Nov. 18, 1952 R. FINZER 2,618,073

MACHINE FOR MAKING STEREOTYPE MATS

Filed July 30, 1951 4 Sheets-Sheet 1

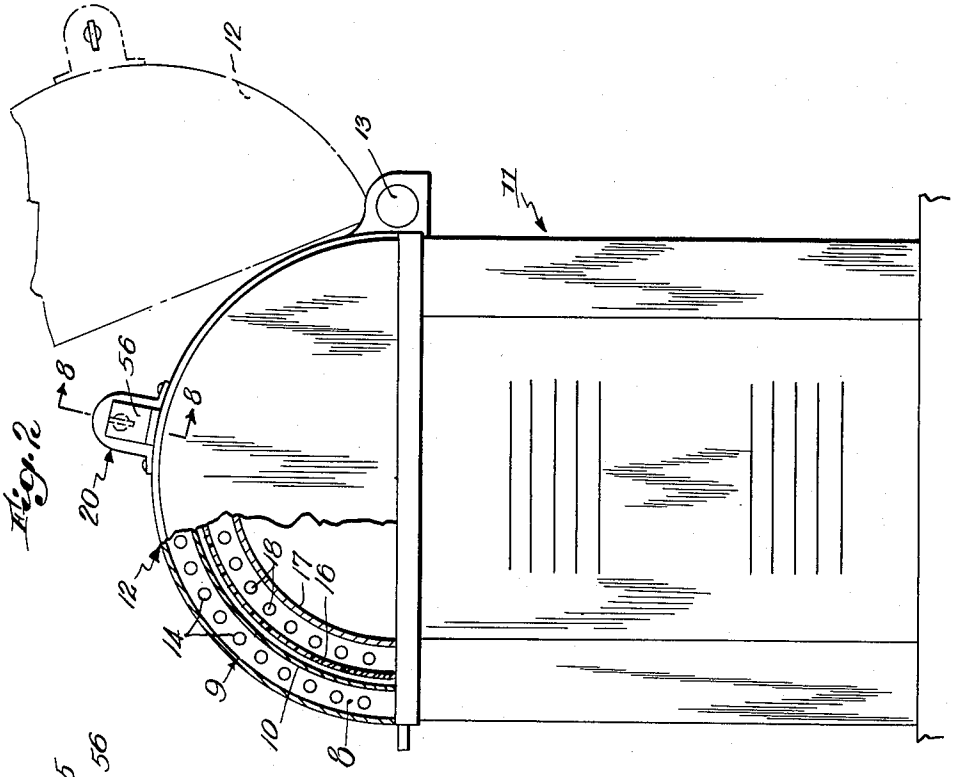


Fig. 2

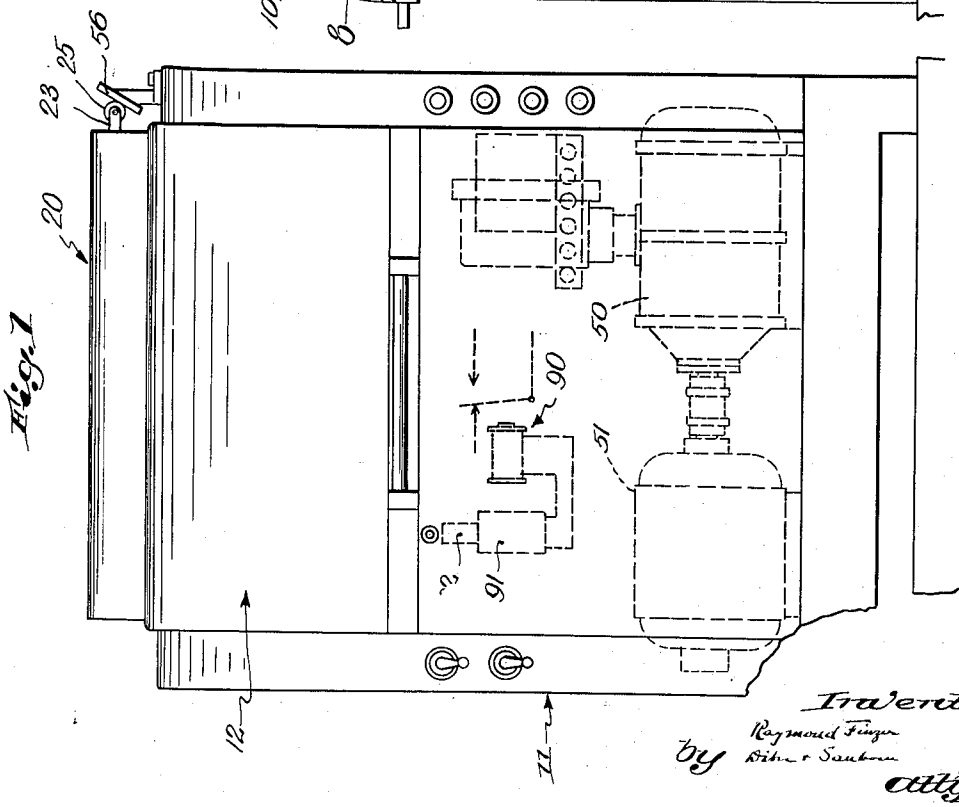


Fig. 1

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MACHINE FOR MAKING STEREOTYPE MATS

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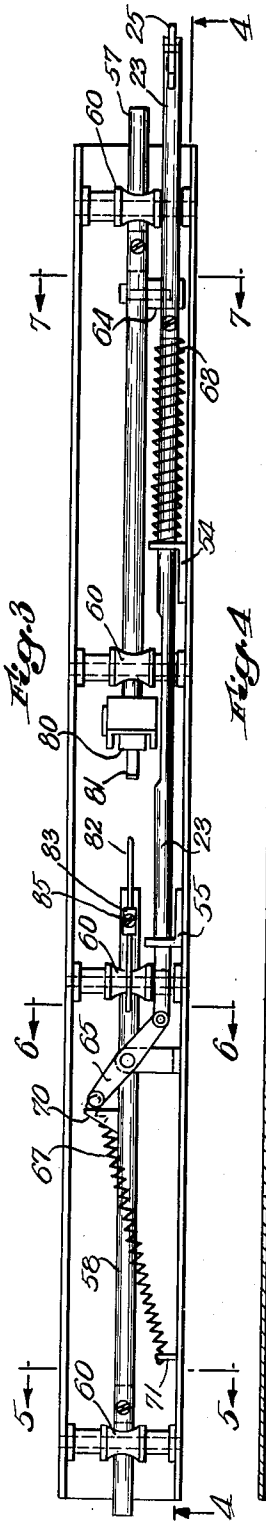


Fig. 3

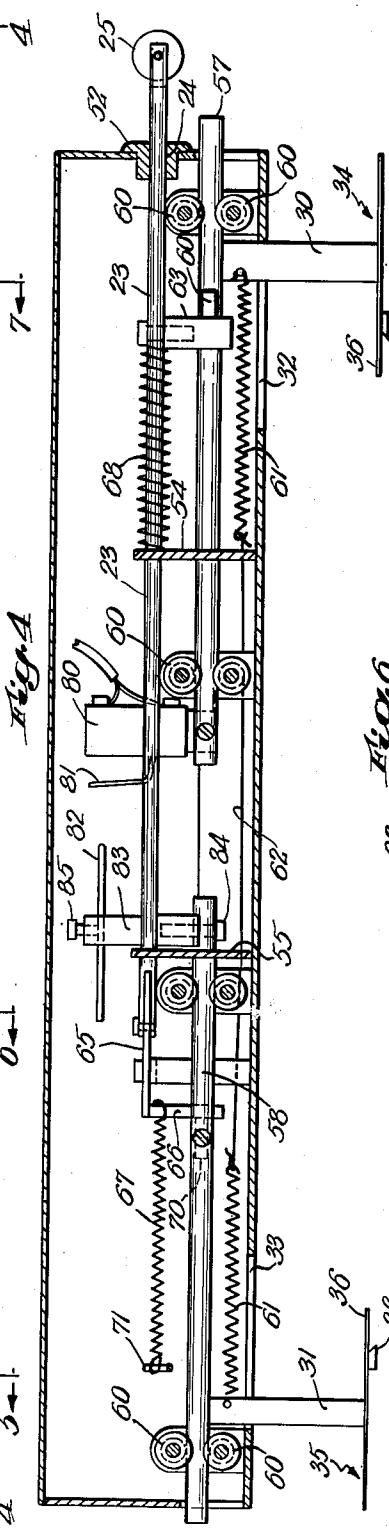


Fig. 4

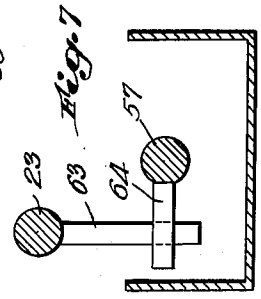


Fig. 7

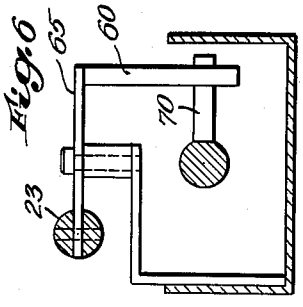


Fig. 6

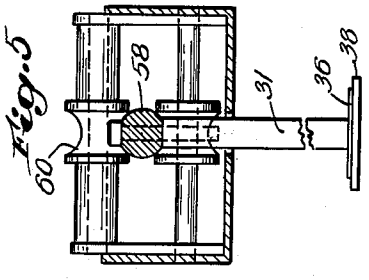


Fig. 5

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MACHINE FOR MAKING STEREOTYPE MATS

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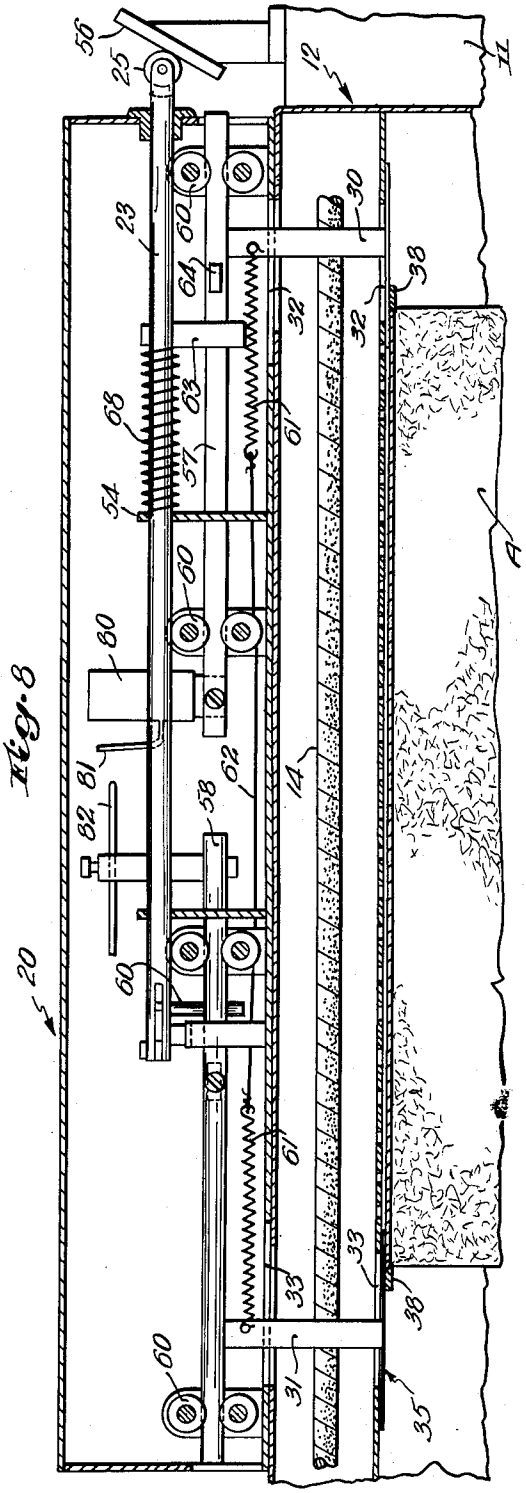


Fig. 8

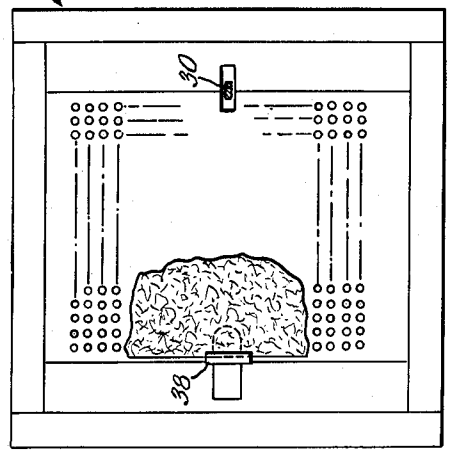


Fig. 9

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Nov. 18, 1952 R. FINZER 2,618,073

MACHINE FOR MAKING STEREOTYPE MATS

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Fig. 10

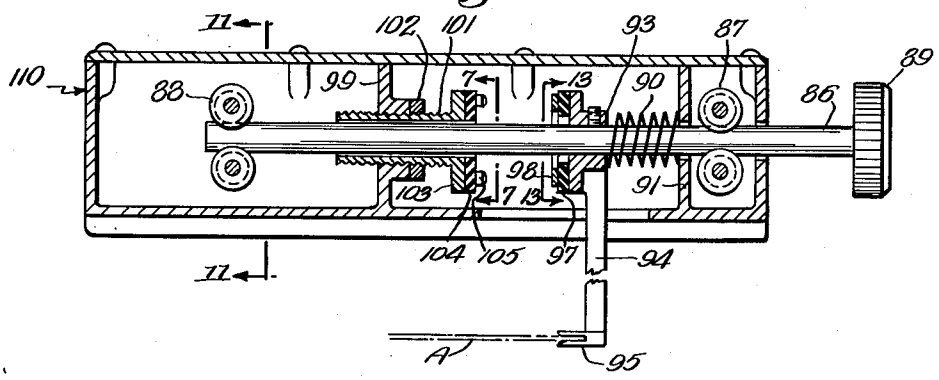


Fig. 11

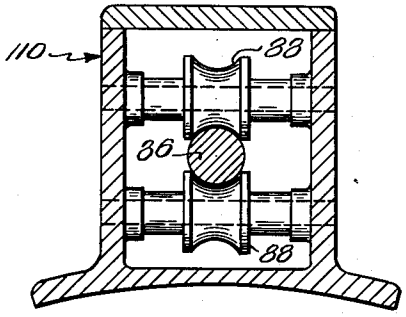


Fig. 12

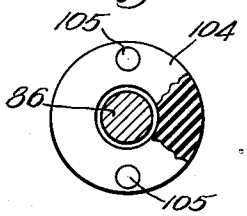


Fig. 13

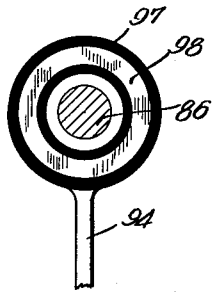
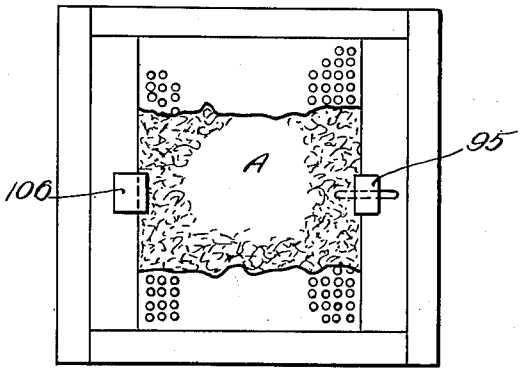


Fig. 14



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Patented Nov. 18, 1952 2,618,073

UNITED STATES PATENT OFFICE

2,618,073

MACHINE FOR MAKING STEREOTYPE MATS

Raymond Finzer, Hoosick Falls, N. Y.

Application July 30, 1951, Serial No. 239,366

7 Claims. (Cl. 34—43)

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This application is a continuation in part of my previous application, Serial No. 163,723 filed May 23, 1950.

This invention relates to a machine and method for controlling during drying or baking, the shrinkage of molded stereotype mats, such as are used in printing offices and particularly newspaper printing offices. As is well known to those skilled in the art, stereotype mats are made from sheets of wet pulp which contain large amounts of moisture and are dried and hardened in a machine known as a scorcher. Such sheets shrink greatly during baking, the shrinkage being ordinarily as much as 1⅛ inches. Since it is important that the mats be substantially uniform in width, the large shrinkage leads subsequently to serious troubles. Attempts have been made to produce mats of uniform width by using automatic timers which stop the heating after a predetermined length of time, but it has been found that stereotype mats as they come to the machine vary so greatly in moisture content that there is substantial variation in width, even though the time of drying and the temperature are the same. It is also well known to those skilled in the art that a mat, a large part of whose area has no printing, will have entirely different shrinkage characteristics from a sheet which is uniformly covered with printed matter. Therefore, it has been found that with machines which have a pre-shrink timer which is set for a predetermined length of time, the mats produced vary greatly in width both on account of variations in moisture content and also variations in the amount of white on the page, the open page shrinking much more than a solid page. Since it is not customary to reset the pre-shrink timer for each mat that is to be baked, the mats produced vary greatly in width.

Mats which after drying are outside the permissible width limits result in loss of material, labor and time, and often also result in serious delay in the production of the newspaper. As the time which elapses between the time when the forms are locked and time when the plates go to the press room is in the vicinity of ten minutes any interruption or delay during the period is a serious matter. Mats that are undersize in width due to too much shrinkage cause a loss in advertising lineage.

The apparatus and method embodying my invention produces stereotype mats of substantially uniform width. Also it is possible to use stock which in its original condition varies greatly in moisture content, and the difficulties due to variations in width resulting from the differences in

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the proportion of space which is occupied by the printed matter are overcome. The apparatus for practicing my invention is readily incorporated in machines of standard construction now on the market or may be applied as an attachment to machines already constructed. When so applied, it is necessary to use only one timer instead of the two which are now employed.

I accomplish these results by following one or both edges of the mat with a finger or feeler as the mat shrinks and when a predetermined point has been reached, preventing further shrinkage by clamping the mat against a reticulated or perforated surface by air pressure resulting from a greatly increased vacuum created on the back of the perforated surface.

Referring now to the drawings in which my invention is shown as embodied in or applied to a scorcher of well known construction:

Fig. 1 is a front elevation;

Fig. 2 is an end elevation of the apparatus shown in Fig. 1, portions of the cover being broken away;

Fig. 3 is a plan view of the control unit, the cover of the unit being removed;

Fig. 4 is a section on line 4—4 of Fig. 3 looking in the direction of the arrows;

Figs. 5, 6 and 7 are sections on lines 5—5, 6—6 and 7—7 respectively, looking in the direction of the arrows;

Fig. 8 is a section taken substantially vertically on line 8—8 of Fig. 2 looking in the direction of the arrows;

Fig. 9 is an inside view of the upper chamber of the scorcher to illustrate the position of the feelers with respect to the side edges of the mat which is being dried;

Fig. 10 illustrates a modified form of the machine embodying my invention only one feeler being employed;

Figs. 11, 12 and 13 are sections on lines 11, 12 and 13 of Fig. 10 looking in the directions indicated; and

Fig. 14 is a view showing the position of the fixed stop.

At 11 is shown the base of a scorcher of standard construction provided with a semi-cylindrical cover 12 hinged at 13 to the base. On the base 11 there are two sheets 16 and 17 which are curved to correspond to the curvature of the cylinder on which the cast plate is to be used, the upper or outer sheet 16 being perforated or reticulated to allow the passage of air to the space or chamber between the two sheets. In the space between the two sheets is a series of heating coils 18 supplied with suitable electric cur-

rent. The cover is also constructed of an outer sheet 9 and a perforated or reticulated inner sheet 10 with electric heating units 14 in the vacuum chamber 8 between them. The space between the cover 12 and the perforated sheet 16 is somewhat greater than the thickness of the mat or matrix which is indicated at A in Figs. 8 and 9. The parts thus far described are of standard construction and form no part of my invention except in combination with the elements hereinafter described.

A housing or box 20 is secured to the top of the cover 12 and can be removed when it is necessary to get at the control unit contained therein. A cylindrical rod 23 is mounted in the box with one end projecting outwardly through an opening 24 in the end of the housing. This rod is provided with a roller 25 on the outside and is mounted to slide loosely in a thimble or bushing 52 and two brackets 54 and 55.

The roller 25 on the end of the rod 23 which is outside of the housing 20 is so located that the roller 25 will be in contact with a fixed inclined cam surface 56 (see Figs. 1, 2 and 8) mounted on the base 11 of the machine when the cover 12 is closed. The cam surface 56 pushes the rod 23 in, i. e. toward the left as viewed in Fig. 8 as the cover is closed spreading apart rods 57—58.

Beside the rod 23 are two rods 57 and 58 which carry feeler arms 30 and 31, respectively. These feeler arms extend downwardly through slots 32 and 33 in the base of the control unit and in the cover as shown in Fig. 8. On their lower ends they carry feelers 34 and 35 each having a thin finger 36 extending over the top of the mat A and on the underside a projection 38 to engage the edge of the mat. The two rods 57 and 58 are each mounted in pairs of grooved rollers 60 so that they are movable easily toward and away from each other and but little force is required to move them. Two springs 61 connected by a cable or wire 62 tend to pull the two rods inwardly toward each other and hence to cause the feelers 34 and 35 to make a gentle contact with the edge of the mat A and to maintain this contact as the mat shrinks. The rod 23 is provided with a fixed arm or lug 63 located in the path of movement of a lug 64 on the right hand rod 57, and at its opposite or left end is connected to link 65 provided with an offset arm or lug 66 in the path of movement of a second lug 70 on the left hand rod 58. A spring 67 is fastened at one end to the lug 66 and at the other end at 71 to an immovable part of the machine, e. g. to the control unit. A compression spring 68 also surrounds the rod 23 with one end resting against the fixed bracket 54 and the other against the arm or lug 63 on the rod 23. The spring 61 is stronger than spring 68 which tends to pull the rods 57 and 58, and consequently the feeler arms 30 and 31 toward each other and to hold them in contact with the edge of the mat A.

As long as the cover 12 is open, that is, in the position shown in Fig. 2, in dot and dash lines, the rod 23 will be as far to the right as it can go and the link 65 is as nearly horizontal as it can be. At this time the offset arm or lug 66 is against the lug or projection 70 on rod 58, and, therefore, holds the rod 58 as far to the left as possible. Likewise, the fixed arm 63 on rod 23 is in contact with lug 64 on the right hand rod 57 and pushes this rod to the right. Accordingly, when the cover 12 is open and because of the greater strength of the spring 61 compared with that of spring 68, the feelers are separated as widely as possible.

At 80 (see Figs. 3, 4 and 8) is indicated an electric switch in a circuit leading to a relay 90 which controls a solenoid 91 which in turn operates a vacuum relief valve 92 by which the amount of vacuum in the vacuum chamber is controlled. The switch 80 is mounted on the right hand rod 57. A contact member 82 is mounted on a post 83 which is secured by a screw stud 84 to the left hand rod 58. This contact member is slidable in a drilled hole in the post 83 and can be fixed in adjusted position by a set screw 85. When the contact member 82 strikes the operating member 81 of switch 80, the solenoid 91 is energized and the vacuum relief valve 92 is closed, thereby increasing the vacuum in chamber 8 to the required amount.

The operation of the machine embodying my invention in this form is as follows: After the machine has been warmed up in the usual manner and the vacuum pump motor started, the wet mat A is put in place on the exposed surface 10 on the inside of the opened cover. As long as the cover is open the rod 23 is to the right and the feelers 34 and 35 are separated from each other as far as possible. The cover 12 is then closed. As it closes, the roller 25 on rod 23 strikes the fixed inclined cam surface 56 on the base 11 and this pushes the rod 23 in, i. e., to the left as shown in Fig. 1, compressing the spring 68 and at the same time moving the arms 63 and 66 inward and thus allowing the springs 61 to move the rods 57 and 58 inward until the inner ends of the feelers 34 and 35 carried by them move under the edges of the mat and the projections 38 on the underside come into contact with the edges of the mat. At this time the vacuum relief valve 92 is in its normal pre-shrinking position so that there is a relatively low vacuum in the vacuum chamber 8, for instance, one inch of vacuum.

Thereafter the mat shrinks under the influence of the heat from the heating units 14 and 18 and as it shrinks the feelers move inward following the edge of the mat until they reach a predetermined point at which the contact member 82 strikes the switch operating member 81 which actuates the relay 90 and closes the vacuum relief valve 92 so that the vacuum pump increases the vacuum in the chamber 8, for instance, to above three inches of vacuum, and thereby clamps the mat against the perforated surface 16 which stops any substantial further shrinkage of the mat. Heating is then continued until the mat is sufficiently baked, being stopped by the over-all timer T after the proper time has elapsed.

In Figs. 10, 11, 12, 13, and 14, I have shown a modified and simpler control unit embodying my invention. In this machine there is a box 110 in which is a single sliding rod 86 mounted in rollers 87 and 88 and having on its outer end a handle 89 by which the operator may pull the rod to the right as viewed in Fig. 10. On the rod 86 is a coil spring 90 one end of which rests against a web 91 in the box 110 and the other end of which rests against a collar 93 on rod 86. The collar 93 is fixed on rod 86 and carries a downwardly extending arm 94 on the lower end of which is a notched feeler 95 which engages the mat A. To the left hand face of collar 93 is secured a ring 97 of insulating material and to that is secured a ring 98 of conducting material. At 99 is shown another web in the interior of the box 110. This web has a hole in the center which is screw threaded and into which is screwed a thimble 101 which is held in place by a check

nut 102. The bore of the thimble is slightly greater than the outer diameter of the sliding rod 86 so that the rod is free to slide lengthwise being guided by the roller bearings without making contact with the web 99, the web 91 or the end of the box 110. The thimble 101 has a flange 103 on the right side to the face of which is secured a disk 104 of insulating material on which are placed two contacts 105 in the electric circuit for the motor which operates the vacuum pump.

In operating this modified form of the machine embodying my invention, the rod 86 carrying the feeler 95 is pulled to the right as shown in Fig. 10 and then the mat or matrix is put in place with the left hand edge in contact with the fixed stop 106. Then the rod 86 is allowed to move gently to the left as shown in Fig. 10 until the notched feeler 91 on the arm 94 engages the edge of the matrix A as indicated in Fig. 14. The heating is then started, and as the shrinkage occurs, the spring 90 moves the notched feeler 94 to the left until the contact ring 98 contacts the contact points 105. Thereupon the vacuum in the vacuum chamber 8 is increased and the matrix is clamped against the reticulated sheet 10 so that no further substantial shrinkage can take place. Then, after a pre-set timing cycle, controlled by the over-all timer T, which is the same for all mats placed in this machine, the vacuum is released, the cover opens and the matrix may be removed for casting.

The contact points 105 may be adjusted lengthwise of the rod 86 by loosening the check nut 102 and screwing the thimble into or out of the hole in the web 99. Thus the contacts may be positioned so that he vacuum will be increased at the instant when the mat has shrunk to the predetermined width.

It will, therefore, be seen that each mat is of predetermined width and that neither the amount of moisture in the mat, nor the temperature of the heater nor the proportion of white space on the page, affect the final width of the mat. The machine, therefore, produces much better mats than bakers in which the vacuum is increased after the mat has been heated by a time switch for a fixed length of time.

I claim:

1. The combination with a scorcher for stereotype mats, said scorcher having a reticulated surface with which the mat is in contact, a feeler engaging the edge of the mat to be dried, means urging the feeler against the edge of the mat and causing the feeler to follow the edge of the mat during shrinkage, and means operated by the feeler to clamp the mat against the reticulated surface when the mat has shrunk a predetermined amount.

2. A scorcher for stereotype mats having in combination a perforated bed against which the mat to be dried rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, means for creating a vacuum in said chamber, the vacuum in said chamber operating to hold a mat which is being dried against the perforated bed and thereafter to prevent shrinkage thereof, heating means for the chamber, a feeler engaging the edge of the mat, means causing the feeler to follow it during shrinkage, and means operated by the feeler when the feeler reaches a predetermined point to increase the vacuum in the chamber and clamp the mat to the perforated bed, thereby preventing substantial shrinkage thereafter.

3. In a scorcher for stereotype mats having a reticulated bed against which the mat rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, heating coils therein, a vacuum pump creating a vacuum in the chamber and an electric motor operating the vacuum pump, the combination of a feeler engaging an edge of the mat to be dried, means urging the feeler against the edge of the mat and causing the feeler to follow it during shrinkage and means operable by the feeler when it reaches a predetermined point to increase the vacuum in the chamber and thereby clamp the mat against the reticulated bed.

4. A scorcher for stereotype mats having a cover and a base, a vacuum pump and an electric motor to operate it, a perforated bed in the cover against which the mat to be dried rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, heating coils therefor, a feeler engaging the edge of the mat, means normally holding the feeler out of contact with the edge of the mat when the cover is open, means causing the feeler to follow the edge of the mat during shrinkage of the mat, cooperating means operated by the closing of the cover to bring the feeler into contact with the edge of the mat, and means operated by movement of the feeler when it reaches a predetermined point to increase the vacuum in the chamber and thereby clamp the mat against the perforated bed and prevent further substantial shrinkage of the mat.

5. A scorcher for stereotype mats having in combination a perforated bed against which the mat to be dried rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, heating elements therefor, a vacuum pump and an electric motor operating the vacuum pump to create a vacuum in the chamber, a pair of feelers engaging opposite edges of the mat, means normally holding the feelers away from the edges of the mat, means operating automatically to bring the feelers into contact with the edges of the mat and urge them inwardly, and means controlling the vacuum in the chamber operated by the inward movement of the feelers to increase the vacuum when a predetermined point is reached and thereby clamp the mat against the bed.

6. A scorcher for stereotype mats having in combination a cover and a base, a perforated bed in the cover against which the mat to be dried rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, heating elements therefor, and a vacuum pump, a pair of feelers adjacent opposite edges of said mat, two members carrying said feelers and movable toward and away from the edges of the mat, springs urging said members toward the edges of the mat, a switch controlling the amount of vacuum in the vacuum chamber and operated by said members when a predetermined point in their inward movement is reached, and means normally holding the said members separated when the cover is open, and releasing them for movement inward when the cover is closed.

7. A scorcher for stereotype mats having in combination, a cover and a base, a perforated bed in the cover against which the mat to be dried rests, a vacuum chamber on the side of the bed opposite to that against which the mat rests, heating elements therefor and means for creating a vacuum in the vacuum chamber, said means including a relief valve, a pair of feelers adjacent

opposite edges of said mat, two members carrying said feelers and movable toward and away from the edges of the mat, a solenoid operating said relief valve, a relay operating the solenoid and a switch operated by said members when a predetermined point in their inward movement is reached whereby the solenoid is energized, the vacuum relief valve is closed, and the vacuum in the vacuum chamber increased, and means normally holding the said members separated when the cover is open and releasing them for movement inward when the cover is closed.

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REFERENCES CITED

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

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