

Dec. 4, 1962

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3,066,430

HEATING BODY, ESPECIALLY FOR PRESSING PLATES

Filed March 11, 1960

Fig. 1

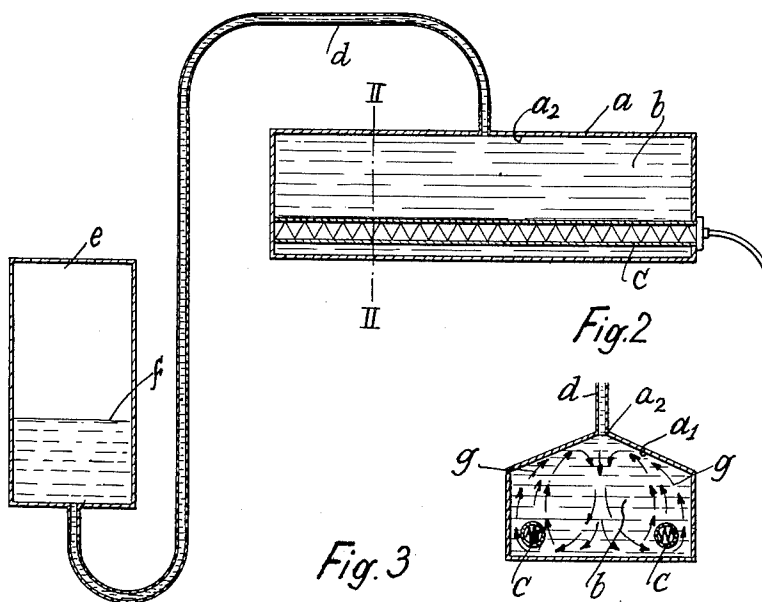


Fig. 2

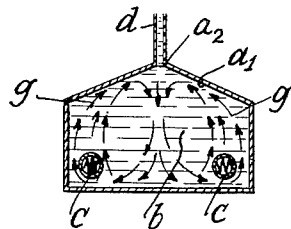
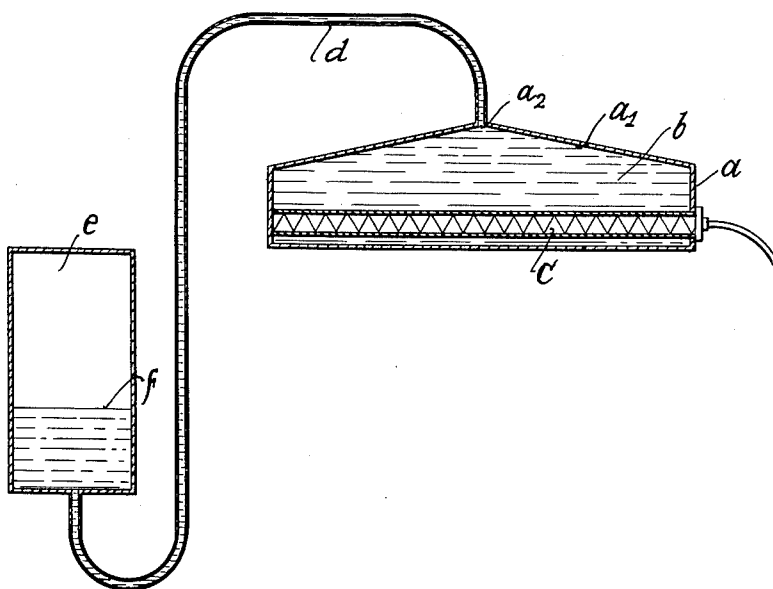


Fig. 3



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HEATING BODY, ESPECIALLY FOR PRESSING PLATES

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Filed Mar. 11, 1960, Ser. No. 14,385
2 Claims. (Cl. 38—66)

The present invention relates to garment presses and, more particularly, to a heatable hollow body especially for use in connection with garment presses.

It is a well-known fact that pressing plates for garment presses work at considerably high temperatures inasmuch as the pressing surface proper should have a temperature of up to 200° C. If such pressing plate is to be heated by a fluid, it is necessary that the heating fluid in said pressing plate adjacent the pressing surface must have at least a temperature of 240° C. Inasmuch as the pressing surface as a rule points downwardly, which means is the lowest surface in the hollow body representing the pressing plate, it will be obvious that the temperature of 240° C. of said heating fluid will represent the lowest temperature of the heating fluid.

It is an object of the present invention to provide a fluid heatable hollow pressing body adapted to serve as pressing plate for garment presses, which will assure a safe operation of the press while retaining the fluid for a maximum of time.

It is another object of this invention to provide a pressing plate of the type set forth in the preceding paragraph, which will be relatively simple in construction, economical as to cost and safe as to operation.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawing, in which:

FIG. 1 diagrammatically illustrates a hollow body according to the invention with a compensating container.

FIG. 2 is a transverse section through FIG. 1 along the line II—II of FIG. 1.

FIG. 3 diagrammatically illustrates a slight modification over the hollow body of FIG. 1.

The invention is characterized primarily in that the completely closed hollow body filled with fluid as for instance contact oil, has heatable means located in said hollow body and said fluid. A single conduit means leads from the highest point of said hollow body to a likewise completely closed compensating container while first slightly ascending and then descending and leading into the lower end of said last mentioned container. The said connecting conduit means between the completely closed hollow body and the compensating container forms therewith a completely closed system. The said system serves as cooling system for ascending vapors which in this way will be condensed.

With pressing plates, the highest temperature at the upper portion of the hollow body amounts to approximately 300° C. This temperature corresponds approximately to the volatilization temperature of specific heating oils. Due to the considerable heat withdrawal during the pressing of wet garments, laundry or the like, a quick heat transfer from oil to the pressing surface is required. This in turn requires a considerably high temperature drop and a considerably high temperature of the heating body contacted by the heating fluid. A partial evaporation at the heating means or heating elements proper cannot be avoided at these temperatures. An improvement can, however, be obtained by increasing the speed at which the fluid rakes the heating body, which means that a thorough and fast circulation must be effected within the heating fluid.

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The formation of vapor bubbles brings about the danger that the rising vapor bubbles which pass to the compensating container move ahead of the fluid particles so that a reduction in the quantity of liquid in the hollow body may occur very quickly. This, however, will bring about an increased evaporation, particularly if the hollow bodies are not completely immersed any longer in the fluid, which would result in a very fast increase in pressure. If mineral oils are used as heating fluid, there may occur the additional danger that a cracking of the oil will occur whereby the heating fluid will become useless for all practical purposes.

Referring now to the drawing in detail and FIG. 1 thereof in particular, the hollow pressing body shown therein comprises a hollow body generally designated *a* which is tightly closed in itself and designed as a pressure container. This hollow body *a* which, when employed for garment presses, forms the pressing plate, is filled with a fluid *b*, for instance oil. Arranged within said hollow body are heating elements *c* which, in conformity with FIG. 1, extend along said hollow body and may be heated electrically, by gas, steam or other heating means. By heating the oil *b* in said hollow body *a*, the volume of the heating fluid will expand.

In order to allow such expansion without harmful effect on the hollow body, the highest point of the hollow body *a* has connected thereto a single conduit *d* which first preferably ascends and then extends laterally and then descends and leads into the bottom portion of a compensating container *e*. This gives a substantial length of conduit *d* which is exposed to the atmosphere for loss of heat thereto. When heating the fluid *b*, due to the expansion of the fluid, liquid will enter the compensating container *e* from below whereby the air contained in said compensating container above the oil level *f* will be compressed. When the heating fluid *b* in the hollow body *a* cools down, the volume within the hollow body shrinks and this reduced volume of fluid is compensated for by fluid which due to the pressure prevailing in the compensating container *e* above the fluid level *f* will be pressed from the compensating container *e* into the hollow body *a*.

This arrangement of a completely closed system will assure that the heating elements will always be surrounded by heating fluid and that no oxygen will be able to reach the heating elements or the heating fluid.

The heating elements may in the form of cartridge heaters be screwed or otherwise inserted into the hollow body *a*. These elements are located near the lower corners of the hollow body to provide for rapid circulation of the oil in the hollow body on account of convection currents.

According to the configuration shown in FIG. 2, the hollow body *a* is provided with a roof-shaped top *a1*, and the conduit *d* is connected to the hollow body at the ridge of said roof. In this way, as indicated by the arrows *g*, the fluid circulation within the hollow body around the heating elements will be considerably increased. It will thus be seen that the hottest fluid particles rising from the heating elements will hit upon an inclined wall along which they move upwardly to the highest point of the hollow body or container. Due to this arrangement, as mentioned, the circulation of the liquid will be considerably aided and above all also at those points within the hollow body which are not directly neighboring the heating elements. With regard to the vapor formation, these slant upwardly leading wall portions are particularly important in order to prevent the accumulation of vapor bubbles within the hollow body. If this were not the case, due to the increased volume occupied by the vapor, liquid would be displaced from the hollow body which fact would bring

about the above mentioned increase in pressure and other undesirable features. Due to the fact that the compensating container *e* contains only relatively cold fluid, when employing for instance mineral heating oil, the influence of oxygen of the air in the compensating container will for all practical purposes be of no effect.

If oxygen should combine with hot oil, this would bring about a fast aging of the oil and thereby harmfully affect the entire function. When employing glycerine as heating medium, a pressure increase will occur at the start of the heating operation. This is due to the fact that the water particles in the glycerine will evaporate. The water vapor which forms already at relatively low temperatures would condensate in the connecting conduit *d* and would pass as water particles to the compensating container. As a result thereof, after a certain heating time an initial drop in pressure would occur which would considerably increase the safety of the entire system. When the temperature in the hollow body drops, particularly during the rest periods between working periods, the volume in the hollow body will be reduced. In order to return the quantity of fluid which collected in the compensating container, to the hollow body, the connecting conduit *d* between hollow body *a* and compensating container *e* must lead into the latter at the lowest portion thereof.

The modification shown in FIG. 3 illustrates that the roof instead of descending in transverse direction of the hollow body may decline in longitudinal direction of the hollow body. Also in this way, a good fluid circulation will be obtained. A compensating container *e* having liquid level *f* is connected by conduit *d* to the highest point of the top wall of hollow body *a*.

It is, of course, also possible that the roof is non-symmetric. It is merely essential that the top or lid portion of the container has upwardly inclining walls along which the heated particles of the heating fluid may move upwardly. The heating elements may be exchangeably inserted into corresponding pipes of the hollow body. It would also be possible to provide a plurality of conduits between the compensating container *e* and the hollow body *a*. If the heat dispensing hollow body is movably mounted, the connecting conduit means *d* may advantageously be replaced by hoses.

As will be evident from the preceding description, an arrangement according to the present invention will bring about that the vapor bubbles will collect at the highest point of the hollow body and will be condensed again to liquid. Furthermore, the vapor bubbles will be prevented from moving liquid ahead of them into the compensating container. Only cooled-off liquid particles will pass into the compensating container whereby a con-

siderable saving in the heating power will be obtained. With a rising conduit to the compensating container, vapor bubbles and the hottest liquid particles would be able directly to pass into the compensating container where they would create a temperature which would almost equal the highest temperature within the hollow body.

It is, of course, to be understood that the present invention is, by no means, limited to the particular constructions shown in the drawing but also comprises any modifications within the scope of the appended claims.

What we claim is:

1. A heated press shoe for laundry presses, especially for garments, which comprises in combination: a closed hollow body for cooperation with a buck carrying the material to be pressed, said hollow body having side walls and also having a lower wall forming the pressing surface, said body having an upwardly inclined roof-shaped top wall, electric heating elements in said hollow body near the lower wall and adjacent the side walls of the hollow body, heating oil filling said hollow body completely up to the apex of said roof-shaped top wall, said heating elements being surrounded completely by the heating oil, said heating oil being such as to be adapted to be heated by electric heating means up to a temperature of at least 240° C. at which temperature said heating oil retains its liquid condition, a closed compensating container having an upper wall which is substantially flush with the horizontal plane passing through the lower wall of the hollow body, and conduit means extending from the apex of the roof-shaped top wall of the hollow body through the atmosphere to the lower part of the compensating container connecting the interior of the hollow body with the interior of said container and being adapted together with the hollow body and compensating container to form a system which is completely closed from the atmosphere.

2. A heated press shoe for garment presses according to claim 1, in which the said conduit means leads from the highest point of the hollow body upwardly and then laterally and then downwardly to the compensating container to expose a substantial length of the conduit to the atmosphere.

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