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R. MARTIN

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PRESS

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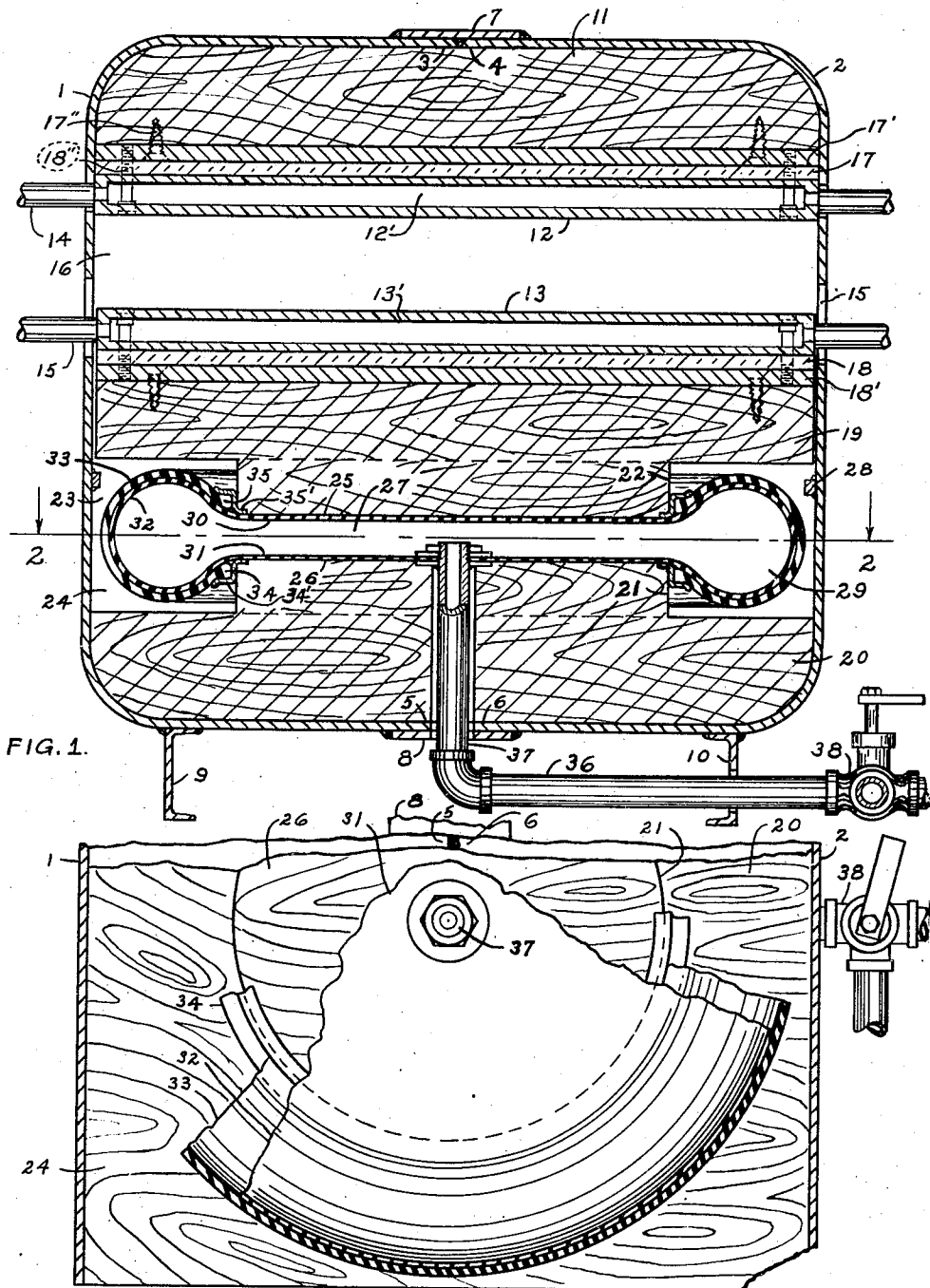


FIG. 1.

FIG. 2.

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UNITED STATES PATENT OFFICE

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PRESS

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8 Claims. (Cl. 144—281)

This invention relates to presses and particularly to that class which are adapted for use in making plywood.

Due to the rapidly increasing demand for plywood for use in building boats, panel sections for houses, airplanes and other manufactured articles and the unavailability of metals and skilled labor and tools at this time to produce the normal type of press, there has arisen a constantly increasing demand for a low cost efficient fluid-operated machine which can be manufactured by inexpert labor from available materials without the necessity of employing pistons, piston ring, cup leathers or packings.

According to my invention the use of metal is practically negligible, machine work is reduced to a minimum if not wholly avoided and the resultant machine will have a high efficiency with a minimum of cost.

An important feature is that the press constituting my invention can be built almost anywhere with ordinary tools.

Other objects and advantages of the invention will be better understood by reference to the following description in connection with the accompanying drawing in which:

Fig. 1 is a cross section through a press constructed in accordance with my invention and:

Fig. 2 is a fragmentary section on the line 2—2 of Fig. 1.

As illustrative of my invention I provide a frame consisting of two U-shaped members 1 and 2 having their respective free edges 3 and 4 and 5 and 6 in abutting relation, the edges 3 and 4 being secured together by a binder strip 7, and the edges 5 and 6 being fastened together by a similar strip 8 so that a box-like frame is provided open at its respective ends. The frame may be supported on base rails 9 and 10. The upper portion of the frame carries a rigid head member 11 which may be secured to the frame in any well known manner.

Supported under the head and upon the ram are platens 12 and 13. The platens may be provided with passageways 12' and 13' for circulation of a heating medium such as steam supplied from any suitable source through the pipes 14 and 15, the pipes 15 extending through slots 15' in the members 1 and 2 to accommodate movement of the ram. Between the platens 12 and 13 there is a space 16 to receive the material to be pressed for example laminations of plywood with suitable binding material between them. There may be insulation 17 between the head 11 and the platen 12 and similar insulation 18 may be interposed between the platen 13 and the movable ram 19 to be actuated by pressure below. It is to be noted that the head, the platen 12 and the insulation between are all rigid with the casing, while the platen 13, the press ram and the insula-

tion between them all move together to compress the material to be treated. To facilitate attachment of the platens 12 and 13, the facing surfaces of the head and ram may carry plates 17' and 18' attached thereto by suitable fastening devices such as screws 17". The platens, with the insulation are then attached to the plates by machine screws or the like 18".

In the bottom of the frame is a base block member 20 cut away circumferentially at 21 complementary to a cut away portion 22 in the ram, such cut away portions forming recesses 23 and 24 to provide facing projecting portions 25 and 26 and an annular space therearound between the ram and base for receiving the shoe or reinforcing member of an expansible envelope located between the base block and the ram as will be more clearly understood hereinafter.

A space 27 is also maintained between the ram and the base block by the stops 28 on the frame. The space thus provided accommodates an expansible and contractible fluid receiving member 33. The member 33 is formed of flexible material capable of withstanding normal working pressures and being of substantially C-shape cross-section to provide an annular wall terminating in inwardly extending marginal edges 34 and 35, the edge 34 being secured to the base block by a ring 34' and the edge 35 to the ram by a ring 35' which rings encompass the reduced portions 25 and 26 of the base block and ram respectively. The flexible member 33 thus connects the ram with the base block and cooperates with the space 27 to form an enclosed pressure chamber adapted for expansion in the direction of the ram but having substantially little perimetrical expansion when a pressure fluid acts within the chamber. To assure positive retention of the pressure fluid the pressure chamber may be provided with an envelope 29 consisting of webs 30 and 31 respectively engaging the end faces of the reduced portions 25 and 26 and connected by an enlarged perimeter 32 substantially C-shaped in cross-section and contained in the flexible member 33. It is thus obvious that the member 33 acts as a shoe to reinforce the enlarged perimeter of the envelope when it is distended by internal pressure.

The pressure fluid is admitted through pipes 36 and 37 under control of a three-way valve 38 whereby the pressure fluid is admitted to the chamber in one position of the valve and vented from the chamber in another position as will well be understood.

From the foregoing it will be apparent that the material to be pressed can be inserted in the space 16 in the usual manner and that when pressure is generated within the envelope the ram will move toward the material and compress the laminations (if plywood is being made) together with

an initial cushioning effect so that all the laminations with the binding material between them will be forced one against the other in an efficient manner to produce the desired result.

As heretofore stated, it is one of the prime objects of my invention to make an efficient press in an inexpensive manner and wherever possible conserve material by using whatever material is at hand. To this end I have found that old tire casings admirably serve as shoes 33 and that wheel rims can be used to fasten the beads or free edges of the tire casings to the base block and the ram respectively. I recommend this whenever expedient but I do not wish to necessarily limit myself to their use. I prefer the tire casings because they are cheap and have enough flexibility to move the ram into pressing position and will readily assume their normal shape when the ram is retracted by exhausting fluid from the envelope.

It will be appreciated that danger of the rubber envelope chafing during the movement of the ram is prevented by enlarging its perimeter and extending it and its shoe outwardly in space beyond the central support.

What I claim is:

1. A press comprising a frame, a head carried by the frame, a base, a ram movable toward the head and means for actuating the ram, said means consisting of an envelope having central upper and lower web portions in spaced relation and connected one to the other by a peripheral portion C-shaped in cross section, a flexible shoe C-shaped in cross section surrounding the peripheral portion of the envelope, the inner edges of the shoe being spaced apart to accommodate said web portions therebetween, one edge of the shoe being secured to the base and the other to the ram, and means for admitting expanding fluid into the envelope.

2. A press comprising a frame, a head carried by the frame, a rigid base carried by the frame having an inwardly disposed constricted end, a movable ram between the head and the base having a constricted end disposed toward the constricted end on the base, an envelope between the ram and the base, and a flexible reinforcing member surrounding the envelope, said reinforcing member having one edge secured to the constricted end of the base and another to the constricted end of the ram, and means for directing fluid under pressure into the envelope.

3. A press comprising a frame, a head at one end of the frame, a base at the other end of the frame, a movable ram between the head and the base and in spaced relation with each, a constricted end on the base facing the ram, a constricted end on the ram facing the base, an envelope between the constricted ends of the base and the ram and extending beyond the edges thereof, the outer portion of the envelope having an enlarged form, and a reinforcing shoe for the enlarged outer portion of the envelope, said shoe consisting of a flexible member substantially C-shaped in cross section having one edge fastened to the base and the other to the ram, and means for supplying fluid under pressure into the envelope.

4. A press comprising a frame, a head at one end of the frame, a base at the other end of the frame below said head, a movable ram be-

tween the head and the base and in spaced relation with each, a flexible tire-like casing member, in the outer part of the space between the ram and the base, means for fastening one edge of the tire-like casing member to the upper portion of the base, means for fastening the other edge of the member to the lower portion of the ram, and means for admitting fluid under pressure into the space between the base and the ram.

5. A press comprising a frame, a head in the frame, a base in the frame distant from the head, a ram between the head and the base and in spaced relation with both, a fluid pressure receiving envelope between the ram and the base, the envelope being circumferentially reinforced by a flexible wall having C-shaped cross-section, said wall having its terminating edges fastened to said ram and base respectively, and means for admitting fluid under pressure into the envelope.

6. A press including, a base, a head spaced from the base, a ram movable in said space to and from the head, said base and ram being provided with annular seats, a flexible tire-like fluid receiving member having an annular wall terminating in annular bead-like edges with one edge engaging the seat of the ram and the other edge engaging the seat of the base to connect the ram with the base and provide an enclosed space between the base and the ram, and means for admitting fluid under pressure into said enclosed space to move the ram.

7. A press including a head member, a base member spaced from the head member, a movable ram located in the space between the base and head members, said ram and one of said members having facing projecting portions cooperating to provide an annular space between said member and the ram surrounding said projecting portions, a member made of a flexible material and being substantially C-shaped in cross section arranged in said annular space and having one edge fastened to the periphery of one projecting portion and the other edge fastened to the other projecting portion, said flexible member cooperating with the projecting portions to provide a pressure chamber between said projecting portions and having outwardly disposed portions extending into said annular space so that the edges of said C-shaped member may spread apart to permit the ram to move without appreciably effecting the perimeter of said C-shaped member, and means for admitting a pressure medium into the pressure chamber.

8. A press including a head member, a base member spaced from the head member, a movable ram in the space between the base and head members, said ram and said base member having facing projecting portions cooperating to form an annular space between said members and surrounding said projecting portions, a fluid receiving member made of a flexible material and being substantially C-shaped in cross section and positioned in the annular space between the ram and base members and having one edge fastened to the projecting portion of the ram and another edge fastened to the projecting portion of the base and cooperating with said facing projecting portions to provide a pressure chamber, and means for admitting fluid pressure into the pressure chamber.

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