

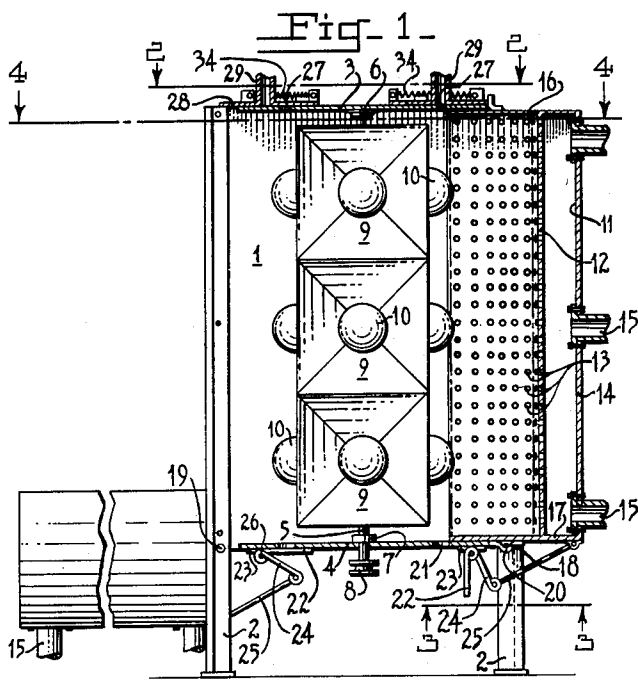
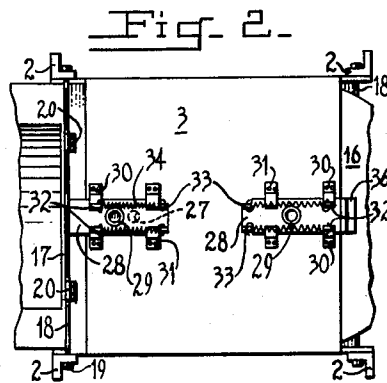
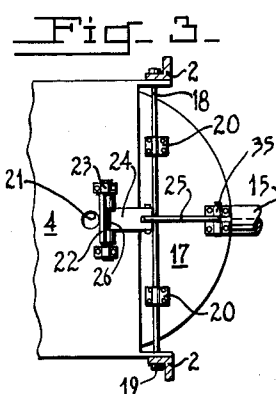
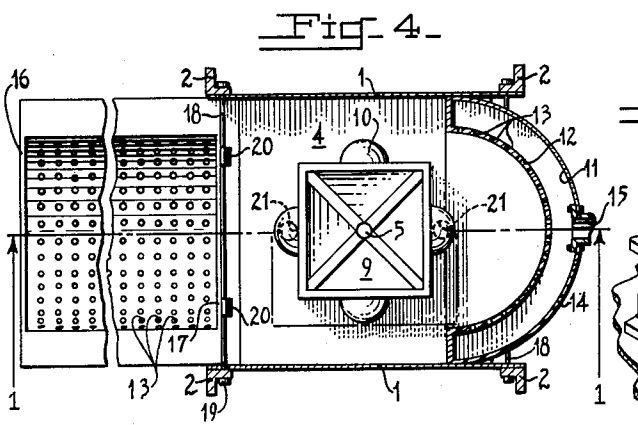
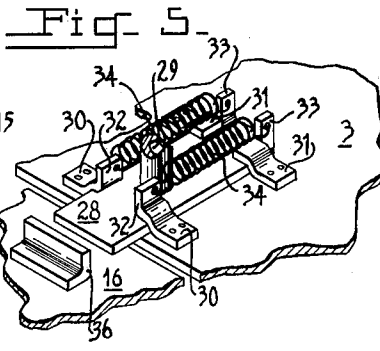
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MATRIX FORMING APPARATUS

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MATRIX FORMING APPARATUS

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6 Claims. (Cl. 34-146)

This invention relates to forming apparatus and in particular to apparatus for imparting a curved or semi-cylindrical form to a matrix plate for newspapers and the like and adapted for the casting of curved metal printing plates for rotary presses.

A newspaper matrix plate as is well known in the trade is a plate of paper composition made from type set by a linotype machine and from which the curved or semi-cylindrical metal plates are cast for use on rotary cylinder printing presses. When initially made up a matrix is substantially moisture laden and it must be carefully and thoroughly dried and set in the curved form in which a curved printing plate is to be cast. Speed is essential in newspaper printing and yet care must be taken not to distort the matrix or any portion thereof by uneven shrinkage in the drying and forming process. Generally a matrix is subjected to an initial drying operation to remove the greater portion of the moisture content evenly and so as to shrink the matrix plate substantially to its final dimensions. The matrix is then set into curved form, usually semi-cylindrical, and the moisture content thereof further reduced before casting the metal. Apparatus for setting the matrix in curved form generally consists of a vacuum chamber against which the matrix is drawn to its curved form and then held by a clamping means formed to hold the matrix sandwiched therebetween.

An object of the present invention is to provide apparatus designed to speed the extraction of the remaining moisture content from a matrix plate and shorten the time generally required for forming and setting the same.

Another object is to provide a forming cabinet in which an even application of radiant heat may be applied directly to the matrix surface when held by a vacuum forming device and from which the moisture laden air humidified by the drying matrix may be conveniently vented to the atmosphere so as to accelerate the time required for the forming operation.

A further object is to provide a forming cabinet in which the venting means for the same is automatically operable on placing the matrix in position in the cabinet enclosure for the drying and forming operation.

These and other objects and advantages of the invention will be seen from the following description of an embodiment thereof as exemplified by the apparatus shown by the accompanying drawings, in which,

Fig. 1 is a vertical sectional view of the apparatus;

Fig. 2 is a partial top plan on line 2-2 of Fig. 1;

Fig. 3 is a fragmentary bottom view on line 3-3 of Fig. 1;

Fig. 4 is a horizontal sectional view on line 4-4 of Fig. 1; and

Fig. 5 is a fragmentary perspective showing detail of a closure device for the top venting means of the cabinet.

The matrix forming cabinet is shown in the drawings with side panel walls 1 suitably mounted on corner posts as the angle iron supports 2. A top wall 3 and bottom wall 4 between the side walls 1 form the cabinet enclosure having vertically extended openings at each side between the walls 1. In the cabinet between the top and bottom is a vertically disposed lamp supporting post 5 journaled in a bearing 6 mounted on the top wall 3 and carrying a collar 7 supporting the post for rotation in an opening of the bottom wall 4. The post 5 extends below the wall 4 and is adapted to be rotated by any suitable driving means as through the belt pulley 8.

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On the post 5 in the interior of the cabinet are provided heat radiation means consisting of vertically disposed conically formed reflectors 9 with incandescent bulbs which are preferably of the infra red type. Four banks of reflector units are arranged in back to back relation on the post providing as shown by Fig. 4 a rotatable cluster of lamps for the even distribution of radiant heat from a central position in the cabinet.

Hingedly connected to the cabinet for positioning in the side wall openings between the ends of the walls 1 are duplicate vacuum chamber devices shown at each side of the cabinet and on which a partially dried matrix plate may be positioned for imparting the semi-cylindrical form thereto. The chamber 11 as shown is preferably arcuate in shape with a semi-cylinder inner wall panel 12 formed with perforations 13 providing a grid like surface. An outer wall panel 14 is provided with suitable suction ports 15 for drawing a vacuum in the chamber 11 when a matrix plate is positioned against the inner wall 12.

The vacuum chamber 11 at the top and bottom is provided with top and bottom walls 16 and 17 respectively. These walls are semi-circular and extend between the ends of the arcuate chamber so as to provide an extension of the top wall 3 and bottom wall 4 of the cabinet when the device is in operative position in the opening of the cabinet.

The vacuum device is hingedly mounted on the cabinet, as shown more clearly by Fig. 3, as on a pintle rod 18 supporting the bottom wall 17 of the vacuum chamber. Rod 18 may be held between the walls 1 on the corner posts 2 having the projecting ends of the rods capped against removal as indicated at 19. Pintle straps 20 on the underside of the bottom wall 17 receive the rod 18 for the pivotal swinging of the vacuum chamber unit between a vertical closed position thereof (at the right side of the cabinet in Fig. 1) and a horizontal open position (at the left in Fig. 1).

In operating the device the partially dried matrix plate is placed against the inner perforated panel wall 12 when the vacuum device is in horizontal open position. A vacuum is drawn in the chamber 11 to draw the matrix plate snugly against the wall 12 and hold the same in semi-cylindrical form. The unit is then swung to the closed vertical position where the drying action of the heat radiating devices takes place and the matrix plate is set to the desired form while held under the influence of the vacuum.

In order to assist the drying action of the machine the cabinet is further provided with draft venting apertures. An air inlet 21 in the bottom wall 4 is provided between the post 5 with its banks of reflectors and the lower edge of the cabinet opening. In the vertical closed position of the vacuum device the aperture 21 is open. In horizontal open position of the vacuum device a closure plate 22 is swung to block the opening of the aperture as shown at the left in Fig. 1. The plate 22 is pivotally mounted adjacent the aperture 21 on a pivot pin 26 held by straps 23 on the bottom 4. The inner end portions of the plate 22 are turned around the pin 26 in the manner of spaced hinge knuckles and the central portion between the ends is angularly extended to provide an angled depending arm 24. The outer end of arm 24 is linked by a connecting rod 25 to the outer edge of the bottom wall 17. The rod 25 is pivoted to the end of arm 24 and pivotally anchored as by a strap connection at 35.

An air outlet port is provided in the top wall 3 by an aperture 27 vertically disposed above the aperture 21 and preferably in vertical alignment therewith. As with the aperture 21 the outlet 27 is open for the passage of air

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when the vacuum device is in vertical closed position and closed when the device is swung to horizontal position below the opening between side walls 1. The closure means for the aperture 27 is best shown by Figs. 2 and 5. A slidable plate 28, provided with a draft opening as supplied by a chimney 29, is mounted on the top wall 3 and held at opposite ends of the plate by the side straps 30 adjacent the edge of the wall 3 and the inner straps 31 spaced therefrom at the inner side of the aperture 27.

The plate 28 in closed position of the vacuum device registers the chimney opening 29 with the aperture 27 (as at the right in Fig. 2). In open position of the device (as at the left in Fig. 2) the plate is moved to block the aperture 27. As shown the outer straps 30 are provided with inner upstanding ends 32 and the slide plate 28 at its inner end is provided with upstanding prongs 33. Between the prongs 33 and ends 32 at each side of the plate and chimney tension springs 34 are linked to normally bias the slide to its aperture closing position. The prongs 33 in this position about the inner straps 31 and prevent further outward movement of the slide.

As clearly seen in Fig. 5 the closure plate 28 normally extends beyond the edge of the wall 3 and the pivotal swing of the top wall 16 of the vacuum device to its closed vertical position causes movement of the slide plate 28 to register the chimney 29 with aperture 27 by reason of an upstanding lug 36 on the wall 16 striking the outer edge of the plate 28 and moving the same against the springs 34.

Thus with the matrix plate in operative position facing a revolving bank of radiant lamps moisture laden air may be vented out the draft opening afforded by the aperture 27 in the top wall while being replaced with drier air through the bottom aperture 21.

What is claimed is:

1. Matrix forming apparatus comprising an enclosed cabinet, vertically disposed heat radiating devices therein and a support journaled on a vertical axis rotatably carrying said devices, top and bottom walls, and vertically extending side walls with a side wall opening spaced from said heat radiating devices, said bottom wall having an air inlet aperture between said pivotal support and said opening and the top wall having an air outlet aperture vertically disposed above said inlet, and a vacuum chamber device hingedly connected to said cabinet adjacent said side wall opening and being pivotally movable to close said cabinet opening in vertical oppositely facing relation to said heating devices, said chamber device having an inner perforated concave panel wall and spaced therefrom an outer wall formed with suction ports.

2. The structure of claim 1 in which said vacuum chamber device has top and bottom wall surfaces extending outwardly of the cabinet top and bottom walls in vertical closed position of said vacuum chamber device, and said top and bottom walls of the cabinet are provided with movable closure members blocking off said outlet and inlet apertures thereof when the chamber device is pivoted away from the wall opening of the cabinet, said top and bottom walls of the chamber device having means engageable with said closure members and operable to move said members for opening said apertures.

3. Matrix forming apparatus comprising a cabinet with vertically arranged heat radiating devices and a support journaled on a vertical axis carrying said devices, cabinet top and bottom and side walls with a side wall opening extending between the top and bottom walls, a semi-cylindrical vacuum chamber device with an outer wall panel provided with suction ports and a concave inner wall panel spaced therefrom and provided with perforations therein for holding a matrix plate against the same on drawing a vacuum in the chamber, semi-circular top bottom walls closing the top and bottom of said chamber and extending between the ends of said chamber, hinge pintle means fixed between opposite

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side walls of the cabinet adjacent the lower edge of said opening and supporting the bottom wall of said vacuum chamber device for pivotally swinging the device between a closed vertical position in said opening and a horizontal open position below the opening, an air inlet aperture in the bottom wall of the cabinet and a closure plate pivoted adjacent thereto and movable against said aperture, said plate having a depending angular arm and a link pivoted to said arm and to the bottom wall of the vacuum chamber and movable to swing said plate against the adjacent aperture in the lower pivotal position of said chamber, said top cabinet wall having an aperture in vertical alignment with the aperture of the bottom wall and a plate slidably mounted over said aperture of the top wall and provided with a draft chimney for registration therewith, said plate being spring biased to close said aperture with the draft opening adjacent thereto and in said spring urged position having an extension lying beyond the edge of the top wall over said cabinet opening, said top wall of the vacuum device having an upstanding lug engageable against said slidable plate to move said plate against its spring in closed position of said vacuum device, said chimney draft and aperture in the latter position of said device being in registration for venting air from said cabinet between said heating devices and vacuum chamber.

4. The structure of claim 3 in which opposite side wall openings are provided in said cabinet and a vacuum chamber device is pivotally hinged adjacent the lower edge of each of said openings for vertical disposition on each side of said rotatable heat radiating devices.

5. Matrix forming apparatus comprising an enclosure having a vertically extending side wall opening, a vertically disposed heat radiating means within the enclosure walls and facing said opening, a vacuum chamber structure hingedly connected to said enclosure at an edge of said opening and pivotally movable to close said opening, the inner wall of said vacuum chamber being perforated and forming a matrix receiving panel for holding a matrix plate against the same on introduction of a vacuum in said chamber, and air inlet and outlet means for said enclosure positioned respectively below and above said radiating means and intermediate the bottom and top thereof and the bottom and top of said perforated inner wall of the vacuum chamber in closed position of the latter, all constructed and arranged for the thermal passage of humidified air evenly from the surface of the matrix plate, the heat rays of said radiating means having direct access to the wholly exposed surface area of a matrix held against said panel.

6. Matrix forming apparatus comprising a cabinet enclosure having vertically mounted rotatable heat radiating means within the enclosure and a vertically extending side wall opening spaced from said means, a vacuum chamber closure device having a perforated semi-cylindrical concave inner panel wall for receiving a matrix plate against the same on introduction of a vacuum in the chamber, said closure device being hingedly mounted on said cabinet and pivotally movable to close said opening with the heat rays from said radiating means having unrestricted access to the wholly exposed face of a matrix plate held against said perforated wall and air inlet and outlet means for said enclosure positioned respectively below and above said radiating means and intermediate the bottom and top thereof and the bottom and top of said perforated inner wall of the vacuum chamber in closed position of the latter, all constructed and arranged for the thermal passage of humidified air evenly from the surface of the matrix plate.

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