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PHOTOPRINTING SYSTEM

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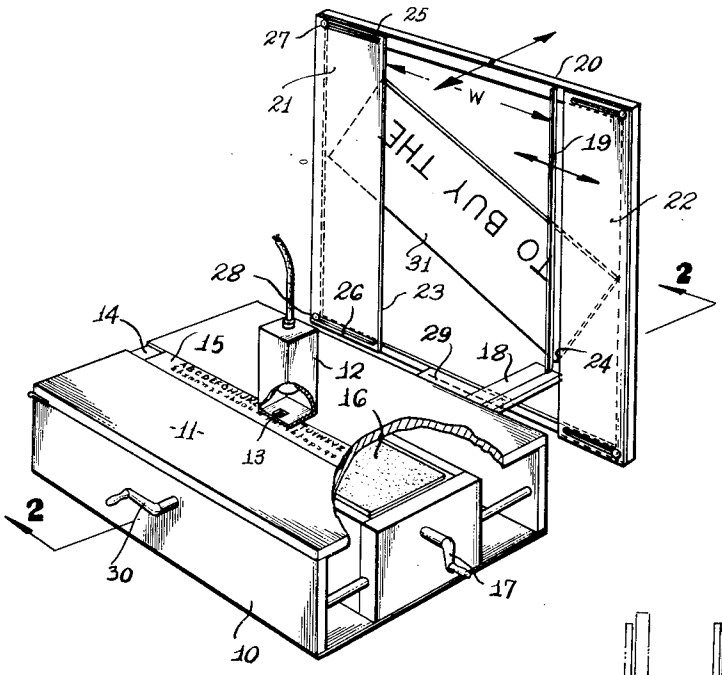


Fig. 1

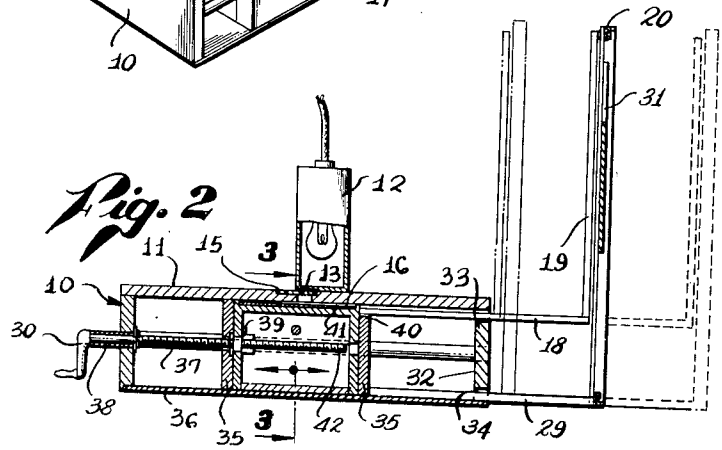


Fig. 2

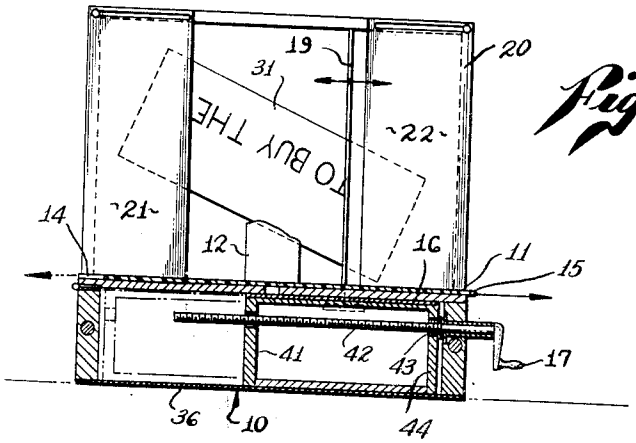


Fig. 3

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PHOTOPRINTING SYSTEM

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5 Claims. (Cl. 95—4.5)

1

This invention relates to a photo printing system and more particularly to a novel phototyping machine useful for photo offset and other photographic printing processes.

Present day photographic printing processes usually employ a typesetting machine which ejects metal slugs or individual pieces of letter type which a makeup man puts into page form The type slugs are usually separated with suitable spacers to fit the composition line between the given margins and thereby provide even left and right hand margins. From the composition page form there is then made at least one copy which is photographed and the negative used to make the final printing plates. Actually all that is needed to make the final plate is a single copy of the printed page for photographing. Much work has been undertaken therefore to provide a means for eliminating the slug typesetting process step and attempting to arrange the letters in properly spaced relationship initially on the single composition copy.

The present invention has for its primary object to provide a machine which furnishes a proof phototypographically, thereby eliminating the slug typesetting process step. The time saved alone is a distinct advantage of the present invention since the characters to be reproduced in a desired composition can be of any convenient size for accurately determining the proper letter spacing in the composition. Furthermore, the proper marginal spacing is also effected.

Another object is to provide a machine of this nature which is extremely simple to operate and which can be manufactured at a relatively low cost.

These and further objects of the invention are attained by providing a screen having parallel marginal lines which may be arbitrarily spaced to any desired width. A plate is secured to the screen but movable in any direction with respect to the screen. The composition to be phototypographed is placed on this plate and the first line of letters or symbols, as the case may be, is oriented to fit between the marginal lines by suitable tilting of the plate. An indexing line disposed parallel to the two marginal lines and movable between the marginal lines is mounted adjacent the front surface of the screen. This indexing line includes an extension arm fixed to an automatic or manually operable means for moving the indexing line from one margin to the other in a controlled manner.

The moving mechanism comprises a flat surface on which a photographic film is placed. The

2

film is covered by a suitable plate having a single aperture therein and a light source disposed above the aperture. Letters or symbols are provided in any suitable sizes and are arranged to be interposed between the light source and the aperture to expose the photographic film to the particular symbol selected. Thus the line of the composition on the screen which is fitted between the two marginal lines is duplicated by placing corresponding letters between the light source and the aperture when the indexing line is moved to pass through the center of the letter in the composition line. The photographic film is moved under the aperture along with the indexing line and is stopped at a position properly spaced from its previous position as determined by the position at which the index line intersects the next letter on the composition line.

Provision is made for also moving the film in a direction perpendicular to the previously mentioned direction in order that several lines of composition may be reproduced on the film.

A clearer understanding of the invention will be had by referring to the accompanying drawings in which:

Fig. 1 is a perspective view of one form of the apparatus;

Fig. 2 is an elevational sectional view as seen along the line 2—2 of Fig. 1; and

Fig. 3 is a longitudinal cross-section as seen along the line 3—3 of Fig. 2.

Fig. 1 shows one embodiment of the invention partly in schematic form as comprising a base frame member 10 provided with a hinged cover plate 11. Secured to the cover plate 11 is a light source housing 12 having an aperture 13 at its lower end. Beneath the aperture 13 and throughout the longitudinal length of the cover plate 11 there is provided a recess 14 adapted to slidingly receive a transparent slide member 15 having all of the letters of the alphabet or any other suitable symbols scribed thereon. The arrangement is such that any one of the letters or symbols may be positioned under the aperture 13 so as to be placed between the light source within housing 12 and a photographic film 16 disposed beneath the cover plate 11. The film 16 may be moved longitudinally with respect to the base frame 10 and cover plate 11 by means of a crank 17 to remove exposed portions of the film under the aperture 13 and move unexposed portions thereunder.

In order to determine the proper extent of movement of the film 16 there is rigidly secured to the film moving means as by an extension arm

18, an indexing line 19. The indexing line 19 is adapted to lie parallel to the surface of a screen 20. Screen 20 is provided with movable plates 21 and 22 defining left and right hand margins 23 and 24 on the screen. The width of these margins W may be adjusted by sliding the longitudinal slots 25 and 26 in the plate 21 for example along the projections 27 and 28. The screen 20 is disposed so that the marginal lines 23 and 24 are parallel to the indexing line 19 and is rigidly secured as by a brace member 29 at its lower end to an inner frame member within the base frame 10 to be described subsequently. The screen may thus be moved towards or away from the base frame 10 by means of a crank 30.

The composition to be phototypographed is secured to a plate member 31 and a single line thereof is arranged to fit exactly between the marginal lines 23 and 24 on the screen 20. This is accomplished by suitable tilting of the plate 31 until the respective ends of the line just touch the marginal lines. For the sake of simplicity in the drawing only a single line comprising three words has been shown.

Any suitable means may be used for securing the plate 31 to the back of the screen 20 in the desired position. For example a temporary adhesive means may be used or the edges of the plate 31 may be magnetized so that they will adhere to the margin defining plates 21 and 22.

Referring to Fig. 2 the rear end wall 32 of the base frame 10 is apertured at 33 and 34 to slidingly receive the extension arm 18 and screen supporting brace 29. Since the indexing line 19 and extension arm 18 move longitudinally relative to the frame 10 and cover plate 11, the aperture 33 comprises a longitudinal slot extending the entire length of the rear end wall 32. The slot 34 however need only accommodate inward and outward movement of the screen 20 as depicted by the phantom line. The inner end of the supporting brace 29 is secured to an inner frame 35 adapted to slide to the left or right as seen in Fig. 2 using the cover plate 11 and floor 36 of the base frame 10 as guides. This motion is accomplished by means of a screw 37 mounted in a suitable sleeve 38 secured to the base frame 10, the screw being threaded into a traveling nut 39 secured to the inner frame 35.

The right hand side wall of the inner frame 35 is provided with an aperture 40 at its upper end to receive the extension arm 18. The inner end of the extension arm 18 is rigidly secured to a telescoping frame 41 slidable longitudinally within the frame 35. As shown in Fig. 3 the telescoping frame 41 is moved longitudinally with respect to the base frame 10 by means of a screw 42 rotatable by the handle 17 and received by a traveling nut 43 in the right hand end wall 44 of the telescoping frame. The photographic film 16 is mounted on top of the telescoping frame 41 as shown. The cranks 30 and 17 thus permit any portion of the surface of film 16 to be positioned under the aperture 13.

As shown in Fig. 1 the slide 15 includes two rows of letters; the top row, for example, being capital letters while the next row comprises small letters shown as being upside down and backwards. This arrangement permits the slide 15 to be removed from the groove 14 and reinserted from the other end in order to place small letters under the aperture 13.

In the operation of the machine, assume it is desired to phototypograph a composition. The marginal plates 21 and 22 on the screen 20 are

adjusted to a width W desired in the final phototypograph of the composition. The composition is fixed to the plate 31 shown in Fig. 1. The first line of the composition is then fitted between the margins 23 and 24 defined by the plates 21 and 22 respectively, by suitable tilting and positioning of the plate 31. If this line is longer than the width W, the plate 31 is tilted until the extreme ends of the line just fit exactly between the margins. It will be noted that the composition is placed on the plate 31 upside down. The reason for this will become clear as the description of the operation proceeds.

The phototypographing process is accomplished by alining the indexing line 19 so that it passes through the center of the first letter of the first word in the line. In the example shown, the composition line is three words consisting of "TO BUY THE." Since T is the first letter of the line the indexing line 19 is positioned by means of the crank 17 to intersect this letter. The corresponding letter T is then found on the slide 15 and positioned under the aperture 13 by sliding the slide 15 along the recess 14. With the capital letter T properly positioned under the aperture 13 the light within the light source 12 is turned on to expose the photographic film 16 under the cover plate 11 to this letter. The light is then turned off and the crank 17 turned to move the film 16 to the left and place an unexposed portion under the aperture 13. The distance moved will be determined when the indexing line 19 which moves with the film, just intersects the next letter O. The letter O on the slide 15 is then positioned under the aperture 13 and the film 16 again exposed as before. This process is continued by moving the indexing line 19 from the marginal line 24 completely across the screen to the marginal line 23 photographing each of the individual letters as described.

It will be appreciated at once that the marginal lines on the photographic paper 16 are exactly separated by the width W and the composition line "TO BUY THE" will be precisely spaced between these two margins. Since the film is moved to the left, the phototypographed line will read from left to right when completed.

To phototypograph the next line a readjustment is made in the plate 31 to fit that line exactly between the margins 23, 24 and the crank 30 is turned a given amount as determined by the amount of spacing between the lines desired. Turning of the crank 30 will move the film 16 towards the screen thereby moving the first exposed line on the film out from under the aperture 13. The crank 17 is also moved to bring the indexing line 19 back to the right hand margin 24 and the phototypographing process is repeated with the next line.

Since each composition line is individually adjusted by suitable tilting of the plate 31 to fit exactly between the set margins 23 and 24, and since the crank 30 is turned an equal number of units each time thereby equally spacing the lines on the photographic film, there results a perfect reproduction of the composition on the photographic film with both left and right hand margins perfectly straight. Furthermore the spacing between the letters in any one line and the words in that one line will be respectively uniform.

The developed photograph 16 may then be used in a photolithographic process for making final type.

It is thus seen that by means of the present

invention I have eliminated the time consuming and complicated step of setting up slug types properly spaced in order to insure both left and right hand even margins.

Various modifications of the present machine will occur to those skilled in the art. For example an automatic means may be employed for moving the film 16 in the longitudinal or transverse direction rather than the manual crank means shown. Furthermore, the aperture and light source may be moved by the film moving means, and the film held stationary. This reversal in the relative movements would permit the composition line on screen 20 to read properly rather than upside down as shown. In addition, suitable lens systems may be used with the light source in order to adjust the size of the image of the symbol projected onto the photographic paper 16.

These and further modifications within the spirit of the present invention will readily occur to persons using the present machine. The apparatus is therefore not to be thought of as limited to the present embodiment disclosed.

I claim:

1. A phototyping apparatus comprising: a photographic film; a light source; means for interposing symbols between said film and light source to permit at least one symbol to be photographed on the film; first means for effecting relative movement between said film and said light source in a first direction to bring unexposed film under said source; second means to effect relative movement between said film and said light source in a second direction perpendicular to the first direction; a screen member having two parallel margins adjustable in width; a plate on said screen including a composition line, said plate being tiltable to permit said line to be fitted exactly between said margins; and an indexing line parallel to and movable between said margins by said first moving means.

2. In a phototyping machine for producing on a photographic film a composition in which the characters are spaced between beginning and end margins of a desired width, the combination comprising: a screen having two parallel margin lines adjustable in width; a plate on the screen carrying at least one line of said composition; means for tilting said plate with respect to the screen to permit said line to be fitted exactly between said margins; an indexing line parallel to and movable between said margins including an extension arm; a surface for supporting said photographic film secured to said extension arm; a stationary light source; and a series of symbols movable between said light source and film whereby at least one of said symbols can be photographed on the film and the film then moved along with said indexing line to place an unexposed portion under said light source for photographing another symbol properly spaced from the first symbol.

3. A machine according to claim 2 in which the spacing of said photographed symbols on the film is determined by the movement of the indexing line between adjacent symbols in said plate composition line.

4. A machine according to claim 2 including means for moving said film in a direction at right angles with respect to the direction of said first mentioned movement.

5. In a phototyping machine for reproducing a composition copy on a photographic film, the combination comprising: a pair of margin defining lines separated by the desired line length for the composition; means for adjusting each composition copy line to fit between said margin lines by tilting the composition copy line with respect thereto; an indexing means movable between said margins and adapted to be centered on each symbol of said composition line; means for positioning, in accordance with the position of said indexing line, corresponding symbols; and means to photograph said corresponding symbols.

No references cited.