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'STEREOTYPE MAT DRIER

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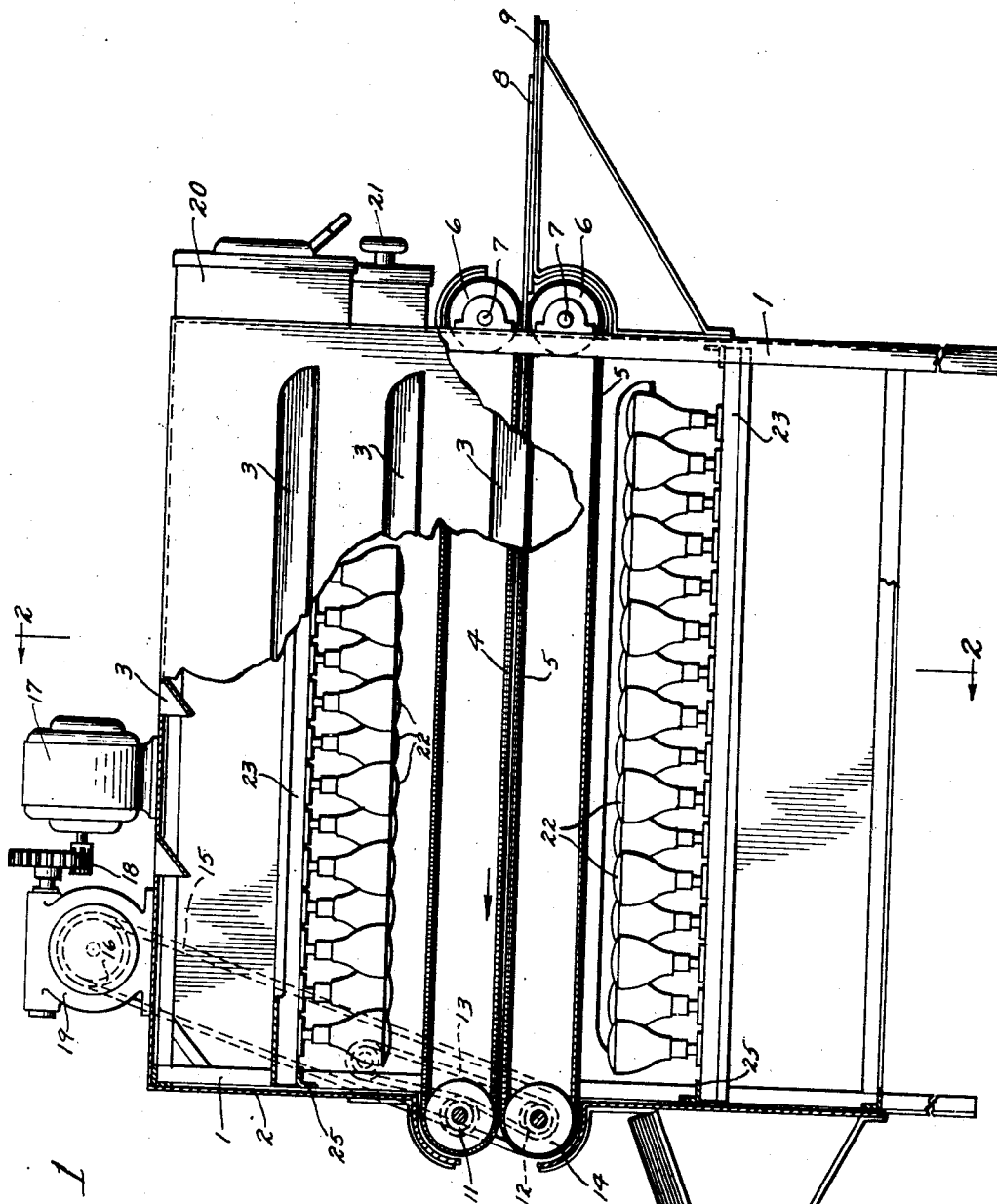


Fig. 1

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STEREOTYPE MAT DRIER

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3 Claims. (Cl. 219—34)

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This invention relates to driers and more particularly to devices for dehydrating printing matrix mats for cylinder printing presses.

In cylinder printing presses, the type forms are set up flat and then mats of moistened paper-like plastic material are pressed onto the forms to take an impression of the printing surfaces. These mats are then dried, usually by means of cylindrically formed steam heating plates, the moisture being driven through a porous backing pad and carried away by a suction pump.

The matrix mats are then placed in a mold having an inwardly concave cylindrical wall against which the mat lies and the printing plate is formed by flowing molten type metal between the inner face of the mat and the opposite wall of the mold so as to form a semi-cylindrical shell having an external convex cylindrical face that is formed by the matrix and becomes the printing surface of the printing cylinder.

The objections to this and the heretofore used driers were: that the amount of drying or dehydrating could not be accurately controlled whereby the resulting shrinkage could not be controlled; the heat used for drying purposes was not constant and would usually "build up" in the drying machine to a point where it became unmanageable; the heat used was dispersed in all directions; were inefficient, slow in action, cumbersome to operate or install, and were expensive to maintain and operate.

It was to overcome these and other obvious defects that the present invention was conceived.

The main objects of the present invention are to provide improved means for drying or dehydrating the water-soaked matrix mats preparatory to placing them in the mold; to provide improved means of this kind that utilizes focused infra-red rays as the drying medium; to provide improved drying equipment that is comparatively inexpensive, comparatively cheap to operate and rapid in its action; to provide improved means of this kind wherein the utilized infra-red rays are definitely focused on the mats; to provide a device of this character wherein the wet mats are left under an infra-red lamp for a predetermined period of time only; to provide a device of this character wherein the heating chamber is so ventilated that the heat will not "build up" and the absorbed moisture is carried away; to provide a device of this character whereby a predetermined amount of moisture may be removed from the mats; and to provide a device of this character whereby the mats may be shrunk to a predetermined measurement.

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A specific embodiment of this invention is shown in the accompanying drawings in which:

Figure 1 is a side elevation of a matrix mat drier constructed according to this invention, the front wall of the housing being partly broken away to disclose the internal arrangement.

Fig. 2 is a vertical section of the same taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional detail of one of the belt pulleys, showing the helically coiled wire spring belt carried by a peripheral groove on the pulley.

In the form shown in the drawings, the drier comprises a rectangular skeleton frame 1 to which is attached end, sides and top wall plates 2, having louvers 3 to form a rectangular housing. Extending horizontally across the interior of the housing 2 are opposed sets of belts 4 and 5 carried by pulleys 6 on parallel shafts 7 at opposite ends of the frame in such a manner that the upper flights of the lower set of belts 5 form a horizontal support for the mats 8 passing through the machine from a receiving platform 9 at one end of the machine to a delivery magazine 10 at the opposite end of the machine.

The upper belts 4 press lightly on the upper face of the mats and hold them flatwise on the grid-like surface that is formed by the upper flights of the lower belts 5. The belts are preferably formed of helically wound spring wire, such as piano wire, and are of such length as to remain stretched taut across the interior of the housing regardless of the temperature to which they are subjected. Such belts offer a minimum of impediment to the access of heat to the mats and to the escape of moisture therefrom.

The pulleys 6 at the delivery end of the machine, which is at the left of Fig. 1, are driven by sprockets 11 and 12 meshing with a chain belt 13 which is in turn driven by a sprocket 14 and chain belt 15 from a sprocket wheel 16 driven by a motor 17 through reduction gears 18, including a worm gear and worm wheel in the housing 19.

The motor is controlled in turn by an electric circuit, not shown, having a main switch 20 and rheostat 21, whereby the speed of travel of the mats through the machine on the conveyor formed by the belts 4 and 5 can be accurately timed, as will be understood.

The dehydrating function is accomplished by means of opposed banks of reflector-type, infra-red lamps 22. Each lamp 22 comprises the usual incandescent filament and an internal reflector surface arranged to project a concen-

trated and focused beam of infra-red ray toward the path of the mats carried on the belts 5.

Each bank of infra-red lamps is made up of a plurality of rows of lamps, each bank preferably comprising two rows of 7 bulbs each and one row of 8 bulbs, evenly spaced apart so that the rays from the lamps are evenly focused on each side of the matrix mats. The lamps in one row are staggered with respect to those in the next adjacent row so that the combined effect of the lamps is to subject both the upper and lower surfaces of the mats substantially uniformly to the effects of the thermal rays that are projected by the lamps.

Each bank of lamps is carried by a rigid frame 23 having closed wiring troughs 24 for supplying current to the lamps. This current may also be controlled by the switch 20 or by independent means.

The frames 23 are supported on the vertical bars of the supporting frame 1 by means of angle irons 25 which are anchored at a predetermined point to the frame in any suitable manner, such as by welding. In Fig. 1 the frames 23 lie in a horizontal plane which is the preferred arrangement of the lamps.

The louvers 3 in the housing walls allows the air to circulate freely by convection through the machine and carry off the moisture that is driven out from the mats by the penetrating infra-red rays. The louvers also prevent the housing from becoming an oven by "building up" heat. It will be noted that the bottom of the cabinet is open.

In operation the mats are fed into the machine from the receiving platform 9, one after another, being conveyed through the machine by the belts and delivered to the delivery magazine 10.

The timing of the speed of the conveyor and the spacing of the lamp banks with respect to the path of the mats are adjusted by experiment according to the type of material used in the mats and its moisture-carrying capacity. It has been determined that when the standard newsprint type of mat is used, the mat can be shrunk three-eighths of an inch and approximately 8% of the moisture removed, which are the desirable figures at which to reinforce the mats with "backing felt" preparatory to placing them on the mold, by spacing both banks of lights six inches away from the mats.

The six inch spacing will project the rays from the lamps on the mats in the most efficient manner and the desired shrinking and drying figures may be constantly maintained by operating the belts at a predetermined speed. So long as the same kind of material is used and the same preliminary procedure of preparing the mats are followed, little or no adjustment will be necessary. It was found that moving the lamps above or below the designated 6 inch distance resulted in a drop in efficiency.

While numerous heaters and dryers, some of them utilizing infra red radiation, have been patented, none of the devices have had controlled radiation or heat developed to such an extent that the amount of shrinkage and moisture to be removed from an article could be predetermined.

It is to be understood that applicants do not "bone" dry the mats when utilizing the machine of their invention but merely shrink the mat $\frac{3}{8}$ of an inch and remove 8% of the moisture. The mat is then placed in standard "Stahi" machine for thoroughly drying the same in final form for the press.

Although but one specific embodiment of this

invention is herein shown and described, it will be understood that numerous details of the constructions shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

We claim:

1. A mat drier comprising a closed housing with an open bottom, a plurality of louvers in said housing and spaced therearound, upper and lower conveyor belts comprising a plurality of spaced spring wires, one set of belts above and one below for engaging opposite faces of the mats and holding the mats flatwise between them, banks of spaced infra-red reflector lamps positioned approximately six inches above and below said mats for projecting their rays against opposite faces of said mats on said conveyor, said banks of lamps being symmetrically disposed with respect to the path of said mats, a motor, reduction gears and rheostat for controlling the speed of said belts whereby said mats are shrunk approximately three-eighths of an inch and only eight per cent of the moisture therein removed as the mats pass through the housing.

2. A mat drier comprising a closed housing with an open bottom, a plurality of louvers in said housing and spaced therearound, upper and lower conveyor members comprising foraminous belts, one set of belts being located above and one below the mat which it engages and holding the mat flatwise between them, banks of spaced infra-red reflector lamps positioned approximately six inches above and below said mats for projecting their rays against opposite faces of the mats between the conveyors, said banks of lamps being symmetrically disposed with respect to the path of said mats, a motor for driving said belts, reduction gears and rheostat for controlling the speed of said belts whereby said mats are shrunk approximately three-eighths of an inch and only eight per cent of the moisture therein removed as the mats pass through the housing.

3. A mat drier comprising a closed housing with an open bottom, a plurality of louvers in said housing and spaced therearound, upper and lower conveyor members comprising foraminous belts, one set of belts being located above and one below the mat which it engages and holding the mat flatwise between them, banks of spaced infra-red reflector lamps positioned approximately six inches above and below said mats for projecting their rays against opposite faces of the mats between the conveyors, said banks of lamps being symmetrically disposed with respect to the path of said mats, a motor for driving said belts, and means for controlling the speed of the belts whereby said mats are shrunk approximately three eighths of an inch and only eight per cent of the moisture therein removed as the mats pass through the housing.

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