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 [21] Appl. No. **6,652**
 [22] Filed **Jan. 29, 1970**
 [45] Patented **Apr. 20, 1971**
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[50] Field of Search..... 250/65 (T);
 355/3, 18, 78; 219/216, 388, 469

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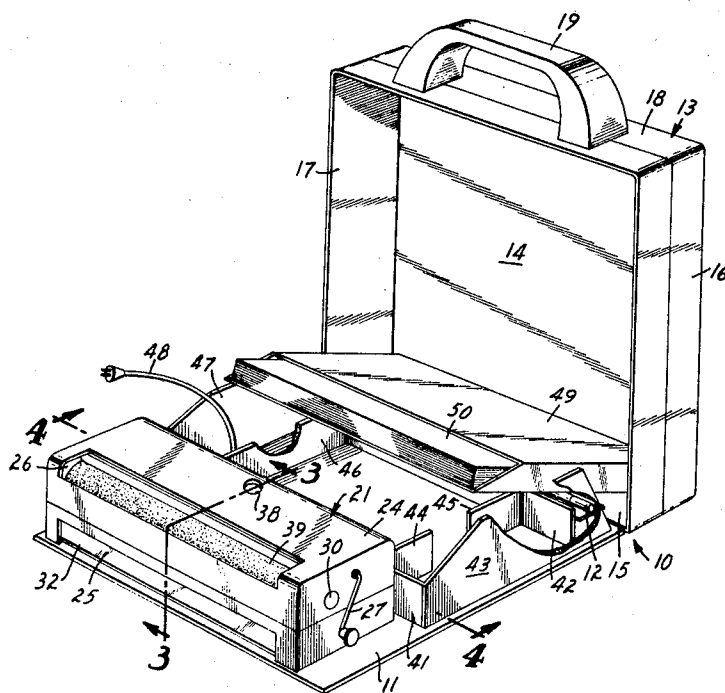
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[54] **PORTABLE THEMOGRAPHIC DUPLICATOR MOUNTED IN A CARRYING CASE HAVING HINGED HOUSING PORTIONS**
3 Claims, 4 Drawing Figs.

[52] U.S. Cl..... **219/216,**
219/388, 219/469, 250/65T
 [51] Int. Cl..... **H05b 1/00,**
G03b 41/00

ABSTRACT: A portable duplicator in an attache case includes a heating station for subjecting copy-sheet and master to uniform heating, and a container tiltable for easy access to a supply of copying materials.



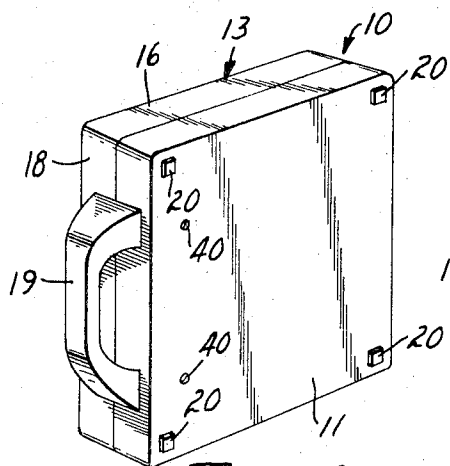


FIG. 1

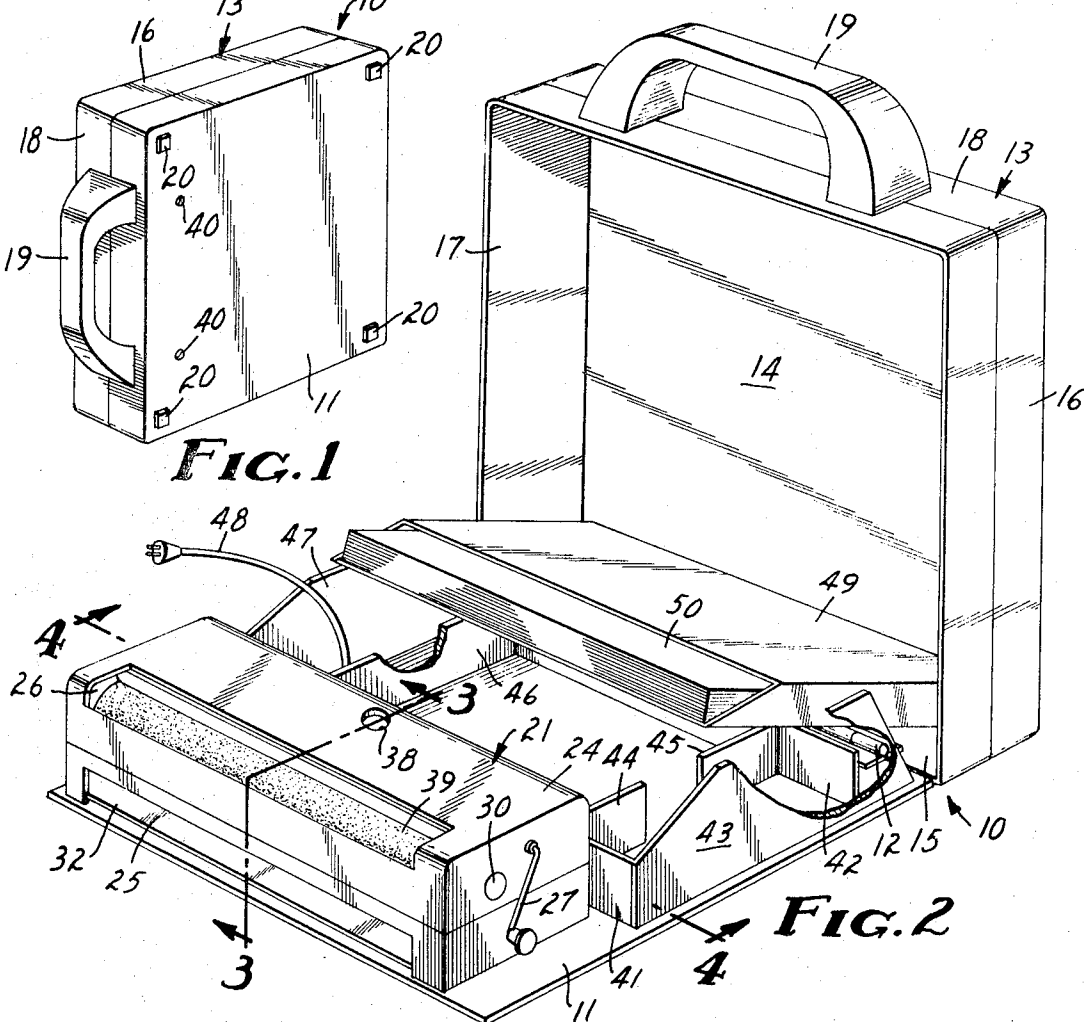


FIG. 2

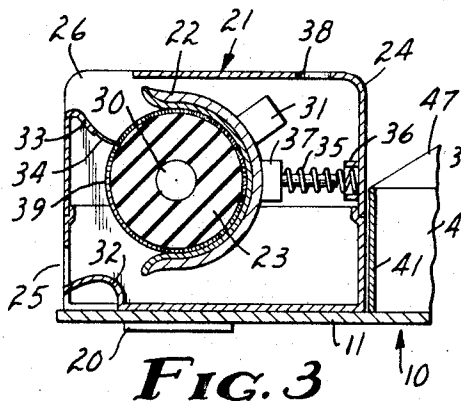


FIG. 3

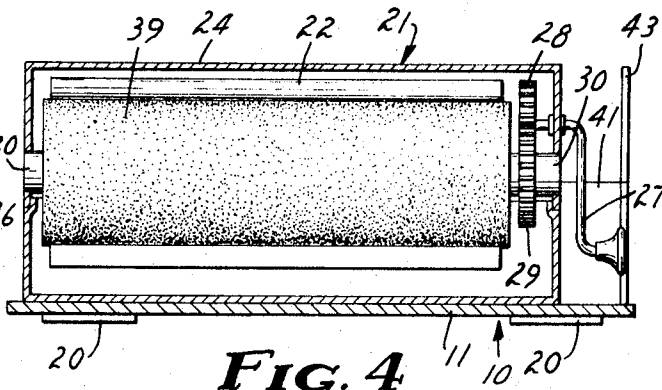


FIG. 4

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PORTABLE THEMOGRAPHIC DUPLICATOR MOUNTED IN A CARRYING CASE HAVING HINGED HOUSING PORTIONS

This invention relates to portable duplicators useful for making copies on sensitized sheet materials by a process requiring brief uniform heating.

An important method of duplicating involves the heat transfer of image-forming material from a prepared master to each of a series of treated copy-sheets. As an example, a master printed or otherwise provided with indicia containing a volatile reactant is uniformly heated in contact with each of a series of copy-sheets containing a coreactant. The reactant transfers to and reacts with the coreactant at the image areas to form a visible reproduction of the printed original.

The present invention provides a convenient portable apparatus with which to perform the heating step. Storage space supplied for copy-paper and other required materials makes such materials readily available. The complete unit is of small size and light weight yet in operation does not easily slide about but remains firmly positioned on the desk top or tabletop. The apparatus when closed for storage and transportation is surprisingly compact and of attractive appearance, and may be completely self-contained.

FIG. 1 is a view in perspective of a preferred form of the duplicator closed for storing or transporting;

FIG. 2 is a view in perspective, with portions cut away, showing the duplicator of FIG. 1 opened and ready for operation;

FIG. 3 is a partial cross-sectional elevation of the heater module taken approximately at line 3-3 of FIG. 2; and

FIG. 4 is a partial cross-sectional elevation of the heater module taken approximately at line 4-4 of FIG. 2.

It will be seen from FIG. 1 that the miniature duplicator 10 of this invention when closed assumes the general appearance of an attache' case, and may therefore be conveniently stored or transported. The case 10 consists of a base 11 hingedly attached along the rearward edge, i.e. at hinge 12, to a cover 13 consisting of a top 14, rear edge 15, side edges 16 and 17, and front edge 18, the latter carrying a handle 19. Supporting feet 20 may be supplied on the base 11.

A heater module 21 is removably mounted on the base 11 adjacent the forward edge thereof, e.g. with screws 40. The unit 21 comprises a transversely arcuate open-faced heating platen or shoe 22 and a roller 23 mounted within a casing 24 having an inlet opening 25 and outlet opening 26. A crank 27 is attached to a pinion 28 meshing with a gear 29 which is keyed to the shaft 30 supporting the roller 23. A thermostatic control device 31 on the shoe 22 assures a constant shoe temperature during operation.

The inlet opening 25 is defined in part by a reversely folded segment 32 of the casing 24. Similarly, the outlet opening 26 is defined in part by a reversely folded segment 33 of the casing. A V-shaped extension 34 of spring wire extends out of the free edge of the segment 33, the flattened point of the V making contact with the surface of the roller 23. The combination acts to strip the sheet materials from the roll without conducting any significant amount of heat to the case. The arcuate shape of the segment 33 and extension 34 redirects the outcoming copy-sheet and master from the curve they assume during their passage between roller 23 and shoe 22 into an opposite curve and thereby exerts a straightening influence on the otherwise curled sheets while the latter are still warm and somewhat plastic, so that the finished copy will lie flat.

The surface of the roller 23 is resiliently compressible, preferably comprising a resilient insulative velour 39 or analogous fibrous surface structure, so that the copy-sheet and master are held smoothly and firmly in contact with each other and in heat-conductive contact with the heated shoe. The latter is resiliently biased against the roller, e.g. by single spring mounting means, here indicated as coil spring 35 seated

between tabs 36 and pressing against a block 37 located centrally on the shoe 22, where by uniform pressure is assured along the entire length of the heating surface, and heat conduction to the casing is minimized. The temperature of the shoe may be adjusted by suitable regulation of the control 31, e.g. through an opening 38 provided for the purpose in the casing 24.

An economical and presently preferred form of heater shoe 22 comprises an inner smooth aluminum plate formed to the desired arcuate cross section as illustrated in FIG. 3. The convex surface is covered with an insulating first layer of epoxy resin, applied for convenience in the form of a preformed fibrous matt. A thin resistance heating element is laid over the matt, covered with an outer insulative and protective layer of epoxy resin impregnated glass cloth, and the whole is consolidated and bonded together under heat and pressure. Suitable electrical leads are applied to the heating element for connection to a source of current through the control element 31, and the block 37 or other suitable support means is incorporated in the glass-reinforced outer layer, prior to curing.

Thin divider strips 41-47 supported on the rear surface of the base define a series of storage spaces. The space between strips 47 and 46 forms a convenient storage space for the cord and plug 48, the cord entering the casing 21 through an appropriate slot in the strip 41. The opposite space, between side strip 43 and short strips 44 and 45, is convenient for the storage of pens and pencils, a screwdriver for adjusting the thermostat, and other small items. The central space, between strips 44 and 45 and strip 46, may contain drafting instruments, stencils or the like, or alternatively may be used for a number of storage cells for operating the heater 22, thereby providing a completely self-contained and portable unit.

The top edges of the narrower strips 41, 42 and 44-46 support a tray 49 for enclosing a stack of copy-sheets 50 and other necessary sheet material. The tray is retained in position at the sides by the wide divider strips 43, 47 and is supported, in the slant position illustrated, upon the rear divider strip, the rear edge of the tray then contacting the top 14 and edge 15 of the cover 13. In this position the tray is held sufficiently rigidly to remain fixed during use, the open front permitting easy access to the supply of copy-sheets. On lowering the cover 13, the tray is slid forward so that its front edge rests on the strip 41. The tray then serves as a cover for the storage spaces beneath.

I claim:

1. A portable duplicator comprising: a hollow case having the external appearance of an attache' case and comprising a base and a cover hingedly attached thereto by hinge means disposed along the rearward edge thereof; a compact heater module supported on said base adjacent the forward edge and comprising an elongate transversely arcuate open-faced heater shoe, a compression roller pressing against said shoe, means for imparting uniform rotation to said roller, and casing means having input and output openings for directing papers to and from said roller and shoe; and divider strip means, supported on said base between said heater module and said hinge means, for supporting a flat covered tray means parallel to said base and against said heater station while said case is closed and at an angle to said base and against said cover while said case is open.

2. The duplicator of claim 1 wherein said heater shoe is resiliently biased against said roller by spring means contacting a single central contact area on the outer surface of said shoe.

3. The duplicator of claim 1 wherein said output opening is partially defined by an arcuate reversely folded segment of said casing and, as an extension thereof, spring-wire paper-stripping means for contacting said compression roller.