

Feb. 13, 1945.

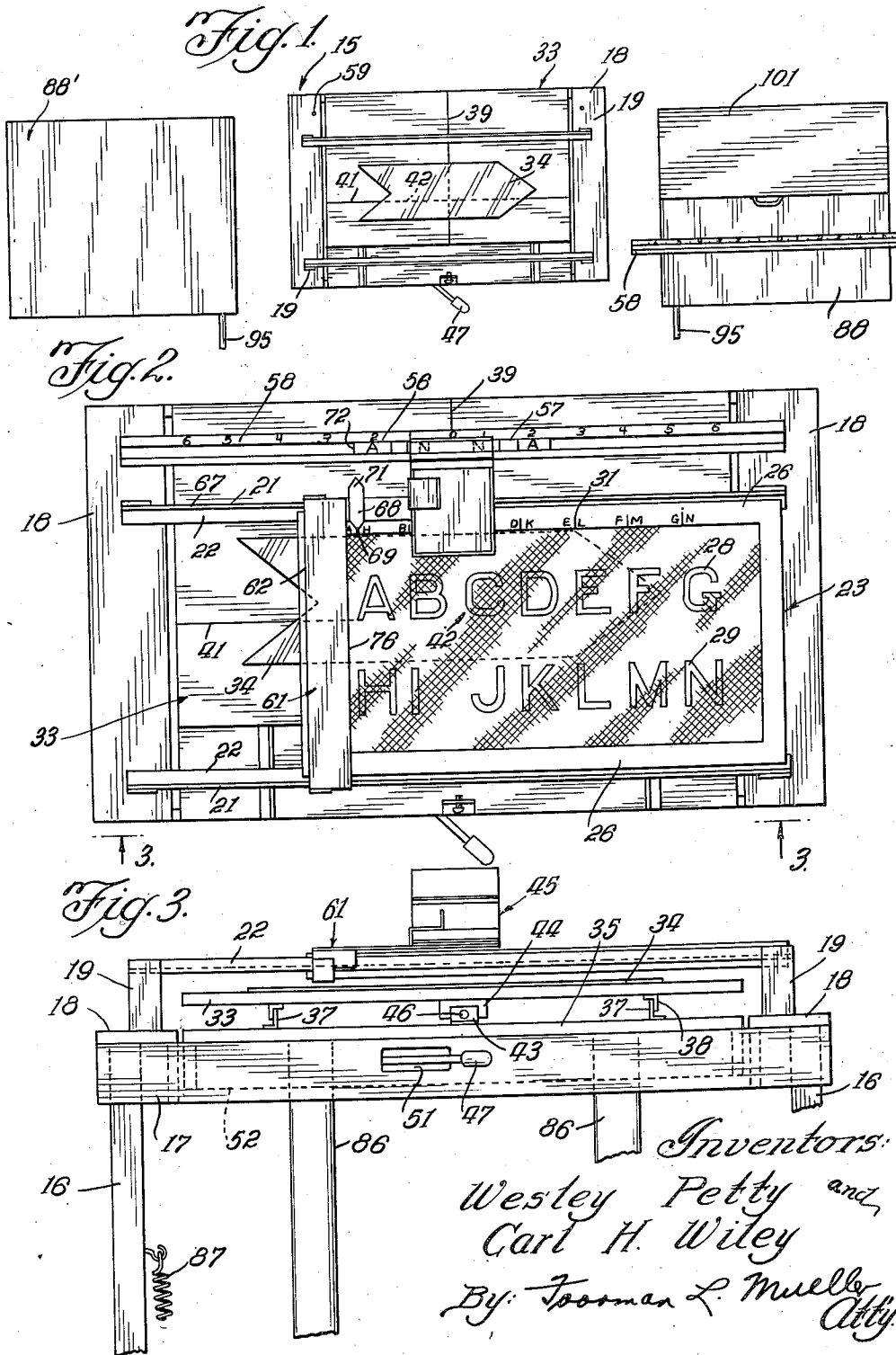
W. PETTY ET AL

2,369,602

SCREEN PRINTING APPARATUS

Filed June 11, 1941

3 Sheets-Sheet 1



Feb. 13, 1945.

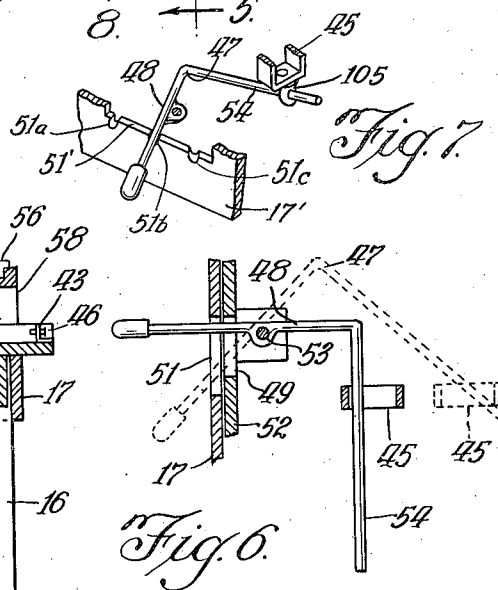
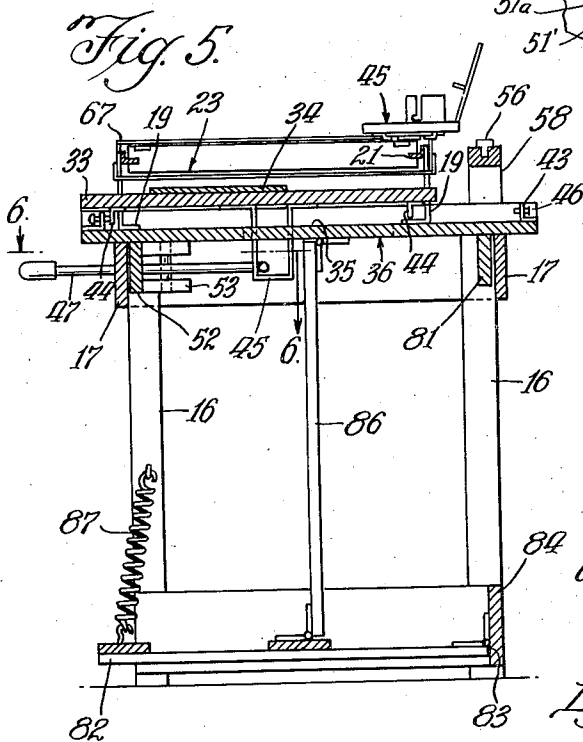
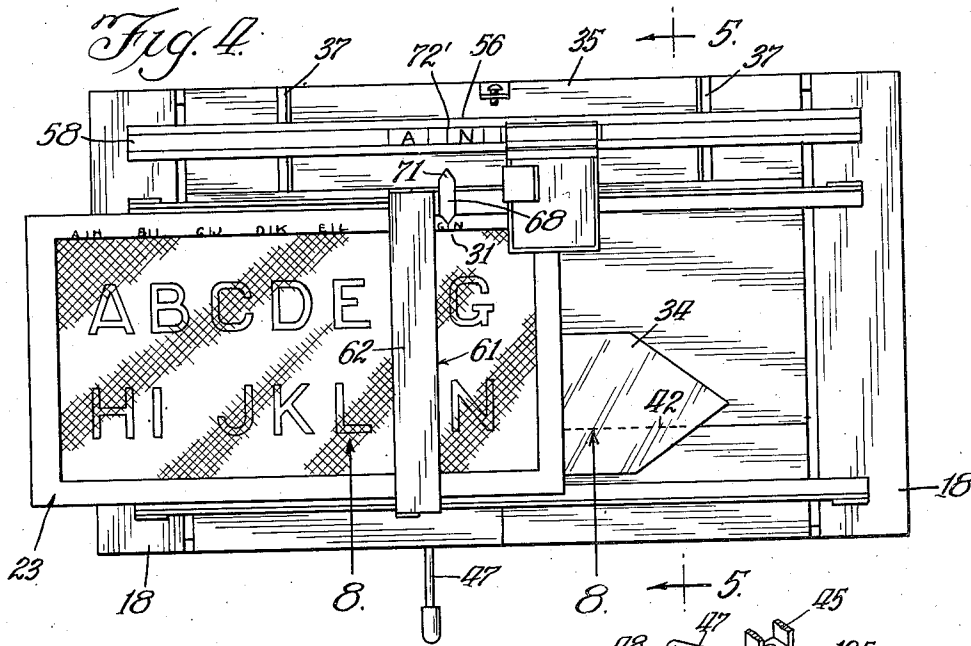
W. PETTY ET AL

2,369,602

SCREEN PRINTING APPARATUS

Filed June 11, 1941

3 Sheets-Sheet 2



Inventors:
 Wesley Petty and
 Carl H. Wiley
 By: *Forman L. Mueller*
 Atty.

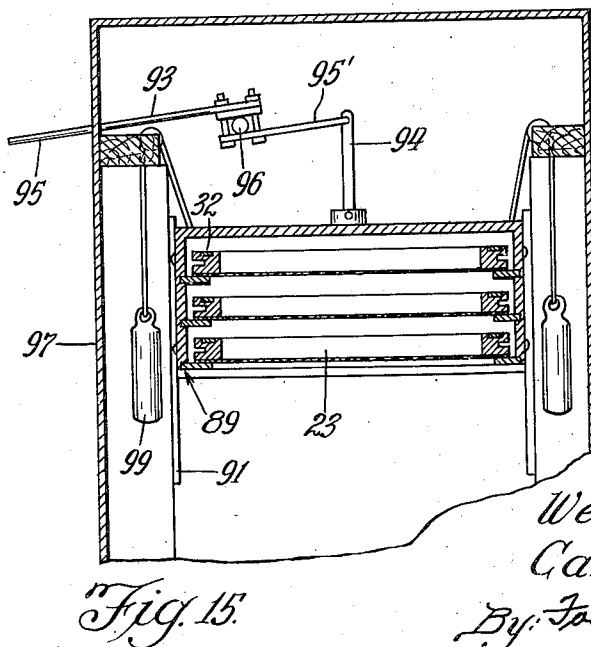
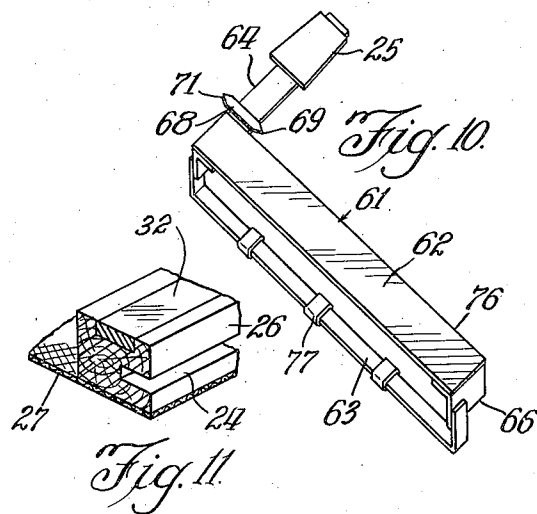
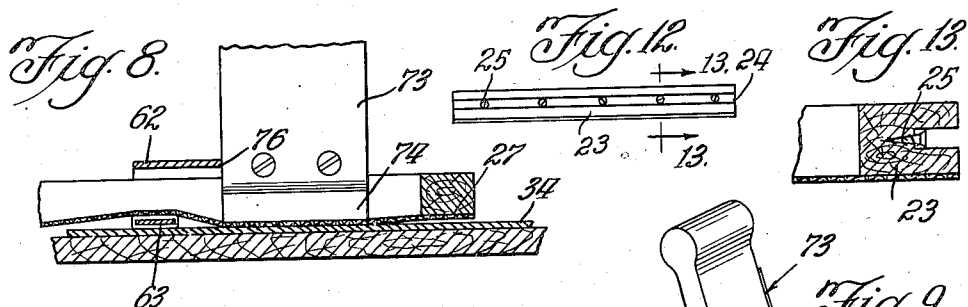
Feb. 13, 1945.

W. PETTY ET AL
SCREEN PRINTING APPARATUS

2,369,602

Filed June 11, 1941

3 Sheets-Sheet 3



Inventors:
Wesley Petty and
Carl H. Wiley
By: *Forman L. Mueller* Atty.

UNITED STATES PATENT OFFICE

2,369,602

SCREEN PRINTING APPARATUS

Wesley Petty and Carl H. Wiley,
Effingham, Ill.

Application June 11, 1941, Serial No. 397,597

9 Claims. (Cl. 101—114)

This invention relates to apparatus for screen printing and in particular to a screen printing apparatus in which the same printing frames are used to print a plurality of signs, each of which has different lettering thereon.

In screen printing, particularly in the printing of signs and the like, the general practice usually consists in preparing a stencil of the entire copy to be printed on a screen printing frame, with the copy corresponding in all respects to the sign which is to be printed. The printing frame is then placed over a printing base or blank workpiece and a rubber squeegee with a quantity of paint thereon is drawn across the frame, the paint being forced through the screen at the stencilled portions of the printing frame and onto the printing base. A complete copy of the stencil may be thus quickly printed on the workpiece. This method of printing provides for a rather economic and rapid production of signs in large quantities. However, for small quantity production where one or but very few of the same lettered signs are needed, the signs can be more economically lettered by brush since it is evident that a special printing frame for each individual sign of a plurality of signs would be very costly. By virtue of the wearing qualities of a screen printed sign, its use for printing only one or several signs is oftentimes highly desirable, as for instance in the making of road signs, but because of the prohibitive cost of screen printing signs in small quantities, its application for such purposes has been greatly restricted.

It is an object of this invention, therefore, to provide an improved apparatus for screen printing.

Another object of this invention is to provide an improved apparatus for screen printing individual prints each of which is different.

A further object of this invention is to provide an improved apparatus for screen printing in which the same screen printing frames are used in printing a plurality of signs each of which is lettered differently.

Yet another object of this invention is to provide an improved apparatus for screen printing which is simple in design, rugged in construction, and easily and quickly operated to print a plurality of signs which may be similarly or differently lettered.

Still another object of this invention is to provide an improved apparatus for screen printing in which the same printing frames are used for printing a plurality of different signs the letter-

ing on which is comprised of different type characters.

Yet a further object of this invention is to provide an improved apparatus for screen printing in which a screen frame having character design markings suitably arranged thereon may be used a plurality of times to produce prints of different kinds.

Another object of this invention is to provide a screen printing apparatus having means for keeping the printing base out of rubbing contact with the screen printing frame between successive printing operations on the printing base.

A further object of this invention is to provide a combination letter aligning and squeegee guiding unit which also functions to move the screen on the printing frame away from a freshly printed letter immediately on lifting of the squeegee therefrom.

A particular feature of this invention is found in the provision of a screen printing apparatus including a table having means for adjustably supporting a printing base and screen frame for relative movement thereon.

Another feature of this invention is found in the provision in a screen printing apparatus having a relatively movable printing base and screen frame with rows of character markings positioned thereon, of means for defining the movement of the base relative to the screen plate so that the markings in each row of the frame are positioned for printing in a straight line across the printing base.

Yet another feature of this invention is found in the provision of lettered spacing blocks arranged in copy form and longitudinally centered relative to the printing base, and which in cooperation with aligning means provide for a proper positioning of the corresponding letters on the screen frame relative to the printing base.

A further feature of this invention is found in the provision of a screen printing apparatus having a longitudinally adjustable screen printing frame with spaced rows of letters thereon and a printing base which is adjustably movable transversely of the printing frame so that relative movement between the printing base and screen plate provides for the location of a selected letter on the screen at a proper position for printing on the base.

A still further feature of this invention is found in the provision of apparatus for screen printing having a table with longitudinally extending members for slidably supporting a screen printing frame and a rack at one side of the table

for holding a plurality of frames in a superposed spaced relation, with the rack being movable to selectively position a frame in an engaging position with the frame supporting members on the table so that the selected frame is moved into a supported position on the table concurrently with its removal from the rack.

Yet another feature of this invention is found in the provision of an apparatus for screen printing including a work table having a paint pan supported thereon for movement longitudinally thereof which is adapted to hold the squeegee when it is not in use, and which has means thereon for removing paint from the squeegee in excess of that required for a particular printing operation.

A further feature of this invention is the provision of a linearly slidable screen frame and adjustable means associated therewith for aligning said screen frame for true linear travel.

Further objects, features and advantages of this invention will appear from the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a plan view of the improved screen printing apparatus showing the assembly relation of the table with respect to a rack on each side thereof for holding the screen printing frames, with parts of the apparatus being removed from the table for the purpose of clarity;

Fig. 2 is a plan view of the table showing the relative arrangement of the printing base, a screen printing frame, and the letter spacing means for one operating position of the improved apparatus;

Fig. 3 is a front view of the table as seen along the line 3-3 in Fig. 2;

Fig. 4 is a view illustrated similarly to Fig. 2 showing the parts thereof in changed positions;

Fig. 5 is a transverse sectional view of the table as seen along the line 5-5 in Fig. 4;

Fig. 6 is a fragmentary detail view partly in section showing the means for moving the printing base transversely of the table;

Fig. 7 is a fragmentary perspective view of modified means for moving the printing base transversely of the table;

Fig. 8 is a fragmentary detail view taken along line 8-8 in Fig. 4 illustrating the function of the combination squeegee guiding and letter aligning means during a printing operation;

Fig. 9 is a front perspective view of the paint pan showing the squeegee in a supported position and the means for removing excess paint from the squeegee;

Fig. 10 is a top perspective view of the combination letter aligning and squeegee guiding means;

Fig. 11 is a fragmentary perspective view of a screen printing frame;

Fig. 12 is a side view of a printing screen showing the aligning screws therein;

Fig. 13 is a sectional view as seen along the line 13-13 in Fig. 12;

Fig. 14 is a front perspective view of a rack for holding the screen printing frames; and

Fig. 15 is a transverse sectional view of the rack shown in Fig. 14.

The invention as illustrated includes a table having means thereon supporting a screen printing frame for longitudinal movement and a printing base for transverse movement thereof. A printing screen is shown as having a pair of spaced longitudinally extending rows of letters alphabetically arranged but it is to be under-

stood that any number of rows may be used and also that characters or designs may be substituted for the letters of the alphabet. A plurality of printing screens carrying the complete alphabet are carried in a superposed spaced relation in a rack located to one side of the table. Means are provided on the rack for selectively positioning each of the printing frames in an engaging position with the frame supporting means on the table so that a selected frame is moved into a supported position on the table concurrently with its removal from the rack. By virtue of the relative movement between the printing base and the screen frame supported on the table, each letter on the printing frame may be positioned to a proper printing position relative to the printing base. To facilitate straight-line printing, the transverse movement of the printing base is defined by coacting stop portions provided on a mounting member for the printing base and on the table, so that in each extreme position of movement of the base one of the rows of letters on the printing screen is arranged in proper alignment with the lettering line on the printing base. With the printing base in a position corresponding to a row of letters, the printing frame is moved longitudinally of the table until a selected letter is in a proper printing position. This printing position is determined by aligning the selected letter transversely of the table with a corresponding letter indicated on spacing blocks centered relative to the printing base and supported longitudinally of the table. The letters on the spacing blocks are arranged in copy form, so that the correct sequence of the letters to be printed is indicated concurrently with the spacing provisions for such letter. To eliminate any smearing of letters already printed, means are provided to separate the screen from a freshly printed letter immediately on the removal of the squeegee from the screen and also during the relative movement between the screen and the printing base in the positioning of a new letter which is to be printed.

With reference to the drawings the invention is shown in Figs. 1-3 as including a table 15 having legs 16 with side frame members 17 and top end members 18. Each top member 18 has a pair of spaced upwardly projecting brackets 19 thereon for supporting angle members 21 extending longitudinally of the table, with a leg or angle portion 22 on each member 21 being longitudinally arranged and turned inwardly of the table. A screen printing frame 23 of rectangular shape (Figs. 2, 11, and 15) is provided with a groove 24 in each longitudinal side member 26 thereof for slidably receiving a corresponding leg 22 of the members 21, whereby to support the screen for guiding movement longitudinally of the table 15. From a consideration of Fig. 2, it is evident that the screen printing frame 23 is longitudinally movable entirely across the table 15 and outwardly from each end thereof.

The screen printing frame 23 is constructed in a usual manner with a silk cloth 27 (Fig. 8) stretched transversely thereof. It is contemplated in the present invention that the cloth 27 have a pair of spaced longitudinally extending rows of letters 28 and 29 stencilled thereon with the letters preferably being arranged in an alphabetical order, the letters A to N being indicated. The letters in each rod 28 and 29 are spaced a similar distance apart with the spacing between the front edges of adjacent letters being indi-

cated by indications 31 provided on the upper longitudinal side 26 as viewed in Fig. 2. In practice it has been found that where the frame of the printing screen 23 is formed of wood, the longitudinal sides 26 thereof tend to be pulled inwardly toward each other on stretching of the silk cloth 27 thereacross, so that the sides 26 are bowed away from the guiding portions 22 of the supporting members 21. On movement of the screen frame 23, therefore, to a position where a considerable portion thereof is out of engagement with the guiding portions 22, the bowing in of the sides 26 permits the screen frame 23 to rock relative to the guiding portions 22. This rocking movement, of course, impairs the true guiding of the screen frame 23 in a straight line longitudinally of the table 15. To substantially eliminate the sides 26 from bowing inwardly each is provided with a metal bracing member 32 (Figs. 11 and 15).

In some instances the frames 23 become misaligned during use, or the grooves 24 therein may become worn so as to vary in depth. It is apparent that these conditions would also impair a true travel of the screen frame in the guides 22. To assure a correct aligning of the frame and guides in these cases the bottom of each groove 24 is provided with spaced screws 25 (Figs. 12 and 13) which are adjustably threadable laterally of the frame. Thus the screws 25 may be selectively adjusted in a direction outwardly from the groove 24 to completely eliminate any side play of the frame 23 between the guides 22 and to align the frame 23 for straight-line travel over all portions thereof in a direction longitudinally of the table 15.

The screen printing frame 23 is operatively associated with a mounting member 33 (Figs. 3 and 5) for supporting a printing base or flat workpiece 34 illustrated for the purpose of clarity in the disclosure as being of arrow form. The mounting member 33 is slidably supported for movement transversely of the table 15 on the flat top 35 of a movable table unit 36 arranged between the table side members 17 and top members 18 and which will be later fully described. This support of the mounting member 33 is accomplished in an obvious manner by coating angle irons 37 and 38 (Fig. 3) provided on the flat top 35 and the mounting member 33, respectively. It is evident, of course, that tracks and rollers or the like may be used in place of the coating members 37 and 38. The mounting member 33 is provided with transversely and longitudinally extending centering lines 39 and 41, respectively, to facilitate the centering of the printing base or work blank 34 thereon. The longitudinal centering line 41 is used to indicate the bottom of the letters to be printed on the base 34 so that in the centering of the base 34 the lettering line 42 thereon is arranged in longitudinal alignment with the centering line 41. Thus in the printing of a letter in a row 28 or 29 of the printing screen 23, the mounting member 33 is transversely adjusted until the centering line 41 is in alignment with the bottom of a row of letters longitudinally of the table 15. This positioning of the member 33 is obtained by limiting its transverse movement to defined positions corresponding to an aligned position of the centering line 41 with the bottom of a lettered row 28 and 29. The overall transverse movement of the member 33 and hence of the printing base 34 is thus equal to the distance between the bottoms of the rows 28 and 29 and

is positively defined by cooperating stop or abutment portions 43 and 44 (Figs. 3 and 5) on the table top portion 35 and mounting member 33, respectively. The stop portions 43 are provided with adjustable screw 46 to limit the transverse movement of the member 33 to correspond with the spacing between the bottoms of the lettered rows on a particular screen plate 23.

The mounting member 33 is moved to its defined positions by means including a U-shaped bracket 45 (Figs. 5 and 6) which is supported from the member 33 and extends through the top 35 of the movable unit 36. A manipulating lever 47 of substantially right-angle shape has one leg 48 thereof extending outwardly through the front of the table 15 through openings 49 and 51 formed in a frame member 52 of the unit 36 and in the front table member 17, respectively. The leg 48 of the lever 47 is pivotally supported by means indicated generally as 53 and mounted on the frame member 52, the other leg 54 being extended between the legs of the U-shaped member 45. Thus as is clearly evident from Fig. 6, movement of the lever 47 to its full line position moves the mounting member 33 and in turn the printing base 34 in a direction toward the front of the table, while movement of the arm 47 to its dotted line position moves the base 34 toward the rear of the table. A selective positioning of the base 34 corresponding to a row of letters 28 or 29 on the screen printing frame 23 is thus easily obtained.

With a relative movement of the printing base 34 and of the printing screen 23 in directions substantially normal to each other, it is apparent that any letter on the screen 23 may be readily positioned in proper alignment with the lettering line 42 on the printing base. In order to properly space the letters to be printed along the line 42 means are provided including spacing blocks 56 and 57, the blocks 56 having letters indicated thereon and being of a width corresponding to the width of the letters on the screen printing frame 23. The blocks 57 are of a width corresponding to the distance between adjacent letters on the screen 23. Referring to Figs. 2 and 5 the blocks 56 and 57 are seen to be of substantially T-shape with the leg or trunk portions thereof being adapted to be received in a grooved supporting member 58 extending longitudinally of the table 15. The member 58 is removably supported at its ends on the table top members 18 by pins 59 (Fig. 1) on the member 18 which are inserted in corresponding cavities (not shown) formed in the member 58. Prior to the start of printing operations the lettered blocks 56 are arranged in copy form with the blocks 57 positioned between adjacent ones of the blocks 56. All of the blocks 56 and 57 are then longitudinally centered as a unit relative to the transverse centering line 39 on the mounting member 33. Since the base 34 is also centered longitudinally with respect to the transverse center line 39, a proper longitudinal centering of the matter to be printed on the base is definitely assured.

In order to properly space the letters from the printing frame 23 along the lettering line 42 of the printing base 34, means are provided for positioning the screen plate 23 relative to the spacing blocks 56 which include a combination squeegee-guiding and letter-aligning unit 61 having spaced side members 62 and 63 (Fig. 10) positioned on opposite sides of the screen 23 and about the screen supporting members 21. The member 62 has angle members 64 and 66 at op-

posite ends thereof for slidably engaging the upwardly extending leg portions 67 of the members 21. The side member 63 of the unit 61 is turned up at each end thereof for connection with the angle members 64 and 66 so that the combination unit 61 is locked in sliding guidable engagement with the members 21. The angle member 64 has an indicating element 68 secured thereto in a position extending transversely of the table 15, the element 68 having aligned pointers 69 and 71 at opposite ends thereof. The unit 61 and hence the element 68 is thus adjustably movable longitudinally of the table 15 with the pointers 69 and 71 cooperating to align a spacing block 56 with a corresponding indication 31 on the screen printing frame 23.

In the operation of the present invention, let it be assumed that the word "Anna" is to be printed on the printing base 34. The spacing blocks 56 necessary to spell out the word "Anna" are arranged in the supporting member 58 with a block 57 positioned between adjacent ones of the spacing blocks 56. All of the blocks are then centered or equally divided on opposite sides of the transverse centering line 39. With the printing base 34 in a centered position on the mounting member 33 the letter "A" is ready to be printed. The lever 47 is manipulated to its dotted line position shown in Fig. 6 so that the centering line 41 on the mounting member 33 and hence the lettering line 42 on the base 34 are in longitudinal alignment with the bottom of the letters in the row 28. The combination unit 61 is then adjustably moved on the supporting members 21 until the pointer 71 on the indicating element 68 is opposite the left edge 72, as viewed in Fig. 2, of the first spacing block 56 which has the letter "A" thereon. With the combination unit 61 in this position, the screen frame 23 is adjustably moved along the members 21 until the indication 31 corresponding to the letter "A" on the screen 23 is opposite the pointer 69. The letter "A" on the printing frame 23 is now in a position to be printed on the base 34. A squeegee 73 of the usual type, such as indicated in Fig. 9 and having a rubber wiper portion 74 for carrying the printing paint, is then drawn across the letter "A," its movement across the letter being guided by the guiding edge 76 on the side portion 62 of the combination unit 61 as is clearly shown in Fig. 8.

To print the next letter "N" the lever 47 is moved to its full line position as shown in Fig. 6 so that the lettering line 42 on the printing base 34 is moved into longitudinal alignment with the bottom of the letters in the row 28 which includes the letter "N." The guiding unit 61 is then moved along the members 21 until the pointer 71 on the indicating element 68 is opposite the left edge 72, as viewed in Fig. 4, of the second spacing block 56 which has the letter "N" thereon. With the combination unit 61 in this position, the screen frame 23 is moved along the members 21 until the pointer 69 is opposite the indication 31 corresponding to the letter "N." The letter "N" is now ready to be printed, the relation of the apparatus parts for this printing operation being shown in Fig. 4. The remaining letters in the word "Anna" are printed in a manner similar to that above described for the first two letters "A" and "N" thereof.

In order to have the squeegee 73 readily available for all printing operations a paint pan 45 is provided with a portion 50 extending upwardly from one side 45' thereof having a laterally ex-

tending ledge 55 thereon for holding the squeegee when it is not being used (Fig. 9). The paint pan is adapted to be removably mounted on the unit 61 by the coating engagement of the mounting portion 25 on the angle iron 64 with the fittings 48 on the bottom of pan 45. Another side 60 of the paint pan has a bracket 65 removably secured thereto formed with an angular portion 70 comprising a leg 75 which extends laterally inwardly of the pan with a second leg 75' projecting upwardly therefrom. The leg 75' is provided with a vertically extending cavity or slot 80 for receiving the rubber portion 74 of the squeegee 73. The slot 80 at its lower end has a recess 85 formed in one side thereof. Thus after the squeegee is dipped into the paint pan 45, the rubber portion 74 is drawn through the slot 80 to wipe off all excess paint, it being obvious that only the paint which passes through the recess 85 will be retained on the squeegee portion 74. By virtue of the construction of the bracket 75 the excess paint drops directly into the pan 45. It is contemplated that a bracket 65 having a particularly sized slot 80 and recess 85 be used for the printing of certain sized letters, so that substantially only that amount of paint is retained on the squeegee which will print one of such letters.

In screen printing the letters are heavily printed so that they are not immediately dried. To prevent any smearing or marring of a letter after it has been printed, such as might occur by a rubbing contact of the printed letter with the silk cloth 27 of the screen printing frame 23, means including the lower side portion 63 of the combination unit 61 are provided for immediately separating the cloth 27 away from a freshly printed letter. As previously mentioned the side portion 63 is positioned beneath the screen printing frame 23 so as to be extended transversely of the table 15 and between the printing base 34 and the cloth 27 on the printing frame 23. The side portion 63 is laterally offset from the guiding edge 76 (Fig. 10) of the side portion 62 so that during the printing of a letter by the squeegee 73, and as is clearly apparent from Fig. 8, the cloth 27 is depressed in a gradual curve over the side 63 whereby to prevent any shearing or cutting of the cloth on such side. However, the side 63 is arranged sufficiently close to the letter being printed so that after the printing operation and immediately on lifting of the squeegee 73 from the cloth 27, the cloth 27 is raised by the side 63 away from the freshly printed letter. It is contemplated that the lower side of the member 63, as viewed in Fig. 8, be provided with slidable rings or collars 77 spaced thereon so that when the mounting member 33 is in one of its defined positions they will be positioned to the sides of the printed lettering on the printing base 34. A substantially point rather than a face contact is thus provided between the side member 63 and the printing base 34.

To eliminate any rubbing contact of the printing screen 23 with the printing base 34 during the relative movement therebetween, means, including the movable table unit 36 previously mentioned, are provided for moving the printing base 34 laterally away from the screen plate 23 during such relative movement. Thus as is shown in Figs. 3 and 5, the side members 52 and 51 which depend from the top portion 35 of the unit 36 are positioned inwardly of the table side members 17, the top portion 35 extending between the table top members 18 and over the side member 17. A foot treadle 82 is hinged at one end 83 to a por-

tion 84 of the table 15, and is operatively connected with the top portion 35 of the unit 36 by hinged upwardly extending members 86. As shown in Figs. 3 and 5, the unit 36 is in a position corresponding to a depressed position of the treadle 82 so that the base 34 is moved downwardly away from the screen frame 23. On a release of the foot treadle 82 the printing base 34 is moved upwardly against the cloth 27 of the screen plate 23 by means of tension springs 87 connected at one of their ends to the foot treadle 82 and at their opposite ends to the supporting legs 16 of the table 15. It is evident, therefore, that the unit 36 is in a floating position between the side members 17 and top members 18 of the table 15 with its upward movement in response to the action of the springs 87 being defined by engagement of the base 34 with the screen plate 23, and its movement in a downwardly direction away from the screen plate 23 being defined by the engagement of the overlapping ends of the top portion 35 with the side members 17 of the table 15.

By virtue of this construction of the movable unit 36 and its assembly relation with the operating lever 47 and mounting member 33, the screen plate 23 and mounting member 33 are capable of being relatively moved to a predetermined printing position when the treadle 82 is in a depressed position, namely, when the printing base 34 is separated from the printing screen 23. All of the relative adjusting of the base 34 and screen printing frame 23 prior to the printing of a letter may, therefore, be entirely completed while the base 34 is in a position entirely removed from rubbing contact with the screen plate 23. After these adjustments are made the treadle portion 82 is released to permit the printing base 34 to move into a position for printing by the screen plate 23. Since the treadle 82 is foot operated, its retention in a depressed position in no way interferes with the use of both hands of the operator in relatively setting the screen printing frame and the printing base.

In the description thus far, only one printing screen 23 having letters "A" to "N" thereon has been described. In some instances, such as where the letter characters are rather small, a single screen may be used having all of the letters of the alphabet arranged thereon. However, the letters are usually sufficiently large to require more than one screen for a complete alphabet. To facilitate the use of a plurality of screens having the alphabet divided thereon, a cabinet 88 for the screens is provided at one end of the table 15 (Figs. 1, 14 and 15). The cabinet 88 includes a rack 89 constructed to hold the printing screens in a superposed spaced relation. The rack is slidably supported between guiding members 91 for movement vertically of the cabinet 88 to selectively position a screen frame 23 at an opening 92 in the cabinet wall 90.

In the relative assembly of the cabinet 88 with the table 15, the opening 92 is arranged in the wall 90 so as to be in longitudinal and transverse alignment with the screen frame guiding members 21 on the table 15. Thus on positioning of a selected frame 23 at the opening 92, removal of such frame from the rack 89 through the opening 92 concurrently engages an angle portion 22 of the members 21 in a corresponding recess 24 on the screen. A transfer of the screen printing frames from the rack 89 to the table 15 is, therefore, simply accomplished in a single operation. It is readily apparent that the cabinet

88 may be located in close proximity to the table 15, since during the printing operation should the screen printing frame 23 extend outwardly from the end of the table, such extending end of the screen plate is positioned in the opening 92 and on the rack 89.

The proper positioning of a screen printing frame 23 at the opening 92 is accomplished by a manual operating lever 93 having one end 95 extending outwardly from the cabinet 88 through the wall 97 and its opposite end 95' pivotally connected to a connecting portion 94 on the rack 89. The lever 93 is pivotally supported intermediate its ends as at 96 on a portion of the cabinet 88. A first class lever is thus provided so that pivotal movement of the lever end 95 in a vertical direction moves the rack 89 a corresponding vertical distance. The cabinet wall 97 through which the lever 93 extends is formed with notches 98 for releasably catching the operating end 95 of the lever 93. Three of such notches are illustrated in Fig. 14, with a notch corresponding to one of the three screen printing plates 23 shown in Fig. 15. The movement of the rack 89 is facilitated by the use of counterweights 99, it being apparent that tension springs or the like may be similarly used.

As shown in Fig. 14, the cabinet 88 may have supported thereon a cabinet 101 having trays 102 therein for storing the spacing blocks 56 and 57. As previously mentioned, the supporting member 58 for the spacing blocks is removably supported on the table 15 so that in arranging the spacing blocks therein, the supporting member 58 may be positioned on the cabinet 88 and in front of the cabinet 101 as is clearly illustrated in Fig. 1.

In the printing of some signs it is sometimes desirable to have the sign printed in letters of different sizes, such as for example capital and small letters. Since these different sized letters may be frequently printed in succession it is evident that some inconvenience might arise should the screen printing frames 23 for both sized letters be held in the same rack 89. To overcome this inconvenience, a second cabinet and rack assembly 88'—89' similar in all respects to the cabinet 88 and rack 89 previously described, may be located on the other side of the table 15 (Fig. 1). As above described, the screen printing frames are freely movable outwardly from the table 15 from each end thereof. With the cabinet 88, therefore, holding screen printing frames having letters thereon of one size, and the other cabinet 88' holding printing frames having letters thereon of another size, the frames may be interchangeably used on the table 15 with equal facility. It is, of course, obvious that two frames may be slidably supported on the table 15 at the same time so that screen printing frames having different sized letters thereon may be alternately used in some instances without the necessity of their being moved from the table 15.

As was previously mentioned, the improved screen printing apparatus of this invention is readily adapted to operate with screen frames having any number of rows of markings thereon. Thus referring to Fig. 7, there is illustrated means for moving the printing base 34 to three predetermined positions corresponding to a row of markings in a screen frame (not shown), having three rows of markings thereon. The front side member 17' of the table 15 is formed with an elongated opening 51' having three notches 51a—51c spaced longitudinally thereof. The manipu-

lating lever 47 has the end 54 thereof slidably engageable in a guide or swivel ring 105 operatively supported from the U-shaped member 48. Thus with the lever end 48 in the center notch 51b, the base 34 is positioned so that the printing line 42 thereon is aligned longitudinally with the center row of markings on the three-row screen frame. With the lever end 48 in the notch 51b, the base 34 is moved toward the rear of the table 15 to align the center line 42 with the upper row of markings on the screen frame. When the lever end 48 is in notch 51a, the center line 42 on the printing base 34 is in longitudinal alignment with the lower row of markings. It is evident, therefore, that any number of notches such as 51a-51c may be used depending upon the number of rows of markings on the screen frame, the space between the notches being such that movement of the lever end 48 from one notch to a next adjacent notch corresponds to a movement of the printing line 42 on the base 34 from a position in longitudinal alignment with the bottom of the markings in one row to a position in longitudinal alignment with the bottom of the markings in a next adjacent row.

The operation of the invention has been described above with specific reference to the printing of lettered signs. However, it is not limited in its operation to the printing of lettered signs alone, but may be used equally well for printing designs, numerals, or like character markings. Thus in design printing the component parts of the design are suitably arranged on the screen frame 23 and the printing base 34 and frame 23 are relatively moved until each design part to be printed is in its proper printing position relative to the remainder of the body of the design. In this manner, therefore, a complete design may be simply and quickly printed.

From a consideration of the above description and drawings, therefore, it is seen that the invention provides a screen printing apparatus which is very simple in construction and easily operated to print a plurality of like signs or signs having different words thereon. The apparatus is flexible in operation to the printing of signs having different sized character letters and provides for a multiple use of the screen printing frames so as to appreciably reduce the cost for making individual signs by the screen printing process. Also the apparatus is readily applicable to screen print designs, character markings and the like, since it is readily adapted for use with screen printing frames of any desired size having any number of rows of character markings arranged thereon.

Although this invention has been described with reference to a specific embodiment thereof, it is to be understood that it is not to be so limited, since alterations in the parts and their relative arrangement can be made which are within the full intended scope of the invention as defined by the appended claims.

We claim:

1. Apparatus for screen printing on a printing base comprising a table, a screen printing frame unit having characters spaced thereon, with the spacing of said characters being indicated on the frame of said unit, means supporting said printing base on said table including a holding member, means centering said printing base on said holding member, means carried by said table supporting said frame unit for slidable movement over said printing base and longitudinally of said table, spacing blocks

corresponding to the spacing of said characters, means supporting said blocks longitudinally of said table and in a centered relation longitudinally of said printing base, means aligning said spacing blocks in succession with certain of said characters transversely of said table, and means supporting said aligning means for adjustable movement longitudinally of said table.

2. An apparatus for screen printing on a printing member comprising a table, a screen printing frame having letters in a longitudinally spaced relation thereon, means supporting said printing frame for movement longitudinally of said table, means supporting said printing member on said table in the path of longitudinal movement of said printing frame, spacing blocks corresponding to the spacing of the letters on said printing frame, a supporting member for said spacing blocks extending longitudinally of said table, means for centering said spacing blocks longitudinally of said printing member, means for successively aligning said blocks transversely of said table with certain of said letters, and means supporting said aligning means for adjustable movement longitudinally of said table.

3. An apparatus for screen printing on a flat workpiece with a squeegee comprising a table, means supporting said workpiece on said table, a screen printing frame having letters spaced thereon, means adjustably supporting said screen frame for movement longitudinally of said table and relative to said workpiece, a unit for guiding said squeegee across a letter to be printed on said workpiece including a pair of connected spaced side members, means supporting said guiding unit for slidable movement longitudinally of said table with said side members extending transversely thereof, one of said side members being positioned over said screen frame and the other thereof between said workpiece and screen frame, and means for aligning an edge of said one side member with the end of said letter to be printed so that said edge guides said squeegee across said letter, said other side being laterally offset from said one edge to permit all portions of the letter being printed to be flattened on said workpiece when the squeegee is passed thereover and to retain the screen frame away from the impression of said letter printed on the workpiece after the squeegee has been lifted from said screen frame.

4. An apparatus for screen printing on a printing base comprising a table, means for supporting said printing base on said table, a screen printing frame having characters thereon, means supporting said screen frame for slidable movement across said printing base, means intermediate said printing base and screen frame for retaining a spaced relation between certain opposite portions of said frame and printing base, and means supporting said intermediate means for movement across said printing base, with movement of said intermediate means over a character impression freshly printed on a portion of said printing base preventing contact of said impression with the screen frame on movement of the same to a new printing position.

5. An apparatus for screen printing on a flat workpiece comprising a table, means supporting said workpiece on said table, a screen printing frame having letters spaced longitudinally thereof, means slidably supporting said screen frame for movement over said workpiece, means for successively spacing the letters to be printed across

said workpiece including an aligning unit having a portion thereof intermediate said workpiece and screen printing frame, and means supporting said aligning unit for slidable movement over said workpiece, with movement of said aligning unit in the spacing of a letter to be printed in turn moving said intermediate portion over a letter just printed on the workpiece to prevent rubbing contact between such printed letter and the screen frame.

6. An apparatus for screen printing on a printing base with a squeegee comprising a table for supporting said printing base, a screen printing frame having characters thereon, means supporting said frame for movement over said printing base, a paint pan, means supporting said paint pan for movement over said printing base, and means on said paint pan for removing paint from said squeegee in excess of that needed for printing one of the characters from said frame on said printing base.

7. An apparatus for screen printing on a printing base comprising a table for supporting said printing base, a screen printing frame having letters spaced longitudinally thereof, means supporting said screen frame for adjustable movement across said printing base, spacing blocks corresponding in size to the letters on said screen frame and having letter markings thereon corresponding to such letters, a member extending longitudinally of said table for supporting said spacing blocks, means for centering said spacing

blocks longitudinally of said printing base, with the letters on said blocks being arranged in copy form to correspond with the letter arrangement to be printed on said printing base, and means successively aligning said blocks transversely of said table with the letters on said frame corresponding to the letters marked on said spacing blocks.

8. An apparatus for screen printing on a printing base comprising a table for supporting said printing base, a screen printing frame, means including spaced guide ways slidably supporting said printing frame for movement over said printing base, said printing frame having grooves therein corresponding to said guide ways and adapted to guidably receive the same, and aligning means engageable with said guide ways, spaced in each of said grooves and adjustably supported on said frame, said aligning means being adjustable to provide for the linear movement of said frame over said printing base.

9. An apparatus for screen printing on a printing base comprising a table for supporting said printing base, a screen printing frame, and means including spaced guide ways slidably supporting said printing frame for substantially linear movement over said printing base, said printing frame having grooves therein corresponding to said guide ways and adapted to guidably receive the same.

WESLEY PETTY.
CARL H. WILEY.