United States Patent

Alfsen

[15] **3,679,790**

[45] **July 25, 1972**

[54] METHOD OF FINISHING BOARDS OF VEGETABLE MATERIAL

[72] Inventor: **Alf Adolf Alfsen,** 116, Riddarvagen, Osterskar, Sweden

[22] Filed: **June 12, 1970**

[21] Appl. No.: **48,864**

Related U.S. Application Data

[63] Continuation of Ser. No. 689,450, Dec. 11, 1967, abandoned.

[30] **Foreign Application Priority Data**

Dec. 12, 1966 Sweden.....17032/66

[52] **U.S. Cl.**.....**264/280,** 264/119, 425/324, 425/335, 425/363

[51] **Int. Cl.**.....**B29j 5/10**

[58] **Field of Search**.....264/109, 124, 119, 280; 425/328, 329, 335, 363

[56] **References Cited**

UNITED STATES PATENTS

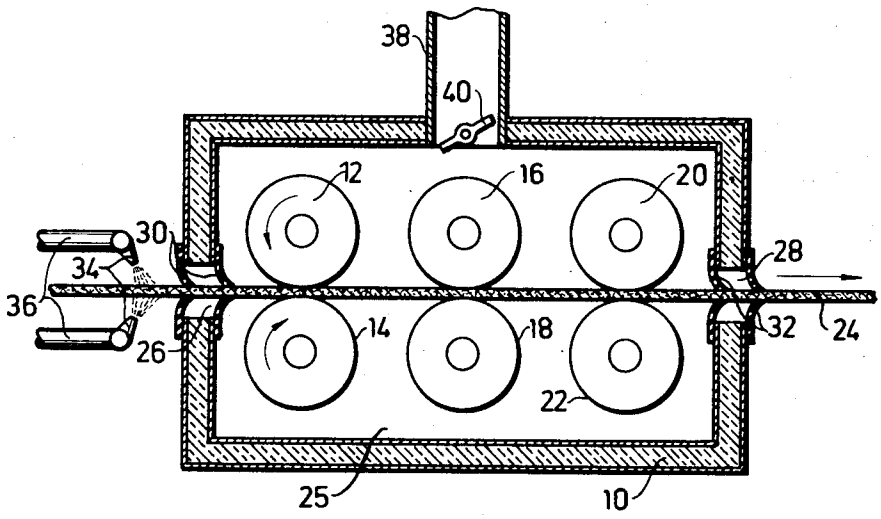
2,335,462	11/1943	Sommerville	264/284
3,021,244	2/1962	Meiler	264/109
3,157,723	11/1964	Hochberg	264/284
3,230,287	1/1966	Caron et al.	264/109
3,518,157	6/1970	Terry et al.	264/109

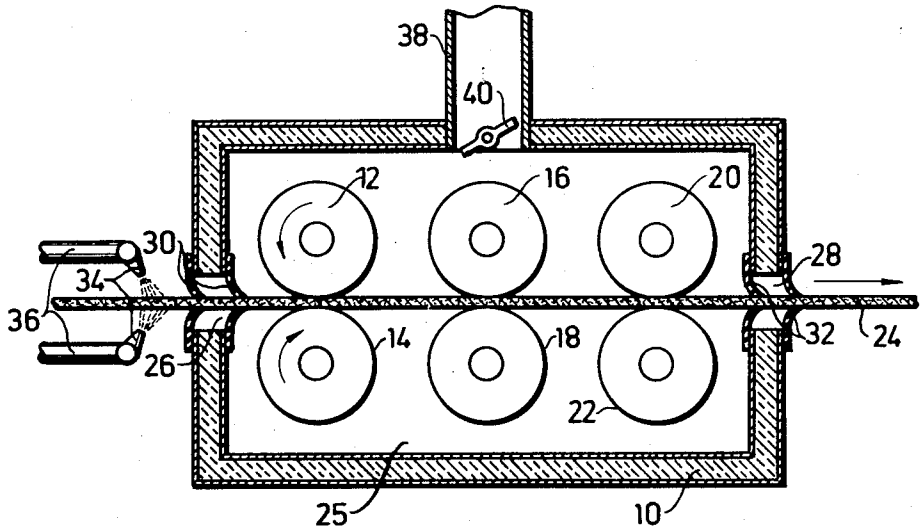
Primary Examiner—Julius Frome
Assistant Examiner—Arthur H. Koeckert
Attorney—Eric Y. Munson

[57] **ABSTRACT**

A method and an apparatus for finishing boards of vegetable material including the production of a sliding movement over at least one surface of the board. Specific apparatus elements are provided to effect the sliding movement including rotative and non-rotative structures. The method includes high temperature and high pressure treatment in combination with the production of a sliding movement on at least one surface of the board. The board may be treated after drying and upon both sides thereof simultaneously.

4 Claims, 1 Drawing Figure





Alf Adolf Alfsen
By Eric G. Swanson
Attorney

METHOD OF FINISHING BOARDS OF VEGETABLE MATERIAL

This application is a continuation of Ser. No. 689,450, filed 12-11-67, now abandoned.

More particularly this invention relates to the finishing of boards of vegetable fiber material and to an apparatus suited for carrying out the said method.

In the manufacture of wood fiber board or wallboard the sheet blanks of fiber pulp are subjected to a pressing operation at high temperature and under high pressure. That is, the temperature and pressure are sufficient to provide a final coherent fibrous structure in fiber pulp blanks. It is known already to expose the fiber boards produced in this way to a further heat treatment at a high temperature, such as 150° to 200° C., and under a long period, normally of 1 to 8 hours, for the purpose of improving their properties with regard to breaking strength and resistance to water. This subsequent heat treatment of the boards has hitherto been carried out in closed chambers, in which air is caused to circulate with high velocity and temperature. The drawbacks inherent to this method are high costs of apparatus, complicated and expensive handling of the boards and also great risk of ignition with waste of great value as a possible consequence.

To impart to the wallboards good surface quality for subsequent painting it is known to coat the surface of the board with a layer of fine fiber pulp prior to the pressing operation in the hot press, or to treat the finally pressed board with so-called sealers, oils or the like coating means.

PURPOSE OF THE INVENTION

One main object of the present invention is to provide a method of treating fiber boards so that they get excellent properties in one or several of the respects set out above while at the same time eliminating the drawbacks inherent to the known methods.

Another object of the invention is to provide a method of finishing fiber boards which can be performed rapidly without being dependent of specific admixtures.

SUMMARY OF THE INVENTION

According to a main feature of the invention the fiber boards are advanced between two surfaces under high temperature and at high pressure with a speed differing from that of at least one of the surfaces so as to create a sliding movement between said surface and said board.

BRIEF DESCRIPTION OF DRAWING

Further objects and advantages of the invention will become apparent from the following description considered in connection with the accompanying drawing which forms part of this specification and which is a diagrammatic cross-sectional view of an apparatus adapted for carrying out the method of the invention.

DESCRIPTION OF SPECIFIC EMBODIMENTS

Referring to the drawing, reference numeral **10** denotes a heat insulated housing in which a number of pairs of rollers or cylinders are mounted, such as in the illustrated embodiment three pairs denoted by, respectively, **12, 14; 16, 18; 20, 22.** The rollers are made of metal, such as steel cast, and preferably all of them have polished cylindrical surfaces. The rollers **16, 18** and suitably also the other rollers are provided with internal devices for the heating thereof to a high temperature, such as 250 to 500° C. The heating may be effected by electrically or by means of hot oil or some other suitable heating medium.

Fiber boards **24** are introduced into the chamber **25** encased by the housing through a gap space **26** and are discharged from the chamber through another gap space **28**, sealing means **30** and **32**, respectively, being disposed for closing the gap space on both sides of the board, if desired. Said boards may before their introduction into the chamber be

sprayed on one or both sides with water, oil, synthetic resins etc. supplied to nozzles **34** by pipes **36**.

The collaborating pairs of rollers are actuated by means (not shown) in such a manner as to cause the rollers to be pressed against the board **24** on both sides thereof with a high pressure. This pressure, calculated per centimeter in the axial direction of the rollers, the so-called linear pressure, can amount to **50** to **200** kgs or even more. That is, the linear pressure is based on the amount of weight imposed on each centimeter of length along the roller axis. One or several pairs of rollers, preferably the two outer ones **12, 14** and **20, 22**, respectively, convey the board through the chamber **24** with a predetermined speed while exerting pressure on said board. These pairs of rollers preferably also transfer heat to the board. One or several pairs of rollers, in the illustrated embodiment the intermediate pair **16, 18**, has another peripheral speed than the speed of advance of the wood fiber boards **24**. This peripheral speed may thus be higher or lower than that of the other pairs of rollers, but is effective in the same direction. This causes the rollers **16, 18** to slide or skid on the boards whereby a kind of ironing effect is obtained, which in conjugation with the high pressure and the high temperature imparts to the boards the desired surface treatment so that they get good capability of becoming painted due to closing the pores in their surfaces and simultaneous elimination of the phenomenon of fiber erection. It is also possible to compress finally dried boards so that they become thinner and thus obtain higher density and mechanical strength, if desired in combination with improved capacity of becoming painted.

The chamber **25** can be provided with an outlet **38** in which a valve **40** for control of the temperature in the chamber is provided.

The surface treatment of the fiber boards **24** passing through the chamber **25** in subsequent rows may be effected on one or both sides of the board. In the first-mentioned case only one of the rollers **16, 18** must have another relative speed than the speed of advance of the boards. When treating the boards **24** on their both surfaces the wire marking existing on one of their surfaces can be ground off beforehand. Hereby, it is rendered possible to manufacture from board having a smooth surface on one side only a board of the type S-2-S, viz., board with a finished surface on both sides. Hitherto, the manufacture of boards of this last-mentioned type has been possible only by applying the wet-dry process or the dry process. The boards treated according to the invention may be hardboard, semi-hardboard and porous board.

The rollers effecting the surface treatment, such as in the embodiment shown one of the rollers **16, 18** or both of them, may also be non-rotative or rotate in a direction opposite to the direction of advance of the boards, in which case the effect on the surfaces of the boards becomes particularly great. The number of roller pairs serving as conveyors for the boards **24** is preferably greater than the number of roller pairs creating sliding friction, especially if all have cylindric surfaces finished to the same degree.

The members producing the relative movement must not necessarily be rollers or cylinders but can also be constituted of sliding blocks, in particular in case they are non-rotative, or of endless bands. The invention includes also the treatment of wood particle boards and the like.

While the method of finishing boards of vegetable material and apparatus for carrying out said method have been shown and described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of the invention, without departing from the spirit thereof.

What I claim is:

1. A method for finishing the surface of rigid boards of vegetable fiber material comprising the steps of:

a. providing a treating zone having a plurality of pairs of pressure rollers disposed therein,

b. heating at least one of said pairs of pressure rollers to a temperature of from about 250° to 500° C.

c. advancing the boards through the treating zone between the plurality of pairs of rollers,

d. exerting pressure with said pressure rollers against the board,

e. said pressure being linear and at least 50 kilograms per centimeter along the axis of the rollers, and

f. producing a sliding movement in said treating zone onto at least one surface of the heated board to close the pores in the board and substantially eliminate fiber erection,

g. said sliding movement being produced by maintaining the rotating speed of at least one pressure roller at a different rate than the speed of the advancing board.

2. A method as defined in claim 1 wherein the sliding movement is provided after the board is in a dried condition.

3. A method as defined in claim 1 wherein said sliding movement is produced by passing the advancing board between at least one pair of rollers that are rotating at a relative speed less than the advancing speed of the board.

4. A method as defined in claim 1 wherein the sliding movement is provided on both sides of the board within the treating zone.

* * * * *