

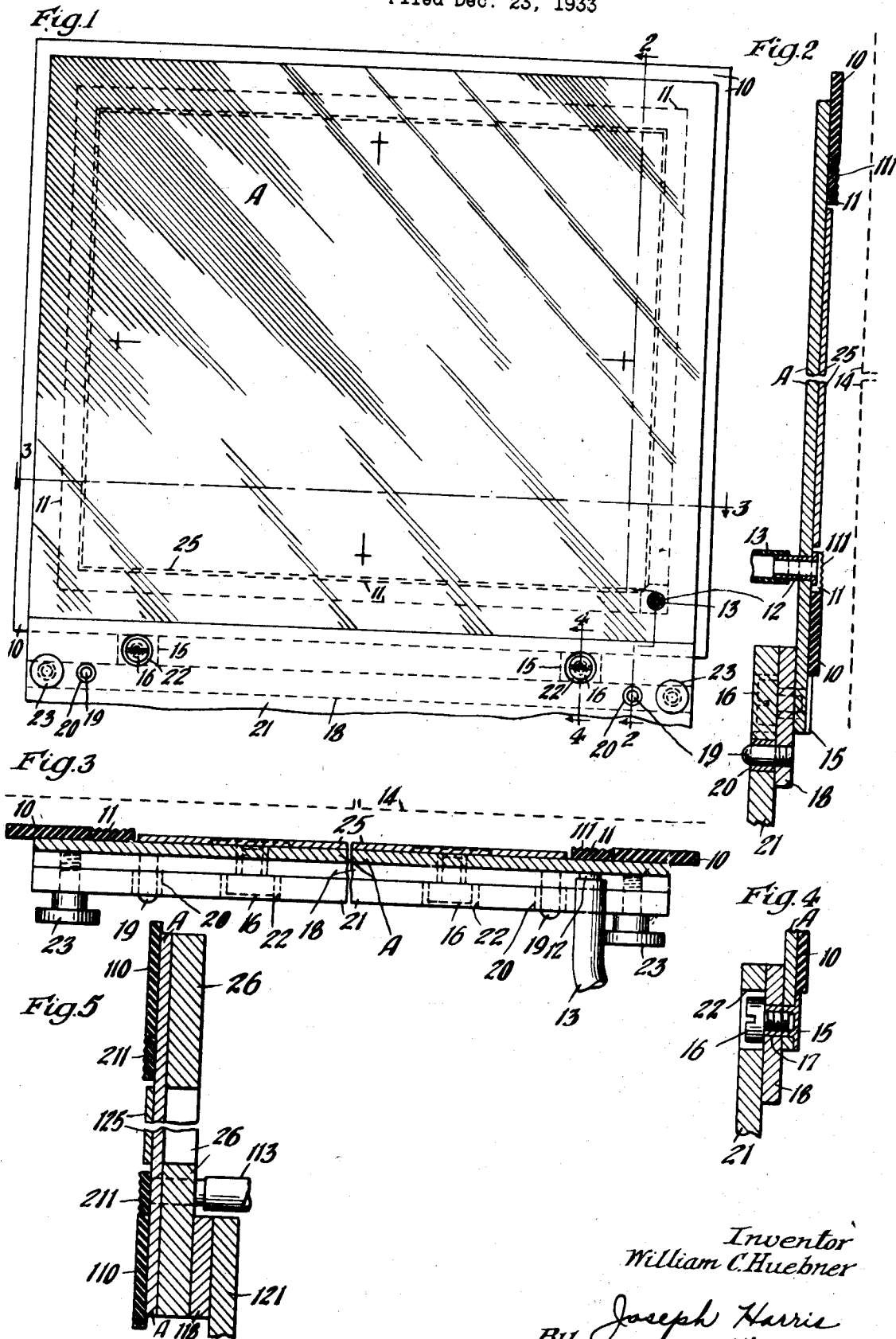
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PHOTOGRAPHIC VACUUM SQUEEGEE AND NEGATIVE HOLDER

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PHOTOGRAPHIC VACUUM SQUEEGEE AND
NEGATIVE HOLDER

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This invention relates to improvements in photographic vacuum squeegee and negative holder.

In the art of photo-composing or photo-mechanical printing, certain classes of work necessitate mounting films on glass plate supports or the like as, for instance, when making a composed negative or positive comprised of a number of different smaller subjects. In such work it is essential that each film be pressed intimately into full surface contact with its support or mounting. Heretofore, the general practice has been to attain this result by the use of ordinary rubber strip squeegees or roller squeegees. Such prior methods, however, have certain serious disadvantages particularly in photo-composing where the applied films must be accurately registered on their mounts. With the ordinary hand method employing the usual rubber strip squeegee or roller, there is great danger of shifting the applied film from its predetermined registered position and hence destroying the register when the applied film is finally pressed and cemented to its mount.

One object of this invention, therefore, is to provide a squeegee which is actuated by air pressure or vacuum for smoothing down and pressing into full surface intimate contact, negative films and the like on their mounts without danger of shifting the negative films during the process of smoothing and pressing into contact.

More specifically, an object of the invention is to provide a squeegee particularly adapted for photographic work wherein is employed a relatively heavy but semi-flexible film having associated therewith air sealing means or gasket on one side with provision for connection to a source of suction so that, as the air is exhausted from beneath the relatively heavy semi-flexible film, underlying negative films may be pressed into intimate contact with their mounts without danger of disturbing their previously determined position and location or register with reference to the mount.

As is also well known to those skilled in the art of photo-composing, it has heretofore been customary to employ negative holders having a relatively heavy metal frame with a central opening in which or over which is placed the negative film or glass plate carrying the image to be reproduced, the film or negative plate then being adjusted to registered position and clamped or locked to the frame by means of a plurality of clamps, set screws or the like applied around the edges of the film or plate. Such types of negative holders are relatively expensive; there is constant danger of the negative film or plate being jarred sufficiently to destroy the registered position of the image with reference to the metal frame; and, particularly in the case of the larger sizes of such negatives, the weight is so great as to present

considerable difficulty in handling the same from the registering machine to the photo-composing machine and back again. Particularly are the foregoing disadvantages encountered in so-called black and white work where a given image or subject is repeated many times onto a press plate.

Another object of this invention, therefore, is to provide a simple, relatively light weight, and relatively inexpensive holder for either film or glass negatives wherein the usual clamps or negative attaching means may be entirely dispensed with and, if desired, also any metal frame, the improved holder embodying a relatively thick but more or less flexible film onto which the negative films or negative plates may be attached by cement or equivalent in directly registered position, the holder being adapted for use with a photo-composing machine proper by suitable adapter means insuring the known registered position of the negative on the holder with reference to the usual travel lines of the photo-composing machine.

Another object of the invention is to provide a negative holder of the type indicated in the preceding paragraph wherein the improved holder may be employed in conjunction with vacuum in effecting the necessary intimate surface contact between the printing element and the sensitized print-receiving surface during the exposure.

A further object of the invention is to provide a device or means which may be interchangeably used either as a squeegee or as a negative holder in the manner indicated in the preceding objects of invention.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawing forming a part of this specification, Figure 1 is a front, elevational view of an arrangement having the improvements incorporated therein, the improved arrangement being illustrated as used in conjunction with a portion of a photo-composing machine as a negative holder. Figure 2 is a vertical, sectional view, upon an enlarged scale and portions broken out, corresponding to the section line 2-2 of Figure 1. Figure 3 is a similar horizontal, sectional view, corresponding to the section line 3-3 of Figure 1. Figure 4 is an enlarged detailed sectional view, corresponding to the section line 4-4 of Figure 1. And Figure 5 is a view similar to Figure 2, illustrating a modified form of the device. In each of said Figures 2, 3, 4 and 5, the several films and sealing gaskets are considerably exaggerated as to thickness in order to more clearly illustrate the details of construction.

In carrying out the invention, a supporting member A is provided, preferably of rectangular outline, and of sufficient area to accommodate such size films, plates and the like as are intended

to be used therewith. The supporting member A will be made of transparent material and, preferably, will comprise a relatively thick film such as pyrolin acetate or the like and of such thickness as to be semi-rigid or, stated otherwise, semi-flexible. That is, the supporting film A will be of such characteristic as to normally maintain its planar condition but nevertheless of flexibility that, when subjected to unbalanced air pressures on opposite sides thereof, will flex without fracture and enough to effect the desired pressure on the film or plate against a mount. On one side of the supporting film A and extending around the periphery thereof, is provided means for sealing off air over the main central area of the film A. Said means preferably comprises a thin layer or gasket of rubber 10 of rectangular outline, the rubber gasket being also preferably extended beyond the edges of the film support A on the sides and top thereof as illustrated in Figure 1. Around the inner edges of the sealing gasket proper 10 on the same side of the film A, is applied an additional strip of preferably rubber 11, having a corrugated or channeled exposed surface 111 so that, as the air is exhausted from the under side of the supporting film, the air can be withdrawn from the channeled surface 111, thus minimizing any possibility of leakage. As will be understood, the secondary strip 11 may, if desired, be formed integrally with the outer sealing gasket proper 10.

Outside of the available work area defined by the inner edges of the sealing strip 11 but inside of the outermost edge of the sealing gasket proper 10, provision is made for connection to a source of suction to the work area or space by means of a suitable hollow light bushing 12 extended through the supporting film A and preferably flanged at its inner end and sealed to the film A. The bushing 12 is extended sufficiently to the outer side of the film A so as to be available for attachment thereto of a vacuum hose 13.

Considering the device as so far described, it is evident that the same may be employed as a vacuum squeegee by laying the supporting film A with its associated air sealing gaskets over the negative film to be pressed onto its mount and without disturbing the negative film in so positioning the squeegee thereover. In this connection, it is to be assumed that the film to be mounted is in its predetermined or registered position and location with reference to the mount which may be considered as indicated by the dotted line 14 of Figure 2 but which normally will be in horizontal position rather than vertical, as shown. When the air is exhausted from the work area or space beneath the supporting film A, it will be obvious that the latter will be flexed gently downwardly over the work area and thereby squeeze the negative film on its mount and smooth it out without danger of shifting its position, due to the uniform application of the pressure throughout the entire surface of the film being mounted.

To adapt the squeegee for use as a negative holder, the same has the supporting heavy film A extended downwardly below the rubber sealing gasket proper 10 and secured to such depending portion of the film A are two dowel bushings 15—15, each of which is extended through the film and, preferably, has a flange at its inner end and permanently secured to the film by cement or the like. The hollow extended outer end of each bushing is interiorly threaded to receive the shank of a cap screw 16, as best shown in

Figure 4. The dowel bushings 15 are in predetermined location and position and constitute registering devices cooperable with corresponding dowel openings 17 in an adapter bar 18. The latter, preferably of metal, may obviously be attached rigidly to the supporting film A by the cap screws 16 as shown in Figure 4.

The adapter bar 18 is, in turn, provided with additional registering devices in the form of two dowel pins 19—19 secured thereto and which dowel pins are adapted to cooperate with corresponding register means in the form of dowel hole bushings 20—20 provided in the negative holder or carrier 21 constituting a part of the photo-composing machine. In the photo-composing machine, provision will be made for relative movement between the carrier 21 and the press plate support in two directions at right angles to each other and likewise, provision made for relative movement toward and from each other of the carrier 21 and press plate support. The carrier bar is suitably apertured, as indicated at 22, to accommodate the heads of the cap screw 16 and allow access thereto. Additionally, attaching screws for the adapter bar 18 will be provided as indicated at 23—23, the latter taking through the carrier 21 and threading into the adapter bar 18 so as to retain the latter securely in place when on the composing machine.

With the device constructed as described in combination with the adapter bar 18, it is obvious that the same may be used as a negative holder in conjunction with a photo-composing machine. In such use, the negative film, such as indicated at 25, is applied to the back side of the supporting film A, being secured thereby by cement or adhesive tape or other suitable means. In this connection, the negative film 25 will be applied in registered position before the holder is used on the machine and when so applied it is evident that the squeegee holder when brought up against the sensitized press plate mounted on the press plate support, indicated by the dotted lines 14 and the air exhausted from beneath the film A, the negative film will be pressed into intimate contact with the sensitized press plate, at which time the proper exposure may then be made. Obviously, if the negative film 25 is first applied in predetermined registered position on the squeegee holder, the registered position with reference to the photo-composing machine will be maintained, since the squeegee holder is registered with reference to the adapter bar 18 and the latter, in turn, is registered with the carrier 21 of the photo-composing machine.

The negative film 25 may, of course, be a dry plate glass negative or paper negative without departing from the spirit of the invention.

For the larger size squeegee negative holders, it may be desirable to employ a relatively light metal frame in conjunction with the supporting film A, as shown in Figure 5, where such frame is indicated at 26. In this case, the transparent film A will preferably be cemented to the frame 26 and the supporting film A will be supplied with the same type of sealing gasket proper 10, channeled inner sealing gasket 211, suction hose connection 113 and the registering devices (not shown) cooperable with the register bar 118 and the latter with registering devices (not shown) cooperable with the carrier 121 of the photo-composing machine. In certain instances, it may be desirable to replace the supporting film A of the

Figure 5 construction with a glass plate support in which case the flexible feature under suction is not availed of but nevertheless the necessary pressure in forcing the negative 125 against the sensitized surface will be obtained when the air is exhausted from beneath the plate, it being understood that in this construction, as well as those previously specifically described, the rubber sealing gaskets will compress sufficient to permit of the necessary pressure application.

From the preceding description, it will be seen that the combination squeegee negative holder is of relatively light construction; may be easily handled without danger of breakage; allows of pre-registering of the negative films when used as a negative holder; and is far less expensive in initial cost than the usual types of negative holders now commonly employed in photo-composing.

What is now considered the preferred manner of carrying out the invention has herein been shown and described in detail but the same is by way of illustration and not by way of limitation, since it is evident that various changes and modifications may be made without departing from the spirit of the invention. All changes and modifications are contemplated that come within the scope of the claims appended hereto.

What is claimed is:

1. A vacuum device of the character described comprising: a relatively heavy and semi-flexible film of sufficient rigidity, per se, to maintain a planar condition; an air sealing gasket permanently affixed to one face thereof and extending therearound, the gasket and film thereby constituting a unitary member; and means for placing the space within the sealing gasket on the same side of the film in connection with a source of suction.

2. A vacuum device of the character described comprising: a relatively heavy transparent flexible film; means for air sealing off a central area of the film on one side thereof when placed in contact with another surface, said means being permanently affixed to the film; and means providing communication between said sealed off area and a source of suction.

3. A vacuum device of the character described comprising: a relatively heavy but flexible film; an air sealing gasket permanently affixed to one side thereof defining a central work area; and a hollow bushing permanently secured to the film and adapted for attachment of a suction line thereto on the side of the film opposite that of the gasket and so located as to permit withdrawal of air from the work area.

4. A combined squeegee and negative holder comprising: a flexible relatively heavy transparent film; means on one side thereof for air sealing off a central area of the film when in contact with an opposed surface; means providing communication between said sealed off area and a source of suction; and register means on said film cooperable with corresponding register means of another member to adapt the film for use in a photographic printing apparatus in predetermined position and location with respect thereto.

5. In a device of the character described, the combination with a transparent flexible film having means on one side thereof for air sealing off an area of the film; of an adapter having register means thereon cooperable with corresponding register means of a photographic printing

machine for mounting the adapter in predetermined position and location on the machine; and cooperable register means for the adapter and film for likewise attaching the film to the adapter in predetermined position and location.

6. In a device of the character described, the combination with a transparent, flexible, relatively heavy supporting film; of an air sealing gasket on one surface thereof and extending therearound to provide a central work area; an air exhausting connection providing communication between said work area and a source of suction; an adapter bar; cooperable register means on said adapter bar and supporting film; and register means on said adapter bar adapted to cooperate with corresponding register means of a photographic printing machine part.

7. A device of the character described comprising: a transparent supporting member on one face of which is adapted to be mounted a printing element; air sealing means directly carried by said supporting member on that side on which the printing element is adapted to be attached; means providing for exhaust of air from the area enclosed by said sealing means; and register means on said supporting member adapted for cooperation with corresponding register means of another member to thereby adapt the device for use in a photographic printing machine.

8. A device of the character described comprising: a transparent supporting member to one face of which a printing element is adapted to be secured in predetermined registered position; of a frame extending around the periphery of and directly secured to the opposite face of said member; an air sealing gasket extending around the periphery of said member on that face to which the printing element is adapted to be secured within the area defined by the gasket; means providing for exhaust of air from that face of the member within the area defined by the sealing gasket; and register devices carried by the frame and support adapted for cooperation with corresponding register devices of another member.

9. A vacuum actuated device of the character described comprising: a transparent, relatively heavy, flexible supporting film; an air sealing gasket on one face thereof extending therearound and defining a work area therewithin; a hollow bushing extending through the film and providing communication between said work area and a source of suction; an adapter bar; cooperable dowel pin and dowel hole registering means on the film and bar; means for securing the supporting film and bar together when in registered relation; and register devices on the adapter bar for cooperation with corresponding register devices of a photo-composing machine part.

10. An adapter for interposition between a negative holder and a photo-composing machine, said adapter comprising a rigid member having two sets of registering devices thereon, one set being located for access on one side thereof for cooperation with corresponding cooperable registering devices of a negative holder, and the other set being located for access on the opposite side of the adapter for cooperation with corresponding cooperable registering devices of a photo-composing machine part.

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