Feb. 20, 1951 E. C. GADDEN 2,542,654

APPARATUS FOR SCORCHING AND PRESHRINKING MATS

Filed Aug. 25, 1947 2 Sheets-Sheet 1

Fig. 1

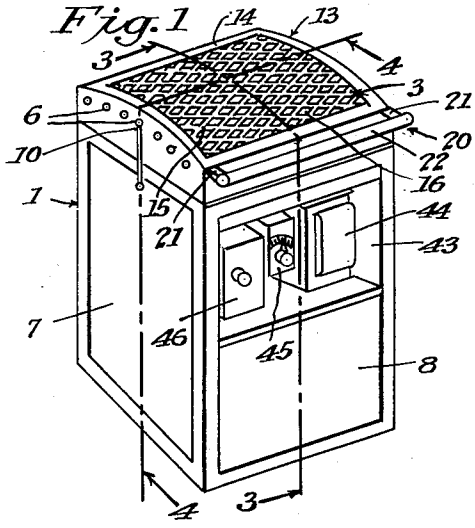


Fig. 2

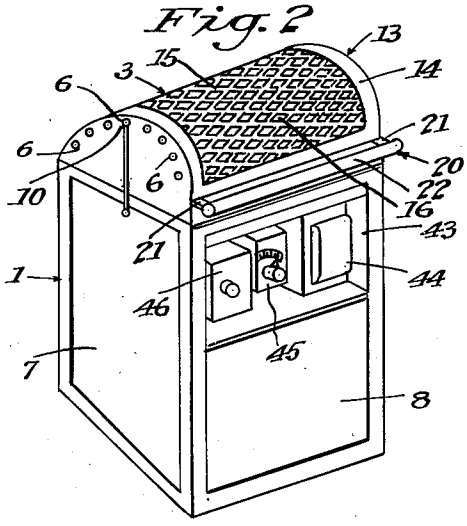


Fig. 3

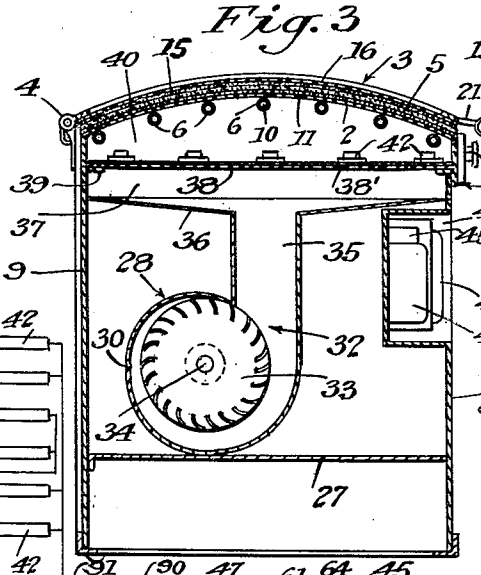
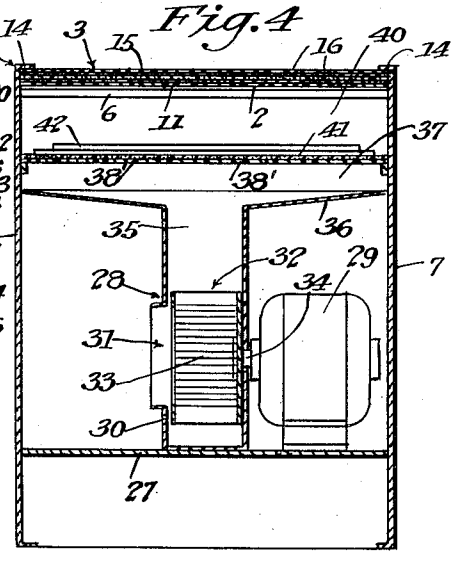


Fig. 4



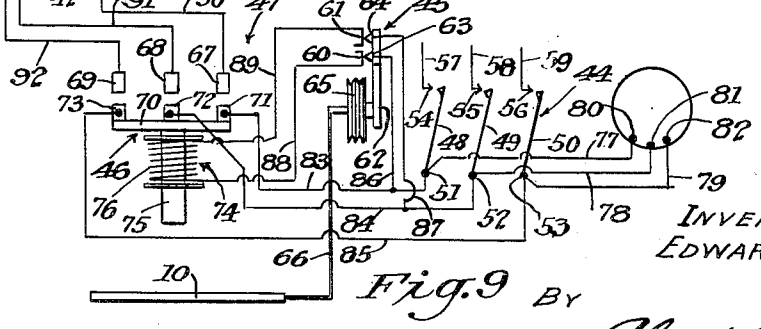


Fig. 9

INVENTOR:
EDWARD C. GADDEN.

BY

Alan Franklin,
ATTORNEY.

Feb. 20, 1951 E. C. GADDEN 2,542,654

APPARATUS FOR SCORCHING AND PRESHRINKING MATS

Filed Aug. 25, 1947 2 Sheets-Sheet 2

Fig. 5

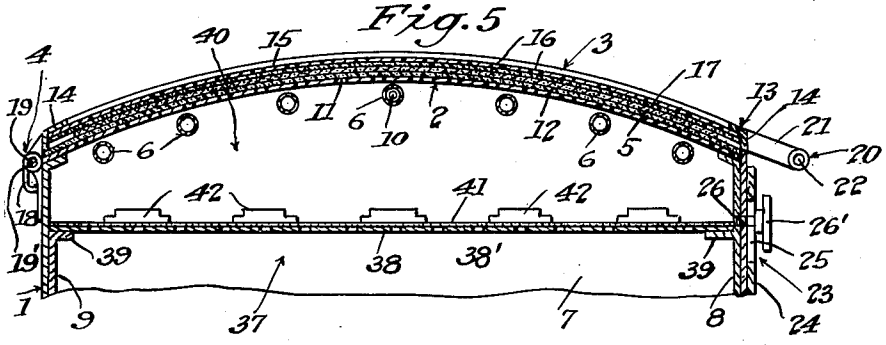


Fig. 6

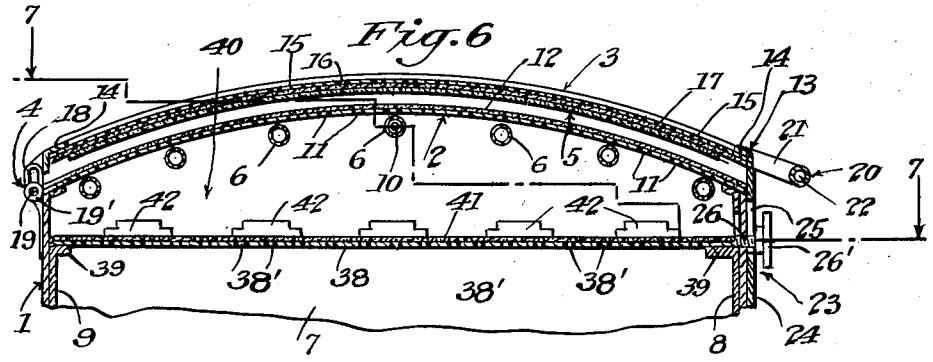


Fig. 7

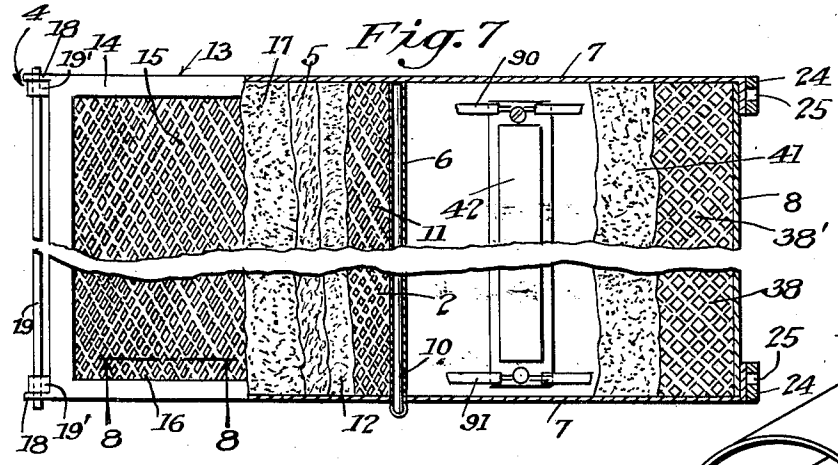


Fig. 11

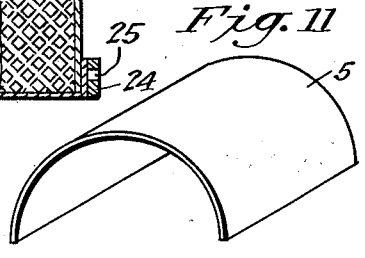


Fig. 8

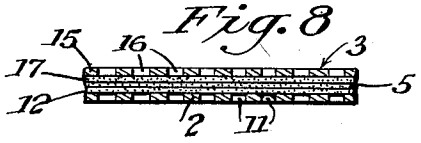
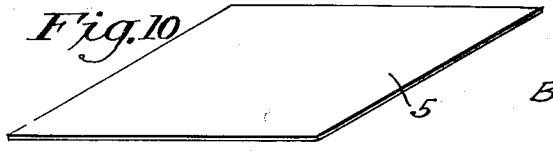


Fig. 10



INVENTOR.
EDWARD C. GADDEN.

BY Alan Franklin,
ATTORNEY.

Patented Feb. 20, 1951

2,542,654

UNITED STATES PATENT OFFICE

2,542,654

APPARATUS FOR SCORCHING AND PRESHRINKING MATS

Edward C. Gadden, Los Angeles, Calif.

Application August 25, 1947, Serial No. 770,355

3 Claims. (Cl. 34—48)

1

This invention relates to apparatus including a scorcher and pre-shrinker, for scorching and pre-shrinking "mats" or matrices before placing the same in a casting machine for casting type for printing presses.

The general object of the invention is to provide a combination scorcher and pre-shrinker of the character stated, which will dry, shrink and form a mat fast without buckling the same, before placing the mat in a casting machine, for casting a block of type for use in a printing press for printing.

A more particular object is to provide a scorcher and pre-shrinker of the character stated equipped with a thermostat control for controlling the heat in the same within suitable limits.

Other objects and advantages will appear hereinafter as this specification progresses.

The invention is illustrated in the annexed drawings, which form a part of this specification, and in which:

Fig. 1 is a perspective of my invention for scorching and pre-shrinking a mat in substantially flat or slightly curved form.

Fig. 2 is a perspective of my invention for scorching and pre-shrinking a mat in substantially curved form.

Fig. 3 is a vertical longitudinal section of my invention taken on line 3—3 of Fig. 1.

Fig. 4 is a transverse vertical section of my invention taken on line 4—4 of Fig. 1.

Fig. 5 is an enlarged fragmentary vertical section of my invention taken on line 3—3 of Fig. 1, with the cover thereof shown lying down tightly upon the mat resting upon its support in the upper part of the apparatus.

Fig. 6 is a view like Fig. 5, except that the cover is shown swung slightly upwardly above the mat, to permit freedom if the mat to float under air pressure from below the mat.

Fig. 7 is a horizontal section of my invention taken on line 7—7 of Fig. 6, illustrating certain parts of my invention.

Fig. 8 is a fragmentary vertical section of the upper part of my invention, showing the mat held in position by the cover for scorching and preshrinking, taken on line 8—8 of Fig. 7.

Fig. 9 is a diagram of the electric control circuit of my invention.

Fig. 10 is a perspective of a mat before it is scorched and pre-shrunk by my invention.

Fig. 11 is a perspective of a mat scorched and preshrunk by my invention as shown in Fig. 2 of the drawings.

Referring more particularly to the drawings, in

2

which corresponding parts are designated by the same reference numerals in all of the figures, 1 designates a casing constructed with an upper perforated wall 2 and a cover 3, which is hinged at its rear edge by a hinge 4 to the rear upper edge of said casing 1 to swing down upon said upper perforated wall 2 or to swing upwardly away from said upper wall. Said upper perforated wall 2 may be formed with a slight upward curvature between its front and rear edges as shown in Figs. 1 and 3 of the drawings, for use in scorching and pre-shrinking a mat 5 with a slight curvature, to form what is known in the art as a "flat" mat. A plurality of tubes 6 extend transversely of the casing 1 between the upper edges of the side walls 7 of said casing immediately under the upper perforated wall 2, in spaced relation between the front wall 8 and rear wall 9 of said casing, which tubes 6 are secured at their ends to said side walls 7, for supporting said upper perforated wall 2. One end of one or more of said tubes 6 extends through one of the side walls 7 of the casing 1, for receiving a thermostat 10 from outside said casing as shown in Figs. 1, 2 and 5 to 7, inclusive.

The perforated upper wall 2 is provided with a plurality of perforations 11 therein through which heat may pass in the manner and for the purpose hereinafter more fully described. On the upper side of the perforated plate 2 is secured a sheet of asbestos 12. The cover 3 comprises a rectangular frame 13, formed at its upper edge with an internal flange 14, a perforated plate 15, provided with perforations 16, secured in said frame to the under side of said flange 14, and a sheet of asbestos 17 secured to the under side of said perforated plate. The hinge 4 is formed with slotted knuckles 18 secured to the rear side of said cover frame 14, through which knuckles the hinge pivot rod 19 secured in knuckles 19' formed on the rear upper edge of the casing 1, may move upwardly to prevent the rear part of the cover from clamping the rear edge portion of the mat 5, when the cover is closed, and to allow the cover to rest of its own weight only upon said rear edge portion of said mat.

A handle 20 is secured to the forward side of said frame 14, which handle includes a pair of arms 21 and a rod 22, said arms extending forwardly from the forward corners of said frame and to the forward ends of which arms are secured the ends respectively of said rod, with said rod extending parallel to the forward side of said frame in spaced relation thereto.

A cover adjusting means 23 is provided on the front of the casing 1 at the upper edge thereof, for adjustably supporting the forward part of the cover 3 swung upwardly to different positions on its hinge 4, which adjusting means comprises a plate 24 provided with a vertical slot 25, and a thumb screw 26 extending through said slot and threaded in the front wall 8 of the casing 1, the head 26' of said thumb screw engaging the outer side of said plate for clamping said plate against said front wall of said casing in adjusted positions, with the arms 21 of the handle 20 of the cover 3 resting upon the upper edge of said plate, whereby said cover is supported raised to different adjusted positions slightly above the mat 5 resting upon the sheet of asbestos 13 on the upper side of the upper perforated wall 2 of the casing 1, in the manner and for the purpose hereinafter more fully described.

In the lower part of the casing 1 is secured a horizontal wall 27 upon which is mounted a blower 28, and an electric motor 29 for driving said blower. The blower 28 comprises a casing 30, provided with an inlet 31 and an outlet 32, and a rotatable fan 33 secured on the shaft 34 of the motor 29 within said casing 30. From the blower outlet 32 extends an outlet duct 35 upwardly through a wall 36 extending across the upper part of the casing 1 and forming the bottom wall of an air reservoir 37.

In the upper part of the casing 1, spaced above the wall 36 and spaced below the upper perforated wall 2 of said casing is secured a horizontal perforated wall 38 on a horizontal flange 39 extending inwardly from the front wall 8, rear wall 9, and side wall 7 of the casing 1, which perforated wall 38 divides the upper part of said casing into the air reservoir 37 and a heating chamber 40, forming the upper wall of said air reservoir and the lower wall of said heating chamber, the upper wall of which heating chamber being formed by upper perforated wall 2 of the casing 1. Said perforated wall 38 is provided with a plurality of perforations 38. A sheet of asbestos 41 is secured over the upper side of the perforated wall 38 and the perforations 38' therein. A plurality of electric strip heaters 42 are mounted on the lower part of the heating chamber 40 upon the asbestos sheet 41, with said heaters extending transversely of said heating chamber in spaced relation to each other.

In the upper part of the front wall 8 is formed a pocket 43 in which are accessibly mounted a main switch 44, a thermostatic switch 45 and a magnetic switch 46, which switches are included in an electrical controlling circuit 47 for my scorcher and pre-shrinker, which circuit is illustrated in Fig. 9 of the drawings. The main switch 44 comprises three switch bars 48, 49 and 50 hinged at one end to terminal hinges 51, 52 and 53, respectively, for engaging at their other ends terminal contacts 54, 55 and 56, respectively, to which are connected the main leads 57, 58 and 59, respectively. The thermostatic switch 45 comprises a pair of terminal contacts 60 and 61, a switch bar 62 on one end of which are secured a pair of contacts 63 and 64 for engaging said contacts 60 and 61, respectively, and a bellows 65, to which said switch bar 62 is secured, and into which bellows a tube 66 extends from the thermostat 16. The magnetic switch 46 includes three terminal contacts 67, 68 and 69, a movable switch bar 70 on which are mounted three contacts 71, 72 and 73, and a solenoid 74, including a core 75 secured at one end to said switch bar 70, and a coil 76 through which said core extends. In the controlling circuit 47 leads 77, 78 and 79 extend, respectively, from the main switch terminals 51, 52 and 53 to the terminals 80, 81 and 82 of the motor 29. Leads 83, 84 and 85 extend from said main-switch terminals 51, 52 and 53, respectively, to the magnetic-switch terminals 71, 72 and 73, respectively. Leads 86 and 87 extend from the leads 83 and 84, respectively, to the thermostatic switch contacts 63 and 64, respectively. Leads 88 and 89 extend from the thermostatic-switch terminals 60 and 61, respectively, to the ends, respectively, of the solenoid coil 76 of the magnetic switch 46. Leads 90, 91 and 92 extend from the terminals 67, 68 and 69, respectively, and are connected to the strip heaters 42 in such manner as to maintain at all times a balanced three phase circuit as shown in Fig. 9 of the drawing.

The operation of my invention is as follows:

The cover 3 being swung up on its hinge 4 a mat 5 is placed in position upon the asbestos sheet 12 over the upper perforated wall 2. The cover 3 is then swung down on its hinge 4 upon the mat 5, whereby said mat is clamped between said asbestos sheet 13 and the asbestos sheet 17 on the underside of said cover, as shown in Fig. 5 of the drawings. The main switch 44 is then swung closed and electric current is supplied from the main leads 57, 58 and 59 through said main switch and the motor leads 77, 78 and 79 to the motor 29, whereupon said motor is driven, which rotates the blower fan 33.

The main switch 44 being closed, and the magnetic switch 46 being closed by the solenoid 46 energized by electric current passing from lead 83 through lead 86, contacts 63 and 60 of thermostat switch 45, lead 88, solenoid coil 76 of magnetic switch 46, lead 89, contacts 61 and 64 of said thermostat switch, and lead 87 to lead 84, electric current is supplied to the electric strip heaters 42, through the leads 83, 84 and 85, contacts 71 and 67, 72 and 68, and 73 and 69 of said magnetic switch 46, and through leads 90, 94 and 95 and the terminals 91, 92 and 93 of said heaters to which the leads 90, 94 and 95 are connected, whereupon said heaters 42 give off their heat in the heating chamber 40. As the blower fan 33 is rotated by the motor 29 as aforesaid, air is taken into the blower 28 through its inlet 31 and discharged from said blower through its outlet 32 and through the outlet duct 35 into the air reservoir 37, from which reservoir said air is forced on upwardly through the perforations 38' in the wall 38, and through the asbestos sheet 41 on the upper side of said perforated wall, into the heating chamber 40, where said air is heated by the strip heaters 42, from which chamber said heated air is forced upwardly through the perforations 12 in the upper wall 2, through the asbestos sheet 13 on the upper side of said upper wall 2, and through the mat 5, clamped between said asbestos sheet 13 and the asbestos sheet 17 on the under side of the perforated cover plate 16 and then through the perforations 16' in said cover plate into the atmosphere, until the mat 5 is properly dried, or scorched and pre-shrunk in the apparatus whereupon the cover 3 is swung up on its hinge 4, and the mat is removed from the apparatus.

If the heat in the heating chamber 40 should rise above a predetermined temperature, the air in the thermostat 11, tube 66 and bellows 65 of the thermostat switch 45 is expanded, whereupon said bellows will be expanded and the switch

bar 62 will be moved by said bellows so that the contacts 63 and 64 on said bar will be moved away from the contacts 60 and 61 of the thermostat switch 45 and said thermostat switch will be opened and the solenoid coil 76 will be deenergized, whereupon the solenoid core 75, bar 70 and contacts 71, 72 and 73 of the magnetic switch 46 will drop, and said contacts will disengage the contacts 67, 68 and 69 of said magnetic switch and said switch will be opened, so that no electric current will be supplied to the strip heaters 42, thus shutting off the heat of said heaters in the heating chamber 40, until the heat in said heating chamber, thermostat 11, tube 66 and bellows 65 falls below said predetermined temperature, whereupon said bellows is contracted and the switch bar 62 is moved by said bellows until the contacts 63 and 64 on said bar engage the contacts 60 and 61 and close the thermostat at switch 45, whereupon electric current is again supplied through said switch to the coil 76 of solenoid 74, and the solenoid switch 46 is again closed by said solenoid, and electric current is again supplied through said solenoid switch to the strip heaters 42, to heat up the heating chamber 40, as above described.

The plate 22 of the cover, adjusting means 21 may be adjusted and secured in adjusted position by screw 25 to hold the cover 3 slightly raised on its hinge 4, to permit freedom of the mat to float under air pressure against said cover during the heating and drying of the mat in the apparatus as above described.

I claim:

1. Apparatus as disclosed including an air reservoir, a heating chamber above said air reservoir, a perforated wall separating said heating chamber and said air reservoir, a cover for covering a mat, placed upon the upper wall of said heating chamber, said heating chamber, including an upper perforated wall, means for supplying air to said air reservoir, and through the perforations in said perforated wall to said heating chamber, means for heating the air in said heating chamber, said cover being hinged at one side, and means for holding said cover raised slightly on its hinge above the mat to permit freedom of the mat to float under air pressure against the cover.

2. Apparatus as disclosed including an air reservoir, a heating chamber above said air reservoir, a perforated wall separating said heating chamber and said air reservoir, a cover for covering a mat, placed upon the upper wall of said heating chamber, said heating chamber including an upper perforated wall, means for supplying air to said air reservoir, and through the perforations in said perforated wall to said heating chamber, means for heating the air in said heating chamber, a tube extending through the heating chamber, a thermostat detachably fitted in said tube, means to enable said thermostat to regulate said air-heating means for maintaining the heat in said heating chamber at a predetermined temperature, said tube being accessible through the side wall of said heating chamber and serving to support the perforated upper wall of said heating chamber.

3. Apparatus as disclosed including an air reservoir, a heating chamber above said air reservoir, a perforated wall separating said heating chamber and said air reservoir, a cover for covering a mat, placed upon the upper wall of said heating chamber, said heating chamber including an upper perforated wall, means for supplying air to said air reservoir, and through the perforations in said perforated wall to said heating chamber, means for heating the air in said heating chamber, said cover being mounted to be raised a short distance above the upper wall of the heating chamber, and means for securing said cover in said raised position to permit the mat to float between the upper wall of the heating chamber and the cover.

EDWARD C. GADDEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
296,049	Pearce et al.	Apr. 1, 1884
1,786,316	Riley	Dec. 23, 1930
1,960,697	Cochran et al.	May 29, 1934
2,184,663	Dye	Dec. 26, 1939
2,423,391	Kozloff	July 1, 1947
2,454,334	Moir	Nov. 23, 1948