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Logan

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[54] ULTRASONIC SHEET MATERIAL TESTING APPARATUS

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[52] **U.S. Cl.** **73/618**; 73/609

[58] **Field of Search** 73/609, 610, 618, 632, 73/633, 635, 639, 641, 642, 644

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[57] **ABSTRACT**

A device for testing sheet material, such as wood veneer, includes a rolling transducer for introducing ultrasonic signals into the veneer so as to cause travel of the signals generally in the plane of the veneer. Coupling oil filling this transducer facilitates the transmission of the signals into the veneer. Another similar rolling transducer is provided to detect the travelling ultrasonic signals. Each rolling transducer includes a special rim with an annular focusing ring for directing the ultrasonic signals to and from the veneer. A timer circuit produces a signal representing the travel time taken for an ultrasonic signal to pass between the transducers. An averaging circuit obtains an average of such travel times for each sheet and a grading circuit causes the sheet to be marked with a grade corresponding to the average travel time. A signal threshold detector prevents travel times for detected signals of a magnitude less than a preselected minimum level from being included in the average. Travel times for detected signals of a magnitude exceeding a noise level are blocked by a noise discriminator from being averaged. A variable noise level circuit adjusts the magnitude of the noise level at certain times following the transmission of an ultrasonic signal into the veneer. Detected signals having a travel time which is not between a preselected minimum and maximum time established by a time window circuit are disregarded. A calibration signal generator provides a signal of a known and adjustable time length for use in adjusting the grade corresponding to travel times.

28 Claims, 12 Drawing Figures