March 17, 1936. O. A. OLSEN 2,034,529

ALIGNING FRAME

Filed March 28, 1933

Fig. 1

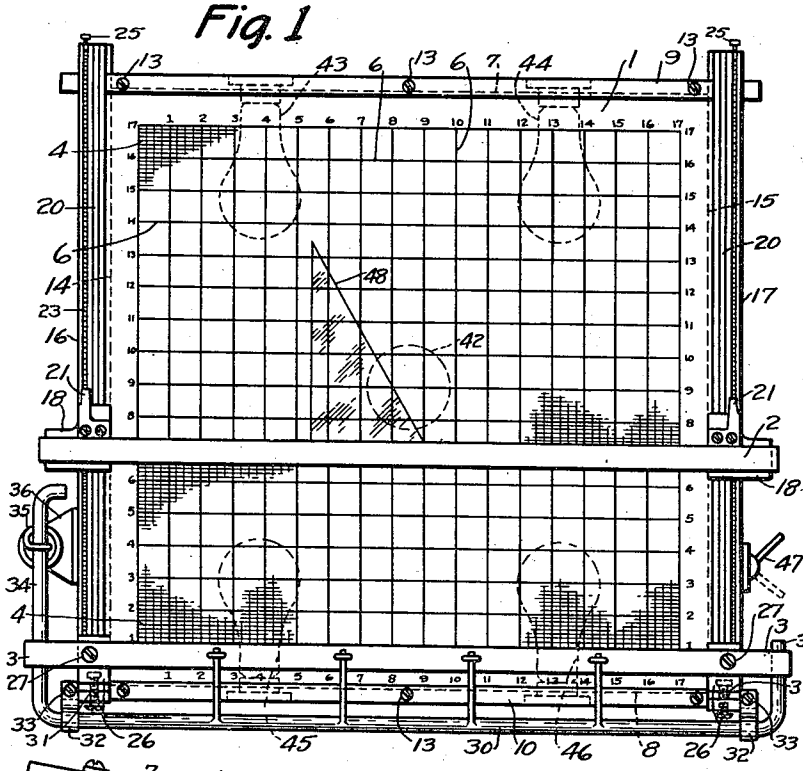


Fig. 2

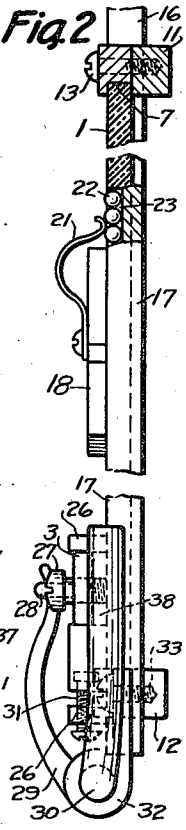


Fig. 3

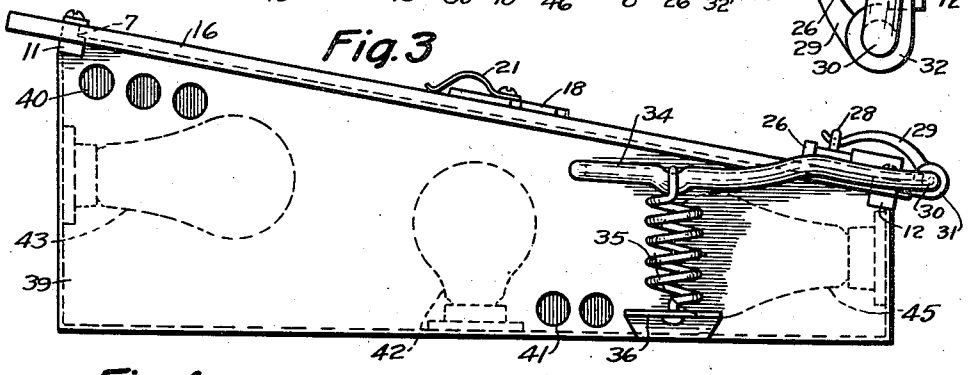


Fig. 4

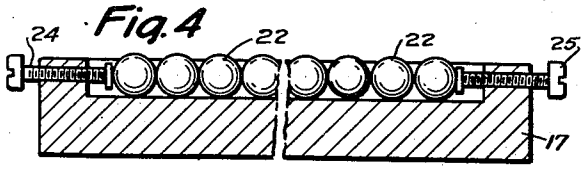


Fig. 7

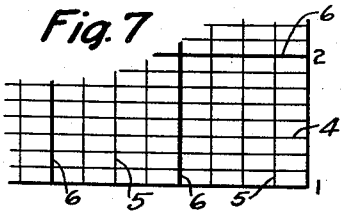


Fig. 5

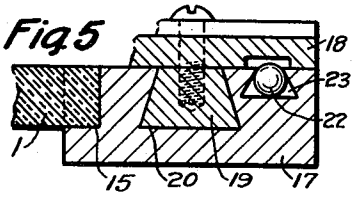
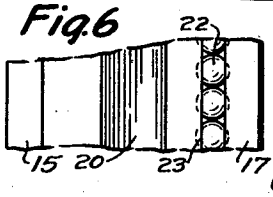


Fig. 6



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ALIGNING FRAME

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18 Claims. (Cl. 33—184.5)

The invention is a light frame having a translucent, lined plate held in an inclined position in the upper part thereof with readily releasable clamping means at the lower edge, and a guide aligned with the lines of the plate in which adjustable means is provided at the edges of the plate to hold the guide and insure perfect alignment between the guide and lines.

It is appreciated that there are many light frames with inclined translucent exposed surfaces and many of these are provided with mats, guides, guide lines and markings of all descriptions upon the translucent plates, but heretofore it has been substantially impossible to mark a plurality of absolutely parallel and evenly spaced lines on a translucent plate and this absolute accuracy is essential for proof reading and the like and the improvement is, therefore, in the translucent plate and the method of mounting the guide so that it may be absolutely adjusted to insure perfect alignment with the lines on the plate.

The invention is a device which is primarily adaptable in the printing and allied crafts for proof reading and may also be used for lining up black and white, or multicolor printing sheets, for laying out matter to be composed in type or plates, for copying or tracing designs, or the like, and for making lay-outs and stickup sheets where hair-line accuracy and exact precision in registration is desired.

The object of the invention is to provide means for readily aligning lines of printing on proofs for squaring up forms, lines of type, and the like.

Another object is to provide a device upon which two or more sheets may be lined up in multicolor printing.

Another object is to provide a frame on which advertising lay-out matter may readily be aligned.

Another object is to provide a glass and a method of lining the same in which the glass texture is milky, such as flashed opal or crystal, which will diffuse light rays instead of permitting them to pass directly therethru.

Another object is to provide a frame having a translucent, lined plate upon which printing matter may be aligned with borders when setting up proofs.

Another object is to provide a frame having a translucent plate which may be used for copying or tracing from original plates or drawings.

Another object is to provide a glass for a frame having an inclined surface with lights therein having horizontal and vertical lines which are in absolute alignment.

Another object is to provide a frame having an inclined glass cover with horizontal and vertical lines in absolute alignment thereon and having a movable guide aligned with said lines, in which adjustable means is provided for mounting and maintaining the guide and clamping member in perfect alignment with the lines on the glass.

A further object is to provide a translucent, lined plate with light penetrating therethru which may be used by lithographers and offset printers for making lay-outs so that absolute accuracy may be obtained.

A still further object is to provide a frame having a translucent top with lines running in both directions so that different types of work may be compared thereon with light passing thru the cover of the frame and the work.

And a still further object of the invention is to provide a work frame having a translucent cover with lines on the cover and a guide aligned with the lines of the cover, which is of a simple and economical construction.

With these ends in view the invention embodies a frame having an inclined upper surface, a glass forming the cover of said frame, vertical and horizontal lines in absolute alignment on said glass, a releasable clamp at the lower edge of said frame, a guide slidable on said frame and means holding the ends of said guide adapted to be adjusted to hold the guide in perfect alignment with the lines of the glass.

Other features and advantages of the invention will appear from the following description taken in connection with the drawing, wherein:

Figure 1 is a plan view of the frame.

Figure 2 is an end view looking toward the edge of the top of the frame with part broken away.

Figure 3 is a side elevation looking toward the opposite side from that at which Figure 2 is taken.

Figure 4 is a detail showing a longitudinal section thru a part of the ball track which locates the guide.

Figure 5 is a cross section thru the ball track showing the method of holding the end of the guide.

Figure 6 is a plan view showing a portion of the ball track.

Figure 7 is a detail showing one corner of the translucent plate showing the arrangement of the lines thereon.

In the drawing the device is shown as it would be made wherein numeral 1 indicates the plate, numeral 2 the guide bar and numeral 3 the holding bar.

The plate 1 is preferably glass which is of

flashed opal on crystal, or pot opal to eliminate glare and also to obtain perfect diffusion of light. The ruling or lines are placed on by a photographic or stencil process or by printing and it may be coated by an emulsion to protect the lines against wear.

In developing this machine, or apparatus, it only seemed necessary to take a plate of glass and place lines thereon by any known method, however, it was found that any method of placing lines on the glass was not practical because it was impossible to obtain absolutely true lines of even thickness and with the perpendicular lines at exactly right angles. It was impossible to etch lines perfectly smooth over this large area, as an exact 90 degree angle could not be maintained, and the lines would be irregular in depth and width. Various experiments were made by manufacturers of scientific instruments, but the comparative size of the plate was the main objection and caused unlimited trouble. Cementing pieces of glass together with a printed sheet of paper between them was then tried, but this was objectionable because of the thickness of the glass, as it was found absolutely necessary that the lines be on the immediate surface. For a while glass was considered impracticable, and other substances such as celluloid and other cellulose materials were used, but these were not practicable because of the contraction and expension from moisture in the air. It was finally found, however, that a particular glass known as flashed opal on crystal would take photographic reproduction on the immediate surface, and therefore this is now used, but in order to insure permanence and protect the lines against water and chemicals, it was necessary to use an emulsion coating over the glass after being photographed. After some experimenting this was found to be possible, and did not injure or blur the lines, and therefore the finished product consists of flashed opal on crystal glass with the lines photographed thereon, and covered with a fine emulsion. These lines are arranged with the horizontal lines 4 one-eighth of an inch apart, and the vertical lines 5 one-quarter of an inch apart, and comparatively heavy lines 6 are provided at one inch intervals in both directions. These lines may be consecutively numbered, as shown, with the numbers beginning at the lower side and at the left, or the numbers may begin at either side and may be arranged in any manner. It will be appreciated, however, that the lines may be arranged with any other spacing and may also be arranged in any other manner. The glass is preferably one-quarter of an inch thick, however, it will also be understood that glass of any thickness may be used.

The glass 1 is held at the edges in a continuous groove formed in the frame. The transverse edges are held in grooves 7 and 8 in members 9 and 10, which are secured to transverse bars 11 and 12 of the frame by screws 13, and the longitudinal edges are held in grooves 14 and 15 in members 16 and 17 in which the ball tracks are formed. The members 16 and 17 are attached to the ends of the members 11 and 12 thereby forming the end sections of the frame.

The guide bar 2 is preferably made of a flat piece of material and may be transparent, translucent, opaque or of any material and may be mounted in any manner. In the design shown the ends of the bar 2 are mounted in frames 18 having tongues 19 on their lower sides which are slidable in grooves 20 in the members 16 and 17 and on the frames 18 are spring clips 21 which engage the balls 22, as shown in Figure 2, and thereby locate and hold the frames and ends of the guide bar. The balls 22 are freely mounted in a groove 23 and the ends of the groove are provided with set screws 24 and 25 so that the position of the balls may readily be adjusted in order to adjust the position of the bar 2 in relation to the lines on the plate 1. It will be noted that in a frame of this type wear develops and the parts thereof become out of alignment so that with the ends of the guide bar held in notches or a gear rack it is practically impossible to adjust one part in relation to another to compensate for wear and unevenness of material, therefore, as it is absolutely essential to be assured of accurate alignment in this device, the balls are freely mounted in a groove and means are provided for readily adjusting the position of the balls in order to readily adjust the guide bar in relation to the lines. By adjusting the set screws 24 and 25 in the four corners of the frame it will be possible to adjust the position of the guide bar very readily and thereby obtain very accurate alignment thereof. It will be understood that other means may be used for locating, holding and adjusting the position of this bar in relation to the lines of the plate. Other means may be used for holding and mounting the bar.

At the lower end of the frame is a clamp bar 3 which is freely mounted in slots in bearings 26 and the upward movement thereof is limited by the heads of screws 27 which pass thru the bar and are held in the bearings which are mounted at the ends of the members 16 and 17 and this bar is provided with extensions 28 having openings thru which fingers 29 from a shaft 30 may pass, as shown in Figures 1 and 2. The bearings 26 are slidably mounted at the ends of the members 16 and 17 and adjusting screws 31 are provided so that the position of the bar may be maintained in absolute alignment with the lines on the plate. The fingers 29 are fixedly attached to a shaft 30, which is pivotally mounted in bearings 32, which are attached to the ends of the bar 12 by screws 33, as shown. One end 34 of the bar 30 extends along one side of the frame and is resiliently held downward by a spring 35, the opposite end of which it attached to a clip 36 on the lower part of the frame housing. The end 34, and also a short end 37 at the opposite side of the frame, pass under the ends of the bar 3, as shown, and it will be noted that as the end 34 is raised by hand, it, with the end 37 and the fingers 29, will raise the bar 3 continuously thruout the length thereof. The underside of the bar 3 may be provided with a pad 38, which may be of rubber or any material adapted to grip and hold paper or objects coming in contact therewith by friction, and it will be noted that as the end 34 is slightly raised the entire bar 3 and the lining material 38 will be raised so that papers, or the like, may be placed thereunder and, as the end 34 is released, the spring 35 will rotate the bar 30 so that the fingers 29 will force the bar 3 downward evenly thruout its length and the paper, or the like, may be gripped or firmly held. It will be understood that any other clamping means may be used at the lower edge of the frame and any other means may be used for raising the clamping means and also for holding it downward.

The upper part of the frame formed by the members 11 and 12 and the side members 16 and 17 is secured to a thin metallic housing 39, as

shown in Figure 3, and this may be of any shape or description. It is preferred to make the housing with one end higher than the other so that the plate 1 will rest in an inclined position, as shown in Figure 3, however, this may be formed in any manner and the angle of inclination may be changed as may be desired. This housing may also be of any depth and the sides may be provided with openings 40 and 41 to provide ventilation therein and these openings may be located at any point or points, as may be desired. Electric lamps may be provided in the frame and these may be positioned as shown with a lamp 42 in the center, lamps 43 and 44 at the upper side, and lamps 45 and 46 at the lower side. These lamps may also be arranged at any other point or points and may be connected to any suitable source of electric current and operated by any manner. It is preferred to use a switch 47 at one side of the frame, however, it will be understood that this switch may be located at any other point or points and any other type of switch may be used. It will be understood that altho these lights are shown and described as electric bulbs, any other type of lamp, such as neon tube, or other means may be provided for supplying light and for reflecting or rereflecting it over the entire surface of the frame. The inner surface of the base and side walls of the housing may be polished to provide reflecting surfaces to reflect the light rays thru the glass, however, it will be understood that this is not necessary and these reflecting surfaces may be omitted if desired. The housing may be of any other type or design and any means may be used for supporting the frame and housing.

It will be understood that other changes may be made in the construction without departing from the spirit of the invention. One of which changes may be in the proportionate sizes of the device as it will be understood that it may be longer or shorter or arranged as desired, another change may be in the use of more than one of the guide bars 2 or in the use of an additional member such as a triangle, as indicated by the numeral 48, and this may be transparent, or of any material and also of any shape or design, and another change may be in the use of any other device, such as mats or the like, in combination with the glass or frame.

The construction will be readily understood from the foregoing description. In use the device may be provided as shown and, when it is desired to use the device by proof readers for checking, the proof is inserted under the clamp bar and the lights switched on. The proof may be adjusted in order to arrive at a right angle with the bottom and left side corresponding or with some major portion of the composition at a right angle and, with the proof correctly positioned, the relative position of each item may easily be determined as the light will penetrate the paper permitting the lines to appear thruout the composition. Any defects in alignment may be noted by the bar 2 which may be used to mark the place which is out of alignment so that attention may be called thereto. The member 48 may be used to detect vertical defects which may be marked in a similar manner. As soon as the proof is completely corrected or checked, the light may be turned off and the frame removed from a desk or table upon which it may be placed, however, it will also be understood that it may be used as a writing desk, or for general work, or for any purpose desired.

The frame may also be used in the press room where it is adaptable for registering purposes with the bars 2 and 3 used as a straight edge.

The frame may also be used in advertising and designing in which case the work to be copied will be placed next to the glass so that the material upon which the work is being copied will be above and the measurements on the glass will shown thru, even several pieces of paper, so that it will not be necessary to use measuring instruments. The light makes it possible to use heavier paper for layouts instead of tissue paper which is commonly used and the different placement and grouping of material can be determined immediately thereby eliminating guess work.

The glass has been described as flashed opal on crystal, or pot opal, both of which, thru the manner in which they are manufactured, prevent direct rays of light passing thru the glass, as they are of a milky texture, however, any glass capable of diffusing the light rays and preventing direct passage thereof therethru, may be used.

Having thus fully described the invention what I claim as new and desire to secure by Letters Patent, is:

1. A frame having a translucent glass plate lined horizontally and longitudinally, said lines photographed on said plate, clamping means at one edge of the frame, a guide bar slidable on said glass plate, spring clips on the ends of said guide bar and rows of balls mounted on the sides of the frame and parallel to the vertical axis thereof over which said clips snap to locate and hold the guide bar in various positions.

2. A frame as described in claim 1 having means locating and holding the ends of said guide bar in relation to said plate.

3. A frame as described in claim 1 having means locating the ends of the guide bar in relation to the lines on the plate, and means readily adjusting the position of said guide bar.

4. In a frame as described in claim 1, said rows of balls at the ends of said frame adapted to be contacted by said spring clips, and means readily adjusting the position of said balls.

5. In combination, a flashed opal on crystal glass having transverse and longitudinal lines imprinted thereon, a frame adapted to hold said glass, resilient clamping means at the lower edge of the frame, a slidable bar extending across said frame and resting upon said glass, tracks at the ends of said frame, means for providing steps in said tracks, means for adjusting the positions of said steps, means on the ends of said guide bar for contacting said steps to locate said bar, said tracks having dovetail grooves therein, and dovetail tongues on said guide bar slidable in said grooves.

6. A combination as described in claim 5 in which the frame is mounted in a housing and electric lamps are positioned in said housing.

7. A combination as described in claim 5 having a housing adapted to support the frame in an inclined position, and electric lamps in said housing.

8. In a combination as described in claim 5, a housing having interior reflecting surfaces adapted to support said frame in an inclined position, and electric lamps in said housing.

9. In a combination as described in claim 5, a housing having interior reflecting surfaces and

ventilating openings therein adapted to support said frame in an inclined position, and means for producing light in said housing.

10. In an aligning frame, a flashed opal on crystal glass plate having transverse and longitudinal graduations imprinted thereon, a housing freely supporting said plate in an inclined position, a guide bar slidable on said plate, lamps in said housing, tracks at the sides of the housing, a plurality of balls in said tracks, set screws at the ends of said tracks adapted to adjust the position of said balls, and spring clips on the ends of said guide bar adapted to engage said balls to locate said bar.

11. A device as described in claim 10, in which the graduations are photographed on said plate.

12. A device as described in claim 10, having means adjusting the position of the guide bar locating means.

13. A device as described in claim 10, having means adjusting each end of the guide bar locating means independently.

14. A device as described in claim 10 having grooves adjacent said tracks, and dove-tail tongues on said guide bar slidable in said grooves adapted to hold said bars in working relation to said balls.

15. A device as described in claim 10 having a clamping bar extending continuously across said frame, resilient means holding said bar in clamping position, a plurality of connections between said resilient means and clamping bar holding said bar at a plurality of points, and means adjusting the position of said clamping bar to maintain absolute alignment with the graduations on the plate.

16. An aligning frame comprising a plate of flashed opal on crystal glass having evenly spaced transverse and longitudinal graduations on the exposed surface thereof, means supporting said plate, means positioning objects on the surface thereof, a guide bar slidable in relation to said plate, spring clips on the ends of said guide bar, and means contacting said spring clips, to adjust the position thereof in relation to the frame.

17. An aligning frame comprising a plate of flashed opal on crystal glass having evenly spaced transverse and longitudinal graduations on the exposed surface thereof, means supporting said plate, means positioning objects on the surface thereof, a transverse guide bar slidable in relation to said plate, spring clips at the ends of said guide bar, and rows of balls at the ends of the frame in engagement with said spring clips for locating both ends of said guide bar to keep same in alignment with the graduations on the plate.

18. An aligning frame comprising a plate of flashed opal on crystal glass having evenly spaced transverse and longitudinal graduations on the exposed surface thereof, means supporting said plate, means positioning objects on the surface thereof, a transverse guide bar slidable in relation to said plate, spring clips at the ends of said guide bar, rows of balls at the ends of the frame in engagement with said spring clips for locating both ends of said guide bar to keep same in alignment with the graduations on the plate, and means adjusting the position of said rows of balls to correspond with the relative positions of the graduations on said plate.

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