March 28, 1933. W. H. MASON 1,903,222

PRESS

Filed April 24, 1929 2 Sheets-Sheet 1

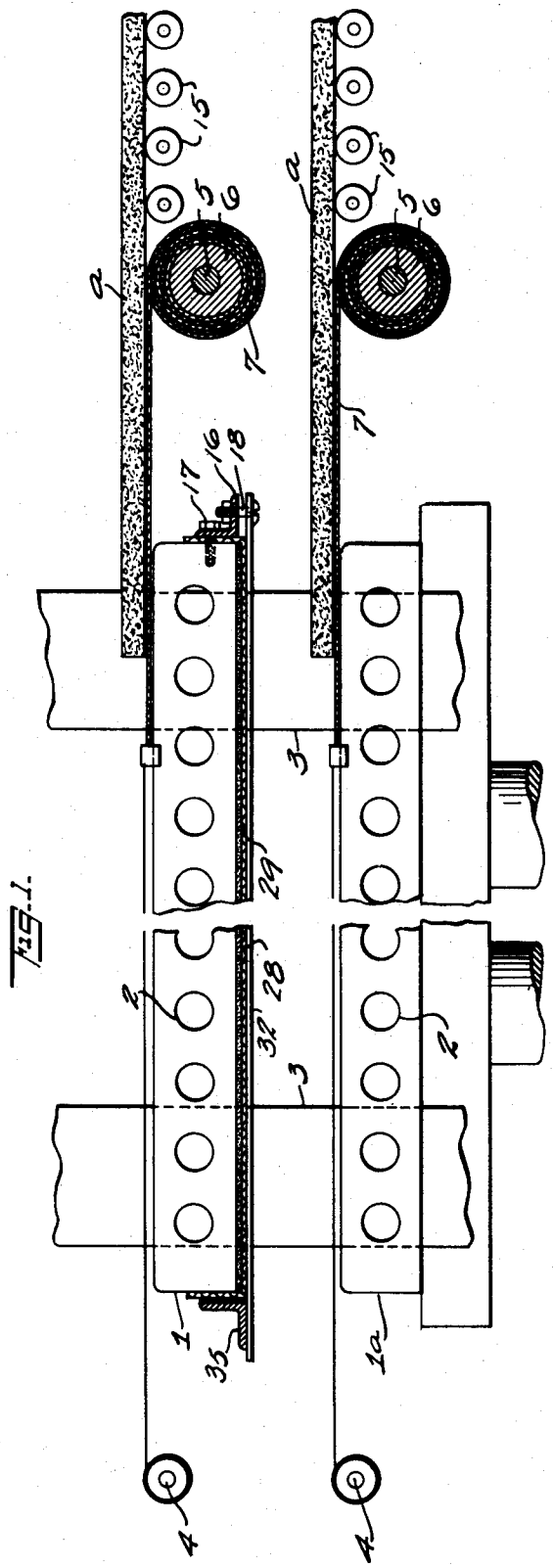


Fig. 1.

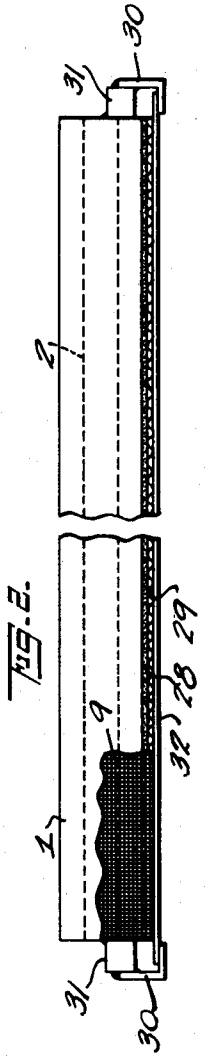


Fig. 2.

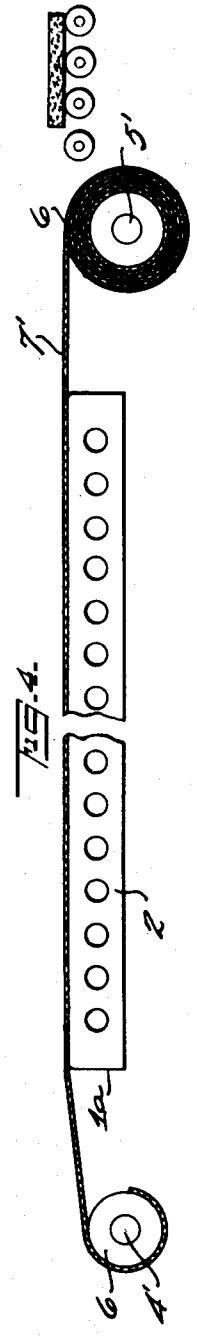


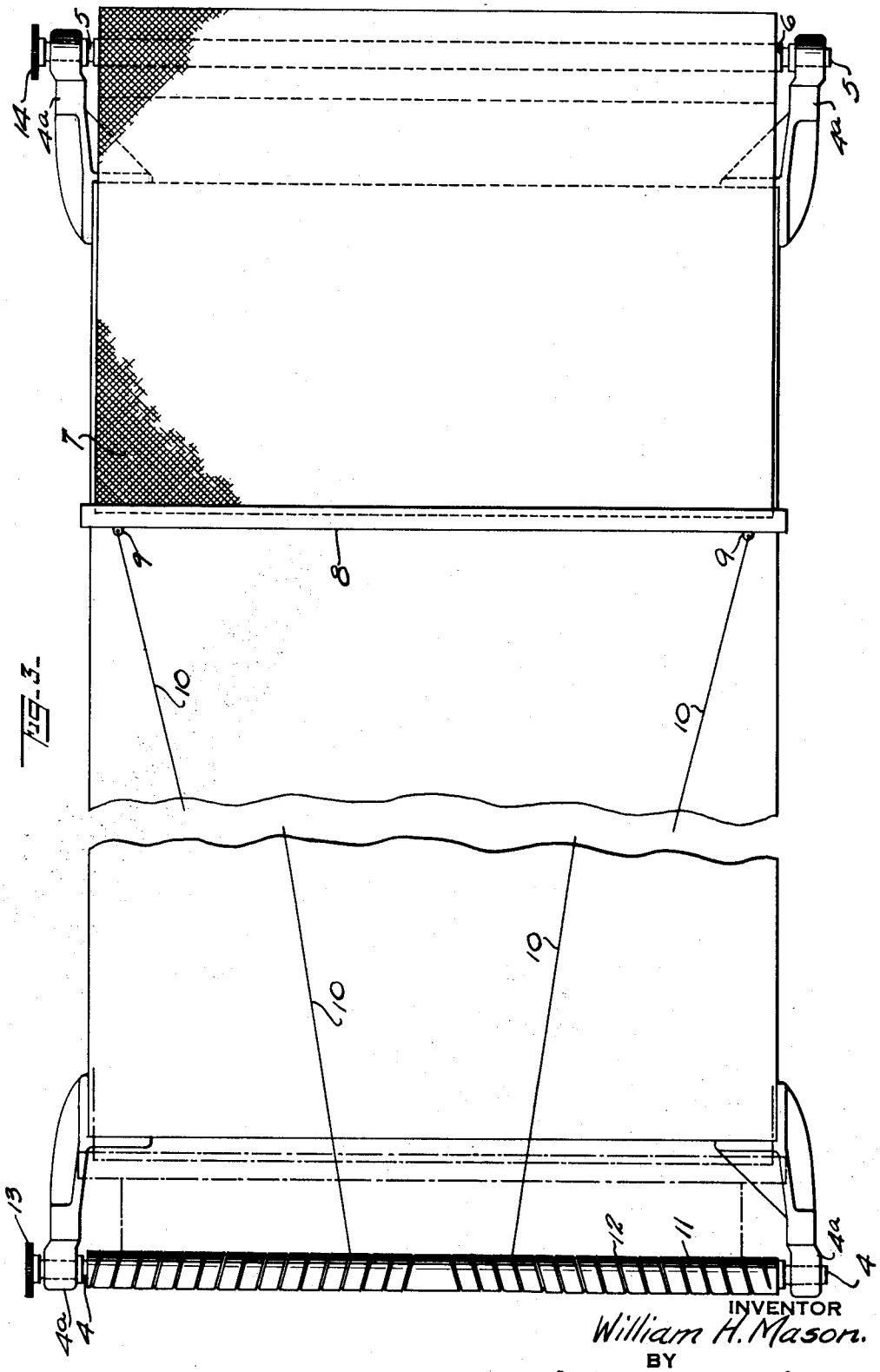
Fig. 4.

INVENTOR
William H. Mason.
BY
Byrne, Holden & Schaines
ATTORNEYS

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PRESS

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INVENTOR
William H. Mason.
BY
Dyke, Holden & Schainer
ATTORNEYS

Patented Mar. 28, 1933 1,903,222

UNITED STATES PATENT OFFICE

WILLIAM H. MASON, OF LAUREL, MISSISSIPPI, ASSIGNOR TO MASONITE CORPORATION, OF LAUREL, MISSISSIPPI, A CORPORATION OF DELAWARE

PRESS

Application filed April 24, 1929. Serial No. 357,737.

My invention relates to hydraulic presses, more particularly of the type in which a large number of steam heated platens are movably mounted in a frame and operated by one or more rams, so that a multiplicity of articles, for example sheets of wet felted fibre, hereinafter referred to as wet lap sheets, can be pressed thereby at a single operation, as disclosed in my Patent No. 1,767,539, granted June 24th, 1930.

In the process of pressing sheets of wet ligno-cellulose material as described and claimed in my Patent No. 1,844,861 granted February 9, 1932, it is desirable for purposes of economy and efficiency to maintain the platens in heated condition, preferably at a temperature of from 220° F. to 500° F. or more, and therefore, in order that the material of such sheets shall not be permitted to attain a temperature above 212° F. during the closing of the press, I provide means for retarding the flow of heat from the platen to the material.

The present apparatus, although not limited thereto, is particularly adapted for carrying on the process of said Patent No. 1,844,861, granted February 9, 1932.

The invention also includes a novel surface plate which is used between the platen and material, which in addition to retarding the flow of heat, also serves to prevent discoloration of the material and adhesion thereof to the pressure surface. Means are provided for supporting the surface plate in the press and for permitting its ready removal therefrom.

The invention further includes improved means for receiving and conveying into the press the sheets to be pressed and for removing the finished sheets.

In order that the invention may be more fully understood, reference is hereby made to the accompanying drawings, of which—

Fig. 1 is a side elevation partly in section showing two of the movable platens of the improved press, together with parts associated therewith, and conveyors carrying sheets to be pressed.

Fig. 2 is an end elevation partly in section, showing the upper platen of Fig. 1 and means for supporting the surface plate.

Fig. 3 is a plan of the structure of Fig. 1; and

Fig. 4 is a side elevation showing one platen and a modified form of conveyor.

The press as ordinarily constructed comprises an uppermost, fixed, horizontal platen (not shown) and a large number of movable horizontal platens 1 and 1*a*, for example twenty, although obviously the number may vary and there may be no more than one movable platen.

Each of the platens, both fixed and movable, is provided with a large number of bores 2 extending transversely thereof, said bores being connected end to end and supplied with steam through fixed steam pipes, stuffing boxes, and pipes slidable therein arranged in well-known manner to permit vertical movement of the movable platens, which are guided for such movement by the vertical frame members 3.

Each of the movable platens is provided with horizontal shafts 4 and 5. The shafts 4 and 5 are journaled in brackets 4*a* secured to the corners of the platen. The shaft 5 is provided with a roller 6 fixed thereto and to said roller is secured one end of a screen 7, the screen being wound upon the roller. Such screen may consist of ordinary galvanized wire cloth such as is used for window screens.

The outer or free end of the screen 7 is firmly clamped by any suitable means within a rigid holder or clamping bar 8 which is provided with perforated ears 9, and to said ears are secured the ends of flexible tension members 10, which may be wire cables or chains. The other ends of these cables are secured to a drum 11 which is fixed to the shaft 4. The drum 11 is provided with spiral grooves 12 which receive the cables 10 as the drum is rotated and the cables thereby wound thereon.

The shaft 4 is provided with a driving gear 13 and the shaft 5 with a similar gear 14 and suitable driving means and clutches are provided for driving the shaft 4 in the direction for winding up the cables 10 or permitting it to run freely, and for driving the shaft

5 in the reverse direction or permitting it to run freely.

When driven in one direction, that is, by the shaft 4, the screen 7 may be used for conveying into the press material to be pressed, and the finished sheet may be carried out of the press by driving the screen in the other direction by the shaft 5.

In Fig. 1 are shown the forward or advancing ends of two wet lap sheets *a*. These sheets are soft and easily injured. Consequently, means such as a series of driven rollers 15 are desirably used for supporting said sheets and feeding them on to the screen 7. The shaft 4 is preferably driven at such speed that the screen 7 will travel at the same rate of speed as the peripheries of the rollers 15, whereby any risk of damaging the sheets *a* as they are removed from the rollers 15 and fed into the press is avoided.

After the sheets have been pressed they are strong and there is no danger of injuring them by handling. The shaft 5 may therefore be driven at a uniform speed for withdrawing the finished sheets from the press and feeding them to the rolls 15 (the direction of rotation of which has now been reversed), even though such drive results in variable speed of the screen 7 due to the fact that the diameter of the driving element (roll plus screen) increases as the screen is wound thereon.

The screen 7 is useful not only for carrying the wet sheet into the press and the finished sheet out of the press, but for providing a large number of passages or outlets for the escape of water during the closing of the press and of steam during the further pressing and drying of the material. It may, if desired, consist of more than one layer of wire cloth.

Instead of using screens 7 and cables 10, screens 7′ of similar material may be used as shown in Fig. 4. In this construction, the ends of the screens 7′ are secured to the rollers 6 which are mounted on the shafts 4′ and 5′. Each of the screens 7′ is of sufficient length to enable it to be used as a conveyor for carrying a sheet of material into the press, and when driven in a reverse direction for carrying it out of the press, that is, a sufficient length of screen material to permit such movement is wound alternately upon the roller 6 of one of the shafts 4′ or 5′ depending upon whether material is being carried into or out of the press.

Each of the shafts 4′ and 5′ is arranged to be driven in the proper direction from a power source or to be unclutched therefrom. Any suitable gearing may be used for driving said shafts at variable speed to compensate for the increase of diameter of the rolled screen as it builds up on the roller of the driving shaft, so that the screen 7′ will travel at uniform speed.

It will be noted that the screen 7 of Fig. 1 need be only about one-half the length of the screen 7′ of Fig. 4 since the cables 10 take the place of that portion of the screen 7′ which is between the roller 6 of shaft 4′ and the forward end of the wet lap sheet *a*. An important saving is thereby effected by reason of the fact that the cables last indefinitely, whereas the screen material wears out quite rapidly and must be renewed in its entirety since the portion which is wound up by shaft 4′ by reason of bending and corrosion wears almost as rapidly as the other portion of the screen.

In order to retard the flow of heat from platen to material, the top or fixed platen and each of the movable platens except the bottom one 1*a* is provided with a layer 28 of non-conductive, heat-resisting material, preferably of a porous character, for example, asbestos. Such material may be secured in position by any suitable means, for example, a strip of flexible wire cloth 29 which may be of the same material as the screen 7. The ends of the strip 29 are bent up and secured to the ends of the platen 1. The wire cloth strip 29 serves not only for securing the asbestos layer 28 in position, but also as additional heat-retarding means. In case a double layer of wire cloth be used the asbestos sheet may be dispensed with, and it is also possible to obtain good results by the use of a single layer of wire cloth between the platen 1 and face plate or surface plate 32, the asbestos sheet 28 being dispensed with.

The side edges of the fixed platen and each of the movable platens except the bottom one are provided with longitudinal brackets 30, preferably angle bars, the vertical webs of which are spaced therefrom and secured thereto by metal blocks 31, which may be welded to the platen and angle bar. The horizontal webs of the angle bars 30 extend inwardly at a suitable distance below the lower surface of the platen and serve as supporting means for the side edges of the surface plate 32.

The latter is preferably formed of heavy sheet metal, for example, steel, which may have a thickness of $\frac{3}{16}$ of an inch, and I prefer to cover the pressing surface thereof with a coating of chromium. Instead of using a plated steel plate, an entire plate of non-corrosive material may be used, for example, chromium, stainless steel, etc.

One advantage of using a face plate of stainless steel is that its heat conductivity may be as low as from ½ to ⅔ that of ordinary steel. It therefore acts as a greater heat retarder than ordinary steel, and may in some cases be used in the press without other heat retarding means.

It should also be noted, that any of the surface plates mentioned will have some heat retarding effect, as they all delay the flow of

heat from platen to material to some extent.

The use of a surface plate with pressing surface of chromium or like non-corrosive material is very desirable for the pressing of a wet sheet of fibre obtained by explosion of wood chips, said sheet containing cellulose, lignin, water and water solubles, since such a surface plate prevents discoloration of the finished product, and when the flow of heat from the platen to the material is suitably retarded, as by the means herein, the finished product does not stick to the surface plate.

The placing of the surface plate 32 above instead of below the material is of advantage in that, owing to the method of forming the wet pulp sheets which are to be pressed, the upper surface thereof is of finer material than the lower surface which rests upon the screen 7. The surface produced by the surface plate upon the finished sheet, therefore, possessed of maximum smoothness and density, and may present a polished appearance.

In order to facilitate and insure the correct positioning of the face plate within the press, I prefer to secure to the rear edge of said plate an angular strip 35 to act as a stop. The forward edge of the face plate is removably secured by bolts 18 to an angle bar 16 which is removably attached to the platen by cap screws 17

Having now described my invention, what I claim is:

1. In a press, a wire mesh screen for supporting material to be pressed, and means for drawing said support into said press comprising a transverse bar, a flexible tension member applied to either end thereof, and means for moving said tension members.

2. In a press, a wire mesh screen for supporting material to be pressed and means for drawing said screen into said press comprising a transverse bar, a flexible tension member applied to either end thereof, and a winding drum having spiral grooves for receiving said tension members.

3. In a press, a pair of platens, and means for feeding material therebetween comprising a wire mesh screen of a length slightly in excess of the distance between the edges of the platens in the direction of feed, a drum for winding up said screen by movement in one direction, tension means for drawing said screen into the press, and rotary means for advancing said tension means a substantially uniform distance for each rotation thereof.

4. In a press, the combination of cooperating platens having chambers to receive a heating medium, a wire mesh screen interposed between one of said platens and the material to be pressed, a removable imperforate surface plate interposed between the cooperating platen and the material to be pressed, and heat retarding means between said surface plate and last named platen.

5. In a press, the combination of cooperating platens having chambers to receive a heating medium, a wire mesh screen interposed between one of said platens and the material to be pressed, a removable imperforate surface plate interposed between the cooperating platen and the material to be pressed, and a wire mesh screen between said surface plate and last named platen.

6. In a press, the combination of cooperating platens having chambers to receive a heating medium, one of said platens being provided with a movable wire mesh screen for conveying into the space between the platens material to be pressed and to provide a reticulated pressing surface, and the cooperating platen being provided with a removable imperforate surface plate and heat retarding means between the platen and surface plate.

7. In a press, the combination of cooperating platens having chambers to receive a heating medium, one of said platens being provided with a movable wire mesh screen for conveying into the space between the platens material to be pressed and to provide a reticulated pressing surface, the cooperating platen being provided with a removable imperforate surface plate and a wire mesh screen between the platen and surface plate.

8. A press platen having a lower plane pressure surface, side walls extending upwardly therefrom, and surface plate supports secured to said side walls, each of said supports having a portion depending below the pressure surface of the platen and being provided with an inwardly extending shelf, the inner edge of each shelf being exterior to the vertical plane which bounds the pressure surface.

9. The combination of a press platen having an extended plane pressure surface, side walls extending at an angle thereto, and surface plate supports secured to said side walls, all parts of said supports being exterior to the boundaries of said pressure surface, and a removable surface plate of greater length and width than said pressure surface and carried at its lateral edges by said supports, one end of said surface plate being provided with an upwardly extending stop in position to engage said platen.

10. The combination of a press platen having an extended plane pressure surface, side walls extending at an angle thereto, and surface plate supports secured to said side walls, all parts of said supports being exterior to the boundaries of said pressure surface, and a removable surface plate of greater width than said pressure surface and carried at its lateral edges by said supports, said surface plate having a lower surface of chromium.

In testimony whereof, I have signed my name hereto.

WILLIAM H. MASON.