Oct. 12, 1943. V. BENDIX 2,331,297

VENEER PRESS

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Fig. 1.

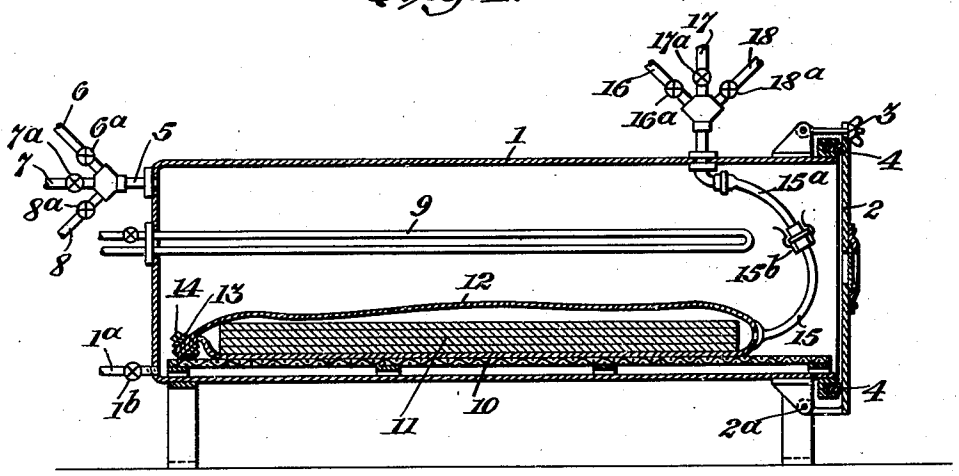
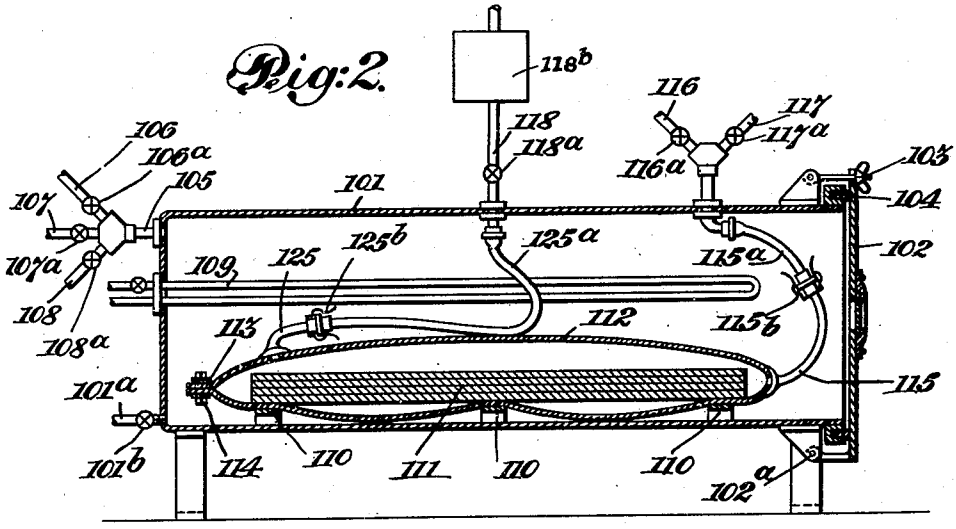


Fig. 2.



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5 Claims. (Cl. 144—281)

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawing which illustrates one form in which I have contemplated embodying the invention, and the said invention is fully disclosed in the following description and claims.

My invention is an improvement in veneer press for pressing and molding veneers of wood and other laminated materials connected by adhesive material to set the adhesive and secure the laminations or parts permanently together, and in some instances shaping them to the configuration of an inflexible mold.

In such presses, the pressure for holding the parts to be united in assembled relation is applied usually by a pressure fluid within a pressure chamber, to the exterior surface of the flexible wall of an envelope, which encloses the article to be treated, and upon the surface or surfaces of which the flexible wall of the envelope is forced by the fluid pressure, thus enabling the pressure of the fluid to be applied uniformly over the surface of the article treated. The flexible wall of the envelope naturally becomes wrinkled when subjected to pressure, and is likely to adhere to the surface or surfaces of the article treated, so that when the adhesive is set it is frequently a difficult matter to remove the flexible wall of the envelope from the article, occasioning delay in the operation and subjecting the flexible wall of the envelope to strains which may frequently cause it to crack or break and shorten its useful life.

The object of my invention is to provide means for facilitating the separation of the flexible wall of the envelope from the surface or surfaces of the article, and the separation of the envelope from the article treated, thereby expediting the treatment of articles in the press, and increasing the useful life of the flexible wall of the envelope.

In the accompanying drawing,

Fig. 1 represents more or less diagrammatically one form of apparatus for carrying my invention into effect, the flexible wall of the envelope being shown separated from the enclosed article for greater clearness.

Fig. 2 is a similar view showing a slight modification, the envelope being shown in distended condition.

In the constructon illustrated in Fig. 1, 1 represents a pressure chamber of any desired shape having a movable closure, preferably in the form of a door 2, hinged at 2a, and provided with securing means 3 and packing 4, by means of which the chamber 1 may be sealed. The chamber 1 is provided with an inlet pipe 5 to which are connected suitable pipes 6, 7 and 8, for example, connected respectively with sources of compressed air, steam and a refrigerating fluid, said pipes being controlled in this instance by valves 6a, 7a and 8a, or any other valve arrangement, so as to permit any one or more of said pipes to be connected with the interior of the chamber. While the admission of steam with or without compressed air affords a means for applying heat to the interior of the chamber, I prefer to provide the chamber with a separate heating means, as the steam coil 9, as indicated in the drawing. The chamber 1 is provided with suitable means for supporting one or more articles to be treated, which may be conveniently in the form of a grid 10, where it is desired to have the pressure fluid in the chamber act on all sides of the envelope. The chamber 1 is preferably provided with an outlet 1a, normally closed by a valve 1b, which may be opened to relieve pressure within the chamber. Pressure in the chamber may also be relieved by opening the door 2.

11 represents an article to be treated, which is here represented as being composed of laminations of wood veneer, or other suitable material, the contiguous faces of which are treated with any suitable or desirable adhesive material. The several parts of the article are assembled in proper relation and the article is enclosed in what I term an envelope or bag 12, preferably composed of rubber reinforced by fibrous material, as a textile fabric, for example, so as to provide a flexible, impervious wall, surrounding that portion of the article to which heat and pressure are to be applied to set the adhesive and permanently unite the parts adhesively connected thereby. The envelope is preferably sufficiently larger than the article to permit the article to be readily inserted therein and removed therefrom, and the said envelope is provided with suitable means for sealing it. In this instance it is shown in the form of a bag open at one end only, the open end being closed by clamping plates 13, secured by clamping means 14, for example.

A vent pipe or passage 15 leads from the interior of the envelope, and may be connected, for example, by a coupling 15b with a pipe 15a leading entirely outside of the chamber 1. As shown in the drawing, the pipe 15a is connected with branch pipes 16, 17 and 18, each provided with means for separately controlling it, in this instance the valves 16a, 17a and 18a respectively.

As shown the branch pipe 17 discharges directly, or indirectly, to the atmosphere. Branch pipe 16 is connected with a supply of fluid under pressure, preferably compressed air. Branch pipe 18 is connected with a supply of a fluid for treating the surface of the article in the envelope, as a waterproofing medium, for example, or the inner surface of the envelope itself, as a substance for reducing the adhesion of the flexible wall of the envelope to the surface of the article to be treated.

In the use of the press it will be understood that the article to be treated will be placed in the envelope 12 and inserted in the pressure chamber 1. After connecting the vent pipe sections 15 and 15a by coupling 15b, the chamber is closed by means of the door 2. The passages 16 and 18 will be disconnected from the envelope by their respective valves 16a and 18a, the valve 17a controlling vent passage 17 being open.

The chamber 1 is then filled with fluid under pressure by admitting steam or compressed air or both, which pressure will be applied to the flexible wall of the envelope 12, collapsing it upon the contiguous surface or surfaces of the contained article (or articles) and distributing the pressure uniformly over the surface (or surfaces) of the article. Where desired, heat can be simultaneously applied to the article from the steam, where steam is introduced, or by the steam coil 9, or by both heating means.

The application of pressure, usually accompanied by heat, will set the adhesive material and permanently unite the parts, as the laminations or other separate parts, of the article. This setting may be further facilitated by shutting off the heating medium and admitting a refrigerating medium, also under pressure to cool the adhesive material, preferably without reducing the pressure exerted thereon, through the flexible wall of the envelope.

As the envelope is forced into contact with the contained article, the occluded air within the envelope will be forced out and discharged into the atmosphere through pipe 17 and open valve 17a. After the setting process is completed, the valve 17a is closed and the valve 16a is opened to force into the envelope and between the flexible wall thereof and the surface of the article, compressed air or other fluid material, which will facilitate the separation of the flexible wall of the envelope from the adjacent face or faces of the article, and the removal of the envelope. This method of separating the flexible wall from the article upon which it will have been forced usually in a more or less wrinkled condition, permits this to be accomplished quickly and with a minimum of strain and wear upon the flexible wall of the envelope, the useful life of which is materially prolonged.

It will be understood that when the envelope or bag is subjected to external pressure it becomes more or less wrinkled and portions in direct contact with the article treated may adhere thereto, while other portions not in contact with the article will not so adhere. When the pressure fluid is admitted to the envelope it will obviously find its way to the non-adhering portions of the wrinkled flexible wall and tend to distend the wall and free the adhering portions of the wall from the article contained therein, thus facilitating the removal of the envelope from said article.

Where it is desired to treat the article with a substance, for example, a water resistant or waterproofing material, or any other desired material, it may be admitted through pipe 18 by opening valve 18a, when the valve 16a is open, and the material will be forced into the envelope and between its flexible wall and the surface, or surfaces, of the article. Obviously where this is desirable, the envelope with the contained article, or articles, so treated can be removed from the chamber 1 and permitted to stand for a greater or less time to enable the added material to effect its desired function.

In Fig. 2 I have shown a slightly modified embodiment of my invention in which the parts corresponding to those shown in Fig. 1 are given the same reference numerals with the addition of 100. In this figure the envelope 112, which is supported on cross-slats 110, is shown in distended or inflated condition and freed from the within article. It will be understood that instead of connecting the interior of the envelope by a single pipe with the atmosphere and also with the inlet passages for fluid under pressure and for admitting a treating fluid, as shown at 17, 16 and 18 in Fig. 1, I may provide the envelope with separate pipes for these several, or other, purposes. In Fig. 2 I have shown the pipe 115 from the interior of the envelope connected to pipe 117 leading to the atmosphere, and a pipe 116 for the admission of fluid pressure, for example, while the envelope is provided with a separate pipe 125, connected by coupling 125b with a pipe 125a, which extends outside of the casing 101, and is connected by a pipe 118, provided with controlling valve 118a with a source of fluid under pressure indicated diagrammatically at 118b, by means of which any added material, as waterproofing or other fluid, for the treatment of the enclosed article, may be admitted into the envelope.

It will also be understood that where the envelope is provided with two (or more) separate pipes or passages, the controlling valves of two of such pipes can be opened to admit a fluid of any kind for treating the contained article through one of said pipes, and discharge it through the other, thus permitting it to be circulated through the envelope around and in contact with the article, without appreciable pressure, and by closing the controlling valve for the outlet pipe more or less and admitting the circulated fluid under suitable pressure, any desired pressure of the circulated fluid can be maintained within the envelope. By closing the controlling valves of all of the pipes but one and connecting that one with a source of fluid under pressure, any desired pressure may be accumulated in the envelope to facilitate freeing it from the article, or for any other purpose.

If it is desired to subject the article within the envelope to a treating fluid under pressure, the pressure within the pressure chamber may be maintained, which will relieve the envelope of outward strain to a greater or less extent, according to the differential of pressures on opposite faces of its flexible wall. It will be understood that the treating fluid may be circulated under pressure as described above while maintaining fluid pressure on the exterior of the envelope.

In Fig. 2 it will be understood that the valve 117 is in closed position and that fluid under pressure is being admitted to the envelope through pipe 116 (or pipe 118, or both) to inflate the envelope and facilitate the separation of the portions of the flexible wall which may have adhered to the article, from said article, and the

removal of the envelope therefrom, and the envelope is shown in this figure in the inflated or distended condition.

What I claim and desire to secure by Letters Patent is:

1. In a press of the kind described, the combination with a pressure chamber, and means for supplying fluid under pressure thereto, of an envelope for containing an article to be treated in said chamber, means for sealing said envelope, said envelope having a flexible impervious wall, and being provided with a passage extending outside of said chamber, means for relieving the pressure within said chamber, means for selectively connecting said passage with the atmosphere, and with a source of fluid under pressure, controlling valve mechanism for said connections, and means for supplying a treating material through said passage to the envelope.

2. In a press of the kind described, the combination with a pressure chamber and means for supplying fluid under pressure thereto, of an envelope for containing an article to be treated in said chamber, means for sealing said envelope, said envelope having a flexible impervious wall and being provided with a vent passage discharging outside said pressure chamber, means for relieving the pressure within said chamber, and means for inflating said sealed envelope to progressively separate the flexible wall of the envelope from the contiguous surface of the article without distortion of the article.

3. In a press of the kind described, the combination with a pressure chamber, and means for supplying fluid under pressure thereto, of an envelope for containing an article to be treated in said chamber, means for sealing said envelope, said envelope having a flexible impervious wall and being provided with a plurality of passages extending therefrom to the exterior of said pressure chamber, independent controlling means for said passages, and means connected with said passages for inflating said envelope to separate the flexible wall of the envelope from the article and for circulating fluid through said sealed envelope at any desired pressure in contact with the article contained therein.

4. In a press of the kind described, the combination with a flexible impervious wall for engaging the article to be treated, means for applying fluid pressure on the exterior face of said flexible wall to force it to conform to the surface of the article and to apply pressure uniformly thereto, means for conducting away occluded air between said wall and the surface of the article, and means for forcing a fluid under pressure greater than that on the exterior surface of said wall between said flexible wall and the surface of the article, to separate said wall from the article while maintaining pressure on said exterior surface.

5. In a press of the kind described, the combination with a pressure chamber, of an envelope in said chamber for containing an article to be treated, and means for sealing said envelope, said envelope having an impervious flexible wall, means for admitting fluid under pressure to said chamber for forcing the flexible wall of said envelope into contact with the surface of the contained article, to force occluded air out of the envelope and to apply pressure uniformly to the article, means for venting the occluded air within said envelope, means for relieving the pressure on the exterior of said envelope, and means for forcing fluid under pressure into said envelope to expand said envelope and break adhesion between said flexible wall and the contained article while the envelope and article are enclosed in said pressure chamber.

VINCENT BENDIX.