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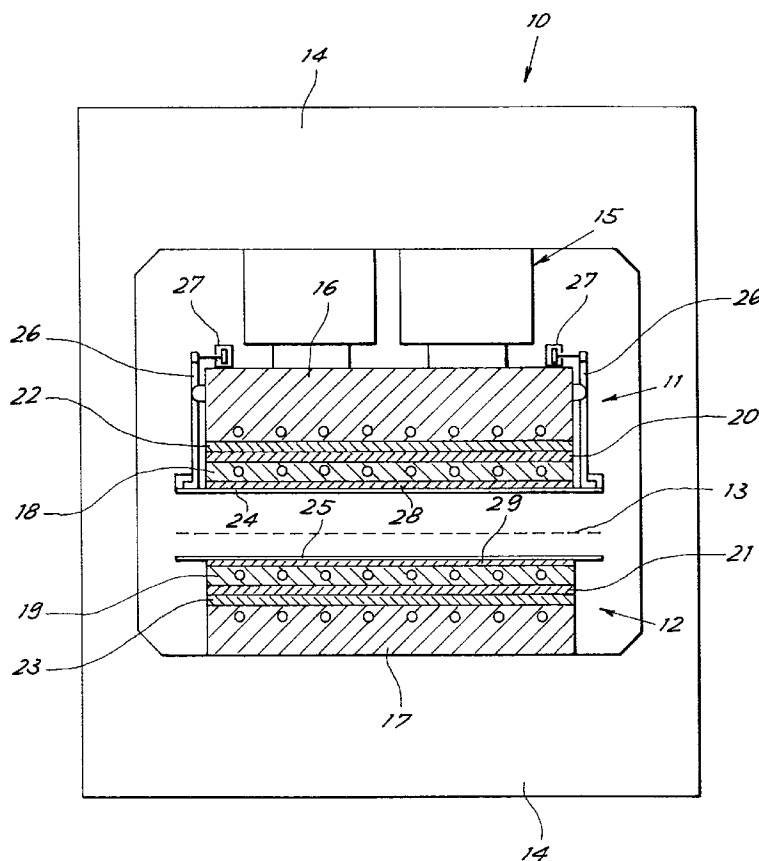
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(54) Hot-plate press for panel pressing

(57) A press for panels comprising two facing press heads (11, 12) movable towards each other and having heated faced surfaces covered with a finish sheet (24, 25) to press a panel between them. Each press head is

formed of a first rear plate (16, 17) and a second front plate (18, 19). The front plate is heated and carries the finish sheet. A layer of elastic material (22, 23) is present between the front and rear plates.

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Description

The present invention relates to a hot-plate press for forming coated panels.

In fast-cycle lines for increasing panel valuableness (that is making "ennobled panels"), presses having two opposite hot plates are currently present. Sandwiched between the press plates is a laminated assembly made up of a panel to the faces of which coatings usually consisting of paper materials impregnated with melamine, urea or phenolic resins are applied.

Metal sheets, of the so-called "finish type" with a thickness of 3-5 mm are usually applied to the hot-plate surfaces for the purpose of giving the ennobled panel the desired surface appearance, that is a glossy, half-lustre or structured (i.e. provided with slight impressions of various types to be then reproduced on the panel coatings) look.

Interposed between the metal sheets and the hot plates of the press is a cushion the function of which is to make pressure distribution over the whole surface uniform, as otherwise said pressure would concentrate only in some regions due to defects in the pressing plates and tolerances in the panel thickness. The cushion is usually formed of fabrics made of vegetable fibres. Also contained in said cushion are metal wires, currently copper wires, so as to achieve a sufficient heat conduction between the press plates and the finish sheets.

Although said cushion is indispensable in present presses, it creates many drawbacks. For instance, it has a limited lifetime because, as it is subjected to compression, it loses its features of pressure distributor almost quickly and becomes a stiff body: therefore it has to be replaced rather frequently, which will be time-consuming and expensive. Due to the fact that the cushion must have a relatively high thickness (also for the purpose of not losing its elastic features too quickly), its insulating effect makes the thermal yield of the press worse. On the other hand, too many metal wires contained therein would impair the cushion elasticity.

In addition, accidental oil losses are likely to take place frequently from the hydraulic press drives and the heating circuit, which oil losses will inevitably impregnate the cushion causing a different heat transmission relative to the dry regions, which will bring about an early replacement of the cushion itself. Finally, during frequent replacements of the finish sheets, the cushion inhibits quick movements of the mechanical parts arranged for movement of said sheets, thereby giving rise to an important increase in non-productive times.

Presses with pressing heads formed of two superposed plates separated by a rigid heat insulator have been also proposed. In these presses, only the outer or front plate is heated. Such a structure however has been proposed only for the purpose of avoiding heat transmission to the press structure and increasing efficiency of the heating circuit. The two superposed plates however, are rigidly connected with each other, optionally

separated by a rigid insulator, and actually constitute a single integral body. Therefore, use of the same cushions as in the above mentioned presses is required for these presses too and they suffer for similar drawbacks.

It is a general object of the present invention to obviate the above mentioned drawbacks by providing a press for increasing panel valuableness, which enables cushions of reduced thickness to be employed and even use of said cushions to be made unnecessary.

In view of the above object, in accordance with the invention a press for panels has been devised which comprises two facing press heads movable towards each other and having heated faced surfaces covered with a finish sheet to press a panel between them, characterized in that each press head is formed of a first rear plate and a second front plate, the front plate being heated and carrying the finish sheet, a layer of elastic material being present between the front and rear plates. For better explaining the innovatory principles of the present invention and the advantages it offers over the known art, a possible embodiment of the invention applying said principles will be given hereinafter, by way of non-limiting example, with the aid of the accompanying drawing consisting of a single figure.

With reference to the drawing, a press for increasing panel valuableness, generally denoted by 10, is shown. The press comprises a frame 14 bearing a pair of faced pressing heads 11, 12, movable towards each other (by means of upper cylinders 15, for example) to press a known laminated panel (generally identified by 13) between them. For instance, the panel is made up of an inner panel coated with finish sheets on both faces thereof. Said panel will not be herein further shown or described, as it is of a well-known type.

The pressing heads 11, 12 are each formed of a rear plate 16, 17 and a front plate 18, 19. The front plate is, for instance, heated by ducts disposed internally thereof and passed through by a hot fluid. The rear plate can be advantageously cooled by inner ducts run through by a cooling fluid. The cooling fluid and hot fluid are supplied from appropriate sources not shown, as they can be of any known type.

Elastic and thermally insulating layers are disposed between the front and rear plates of each head, so as to hinder heat transmission between the front plate and rear plate and enable adaptation movements of the front plate. For instance, these layers can be formed of a rigid and thermally insulating layer of appropriate material (a laminate of fibre glass fabric impregnated with heat-resistant resins, for example), identified by 20 and 21 respectively, in contact with the front plate 18, 19, and an elastically yielding layer 22, 23 in contact with the rear plate 16, 17. The elastically yielding layer may consist for example of a sheet of a thickness of some millimetres, made of rubber of appropriate density. In this way, the elastic layer is not overheated and keeps its properties more easily. At the same time this layer also helps in carrying out heat insulation between the plates.

Finish metal sheets 24, 25 of a substantially known type are disposed on the facing faces of the two front plates and they are adapted to give the ennobled panel the desired surface appearance.

The sheets are anchored to the respective head by means of removable fastening members to enable quick dismantling and replacement of same. For instance, as shown by way of example for the upper head, hooks 26 may be provided to be fitted in appropriate seats on the sheet by means of operating jacks 27.

The front plates are relatively thin (50-60 mm in thickness, for example) and in any case they are sufficiently thin for maintaining some flexibility to the pressing pressures of the press. The rear plates, on the contrary, are of greater thickness (150-300 mm, for example), so that they can be considered as substantially rigid. The thickness ratios of the rear plate to the front plate may be comprised between 2 and 8.

Thus, interposition of the elastic layer enables a certain flexibility to be given to the system. By virtue of the flexibility of the thin plate and the compensation capability of the elastic layer, even in the presence of small differences in thickness of the material to be pressed, a uniform distribution of pressure will be obtained over the whole pressing surface.

For achievement of a better adaptability, elastic cushions 28, 29 may be also provided between the front plate and finish sheet. These cushions however, can be of more reduced thickness than those necessary in the known art, since there is already the elastic adaptability offered by the thin plate and the elastic layer between the front and rear plates. Use of a cushion of smaller thickness, and consequently of more reduced heat insulation, enables a lower number of metal wires to be employed therein, so that its cost too will be lower and its elastic features will last longer.

At this point it is apparent that the intended purposes have been reached. With a press in accordance with the invention, the requirement of a cushion between the heated plates and finish sheets is greatly reduced, to such an extent that it can even be eliminated for some production types, or in any case its weight (and, as a result, its cost) can be greatly reduced or its lifetime can be prolonged, as compared with the known art.

In the press in accordance with the invention, a better pressure distribution is achieved and consequently the quality of the pressed panel is improved in case of particularly difficult productions. In addition, elimination of the use of cushions taking place in some cases leads to the further advantages connected with the elimination of the thermal barrier constituted by said cushions.

Obviously, the above description of an embodiment applying the innovatory principles of the present invention is given by way of example only and therefore must not be considered as a limitation of the scope of the patent rights herein claimed.

For instance, depending on specific requirements, the proportions between the different parts can vary rel-

ative to the embodiment shown in the drawing by way of example.

5 Claims

1. Press for panels comprising two facing press heads (11, 12) movable towards each other and having heated faced surfaces covered with a finish sheet (24, 25) to press a panel between them, characterized in that each press head is formed of a first rear plate (16, 17) and a second front plate (18, 19), the front plate being heated and carrying the finish sheet, a layer of elastic material (22, 23) being present between the front and rear plates.
2. Press as claimed in claim 1, characterized in that the rear plate is run through by a cooling fluid.
3. Press as claimed in claim 1, characterized in that a further layer (20, 21) of thermally insulating material is interposed between the elastic layer and front plate.
4. Press as claimed in claim 1, characterized in that an elastically yielding cushion (28, 29) is interposed between the front plate and finish sheet.
5. Press as claimed in claim 1, characterized in that the thickness ratio of the front plate to the rear plate is included between 2 and 8.

