Another object of the invention is to provide an improved copy making device of simple design and construction, thoroughly reliable and efficient in operation, and economical to manufacture.

Objects and advantages other than those set forth above will be apparent from the following description when read in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a copy making device constructed in accordance with a preferred embodiment of the present invention, with portions thereof broken away and sectional, and other parts eliminated for purposes of clarity;

FIG. 2 is a perspective view of the device looking at it from a different angle with a portion thereof in an exploded view, other portions thereof broken away and sectional, and other parts eliminated for purposes of clarity; and

FIG. 3 is a schematic electrical wiring diagram for the copy making device.

As shown in the drawings, the copy making device of this invention comprises a base 5, FIG. 1, having a compartimented frame 6 secured to a base 5, and a cover 7. A reflector 8 is secured to base 5 above the compartimental frame 6 for reflecting light. A heating element 42 is secured above the reflector for heating the frame 6. A metal roller 12 is journaled at one end of frame 6 and the other end thereof is secured to a threaded bolt 27 (see FIG. 1) for holding sheets of matrix and sheets of copy material. A frame member 7 having side plates 8 is secured to the top of base 5, and each plate 8 has a V-shaped notch 9 for receiving a roller bearing 11 within which one end 10 of a metal roller 12 is journaled. A bracket 13 is pivotally mounted on a shaft 14 carried by side plates 8, and also has side plates 15 with notches 16 therein for receiving roller bearings 17 in which the ends 17' of a resilient roller 18 are journaled. The bracket 13 and its roller 18 are pivotally moved toward and away from metal roller 12 by means of a pair of axially spaced eccentrics 19 (see best in FIG. 2) mounted on a shaft 21 carried by side plates 8 of fixed bracket 7. The eccentrics 19 are in peripheral engagement with cam followers 22 mounted on a shaft 23 carried by side plates 15 of pivotal bracket 13. The pivotal bracket 13 is urged by a pair of helical springs 24 in a clockwise direction as seen in FIG. 2 for urging cam followers 22 into engagement with the periphery of the eccentric cams 19. Each spring 24 has one end encircling a grooved end of a rod 25 carried in a notch 26 in side plates 15, and its opposite end secured to a threaded bolt 27 (see FIG. 1) extending through a bar 28 carried by fixed bracket 7 and secured to the bar by a nut 29. With this arrangement, it is possible to vary the spring tension and hence the force exerted between the pressure rollers 12, 18.

A feed duct comprising upper and lower plates 31, 32 respectively is secured to fixed bracket 7 by any known means, not shown, for guiding a matrix and copy sheet sandwich 30 into the nip of the pressure rollers 12, 18. An upper guide member 33 (see best in FIG. 1) pivotally secured by pins 30 to side plates 8 of fixed bracket 7 is adapted in its operative position to receive the matrix-copy sheet sandwich from the rollers 12, 18 and direct it out of the device. The guide member 33 has a projection 39' at each end which is adapted to rest on the periphery of bearing 17 when it is in its operative position.

Another object of the present invention is to provide an improved copy making device in which a pair of opposed pressure rollers are mounted within an heated enclosure.

Another object of this invention is to provide an improved copy making device having means for automatically moving the pressure rollers into pressure engagement when the device is turned on, and moving the rollers out of pressure engagement when the machine is turned off.
minimize the dissipation of heat from the enclosure, insulating material 43 in blanket form of any known type is secured to the periphery of the enclosure by clips, not shown.

The temperature of the atmosphere within the enclosure and of the rollers 12, 18 is controlled by a thermostat 44 connected to a thermostat probe 44 of known type mounted within the enclosure adjacent the lower plate 32 of the duct (see FIG. 2). The thermostat probe 44 in this position is responsive to the temperature of the lower plate 32, and the temperature of the lower plate is adjusted by the cooler matrix-copy sheet sandwich 38 as it is introduced into the device. Consequently, as the matrix-copy sheet sandwich 30 is moved over lower plate 32 by the operator, the temperature of the lower plate is reduced and actuates the thermostat probe 44 to call for more heat before the matrix-copy sheet sandwich 30 reaches pressure roller 12, 18. Therefore, the normal tendency for the temperature of the pressure rollers to be reduced by the cooler matrix-copy sheet sandwich 30 is counteracted by the heat generated by heater 43 before the temperature of rollers 12, 18 begins to drop. The responsiveness of thermostat probe 30 to the temperature of lower plate 32 may be controlled by the insertion of a sheet of insulating material 45 between the probe 44 and lower plate 32. The insulating material 45 is releasably held to lower plate 32 by a spring clip 46 secured to lower plate 32. By varying the type of insulating material 45, or its thickness, it is possible to vary the amount of pre-anticipation of the drop in roller temperature. By properly selecting the insulating material, it is possible to maintain the temperature range of the rollers 12, 18 while in use between plus or minus 10°C.

The drive mechanism for the copy making device comprises a motor 25, not shown, mounted on base 5 for driving a shaft 48 through a speed reducer, not shown. Shaft 48 extends through an opening, not shown, in plate 36, and is drivenly connected by a coupling 49 to shaft 16 of roller 12 for driving the roller at a predetermined rotational speed. Another motor 51, similar to motor 47, is also secured to the bracket, and drives a shaft 52 through a speed reducer, not shown. Shaft 52 extends through an opening in plate 36, and is drivenly connected by a coupling 53 similar to coupling 49 to one end of cam shaft 21 for driving same. Another cam shaft 21 and cam 55 thereon for moving a micro-switch 56 between two positions in the power circuit. The device also has an operating switch 57 movable between "off" and "on" positions by means of buttons 57, 57 for connecting an electrical power source to the device.

In the operation of this device, particularly with reference to FIG. 3, when the operating switch 57 is turned to the "on" position, the power is immediately connected to the roller drive motor 47 and the cam shaft drive motor 51 through micro-switch 56 which is in its normal position electrically connected to a contact 59. At this instant, the cam 19 and cam follower 22 relationship is such that rollers 12, 18 are out of pressure engagement. As soon as cam shaft 21 and cam 19, 54 have rotated through a predetermined portion of a revolution, projection 55 actuates micro-switch 56 moving it out of its normal position into engagement with contact 59, disconnecting the power to cam shaft drive motor 51. In this position, the pressure rollers 12, 18 are in pressure engagement. The copying device is then in position for use, and the operator may feed matrix and copy sheet sandwiches 38 therethrough for producing copies. When the operator no longer desires to make further copies, the device is turned off by moving the operating switch 57 to its "off" position. This action disconnects the power supply from roller drive motor 47, and connects it to cam shaft drive motor 51 through micro-switch 56 which is still in connection with contact 59. Consequently, cam shaft drive motor 51 drives the cam shaft 21 and cams 19, 54 through the remainder of its revolution, during which roller 18 is moved out of pressure engagement with roller 12, and projections 55 releases micro-switch 56 which returns to its normal position in engagement with contact 59, breaking the electrical circuit to cam shaft drive motor 51.

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

I claim:

1. In a copy making device for making a copy from an exposed matrix by placing a copy sheet in superimposed relation with said matrix to form a copy sheet-matrix sandwich and feeding the sandwich through the device with the exposed matrix side subjected to heat and pressure, the combination comprising:
   (a) an enclosure having an inlet duct and an outlet;
   (b) means mounted within said enclosure for receiving a copy sheet-matrix sandwich which has been introduced through said inlet duct, and simultaneously subjecting said sandwich to pressure, and transporting said sandwich through said enclosure and out of said outlet;
   (c) means for heating said enclosure to maintain said enclosure and said receiving, subjecting and transporting means within a predetermined temperature range, the lower value of which is higher than the normal ambient temperature of said copy sheet and matrix to be introduced into said duct; and
   (d) temperature responsive means for turning said heating means on and off and mounted within said enclosure adjacent said duct whereby a predetermined reduction in temperature of said duct by said cooler copy sheet and matrix actuates said temperature responsive means to turn on said heating means.

2. The invention according to claim 1 wherein said enclosure is insulated.

3. The invention according to claim 1 wherein said inlet duct has a lower surface, and a sheet of insulation is interposed between said lower surface and said temperature responsive means.

4. The invention according to claim 1 wherein said receiving, subjecting and transporting means comprises a pair of opposed, engageable rollers.

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