

April 9, 1935.

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1,996,966

VACUUM FRAME ARRANGEMENT

Original Filed March 7, 1933 2 Sheets-Sheet 1

Fig. 1.

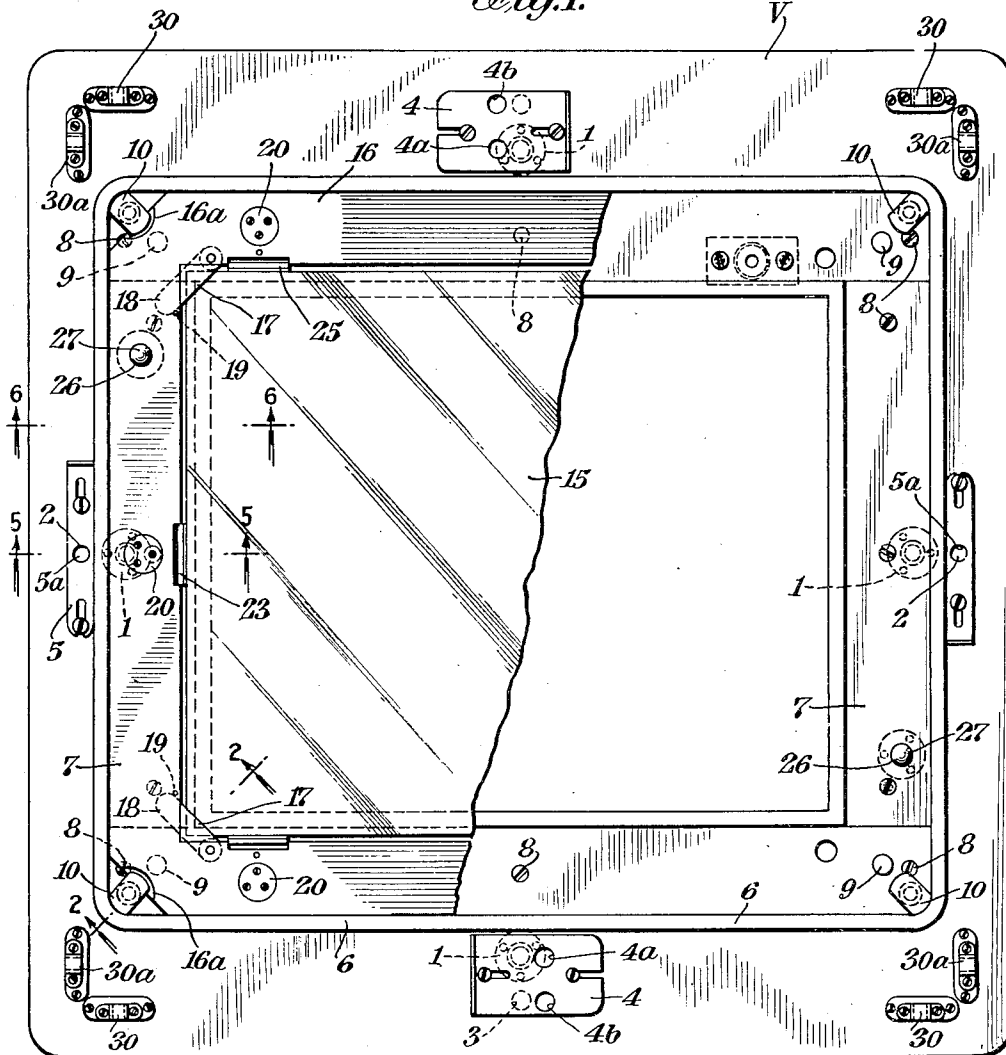
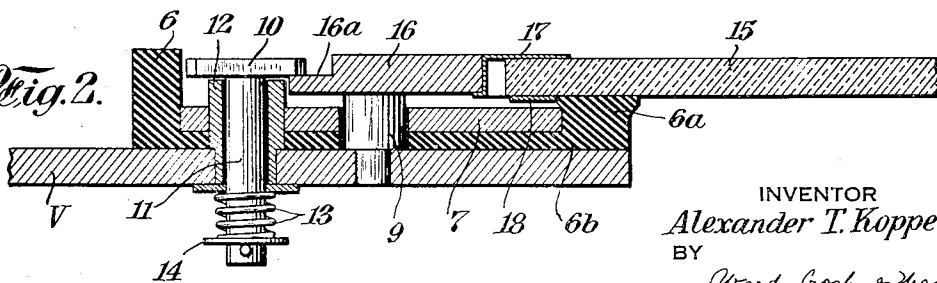


Fig. 2.



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Fig. 3.

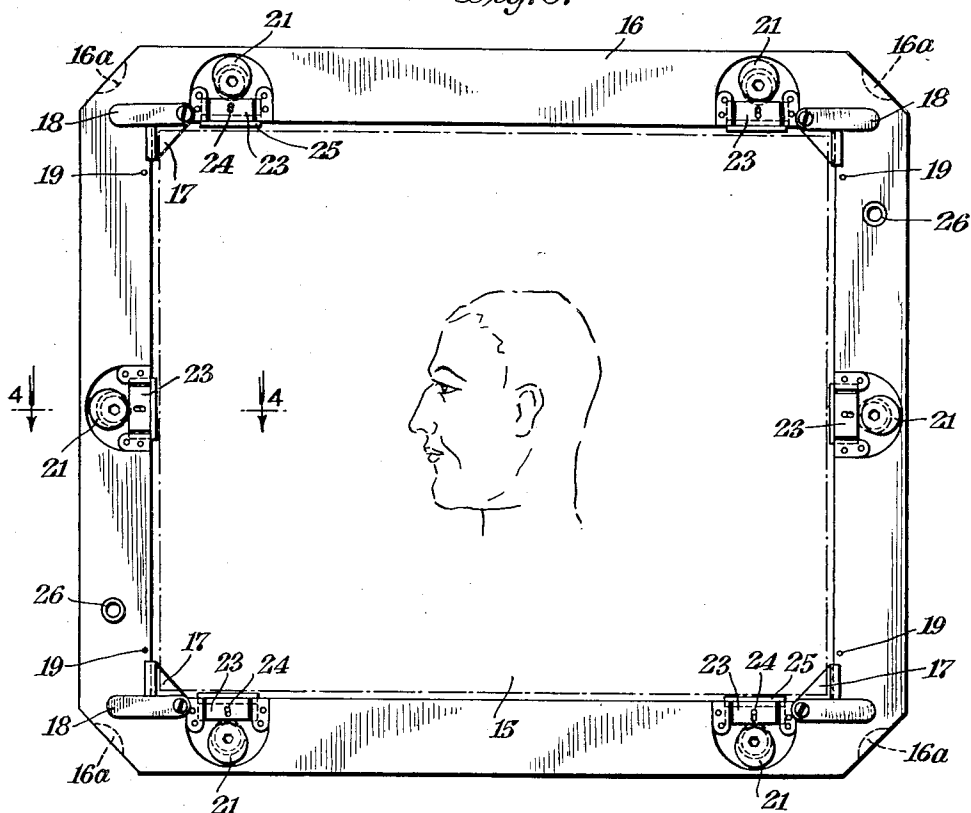


Fig. 4.

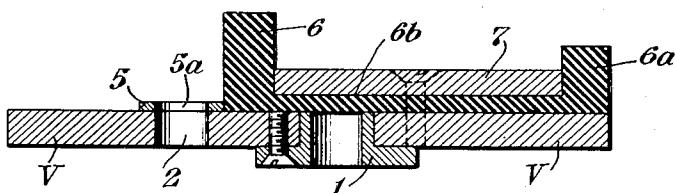
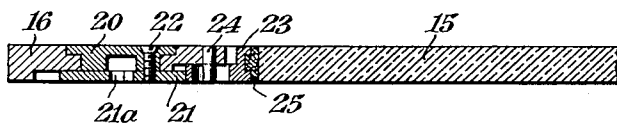


Fig. 5.

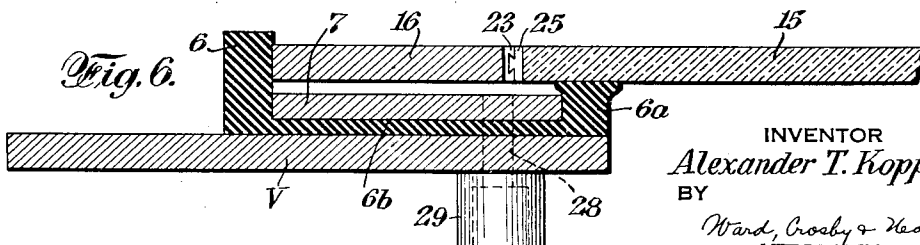


Fig. 6.

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VACUUM FRAME ARRANGEMENT

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Original application March 7, 1933, Serial No. 659,911. Divided and this application June 13, 1934, Serial No. 730,418

6 Claims. (Cl. 95—76)

My invention relates to a vacuum frame adapted for use in a photo-composing machine, or equivalent.

In accordance with my invention, the usual transparent plate which carries the positive or negative is supported by my novel vacuum frame in a highly advantageous and useful manner.

Various other objects, advantages and characteristics of my invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

This application is a division of my pending application Serial No. 659,911, filed March 7, 1933.

For an understanding of my invention and for an illustration of one of the forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is a plan view of a vacuum frame assembly;

Fig. 2 is an enlarged vertical sectional view taken on the line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a plan view of a chase assembly;

Fig. 4 is an enlarged vertical sectional view taken on the line 4—4 of Fig. 3 looking in the direction of the arrows;

Fig. 5 is an enlarged vertical sectional view taken on the line 5—5 of Fig. 1 looking in the direction of the arrows; and

Fig. 6 is an enlarged vertical sectional view taken on the line 6—6 of Fig. 1 looking in the direction of the arrows.

The vacuum frame assembly hereinafter illustrated and described is adapted for use with any suitable photo-composing machine such, for example, as illustrated and described in my aforesaid pending application.

For a detailed description of such vacuum frame assembly, reference is to be had to the drawings wherein V represents a vacuum frame adapted for use as described above. This vacuum frame is of open rectangular configuration and midway along each side thereof is provided with an aperture in which a bushing 1 is received, Figs. 1 and 5. The bushings 1 are so positioned that said vacuum frame V may be seated in the main frame of the photo-composing machine described in my aforesaid pending application with the dowel pins of said main frame received, respectively, by the bushings 1 on opposite sides of the vacuum frame.

In accordance with the invention, the pairs of bushings 1 on opposite respective sides of the vacuum frame V are symmetrically related so that an operator may lift said vacuum frame V from the aforesaid main frame and turn it, while main-

tained substantially horizontal, through an angle of 90 degrees from the position shown in Fig. 1 whereupon the former upper and lower bushings 1 are readily registrable with the respective dowel pins of said main frame.

Referring particularly to Fig. 1, the vacuum frame V is shown as provided with pairs of passages 2 and 3, the former being in horizontal alinement and the latter in vertical alinement. The passages 2 are provided so that, with the vacuum frame V in the position shown in Fig. 1, a member may be passed through each passage 2 and then threaded into a part carried by the aforesaid main frame of the photo-composing machine. The passages 3 are utilized when the vacuum frame V is in the position described above after it has been turned through an angle of 90 degrees from the position shown in Fig. 1. When in this position, a member may be passed through each passage 3 and threaded into the aforesaid part of the main frame. This arrangement is provided so that the vacuum frame V may be securely retained in position interiorly of the main frame of the photo-composing machine when the latter is moved from horizontal to vertical position all as more particularly pointed out in my aforesaid pending application.

Referring particularly to Fig. 1, a pair of members 4 are shown as slidably mounted to a limited extent on the respective upper and lower sections of the vacuum frame V. Each of these members 4 is provided with a pair of vertically aligned passages 4a and 4b, the passages 4a being adapted for alinement with the passages defined by the respective bushings 1 at the top and bottom of said vacuum frame V, and the passages 4b being adapted for alinement with the respective passages 3. In addition to the function just described, the members 4 are movable to the position shown in Fig. 1 wherein they cover the passages of the respective bushings 1 and the passages 3.

At the respective sides of the vacuum frame V, members 5 are mounted thereon for limited slidable movement the same as the aforesaid members 4. Each member 5 is provided with a passage 5a which, as shown, may be alined with a passage 2, the members 5, however, being slidable to such position that the respective pairs of passages 5a, 2 are out of alinement with each other.

The slidable members 4 and 5 are constructed from material suitably resistant to the passage of light. They function in a manner hereinafter to be described to prevent passage of light through

those passages in the vacuum frame V which are not in use for a particular position of that frame. This feature of the invention will be subsequently described.

5 Upstanding from the vacuum frame V, when the latter is positioned horizontally, are a pair of sealing strips or members 6, 6a which preferably are integrally formed with a base section 6b resting upon said vacuum frame V. As illustrated, the sealing members 6 and 6a are of generally rectangular configuration, the latter being disposed within the former, and the members 6, 6a and 6b are formed, preferably, from one integral piece of suitable flexible material such as rubber, or equivalent resilient material.

10 The aforesaid vacuum channel arrangement, which is formed from the sealing members 6, 6a and the base section 6b, is maintained in position on the vacuum frame V by metallic plates 7 which overlie the base section 6b and are secured in position by screws 8 which pass through said plates 7 and the base section 6b.

Secured to the vacuum frame V and projecting upwardly at each corner of the aforesaid vacuum channel arrangement are the respective stop members 9, each of which extends through a plate 7, the underlying base section 6b and is fastened to the vacuum frame V.

15 Disposed adjacent each of the stop members 9 and in each of the four corners formed by the outer sealing member 6 is a latch plate 10 having a shank 11 loosely mounted in a bushing 12 upstanding from the vacuum frame V, said bushing 12 extending through the base section 6b and the overlying plate 7. Below the vacuum frame V, the shank 11 carries a coiled spring 13 maintained under compression between the bottom of the bushing 12 and a disk 14 carried by said shank 11.

20 In accordance with the usual practice, there is utilized a glass plate 15, or equivalent, which has suitably associated therewith any desired positive or negative, a representation of which is to be formed on the light-sensitive surface of the photo-composing machine, such positive or negative being hereinafter generically referred to in this specification and in the claims as a "negative." With the negative on the glass plate 15, the latter is disposed within an open rectangular frame or chase 16 which, in accordance with my invention, is of novel construction.

25 As shown in Figs. 2 and 3 the chase 16, at each of its corners, is provided with a fixed support 17 upon which the respective corners of the glass plate 15 are adapted to rest. A latch 18 is pivoted at each chase corner and each latch may be positioned as shown in Fig. 1 in engagement with a stop member 19. Accordingly, after the glass plate 15 has been suitably located within the chase 16 while resting upon the corner supports 17, the latches 18 may be moved into engagement with the opposite corner surfaces of said plate 15 whereby the latter is securely retained in the chase.

30 The chase 16 carries a plurality of similar devices or units for adjusting the position of the plate 15 interiorly thereof. As herein shown, each of these devices or units comprises a member 20 suitably secured in an opening in the chase 16, Fig. 4. The member 20 forms a support for a cam plate 21 mounted for oscillatory movement on a pin 22 journaled in said member 20. The cam plate 21 coacts with a member 23 slidably mounted in a cut-away portion of the chase 16,

said member 23 having a slot connection with a pin 24 carried by the chase. The member 23 has secured thereto a member 25 of leather, or equivalent, which is adapted to coact with the edge of the glass plate 15.

35 As clearly shown in Fig. 3, a pair of the above described adjusting units is disposed in suitable spaced relation in the top and bottom sections of the chase 16, and a single adjusting unit is disposed in each side of said chase 16 midway between the ends thereof.

40 As illustrated in Fig. 3, each side of the chase 16 is provided with a passage which is defined by a bushing 26. These bushings should be symmetrically located in the sense that the bushing 26 at the left of Fig. 3 is the same distance below the center line of the chase as the bushing 26 at the right of said Fig. 3 is above said center line.

45 In order to locate the glass plate 15 within the chase 16, the latter is placed upon a suitable registering device, not shown, which preferably has upwardly projecting dowel pins to be received in the respective bushings 26. With the chase 16 thus positioned on the registering device, the corner supports 17 are disposed downwardly, and the glass plate 15 is laid upon these supports with the negative facing downwardly. The cam plates 21 of the various adjusting units are now manipulated, as by operation of a socket wrench received in the plate sockets 21a, to adjust the position of said plate 15 within the chase for the purpose of properly locating the negative with respect to the registering device. When this has been completed, the latches 18 may be positioned over the respective glass plate corners whereby said glass plate is positively locked in the chase in its proper located position.

50 The glass plate and the chase now form a unit which may be removed from the registering device and positioned, with the negative facing upwardly, on the vacuum frame V while the latter is disposed in horizontal position. As indicated in Fig. 1, the vacuum frame V has a pair of dowel pins 27 projecting upwardly from opposite sides thereof, these dowel pins being seated in said frame and extending through openings provided in the base section 6b of the vacuum channel arrangement and the overlying plate 7. The dowel pins 27 are so positioned on the vacuum frame V that the bushings 26 of the chase 16 are registrable, respectively, therewith when said chase is properly placed on the vacuum frame. By virtue of the arrangement just described, the chase may be positioned in predetermined relation on said vacuum frame. Further, as will be obvious from a consideration of Fig. 1, the chase, after release of the latches 18, may be lifted from the vacuum frame V, while the latter is horizontally disposed, and turned through an angle of 180 degrees while maintained substantially horizontal. Thereupon, the chase may be redeposited in reverse position on the vacuum frame, this result being obtainable due to the fact that the spacing between the bushings 26 and the dowel pins 27 is selected with this end in view.

55 It will be noted that the corners of the chase 16 are angled as indicated and that these corner sections are cut away to form the respective ledge sections 16a. It is with these ledge sections that the hereinbefore described latch plates 19 are coactable as shown in Figs. 1 and 2 for holding the chase firmly in position on the vacuum frame.

60 As shown in Fig. 2, the chase 16 is held, by the

latch members 10, in engagement with the hereinbefore described stop members 9, the glass plate 15 being held in engagement with the sealing member 6a. The force exerted by the latch members 10, under the influence of the springs 16, is considerable and, therefore, the sealing member 6a is compressed as indicated whereby an air-tight seal is formed between said sealing member 6a and the glass plate 15.

As clearly set forth in my aforesaid copending application, the main frame of the photo-composing machine is brought to such position that the glass plate 15 is located directly opposite the selected area of the light-sensitive plate which is to receive the first print. Thereupon, by relative movement effected between said light-sensitive surface and the vacuum frame assembly, the outer sealing strip 6 is first brought into engagement with said light-sensitive plate. When the parts last named are thus directly engaged with the light-sensitive plate, they take a position wherein the outer sealing strip 6 is under some degree of compression and forms a sealed joint with said light-sensitive plate around the chase 16.

As clearly appears, the vacuum channel arrangement comprising the integral parts 6, 6a and 6b form a sealed chamber closed to the atmosphere by the sealing strip 6 which engages the light-sensitive plate and the sealing strip 6a which engages the glass plate 15. A passage 28 opens into this chamber and extends through one of the members 7, the base section 5b of the vacuum channel arrangement, and the adjacent section of the vacuum frame V, said passage 28 communicating with the bore of a cup member 29 secured to said vacuum frame V. Adapted for detachable sealed connection with the cup member 29 is a hose connection, not shown, which leads to any suitable vacuum pump arrangement.

Accordingly, by way of said hose connection, the air may be exhausted from the aforesaid sealed chamber to a desired degree. When this has been accomplished, the glass plate 15 and the adjacent surface of the light-sensitive plate are held in intimate contact with each other by the action of atmospheric pressure.

After completion of the operations described above, the printing operation may be proceeded with in the manner clearly set forth in my aforesaid pending application. After completion of the printing operation, the aforesaid sealed chamber may be opened to the atmosphere and the glass plate positioned in the next printing position whereupon the operations generally described above may be repeated.

When the vacuum frame V is positioned in the main frame as indicated in Fig. 1, the dowel pins of said main frame are received, respectively, in the bushings 1 at opposite sides of said vacuum frame. Under such circumstances, the bushings 1 at the top and bottom of the vacuum frame are not in use and, therefore, the plates 4 are positioned as shown in said Fig. 1 to prevent the passage of light through the last named bushings 1 and the adjacent passages 3. Otherwise, light would pass through these openings and produce light spots on the light-sensitive plate of the photo-composing machine. When the vacuum frame is to be positioned on the main frame of the photo-composing machine in its alternate position, i. e., after having been turned through

an angle of 90 degrees, it will be obvious that the plates 4 are moved to such position that the upper and lower bushings 1 and passages 3 are free and unobstructed. It will be understood that, in said alternate position of the vacuum frame, the plates 5 have a function corresponding with that above described with respect to the plates 4.

As shown in Fig. 1, the vacuum frame V, at each of its corners, carries a pair of brackets 30 and 30a. As set forth more in detail in my aforesaid pending application, the brackets 30 are adapted to have the ends of suitable light-shielding curtains, not shown, secured thereto when the vacuum frame V is positioned as shown in Fig. 1. When the vacuum frame V is positioned in its alternate position, i. e., after having been moved through an angle of 90 degrees, the brackets 30a are utilized for curtain-attaching purposes.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In vacuum frame apparatus, an open rectangular frame, an open rectangular structure of flexible material supported by and defining a channel on said frame, a chase in said channel, and a negative-bearing plate carried by said chase.

2. In vacuum frame apparatus, an open rectangular frame, an open rectangular structure of flexible material supported by and defining a channel on said frame, a chase in said channel, and a negative-bearing plate carried by said chase, said plate resting upon the inner edge of said channel.

3. In vacuum frame apparatus, an open rectangular frame, an open rectangular structure of flexible material supported by and defining a channel on said frame, a chase in said channel, and a negative-bearing plate carried by said chase, said plate resting upon the inner edge of said channel and the outer edge of said channel projecting above the plane of said plate.

4. In vacuum frame apparatus, an open rectangular frame, an open rectangular structure of flexible material supported by and defining a channel on said frame, a chase in said channel, a negative-bearing plate carried by said chase, said plate resting upon the inner edge of said channel, and means for locking said chase in said channel whereby the inner channel edge forms an air-tight seal with said plate.

5. In vacuum frame apparatus, an open rectangular frame having a positioning aperture extending therethrough on each of the four sides thereof, and light shields slidable on said frame for closing a desired pair of said apertures.

6. Apparatus of the character described comprising a chase, a negative-bearing plate in said chase, and means for adjusting the position of said plate with respect to said chase, said means comprising cam mechanisms carried by the respective sides of said chase.

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