

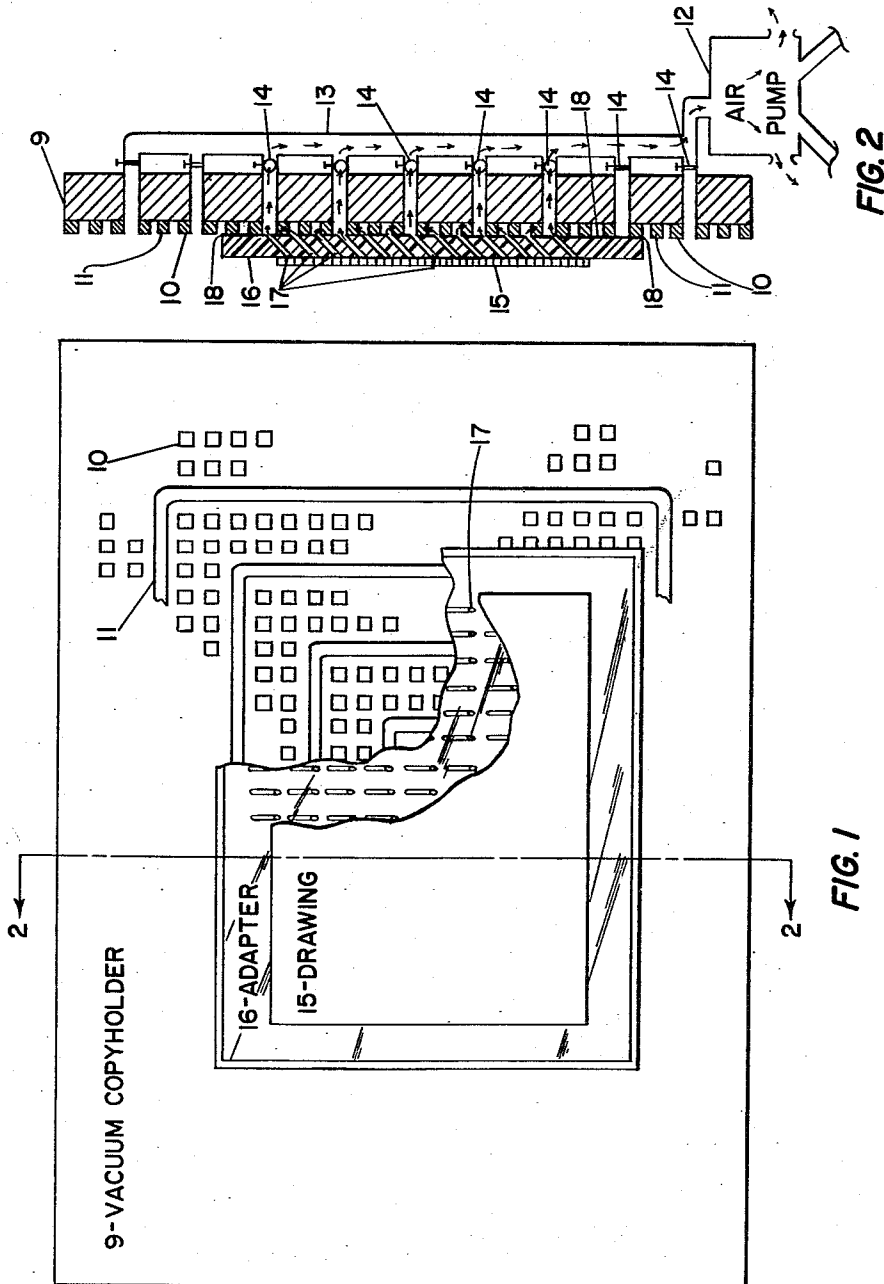
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COPYBOARD ADAPTER FOR FLEXIBLE TRANSPARENT DRAWINGS

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COPYBOARD ADAPTER FOR FLEXIBLE TRANSPARENT DRAWINGS

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The disclosed invention relates to the supporting of photographic film, copy material, drawings to be photographed, and the like. More specifically, this invention relates to a new copyboard adapter for supporting flexible and transparent drawings physically and optically flat for photographic reproduction, inspection, or for other purposes.

In the past decade there has been a transition in the material of undimensional engineering drawings for reproduction, from metal to transparent or translucent glass cloth. This transition has been brought about because of the greatly improved quality of the glass cloth, as Fiberglass or the like, for example, wherein former drawbacks such as heavy weight, cracking, crazing, lack of stability in the material, inability to erase cleanly, and similar difficulties have been largely eliminated. Further, drawings can be constructed dimensionally accurate directly on a stable medium as glass cloth with less overall effort than by the old conventional method of first laying the design out on paper and then scribing the complete detail dimensionally accurate on metal.

For producing full size or reduced size exact scale reproductions of glass cloth drawings, photographic reproduction has been found most desirable and satisfactory. While the photographic reproduction process has been in use for a number of years, noting Patents 627,069 and 2,572,640 one major problem has remained to be solved in the vacuum type copyholder camera, as for example the Lanston Monotype Camera design for template reproduction manufactured by the Lanston Monotype Machine Company of Philadelphia, Pennsylvania, and that involves the development of a satisfactory technique for holding transparent and flexible glass cloth drawings against the copyholder while the drawing is being photographically reduced.

One of the most prevalent practices used in the past as well as currently to obtain reduced size reproduction by photography has been the placing of a perforated white aluminum sheet between the copyholder and the transparent drawing, using the aluminum sheet as the copyboard adapter, note Patents 2,572,640 and 2,317,348. The primary difficulty with this method is the appearance of the perforations in the aluminum sheet as an unacceptable pattern of dots or circles on the negative, and of course, on each reproduction. A secondary difficulty with this method lies in the sucking in or coupling of the flexible cloth drawing in the individual suction holes. These difficulties are also obviously experienced in the copyboard adapter of Patents 627,069 and 1,347,824. Other techniques which have been tried with a similar lack of success include the use of a special porous paper or cardboard behind the perforated steel plate, or special porous material as utilized in Patent Number 2,645,153, in lieu of the metal plate in an attempt to hold the drawing against the copyboard by suction. Other efforts utilized to secure a reduced size reproduction of glass cloth drawings comprise the making of a full scale metal re-

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production of the cloth drawings using a contact printer, as the Bruning printer followed by the placing of the full scale metal reproduction on the vacuum copyholder and the making of the reduced size negative for the making of prints therefrom. This involves costly duplication of effort.

The present invention alleviates entirely the objectionable features of previous suction supports using either a covering glass or system of perforations to exhaust the air, noting particularly the disclosures of Patent 627,069, 2,570,668, or 2,694,337. The glass covering form introduces an additional optical medium causing refractions as well as minute defects from adhering dust or scratches, and the perforated supports now in use and as mentioned previously cause the thin and flexible sheet material to draw into the depressions, distorting the physical as well as the optical plane, with resultant ghost images appearing on the negative.

The principal object of this invention is to provide an improved means for holding a transparent flexible sheet of material, as a drawing for example, in an optically flat plane to be photographed.

Accordingly, it is an object of the invention to provide a new copyboard adapter for a vacuum copyholder that has vacuum holes, the outline of which phases out completely when photographed.

Another object of the invention is to provide a new copyboard adapter having vacuum holes so formed therein that flexible sheet material supported on the copyboard is maintained optically flat.

Yet another object of the invention is to provide a new copyboard adapter for flexible transparent drawings that is more efficient, simple, economical, inexpensive, and easy to construct, light in weight, durable, and easy to use.

Other objects and advantages will be apparent from the specification and claims, and from the accompanying drawings which illustrate an embodiment of the invention.

Fig. 1 shows a plan or front view of the vacuum copyholder showing the drawing being supported thereon by the novel copyboard adapter with parts removed for clarity of disclosure; and

Fig. 2 is a sectional view taken at 2—2 on Fig. 1.

Referring now in detail to the preferred and illustrative embodiment of the present invention as shown in the accompanying drawings, there is shown a vacuum copyholder 9 having projections 10 and ridges 11 on the front or suction surface thereof forming a waffle surface for distribution of the suction created by vacuum air pump 12 in vacuum lines 13. Ridges 11 zone the copyholder by defining gradually increased size suction chambers in the waffle surface for increased size drawings with the top of the ridges and projections lying in a flat plane. Valves 14 are provided in lines 13 for control of the suction over only the particular area or suction chamber desired.

While the copyholder 9 is utilized principally for supporting drawings for photographic reductions, it is also suitable for use as a photographic supporting back for flexible sensitized sheet material, such as photographic film, paper or strip film, as a support for camera copy, or as an enlarging or reducing easel to hold the photographic paper on which the enlargement or reduction is to be made. In the past, when a drawing 15 was desired to be photographed, it was placed directly on the suction surface of the copyholder 9 and maintained in position by the suction applied between the copyholder and the drawing. This means for supporting drawings for photographing has its limitations and accordingly has never been entirely satisfactory.

With the advent of transparent and flexible glass cloth

drawings for photographic reduction, the suction applied for maintaining the drawing in place on the copyholder draws dimples in the drawings between projections 10, resulting in an uneven surface which prevents accurate reproduction of the drawing. Further, projections 10 and ridges 11 leave a waffle pattern on the photograph of the drawing. In attempting to cure these imperfections an adapter or perforated flat plate was placed between the drawing and the waffle surfaced copyholder. The conventional perforated plate adapter used heretofore consisted of a sheet of aluminum with vacuum holes throughout and painted white on the front side adjacent the drawing. While this aluminum sheet adapter was an improvement, still the pattern of circles or outline of each vacuum hole resulted in all photographic reproductions of transparent drawings and optical flat surfaces were still difficult to maintain, particularly for accurate photographic reduction. This pattern of circles, which has never been entirely eliminated is very undesirable, particularly when reductions of the drawings or when templates are made directly from the drawings.

As disclosed in Figs. 1 and 2, a new and novel copyboard adapter 16 of the invention is provided. It is formed of a sheet of transparent plastic, such as but not limited to Plexiglas and approximately 1/4 inch thick. Second, the copyboard adapter 16 has very small, long slender vacuum holes 17 approximately .020 inch in diameter and which are slanted or drilled at a 45 degree angle with the sheet flat surface, the holes coinciding with the suction hole pattern on the copyboard. Third, the back side of the sheet adapter 16 adjacent to the copyboard 9 is covered with an opaque paint or coating 18, of Fig. 2, evenly applied, and which is darker than the shadow cast by the reflected light back through the drilled holes in the copyboard adapter.

Due to the slanting of the vacuum holes, the photograph of the reflected image provides a clear reproduction of the drawing wherein the outline of the holes phases out completely.

Various color backings 18 for the copyboard adapter 16 may be used provided the color sensitivity of the sensitized plate or film used to capture the latent image will phase out or lose the backing.

From continuous study and work on the coloring, it was found that a lemon-yellow coating 18 for the back side of the adapter 16 was required for best results, when using orthochromatic emulsion and a gelatin filter on the camera lens, such as but not limited to a Wratten G-15, manufactured by Eastman Kodak Co., Rochester, New York. By utilizing a yellow filter on the lens of the camera, for example, the yellow backing is filtered out as the reflected image passes through the lens. Accordingly, the drawing negative is provided with excellent contrast between the lines and the background, and with the vacuum hole outlines phased out completely.

For different size drawings, copyboard adapters are easily cut and provided for the particular size required.

While only one embodiment of the invention has been shown in the accompanying drawings, it will be evident that various modifications are possible in the arrangement and construction of the copyboard adapter without departing from the scope of the invention.

I claim:

1. A copyboard adapter comprising, a sheet of transparent material, an opaque coating on a surface of said

sheet material, and canted holes through said sheet material at an angle to said surface to provide for complete phasing out of the outline of said holes when their reflected image is photographed.

2. A copyboard adapter for holding a transparent flexible drawing optically flat thereon for photographing comprising, a sheet of transparent material, an opaque coating on the surface of said sheet opposite to the surface adjacent the drawing, and vacuum holes extending through said sheet, said vacuum holes being positioned at an angle to said surface adjacent the drawing for completely phasing out the outline of said vacuum holes in a photograph of the reflected image of the drawing.

3. A copyboard adapter for use on a vacuum copyholder for holding a transparent flexible drawing optically flat for photographic reduction comprising, a sheet of transparent material, an opaque coating on the surface of said sheet adapted to lie adjacent the copyholder, and vacuum hole means in said sheet for applying suction for holding the drawing on said copyboard, said vacuum hole means being positioned at an angle to said surface such that their outline phases out completely when photographed and maintains the drawing in an optical flat condition.

4. For use on a copyholder having a suction surface, a copyboard adapter for holding a transparent flexible drawing optically flat while being photographed comprising, a sheet of transparent material having a back surface adapted to lie on the copyholder suction surface and a front surface against which the drawing is supported, an opaque coating on said back surface of said sheet material, and small vacuum holes extending through said sheet material at an angle to said surfaces whereby the outline of said vacuum holes phases out completely when the drawing is photographed on said copyboard adapter.

5. A copyboard adapter as recited in claim 4 wherein said transparent sheet material comprises a transparent plastic.

6. In combination with a vacuum copyholder having a suction surface, a copyboard adapter for positioning on said suction surface for maintaining a transparent flexible drawing optically flat for photographic reduction thereof comprising, a transparent sheet of material, an opaque coating on the side of said sheet adapted to be positioned adjacent said suction surface, and vacuum holes canted through said sheet at an angle to said surface whereby the outline of said vacuum holes is completely phased out when the drawing is photographed on said copyboard adapter.

7. Means for holding a transparent sheet of material while being photographed comprising, a sheet of transparent material having a back surface adapted for the application of a vacuum thereto and a front surface for supporting the material to be photographed, an opaque coating on said back surface, and vacuum holes extending from said back surface to said front surface at an angle to said surfaces whereby the outline of said vacuum holes phases out when the transparent sheet material is photographed.

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