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METHOD OF AND MACHINE FOR CONDITIONING STEREOTYPE MATRICES

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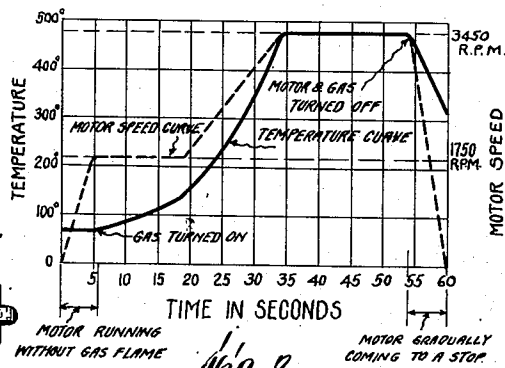
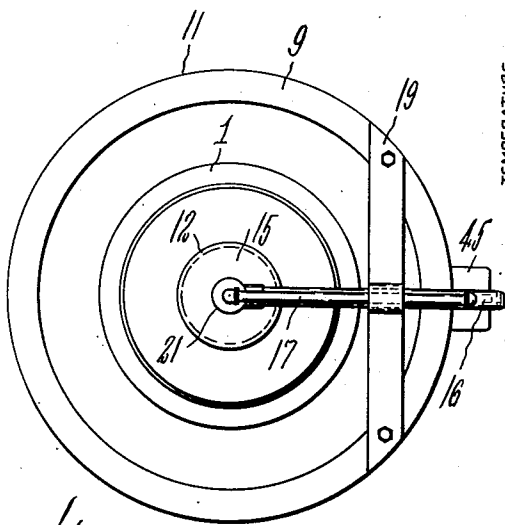
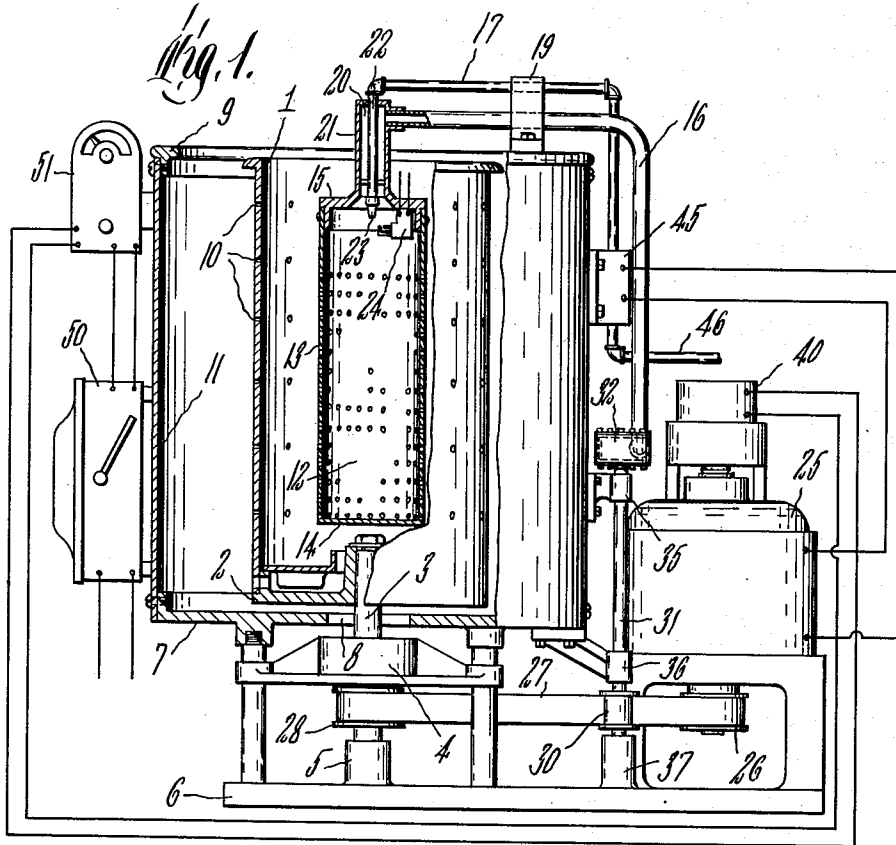


Fig. 3.

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METHOD OF AND MACHINE FOR CONDITIONING STEREOTYPE MATRICES

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5 Claims. (Cl. 210-66)

This invention relates to the shaping to curved contour and the drying out or "scorching" of matrices for use in the production of stereotype printing plates. In my Patent No. 1,935,352 granted May 20, 1931, for Method of and mechanism for treating stereotype matrices, is disclosed a machine in which a moist matrix is inserted in curved condition and subjected to the action of centrifugal force to shape it to accurate curved contour and to expel a portion of the moisture, and it is also subjected to heat to dry out and set the matrix in formed condition.

The present invention relates to the same general method, but with certain improvements. In the patented machine, the receptacle in which the matrix is subjected to centrifugal force is maintained hot, even when the matrix is inserted, and if the matrix is permitted to remain therein for any substantial time before the receptacle is brought up to rotational speed, and particularly with certain types of matrix, the matrix may become so set before the centrifugal action is fully effective that it fails to become shaped to perfect contour.

In accordance with the present invention, therefore, the receptacle is unheated when the matrix is placed therein and the matrix is given an initial centrifugal treatment sufficient to insure proper conformation, but insufficient to injure the type impression, before the matrix is subjected to heated drying action. When it is subjected to this heated drying action, it is also subjected to a more rapid rotation, which further aids in expelling the moisture from the matrix.

For a more complete understanding of this invention, reference may be had to the accompanying drawing in which:

Figure 1 is a view partly in side elevation and partly in vertical section, of a machine employing the method of this invention.

Figure 2 is a fragmentary top plan view of the same.

Figure 3 is a diagram showing the cycle of operations of the machine.

Referring to the drawing, at 1 is shown a cylindrical container open at its upper end and having a base 2 at its lower end. This container is secured to the upper end of a shaft 3 which is suitably journaled in a pair of spaced bearings 4 and 5 supported by a machine frame 6.

The container 1 is arranged within an outer casing comprising a base 7 through which is formed an enlarged opening 8 through which the shaft 3 passes, and to this base is secured an annular upright wall member 11, reinforced at

its upper edge by a rim member 9. This casing acts as a safety mechanism to prevent damage, should the container 1 for any reason become badly off-centered in rotation so as to prevent it from causing damage, and it also retains moisture flying off from the container through perforations 10 in its side wall which facilitate the expulsion of moisture from the matrix by the centrifugal action. The container 1 may be constructed substantially in accordance with the disclosure in my Patent No. 1,935,352 hereinbefore mentioned.

Within the container 1 is shown suspended a foraminous cage 12 having a perforated cylindrical side wall 13, a bottom wall 14 and a top wall 15. This cage is stationary, but is maintained substantially coaxial with the container 1. Partly for this purpose, the top member 15 is shown as extended above the upper edge of the container 1 where it is supported as by means of a pair of pipes 16 and 17, which, in turn, are carried by a bracket 19 fixed to the stationary rim member 9.

The pipe 16 communicates with an annular chamber 20 formed within an upward extension 21 of the top member 15 and between its outer wall and a downward extension 22 of the pipe 17. The pipe 17 terminates in a gas jet 23 which extends slightly into the upper end of the cage 12, and below it is positioned a suitable ignition device, as at 24, herein shown as of the electric type. The pipe 16 is intended to carry a current of air which enters the top of the cage 12 around the gas jet 23, mixing with the gas therefrom and forming a combustible mixture which is more or less confined within the cage 12. Thus this cage becomes a source of heated air which discharges therefrom substantially evenly throughout its length and toward the inner wall of the container 1. The matrix to be shaped and dried is placed between the cage and the inner wall of the container 1, whereupon the container is rotated about its axis so as to press the matrix, which is in relatively soft condition, against the inner wall of the container and cause it to conform thereto by the action of centrifugal force.

Rotation of the container 1 is shown as produced by a motor 25 having a belt pulley 26 thereon connected by means of a belt 27 to the belt pulley 28 secured to the shaft 3 between the bearings 4 and 5. One stretch of the belt 27 also engages a small belt pulley 30 on a vertical shaft 31. This shaft 31 at its upper end is operatively connected to a blower 32 of any suitable type by which air is forced into the pipe 16. This

shaft 31 is shown as supported in bearings 35 and 36 secured to the casing 8 and at its lower end in a bearing 37 at the base of the machine.

The motor 25 may be provided with a magnetic brake 40 which will automatically come into action when current is interrupted to the motor 25, thus to stop the rotation of the motor and through it the rotation of the container 1 and the operation of the blower 32 when current is cut off to the motor. Such an arrangement of motor and brake is well known in the art and per se is not a part of this invention, so that no further description thereof is believed necessary.

At 45 is shown a solenoid-actuated valve for controlling the supply of gas delivered to the pipe 17 from the supply pipe 46. This may be a solenoid-actuated valve of well known type which acts to open the valve a predetermined time after the energization of the solenoid.

At 50 is shown a main switch box for controlling the supply of current to the motor 25 and to the solenoid-operated valve 45 through a time switch shown at 51. Such time switches are old and well known and may be so set that when the switch at 50 is closed, the motor is energized and rotates at, say, half speed for a predetermined number of seconds, as, for example, eighteen or nineteen, in accordance with the diagram of Figure 3. A predetermined time after the start of the motor, shown in Figure 3 as approximately six seconds, the switch 45 opens the supply of gas to the pipe 17 and it is ignited at the nozzle 23, air being supplied by the blower 32, which was started when the motor 25 was started.

The initial period of rotation of the container before the gas is ignited and while unheated air is blown through the cage is sufficient to cause the wet matrix to become conformed by centrifugal force to the curvature of the inner wall of the container, but the rotational speed during that period is held sufficiently low so that the centrifugal force is insufficient to damage the type impressions of the matrix. Too high speed of rotation would tend to flatten the type impressions, forcing the matrix toward flat contact all over with the wall of the container. The matrix thus having had time to be properly conformed to the interior curvature of the container, is then subjected to the action of heated air which is substantially uniformly projected thereagainst by reason of the distributing action of the cage 12, and the speed of rotation of the motor is then increased. The subjection of the matrix to heated air causes it to be dried out quickly to a sufficient extent, so that no damage to the type impressions is thereafter to be feared from a higher rate of rotation with its attendant increased centrifugal force. This increased centrifugal force acts to further expel moisture from the matrix, as through the perforations 10 of the container wall, and the increase in the supply of air due to the high speed of the motor further increases the rate of the drying action, and also the heat to which the matrix is subjected.

In the diagram of Figure 3, the motor is shown as operated at substantially half speed after it reaches this speed from zero, for a period of about 18 or 19 seconds after the machine has been set into operation, whereupon the speed of rotation increases to full speed and the heat correspondingly increases to a maximum after about 34 seconds. This action continues until about 54 seconds after the start of operations, whereupon

the motor is shut down and the gas is cut off and the container 1 is brought to rest in about a minute after the start of operations, at which time the matrix will have been completely conformed and dried in condition for use in casting stereotype plates and the container cooled sufficiently to receive the next matrix to be "scorched."

It will, of course, be evident that various different cycles of operations might be arranged for by proper adjustment of the time switches, but the particular cycle shown has been found in practice to be quite satisfactory for the usual matrices used in connection with newspaper work. It will also be evident to those skilled in the art that various other changes and modifications may be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A machine of the class described, comprising a rotatable perforated cylindrical container within which a matrix in soft wet condition may be placed, said container being open at its upper end, a foraminous cage suspended within the container, a gas jet extending into the cage, means for supplying gas to said jet, an igniter for gas located adjacent the jet, a chamber surrounding the gas jet and communicating with the interior of said cage, a blower for blowing air into the chamber and said cage, and a motor for rotating the container and actuating the blower.

2. The method which comprises placing a wet matrix in a cool cylindrical container having an inner side wall face of substantially the desired curvature of the matrix, rotating the container about its axis at a rate sufficient to conform said matrix by centrifugal force to the curvature of said face while the matrix is cool but at a rate insufficient to damage the type impressions in said matrix, then subjecting said matrix to a current of hot gases to dry the matrix, then cooling said matrix and container and stopping their rotation, and then removing the dried and formed matrix from the container.

3. The method which comprises placing a wet matrix in a cool cylindrical container having an inner wall face of substantially the desired curvature of the matrix, rotating the container about its axis at a rate sufficient to conform said matrix by centrifugal force to the curvature of said face but at a rate insufficient to damage the type impressions in said matrix and while blowing cool air thereagainst, then introducing a combustible gas into said air and igniting the mixture thereby heating and drying the matrix and while the matrix is still subjected to centrifugal force, stopping the flow of gas while continuing to introduce air to cool said matrix and container and discontinuing the rotation of said container, and thereafter removing said matrix from said container.

4. The method which comprises placing a wet matrix in a cool centrifugal container having an inner wall face of substantially the desired curvature of the matrix, rotating the container about its axis at a rate sufficient to conform said matrix by centrifugal force to the curvature of said face but at a rate insufficient to damage the type impressions in said matrix and while blowing cool air thereagainst, then introducing a combustible gas into said air and igniting the mixture thereby heating and drying the matrix and while the matrix is subjected to an increased centrifugal

force, stopping the flow of gas while continuing to introduce air to cool said matrix and container and discontinuing the rotation of said container, and thereafter removing said matrix from said container.

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5. A machine of the class described comprising a cylindrical container open at one end, means supporting said container for rotation about its axis, a foraminous cage supported from said open end within said container, a gas jet extending

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into said cage, a blower for blowing air into said cage, an electric motor for rotating said container and actuating said blower, a main control switch, electrically actuated means for controlling the supply of gas to said jet, electrical ignition means adjacent to said jet, and an electric timing cycle control for said gas control and ignition means and said motor control, controlled by said main switch.

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