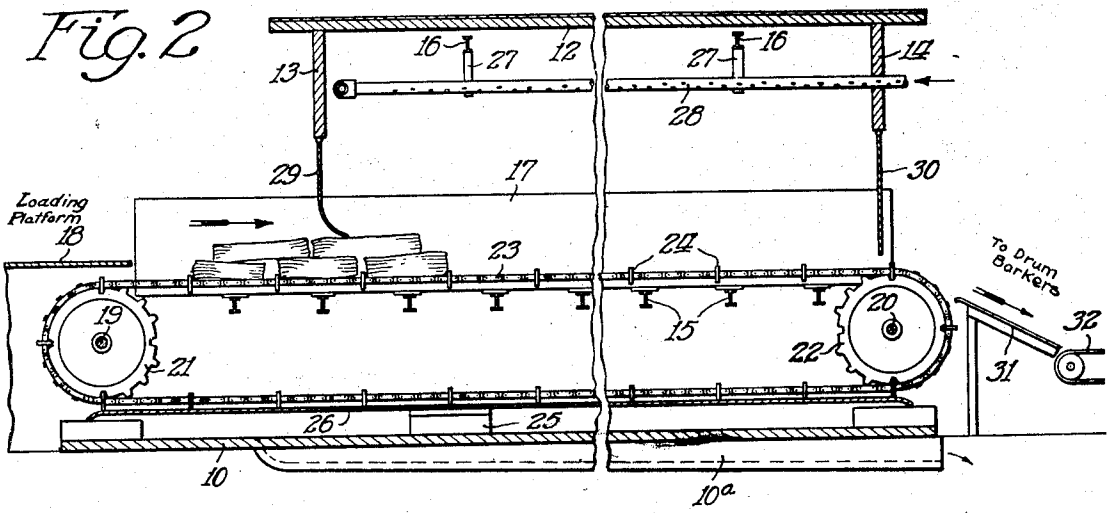


Fig. 2



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METHOD OF AND APPARATUS FOR THAWING PULPWOOD PRIOR TO DRUM BARKING

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2 Claims. (Cl. 144—208)

This invention relates to a new and useful method of and apparatus for thawing frozen pulpwood, and more especially the bark of such pulpwood, to put it in suitable condition for rapid removal of bark by the drum barkers. Heretofore, so far as I am aware, it has been a common practice to thaw the frozen bark of pulpwood by floating the latter in a so-called "hot-pond". This has several disadvantages. The pond is uncovered, and the loss of heat due to radiation is rapid. Also, the wood in a hot pond floats and only about one-half the diameter of the stick is submerged, so that the thawing of the bark is a slow operation and lacks uniformity unless the sticks be continuously rolled.

Another method of thawing the bark has been the application of hot water to the wood in the drum barkers while barking the wood. This method also has several disadvantages. Due to the limited length of time the wood remains in the barking drums, and the limited temperature of the water that can be used without producing excessive vapors and steam in the drum barker building, the efficiency of the barkers is low, and a long period of operation is required to thoroughly strip the wood of its bark.

With these defects of the present practice in view, one object of the present invention has been to provide a method of and apparatus for thawing pulpwood that would materially shorten both the time required for thawing and the time required for the subsequent barking operation. Another object has been to more efficiently thaw the bark and entirely remove the frost and ice before the wood reaches the barking drums, thus enhancing the efficiency of the latter. Another object has been to secure greater economy through a better heat exchange and a very substantial reduction in the loss of heat, as compared with known means and methods.

Still other objects and advantages of the invention will be apparent to persons skilled in the art, as the same becomes better understood by reference to the following detailed description, taken in connection with the accompanying drawing, wherein I have illustrated, somewhat diagrammatically, an equipment well adapted to carry out the novel method of thawing pulpwood, and in which—

Fig. 1 is a vertical transverse section through the thawing house.

Fig. 2 is a vertical longitudinal section, on a reduced scale and broken out between its ends, taken on the line 2—2 of Fig. 1.

Describing in a general way my improved method of thawing pulpwood, this consists in conveying the wood at a slow rate of travel through a building, from end to end of the latter, and, during the travel of the wood through the said building, thoroughly drenching the latter with plentiful sprays of hot water. The length of the building, the rate of travel of the wood, and the temperature of the water spray onto the latter, are all so related that, by the time the wood emerges from the building, the frozen bark has been thoroughly thawed and softened, so that the wood is then in favorable condition to be transferred immediately to the drum barkers.

An equipment adapted to carry out the above described method comprises what I term a thawing house. This may be simply a long rectangular structure comprising, in the instance shown, a concrete floor 10, side walls 11, a roof 12, and front and rear end walls 13 and 14; the latter terminating a short distance below the roof, as shown in Fig. 2; the walls and roof being equipped preferably with heat insulating materials.

Supported by and extending between the side walls 11 is a group of spaced I-beams 15, and supported by and extending between the upper ends of the side walls is another group of spaced I-beams 16.

Supported upon the transverse I-beams 15 are a pair of W-shaped troughs designated as an entirety by 17, these troughs extending the full length of the building and somewhat beyond the front wall 13, as shown in Fig. 2, the projecting portions of the troughs registering with suitable loading platforms indicated at 18. Fast on transverse shafts 19 and 20 at the front and rear ends of the trough 17 are sprocket wheels 21 and 22, respectively. Over each pair of front and rear sprocket wheels is trained a conveyor chain 23 on which, at uniform intervals, are flights 24. As shown in Fig. 1, the conveyor flights 24 are adapted to travel in the V-shaped channels formed in the bottoms of the troughs 17; power being applied to the shaft 20 to effect the travel of the conveyors. Mounted on the floor 10 are blocks 25 that support sheet metal channels 26, which latter constitute supports and guides for the lower limbs of the conveyors in an obvious manner.

Suspended from the I-beam 16 by V-shaped hangers 27 are a pair of pipes 28 each extending centrally above and lengthwise of the troughs 17. Each of these pipes 28 is perforated throughout substantially its lower half, and one end of each pipe is connected to a boiler or other source of hot water and equipped, of course, with a suitable shut-off cock or valve.

To conserve, as far as possible, the heat within the building, the front and rear walls 13 and 14 are equipped with suspended canvas sheets 29 and 30 closing the pulpwood receiving and delivery openings of said walls. The floor 10 is formed with an inclined drain 10^a designed to carry off the waste water, which latter passes by gravity into a water screen where the solid material principally bark, is removed. The screened water passes by gravity into the water heater from where it is pumped to the sprays.

In the operation of the apparatus, the frozen wood is automatically discharged from the loading platform 18 onto the several slowly moving conveyors, and by the latter is advanced in banked relation and without substantial agitation through the building and passes thence over a delivery platform 31 onto a conveyor 32 which carries it to the drum barkers. While traveling through the building the wood is continuously subjected to a plentiful spray of hot water from the spray pipes 28; and, as above stated, the length of the building, the speed of travel, and the temperature of the water are so regulated that, by the time the wood emerges onto the delivery platform 31, the bark has been thoroughly thawed. The wood is thoroughly deluged with the hot water during the entire period that it is on the conveyor in the thawing house.

I have found in practice that when using water at or somewhat below the boiling temperature, the bark is completely thawed in a period of about fifty minutes. And hence, we preferably so fix the length of the building and the speed of the conveyor, that the wood will take this period of time in traveling through the building.

This improvement effects a pronounced economy in the operation of the drum barkers, since I have found that one drum barker taking wood from this thawing conveyor will bark as much wood in a given time as two drum barkers taking green frozen wood direct from cars or storage. The apparatus also reduces the cost of labor and maintenance material, and also wood fiber loss, since it lessens the amount of tumbling, which latter increases brooming.

The temperature of the water will preferably be controlled by a thermostat which, being once set, enables the entire operation to proceed automatically and without attendants; but as such thermostat control is old and common in a number of arts in connection with the circulation of hot fluids, I have not illustrated the same herein.

I claim:

1. That improvement in the art of barking frozen logs, which consists in preliminarily completely thawing the bark on the logs avoiding subjecting the logs to hydrostatic pressure and, as far as possible, violent handling or otherwise loosening the bark before delivering said logs to the apparatus for separating the bark therefrom.

2. The combination with a barking apparatus of a separate apparatus for thawing frozen logs having an enclosing chamber and means for moving the logs slowly therethrough and subjecting them to heat, the temperature and the length and rate of travel being so related as to effect the thawing of the bark during such travel, and means for conveying the thawed logs to the barking apparatus.

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