April 14, 1953 R. G. WEYANT 2,634,773

PRESS DIAPHRAGM

Filed Aug. 13, 1948

FIG. 1

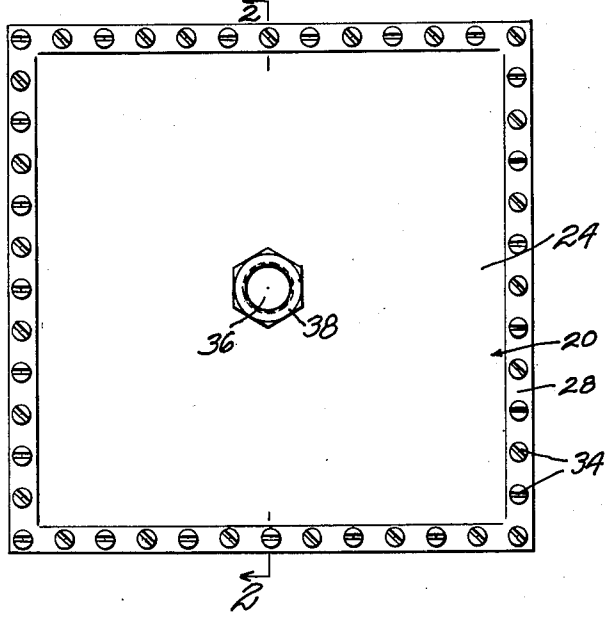


FIG. 2

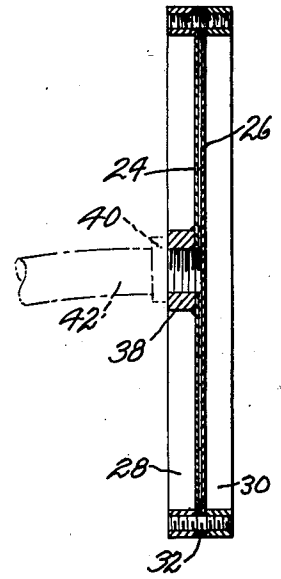
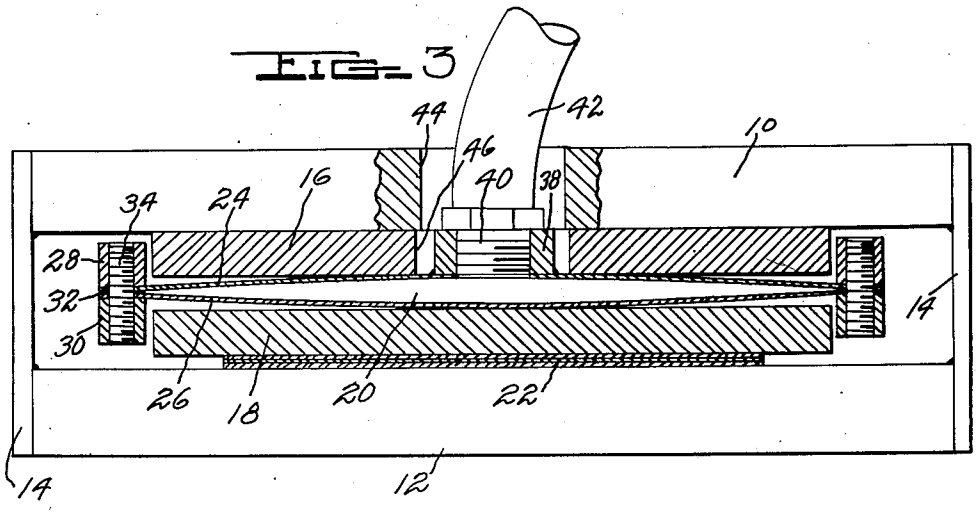


FIG. 3



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PRESS DIAPHRAGM

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1 Claim. (Cl. 144—281)

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This invention relates to a press and more particularly to a pressure transmitting member for use in presses where a small amount of movement is required to develop high pressures especially adapted for use on laminated materials such as plywood.

In forming plywood material several superimposed sheets are glued together and pressure is applied to the sheets while the sheets are in a heated condition.

It is an object of the present invention to provide an inexpensive press frame wherein an expansible diaphragm is used to exert the required pressure; the diaphragm being controlled by a fluid pressure such as air or liquid.

Another object of the invention is to provide a laminated diaphragm in which a pair of thin sheet metal plates are secured together at their edges with a fluid passage in one of the plates for admitting a fluid pressure between the plates.

A further object of the invention is to form the sheets of resilient material, preferably stainless steel or the like, so that the sheets will assume a normal flat position after they have been separated by the application of pressure between the sheets.

Other objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a top plan view of a preferred form of diaphragm used to transmit a fluid pressure to the press;

Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1; and

Fig. 3 is a cross sectional view of the diaphragm as applied to a press wherein parts are broken away and shown in section.

Referring to the drawings, I have shown a press in the form of a frame having a header portion 10 vertically spaced from a base portion 12. The head and the base are held in spaced relation by lateral supports 14 which are welded or otherwise secured to the head 10 and base 12 maintaining them in spaced relation.

An upper pusher plate 16 and a lower pusher plate 18 is arranged between the head 10 and base 12 and the improved diaphragm 20 is placed between the pusher plates 16 and 18. A space is provided between the lower pusher plate 18 and the base 12 for the reception of the work which is illustrated as a plywood sheet 22.

The diaphragm 20 comprises a pair of superimposed thin metal plates 24 and 26 which are secured together at their edges. The plates are preferably formed of stainless steel or a like material which has a considerable amount of resiliency. As a means for securing the edges together, I have shown an upper peripheral ring 28 contacting the outer face of the plate 24 and a similar ring 30 contacting the outer face of the plate 26. A gasket 32 is arranged between the plates 24 and 26 within the area of the overlapping rings 28 and 30. A plurality of peripherally spaced screws 34 are adapted to draw the rings

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28 and 30 toward each other tightening the plates 24 and 26 into sealing contact with the gasket.

A port 36 is provided in one of the plates, preferably at the center of the plate 24, and a threaded flange 38 is secured to the outer surface of the plate 24 to receive a fitting 40 to which is attached a fluid pressure line 42 through which air or hydraulic fluid may be introduced between the two plates for the purpose of expanding the overall thickness when pressure is applied. The pressure when applied moves the two plates away from each other and this motion is transmitted to the base portion 18, reacting against the header portions 10 and 16, which exerts a pressure on the work. When the pressure is reduced the resiliency of the plates caused them to assume their normal flat and contacted position, shown in Fig. 2.

The header 10 and the pusher plate 16 are provided with aligned apertures 44 and 46 respectively for the reception of the flange 38, fitting 40 and pressure line 42.

The diaphragm has been found to be very effective as it provides adequate pressures very quickly due to the double expansion of the diaphragm members and a small amount of movement is required to develop high pressures in the laminated material in the press. It has been found that heat does not adversely effect the life of the diaphragm as in the use of fabric or other flexible materials such as rubber or the like.

I have illustrated the diaphragm as being square but its outer perimeter may be round, oval or any other shape to conform closely with the shape of the work. If it is desired to press a work piece of considerable area two or more units as above described may be used on a single work piece.

While I have illustrated and described a device made in accordance with the preferred embodiment of my invention, it will be understood that various changes including the size, shape and arrangement of parts may be made without departing from the spirit of my invention and it is not my intention to limit its scope other than by the terms of the appended claim.

I claim:

A pressure producing bellows comprising a pair of superimposed resilient sheets of metal, a gasket between the adjacent faces of said sheets at the edges thereof, a ring at each of the outer faces of said sheets within the region of said gasket, spaced screws for drawing said rings together, and an apertured fitting secured to one of said sheets for receiving a fluid pressure fitting.

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