

Oct. 5, 1965

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PHOTOCOMPOSING APPARATUS

3,209,664

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2 Sheets-Sheet 1

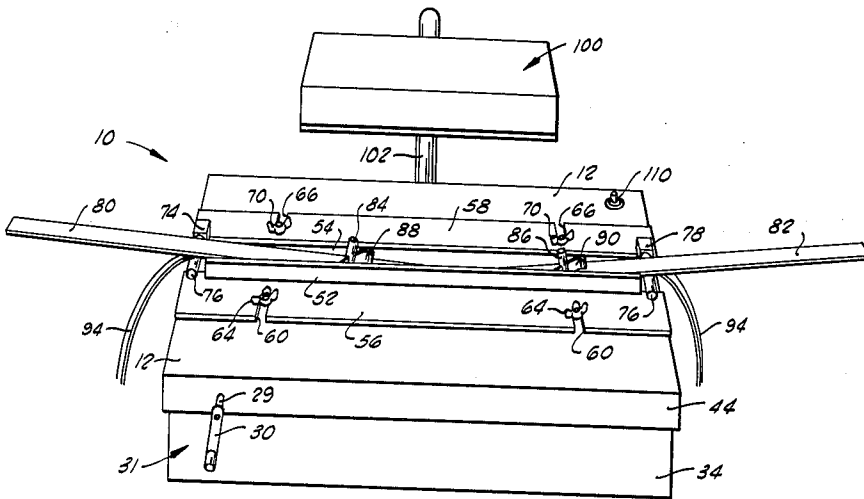


FIG. 1

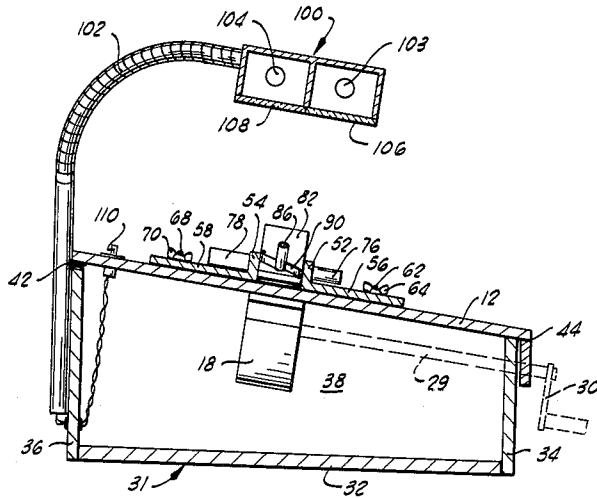


FIG. 2

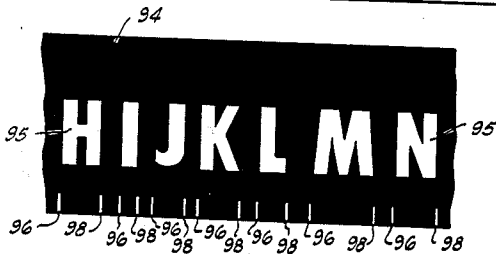


FIG. 3

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2 Sheets-Sheet 2

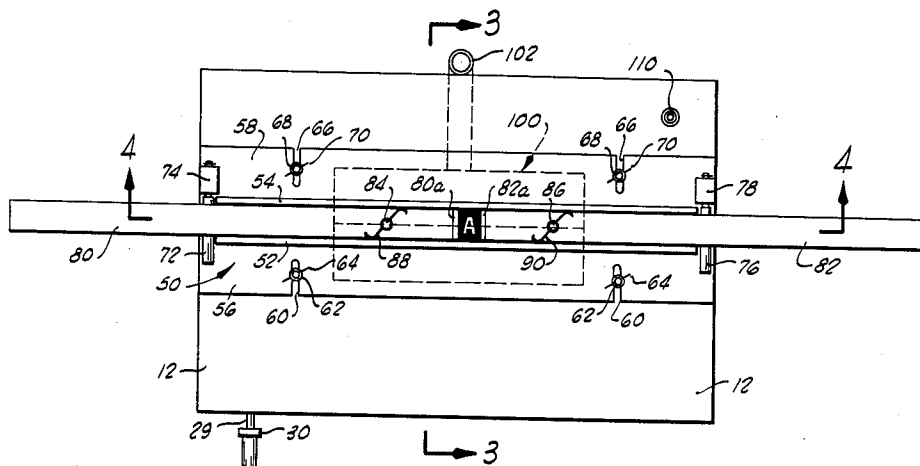


FIG. 2

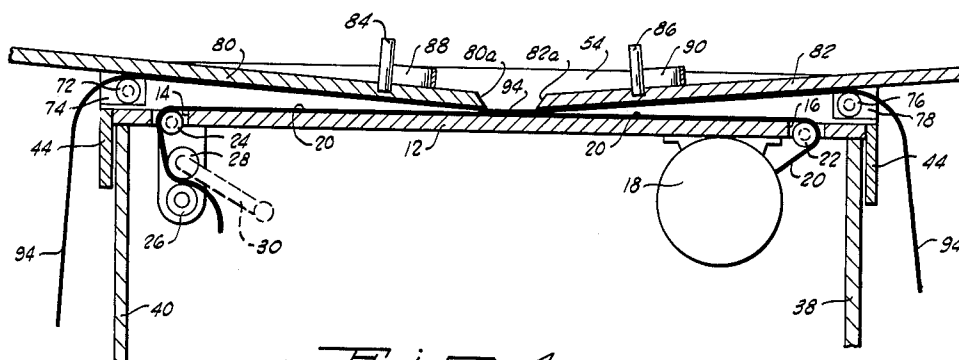


FIG. 4

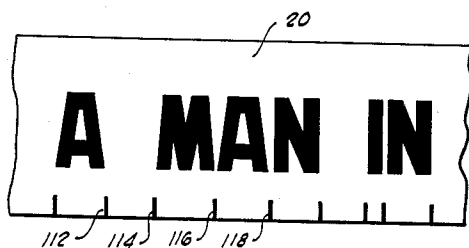


FIG. 6

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**PHOTOCOMPOSING APPARATUS**  
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5 Claims. (Cl. 95-4.5)

The present invention relates to the art of photocomposing and more particularly, but not by way of limitation, relates to an improved method and apparatus for photographically composing a desired word or words on an elongated film strip by means of a font transparency.

As is well known in the printing art, usually the first step in printing large spread advertisements in newspapers and magazines, as well as in printing posters and hand bills, is to prepare all art work together with the desired words and phrases on a layout sheet. A photograph is then made of the layout sheet which is used to produce printing plates or similar devices from which a large number of copies can be printed. The present invention is concerned with the composition of the words and phrases and other characters such as numbers for placement on the layout sheet as well as with the composition of headlines for newspapers or other purposes requiring large letters which need to be uniform and neat. This type of layout work is particularly useful in the offset printing wherein all master printing plates are prepared from a photograph of an entire page of printed or art material.

Various devices have been devised for photographically composing words and phrases. In general, the devices utilized a font transparency which is essentially opaque and has transparent characters for each of the letters and symbols of the alphabet and number system. Of course, the characters on any particular font may be of any desired style, such as script or block letters, and further may have various special textures such as crosshatching, plat, dots, and the like to produce special effects. Each character of the font has an index mark on each side to assist in aligning the character in the proper position so that equal spacing can be maintained between adjacent printed characters. The appropriate character of the font is positioned over a portion of a light sensitive strip of paper or film and then subjected to light which passes through the transparent character and exposes that portion of the film strip. The devices utilize various means for protecting the remainder of the film strip from exposure. A series of separate exposures are made of the successive characters to produce the words or phrases required. The film strip can then be developed and pasted on a layout sheet in the desired positions. The layout sheet can then be photographed as previously described.

In general, the photocomposing methods and devices previously employed have utilized rather elaborate systems for properly aligning the font over each successive portion of the film strip. The more elaborate and expensive devices function fairly satisfactorily, but are of course relatively expensive and somewhat complicated and tedious to operate, and consequently are impractical for use by small printing shops where only a little photocomposing work is required. Attempts to produce a simplified and economical photocomposing machine have been made. However, these machines have, in general, been incapable of producing neat work primarily, it is believed, because no accurate means have been devised for properly indexing each character of the font with respect to the film strip and further because the film strip has not been fully protected from secondary exposure due to light leakage past the shielding apparatus. This is due primarily, it is believed, to the fact that the film strip must be moved longitudinally after each character is exposed in order to position the film so as to be exposed to the next character, and it is very difficult to maintain proper index-

ing and spacing between the adjacent letters on the exposed film strip.

Therefore, it is an important object of the present invention to provide an improved photocomposing method and apparatus whereby accurate indexing or spacing between adjacent characters can be maintained while effectively shielding the film strip from secondary exposure.

Another very important object of the present invention is to provide a photocomposing device which is of very simple and economical construction, and which can be effectively operated by relatively inexperienced personnel.

Still another object of the present invention is to provide a highly versatile photocomposing device of the type described which can print a large range of font sizes on a large range of film strip sizes.

Yet another object of the present invention is to provide a photocomposing device of the type described which does not use an excessive amount of film.

Still another object of the present invention is to provide a photocomposing device of the type described which is compact in size and is therefore fully portable.

Still another object of the present invention is to provide a photocomposing device of the type described which utilizes one of the simplest and most inexpensive types of font transparencies.

Yet another object of the present invention is to provide a photocomposing device of the type described which is capable of using adhesive-backed photosensitive paper without interfering with the spacing accuracy.

Many additional objects and advantages of the present invention will be evident to those skilled in the art from the following detailed description and drawings, wherein:

FIG. 1 is a front perspective view of a photocomposing device constructed in accordance with the present invention;

FIG. 2 is a plan view of the top of the device of FIG. 1, showing the light source housing in dotted outline;

FIG. 3 is a sectional view taken substantially on lines 3-3 of FIG. 2;

FIG. 4 is a sectional view taken substantially on lines 4-4 of FIG. 2;

FIG. 5 is a top view of a segment of a conventional font transparency; and,

FIG. 6 is a plan view of a segment of a typical film strip exposed in accordance with the method of the present invention.

Referring now to the drawings, a photocomposing device constructed in accordance with the present invention is indicated generally by the reference numeral 10. The photocomposing device 10 comprises a generally rectangular support plate 12 the upper surface of which functions as a support surface for an elongated film strip 20 and elongated font transparency 94 presently to be described in greater detail. A pair of spaced apertures 14 and 16, as best seen in FIG. 4, are provided for passing the film strip 20 through the plate 12. A film magazine 18 is connected to the underside of the plate 12 for storing the elongated film strip 20. The film strip 20 passes over a roller 22 disposed in the aperture 16 and journaled on the plate 12, over the upper support surface of the plate 12, and around a roller 24 disposed in the aperture 14 and journaled on the plate 12. The film strip 20 is then threaded between and is frictionally gripped by an idler roller 26 and a drive roller 28. The drive roller 28 is connected to a shaft 29 which extends to the front edge of the plate 12 and is connected to a hand crank 30, both shown in superimposed dotted outline in FIG. 4 and in full outline in FIG. 1. When the drive roller 28 is rotated by the hand crank 30 the elongated film strip 20 will be pulled from the magazine 18 through the aperture 16, across the support face of the

support plate 12, and back through the aperture 14 to a point below the plate 12. The plate 12 preferably forms the lid of a light-tight container indicated generally by the reference numeral 31 and having a bottom 32, a front wall 34, a rear wall 36, right-hand side wall 38 and left-hand side wall 40. The plate 12 is preferably hinged to the top of the back wall 36 by hinge means 42 and may have a peripheral depending skirt 44 to insure that light does not enter the interior of the container. It will be noted from FIG. 3 that the shaft 29 extends through the skirt 44 so as to permit the plate 12 to be lifted to gain access to the container. Thus it will be noted that the film strip 20 passes from the interior of the light-tight container through the aperture 16 and over the support surface 12 back through the aperture 14 into the light-tight container 31.

A suitable guide means, indicated generally by the reference numeral 50, is positioned on the upper surface of the plate 12. The guide means 50 comprises a pair of elongated plates 52 and 54 which are disposed in parallel relationship with the transverse dimension disposed normal to the support surface of the plate 12. The parallel guide plates 52 and 54 extend between the apertures 14 and 16 and are connected to plates 56 and 58, respectively, which rest flat on the upper surface of the plate 12. The plate 56 is provided with a pair of elongated slots 60 which are positioned around bolts 62 which are connected to and project upwardly from the plate 12. Thumb screws 64 are threaded onto the bolts 62 to secure the plate 56 and therefore the guide plate 52 in any selected transverse position relative to the support plate 12. The plate 58 has similar adjusting means, including elongated slots 66, upright bolts 68 and thumb screws 70, for securing the guide plate 54 in any selected position. Thus it will be evident that the two guide plates 52 and 54 can be adjustably positioned to provide any desired spacing between the opposed faces of the plates, of course within the limits permitted by the slots 60 and 66. A suitable support means, preferably a roller 72, is journaled on the plate 58 by a suitable journal block 74. The roller 72 extends transversely of the guide plates 52 and 54 and is preferably of such a length as to extend completely across the space between the two guide plates when the plates are adjusted to provide a maximum spacing. A similar support roller 76 is journaled on a journal block 78 which is also connected to the plate 58. The roller 76 also extends beyond the guide plate 52. As can best be seen in FIG. 4, the support rollers 72 and 76 are positioned at a point above the upper face of the support plate 12, for purposes presently to be described.

A pair of elongated shutter strips are disposed between the guide plates 52 and 54 in end-to-end relationship, the left-hand shutter strip being indicated by the reference numeral 80 and the right-hand shutter strip by the reference numeral 82. The two shutter strips are of substantially identical construction and each is sufficiently long to cover the entire surface of the support plate 12 between the apertures 14 and 16. The adjacent ends 80a and 82a are preferably bevelled as best seen in FIG. 4, and a pair of upright dowels 84 and 86 are preferably connected adjacent the ends 80a and 82a and extend above the guide plates 52 and 54 to serve as handles for conveniently sliding the shutter strips. A pair of S-shaped springs 88 and 90 pass through the dowels 84 and 86 and engage the guide plates 52 and 54 to secure the shutter strips 80 and 82 in any set position. It will be noted that the shutter strips 80 and 82 are free to move longitudinally between the guide plates 52 and 54. However, for purposes presently to be described, the shutter strips 80 and 82 must extend transversely between the guide plates 52 and 54 so as to prevent light from striking the film strip 20, and accordingly may be covered with felt or other resilient material along the opposite edges which are in contact with the guide plates 52 and 54,

and along the bottoms which are in contact with an elongated font transparency strip 94.

The elongated font transparency strip 94 is disposed between the guide plates 52 and 54 and passes between the support rollers 72 and 76 and the shutter strips 80 and 82, respectively, as can best be seen in FIG. 4. It will be noted that the shutter strips 80 and 82 are therefore disposed over both the film strip 20 and the font transparency strip 94 and that when the shutter strips 80 and 82 are pressed downwardly, the ends 80a and 82a hold the font transparency strip 94 in superimposed contact with the film strip 20 in the zone between the ends 80a and 82a. From the portion of the font transparency strip 94 shown in FIG. 5, it will be noted that the major portion of the font transparency is opaque while the characters 95 of the alphabet and also preferably the number system are transparent. Of course it will be appreciated that the font transparency strip 94 will contain all the characters, including letters, punctuation marks and numbers, which may be required. The font transparency strip 94 should have a blank portion at each end of the strip of sufficient length that any character can be positioned at either end of the support surface plate 12 while still grasping the font transparency strip 94. The font transparency strip 94 should also be of substantially the same width as the film strip 20 and as the shutter strips 80 and 82, as will presently be described. As can be seen in FIG. 5, a left-hand index mark 96 and a right-hand index mark 98 is provided for each of the characters. The index marks 96 and 98 may merely be transparent portions, as will be the case with presently available standard font transparencies, but preferably are apertures in the strip for purposes presently to be described.

A light box 100 is supported by a flexible tubular conduit 102 which may conveniently be connected to the back wall 36 as best seen in FIG. 3. The light box 100 preferably contains two separate compartments in which are located two separately controllable lights 103 and 104. A conventional red filter 106 covers the light 103, and provides sufficient illumination to work in a dark room without exposing the film strip 20. The other light 104 is either uncovered or covered only by a suitable diffusing filter 108 and is used to expose the film strip 20 as will presently be described. The exposure light 104 is preferably controlled by a switch 110 which may conveniently be located on the support plate 12. Of course, suitable electrical leads (not illustrated) are provided to energize the two lights 103 and 104. The flexible conduit 102 provides a convenient means for adjustably supporting the light box 100 in substantially any desired position over the film strip 20.

The photocomposing device 10 must be operated in a conventional photographic dark room and is prepared for operation by threading the film strip 20 over the roller 22, across the upper surface of the support plate 12, around the roller 24 and then between the idler and drive rollers 26 and 28, respectively. Next a font transparency strip 94 of the same width as the film strip 20 and the desired style of characters is placed in longitudinally aligned, superimposed relationship over the film strip 20 and over the support rollers 72 and 76. The shutter strips 80 and 82 are then positioned over the font transparency strip 94 substantially as shown in FIG. 4. The thumb screws 64 are then loosened, the plate 56 moved until the guide plate 54 is properly aligned with the film strip 20 and the thumb screws 64 tightened to securely lock the guide plate 52 in place. Next the thumb screws 70 are loosened and the plate 58 moved until the guide plate 54 abuts snugly against the shutter strips 80 and 82 which, as previously mentioned, are of substantially the same width as the font transparency strip 94 and film strip 20.

The device 10 may be used to practice the method

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of the present invention, and for purposes of disclosing the method, the shutter strip 80 will be referred to as the left-hand shutter strip and the shutter strip 82 will be referred to as the right-hand shutter strip, and for convenience of discussion, all movements and ends of the various components of the structure will be referred to in accordance with this orientation. As previously mentioned, the device 10 must be operated in a photographic dark room. However, the light 103 can be turned on to provide sufficient illumination to work without exposing the film strip 20 because of the red filter 106. Assuming now that the film strip is to be exposed with the phrase "A MAN IN" as illustrated in FIG. 6, the left-hand shutter strip 80 is first moved as far to the left as is practical and the end 80a pressed downwardly lightly against the font transparency 94 and film strip 20. The right-hand shutter strip 82 is then moved until the end 82a is spaced from the end 80a of the left-hand shutter strip a distance corresponding approximately to the width of the character "A" on the font transparency strip 94. Next the font transparency strip 94 is moved by gripping the overhanging ends until the character "A" is positioned between the spaced ends 80a and 82a and the left-hand index mark 96 aligned generally with the edge 80a. The edge 82a is then moved until it is aligned generally with the right-hand index mark 98 of the character "A." It will be appreciated that precise alignment of the edges 80a and 82a with the index marks 96 and 98 is not essential for the first character of any sequence, since the only requirement is that the remainder of the font transparency strip 94 be shielded from the exposure light 104. The ends 80a and 82a may then be pressed downwardly to securely press the font transparency strip 94 against the film strip 20. Next the switch 110 is pressed for a predetermined period of time to completely expose the film strip 20 beneath the transparent portion of the character "A" positioned between the ends of the shutter strips 80 and 82.

After the exposure of the character "A" is completed, the exposure light 104 is of course turned off. Then, while holding the font transparency strip 94 stationary, which will automatically be accomplished by the guide plates 52 and 54 and the end 82a of the right-hand shutter strip 82, which frictionally grip the font transparency strip 94, the shutter strip 80 is moved to the right until the end 80a is precisely aligned with the right-hand index mark 98 of the character "A" which has just been exposed, which will be the index point 112 on the film strip 20 as shown in FIG. 6. The right-hand shutter strip 82 is then moved to the right a distance approximating the width of the next character, which in the example of FIG. 6 is a blank space. The font transparency strip 94 is then gripped at each end and moved longitudinally until any standard width character is positioned between the ends 80a and 82a to serve as a space. The left-hand index mark 96 of the standard width character is precisely aligned with the end 80a of the left-hand shutter strip 80 which as stated is index point 112. For convenience, the right-hand shutter strip 82 is preferably moved until the end 82a is precisely aligned with the right-hand index mark 98 of the standard width character, which will be the index point 114 on the film strip 20. The right-hand shutter strip 82 can be gently pressed downwardly to assist in holding the font transparency and shutter strip stationary and the left-hand shutter strip 80 moved to the right into contact with the right-hand shutter strip 82. The end 80a of the left-hand shutter strip 80 will then be aligned with the right-hand index mark of the standard width character and with the index point 114. Of course no exposure should be made of the character being used to make the space.

The font transparency strip 94 is next moved until the left-hand index mark 96 of the character "M" is precisely aligned with the end 80a of the left-hand shutter strip

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80, which is now aligned at index point 114 of the film strip 20. The end 82a of the right-hand shutter strip 82 is preferably aligned with the right-hand index mark 98 of the character "M," which then corresponds to the index point 116 in FIG. 6. The two shutter strips 80 and 82 may then be gently pressed downwardly to hold the font transparency strip 94 firmly against the film strip 20 and the character "M" exposed by turning on the exposure light 104 for a predetermined time period. Since the end 82a of the right-hand shutter strip 82 is precisely aligned with the right-hand index mark 98 of the character "M," the left-hand shutter strip 80 can be moved until the end 80a contacts the end 82a while preferably holding down gently on the right-hand shutter strip 82 to prevent dislocation of the font transparency strip 94. After the end 80a of the left-hand shutter strip 80 is positioned at the right-hand index mark 98 of the character "M," which corresponds to index point 116, the right-hand shutter strip 82 can then be moved to the right a distance approximating the width of the character "A," and the font transparency strip 94 shifted longitudinally until the left-hand index mark 96 of the character "A" is precisely aligned with the end 80a of the left-hand shutter strip 80. The right-hand shutter strip 82 can again be positioned with the end 82a precisely aligned with the right-hand index mark 98 of the character "A," which will be index point 118, and the third character then exposed by turning on the light 104.

This procedure can be rapidly repeated until all of the film strip 20 on the surface of the support plate 12 has been exposed. Of course it will be appreciated that some portions of the film strip 20 at each end are not conveniently accessible and accordingly will not be exposed each time. After the last character has been exposed, a pencil mark is made on the right-hand index mark of the last character through the apertures at the index marks. If only one aperture is provided in the case, it will be appreciated that the end 82a of the right-hand shutter strip 82 will serve as the index guide and the aperture in the font transparency 94 can be positioned adjacent the guide so that the mark can be made on the film strip 20. Next, the hand crank 30 is turned to pull the film strip 20 from right to left across the support plate 12 until the mark made on the film strip is positioned at the left-hand end of the support plate. The end 80a of the left-hand shutter strip 80 is then precisely aligned with the mark on the film strip and the procedure for exposing each character repeated.

It will be noted that the film strip 20 remains stationary as successive portions of the film strip are exposed. The film strip 20 is protected from secondary exposure by the guide plates 52 and 54 and the shutter strips 80 and 82, which also cover the apertures 14 and 16. Since the film strip 20 remains stationary during successive character exposures, the spacing between the successive character exposures can be accurately maintained. After the composition of the desired message is complete, the hand crank 30 is turned until the exposed film strip is moved through the rollers 26 and 28. The film strip can then be torn off and developed by conventional methods. After the film strip is developed, the excess portions of the film strip, especially the lower portion where the series of index points 112, 114, etc., will appear, can be trimmed off and the film strip pasted or otherwise affixed to a layout sheet which can subsequently be photographed.

From the above detailed description of a preferred embodiment of the present invention, it will be evident to those skilled in the art that a very simple and economical photocomposing device has been disclosed. The photocomposing device may be easily and quickly operated by relatively unskilled personnel after a minimum period of practice to produce highly accurate and neat work. Any width of film strip and font transparency strip can be used by reason of the adjustable guide means 50. In this re-

gard it will be appreciated that the guide means may be altered to some degree without departing from the scope of the present invention. For example, one or both of the guide plates 52 and 54 could be spring biased against the shutter strips 80 and 82. It will be noted that the support rollers 72 and 76 hold the font transparency strip 94 and the shutter strips 80 and 82 out of contact with the film strip 20 to prevent scratching of the film. However, the ends 80a and 82a of the shutter strips hold the character of the font transparency strip 94 which is being exposed in close contact with the film strip to insure sharp characters on the finished product. The device 10 is relatively compact and therefore portable. In this respect, it will be appreciated that containers of the necessary developing solutions can be carried in the container 31 together with the various styles of font transparencies 94, the shutter strips 80 and 82, and the light box 100 if desired. Since the film strip 20 is contained within a light-tight magazine 18, there is little danger that the film strip will be prematurely exposed when carrying the device 10 outside a dark room. Of course the device must be operated in a dark room as previously described.

Having thus described preferred embodiments of the present invention, it is to be understood that various changes, substitutions and alterations can be made therein without departing from the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A photocomposing device for photographically reproducing on an elongated film strip, a series of characters from an elongated font transparency having opaque portions and alignment indices for each character, the device comprising:

- plate means having an elongated support surface for supporting the font transparency and the film strip in superimposed relationship;
- a pair of parallel elongated guide means carried by said plate means, said guide means being spaced one from the other to form a channel therebetween to receive said film strip and said transparency;
- aligned, first and second elongated shutter strips slidably disposed within said channel and adapted to form a substantially light-tight seal therewith;
- means adjacent each end of said channel for supporting a portion of said font transparency in a position above and away from said film strip; and

a light disposed above the shutter strips for exposing that portion of the film strip not covered by the opaque portion of the overlying font transparency or the shutter strips.

2. The device defined in claim 1, further characterized to include a light-tight container including said plate means as the top thereof, said container including a pair of spaced apertures for passing the film strip from the container over the plate means and back into the container.

3. The device defined in claim 2 and further characterized to include resilient means mounted on said shutter strips for engaging said guide means to frictionally maintain said strips within said channel.

4. A photocomposing device for photographically reproducing, on an elongated film strip having a width, a series of characters from an elongated font transparency of the same width and having opaque portions and alignment indices for each character comprising the device as defined in claim 1 further characterized by:

a magazine connected to the underside of the plate means for holding the elongated film strip before it passes upwardly through one of the apertures; and, drive means connected to the underside of the support plate for pulling the film strip from the magazine through one of the apertures, across the support surface and through the other aperture.

5. The device defined in claim 1 wherein: at least one of the elongated guide plates is adjustable transversely of the support surface for accommodating film strips of different widths.

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