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HYDRAULIC PRESS, ESPECIALLY FOR PRODUCING PALATE PLATES

Filed June 26, 1934

Fig. 1.

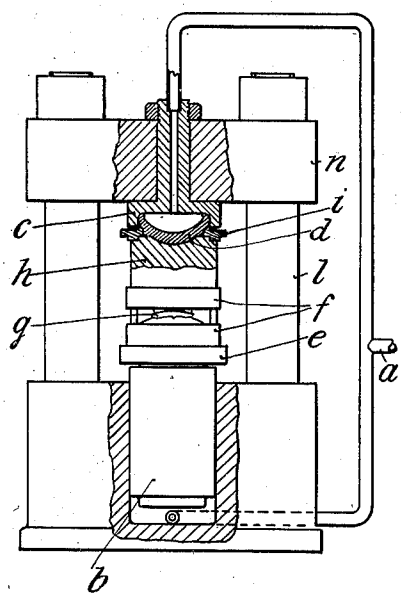



Fig. 2.

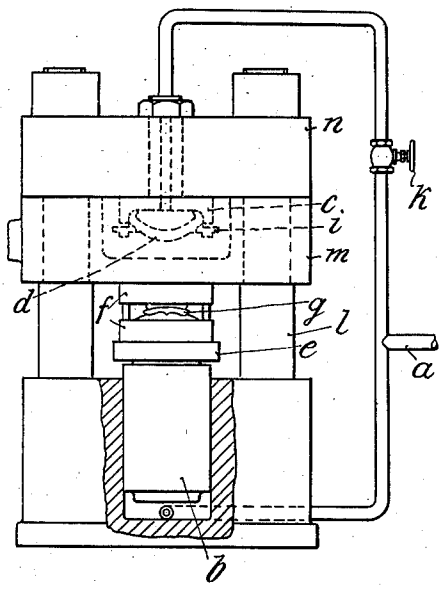
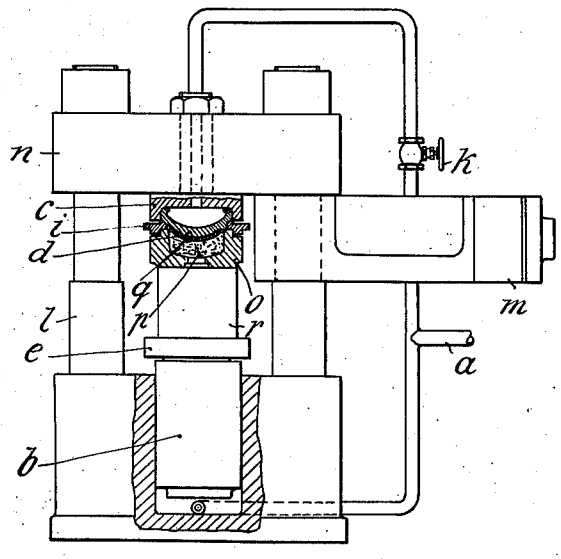



Fig. 3.




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## HYDRAULIC PRESS ESPECIALLY FOR PRODUCING PALATE PLATES

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6 Claims. (Cl. 18—16)

For the manufacture of palate plates, as substitutes for teeth, in the past, there have been two presses necessary, a hydraulic or spindle-press as cuvette-press for the first shaping of the plates at the start and a palate plate press for finishing the roughly formed plates. In the latter press a rubber press plate having the shape of the palate and being under hydraulic pressure serves to produce the exact lines and marks of the patient's palate.

The well known hydraulic rubber presses are provided with a turning spindle in order to tightly press the form ring and cylinder of the rubber press or the holding ring of the rubber press plate against each other, in order to prevent the rubber press plate from getting out of its place. Such winding spindles have to bear very high forces and therefore are very expensive to manufacture.

The press of the present invention has two pistons one of which is placed in the upper traverse, the second in a lower traverse of the press. The direction of movement of the two pistons is against each other.

As abutment for the body which has to be exposed to pressure an intermediate traverse can be placed which can be swung sideways.

The bodies which are to be exposed to pressure may be for instance test bodies, molds in which masses are shaped or the like.

Each piston may be moveable singly if desired.

For manufacturing palate plates it is an advantage that the first pressing of the starting plates as well as the finishing pressing of the roughly formed plates can be pressed with the aid of the same press machine. When the roughly formed plates are pressed, the form ring and the holding ring of the rubber press plate can be kept closed hermetically with each other in such manner that the cylinder of the press piston will have a greater clear cross section than the cylinder with a rubber disc at its end.

In the drawing the press is shown in two constructions; Figures 1 and 2 show the press in the operation of the preforming, that is, as a so called cuvette press, and Figure 3 the press in the operation of finish pressing of the palate press, that is, as so called rubber press.

The use of the press is as follows:

In Figure 1: By a pump not shown the press fluid is forced through pipe *a* to the lower piston *b* and also to the upper cylinder *c* whose end is closed by the rubber disc *d*. On the press plate *e* of the piston *b* the cuvette *f* rests. The cuvette contains the plate *g* properly cut for the preforming operation. On the cuvette *f* an inserting piece *h* is placed which is formed with its upper part corresponding to the shape of the rubber press disc, and lies close against holding ring *i* and rubber disc *d*. Instead of using a special inserting piece *h* the upper part of the cuvette *f* may be so formed that it corresponds to the shape of the rubber press disc and lies close against holding ring *i* and rubber press disc *d*.

As the cylinder of piston *b* has a greater clear cross section than cylinder *c* a metallic contact is attained between the inserting piece *h* and the holding ring *i* of the rubber press disc, because at equal fluid pressure the power of the piston *b* with larger cross section is higher than the power coming from the rubber press disc with smaller cross section.

In Figure 2 the parts of cuvette *f* are pressed together by pumping the fluid through pipe *a* to piston *b* whilst the lead to cylinder *c* is shut by valve *k*. In this case the cuvette *f* lies close against an intermediate traverse *m* which may be swung around one of the columns *l*. The intermediate traverse is so constructed that it encloses the upper cylinder *c* with rubber disc *d* and transfers the pressure, necessary for preforming, directly to the upper traverse *n*. After preforming the plate *g* the pressure of the pipes is released. When using a press with an intermediate traverse *m*, this is turned out and valve *k* opened. See Fig. 3. The form ring *o* with the cup-shaped hollow form *p* and the preformed plate *q* is placed on the intermediate piece *r* of sufficient firmness which lies on press piston *b*. Upon application of the pressure fluid piston *b* lifts itself and brings the form ring *o* with the holding ring *i* of the rubber disc *d* to a metallic close contact. As soon as the close contact is attained, the pressure is increased to the extent necessary for the finish pressing.

In the rubber press, cover layers, for instance, sponge gold or the like, may be pressed on the palate plate.

After the finish the pressure is let off and the ready palate plate *q* is taken out of ring *o*.

What we claim is:

1. A hydraulic press having an upper traverse and a lower traverse, pressing devices mounted in said upper and lower traverses respectively, means for directly actuating said pressing devices either alone or simultaneously with the other by hydraulic pressure for applying pressure in opposite directions to the work supported by the traverse of the lower pressing device between said pressing devices.

2. A hydraulic press having an upper traverse and a lower traverse, pressing devices mounted in said upper and lower traverses respectively, means for directly actuating said pressing devices either alone or simultaneously with the other by hydraulic pressure for applying pressure in opposite directions to the work supported by the traverse of the lower pressing device between said pressing devices, a movable abutment, movably mounted so as to be moved into position between the upper and lower traverses to serve as an abutment for a mold when pressure is applied by one of the pressing devices acting singly.

3. A press as claimed in claim 1, wherein one of the hydraulically actuated traverses comprises a cylinder having a plunger therein and the other traverse comprises a cup having an inlet for liquid under pressure and a rubber diaphragm forming a die.

4. A press as claimed in claim 1, wherein one of the hydraulically actuated pressing devices comprises a cylinder having a plunger therein and the other pressing device comprises a cup having an inlet for liquid under pressure and a rubber diaphragm forming a die, said plunger supporting a hollow form for holding the work for one shaping operation, and the hollow form supporting a removable matrix adapted to coact with the die for another shaping operation.

5. A press as claimed in claim 1, in which one of said pressing devices has a cup, an intermediate traverse pivoted adjacent the upper and lower traverses to be swung across the press between said upper and lower traverses, said intermediate traverse having a recess receiving the cup when the intermediate traverse is so swung, said intermediate traverse then serving as an abutment for the form when the lower pressing device acts alone for the forming.

6. A press as claimed in claim 1, wherein one of the hydraulically actuated pressing devices comprises a cylinder having a plunger therein and the other traverse comprises a cup having an inlet for liquid under pressure and a rubber diaphragm forming a die, the bore of the cylinder exceeding the internal cross-section of the cup.

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