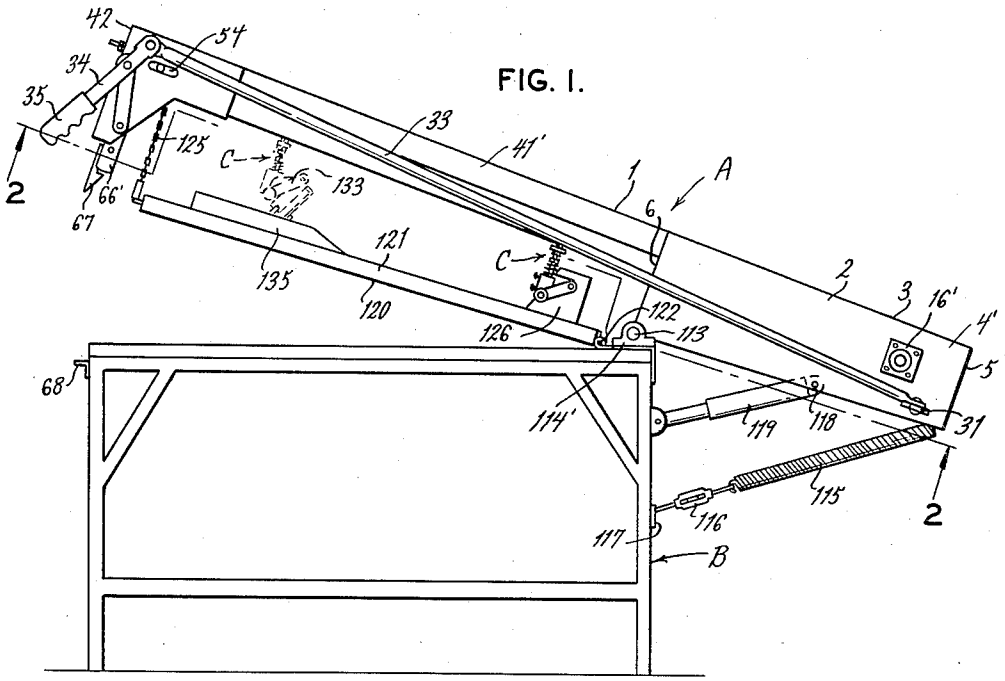
March 22, 1955 E. WALSH, JR 2,704,510

SCREEN PRINTING MACHINES

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FIG. 1.



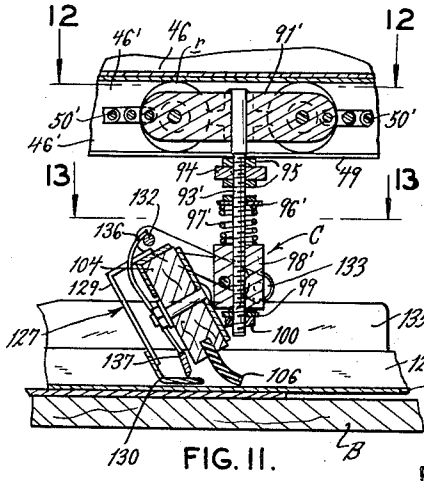


FIG. 11.

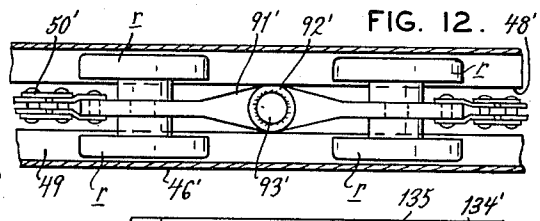


FIG. 12.

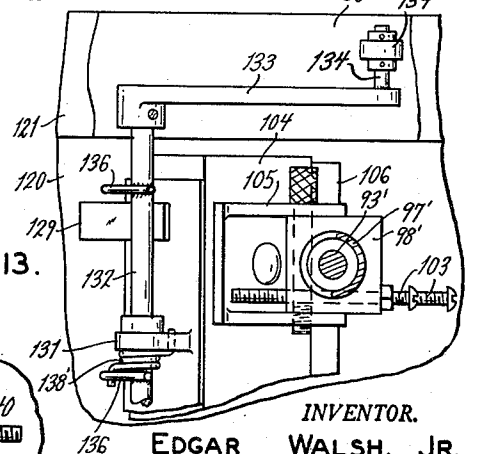


FIG 13.

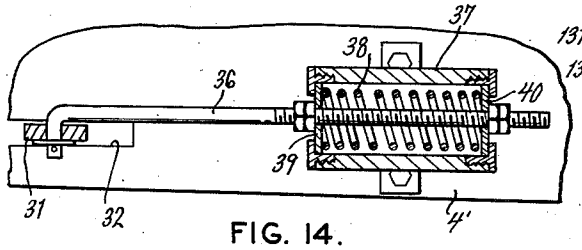


FIG. 14.

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SCREEN PRINTING MACHINES

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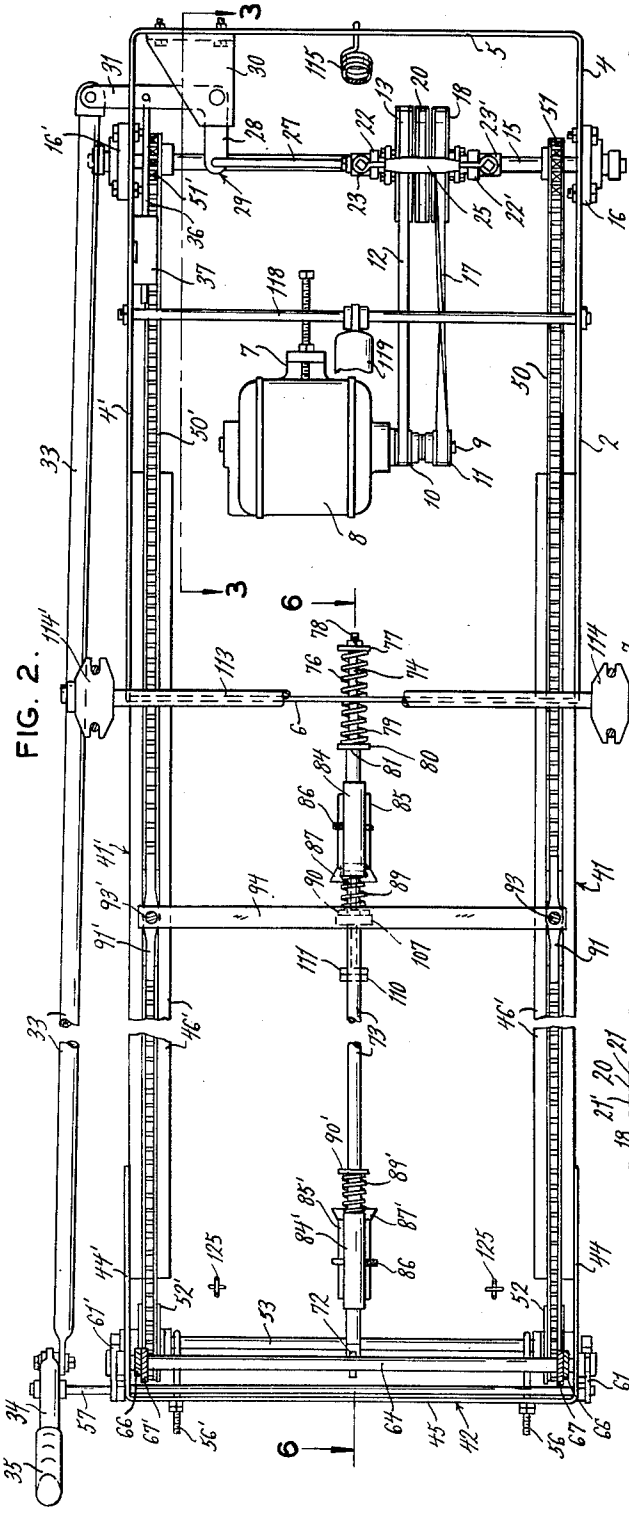


FIG. 2.

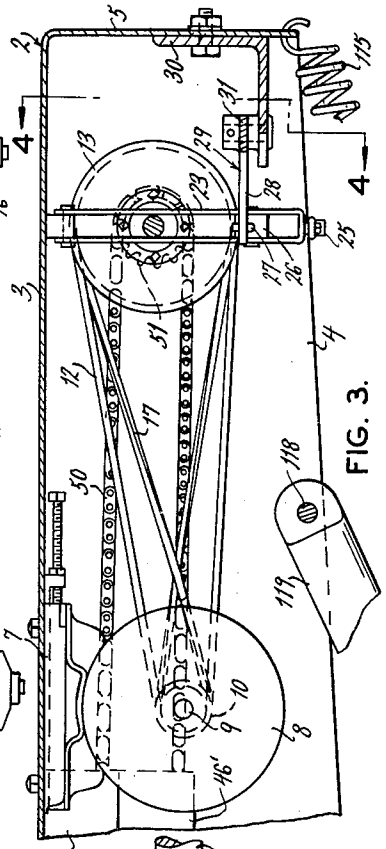


FIG. 3.

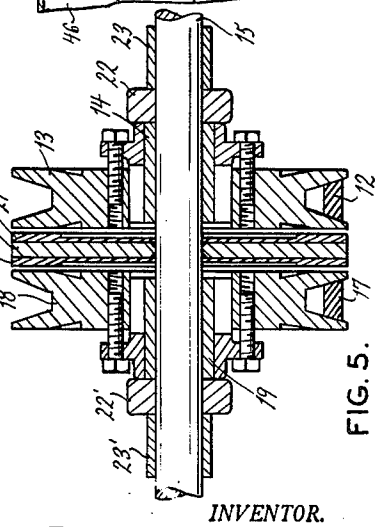


FIG. 5.

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FIG. 4.

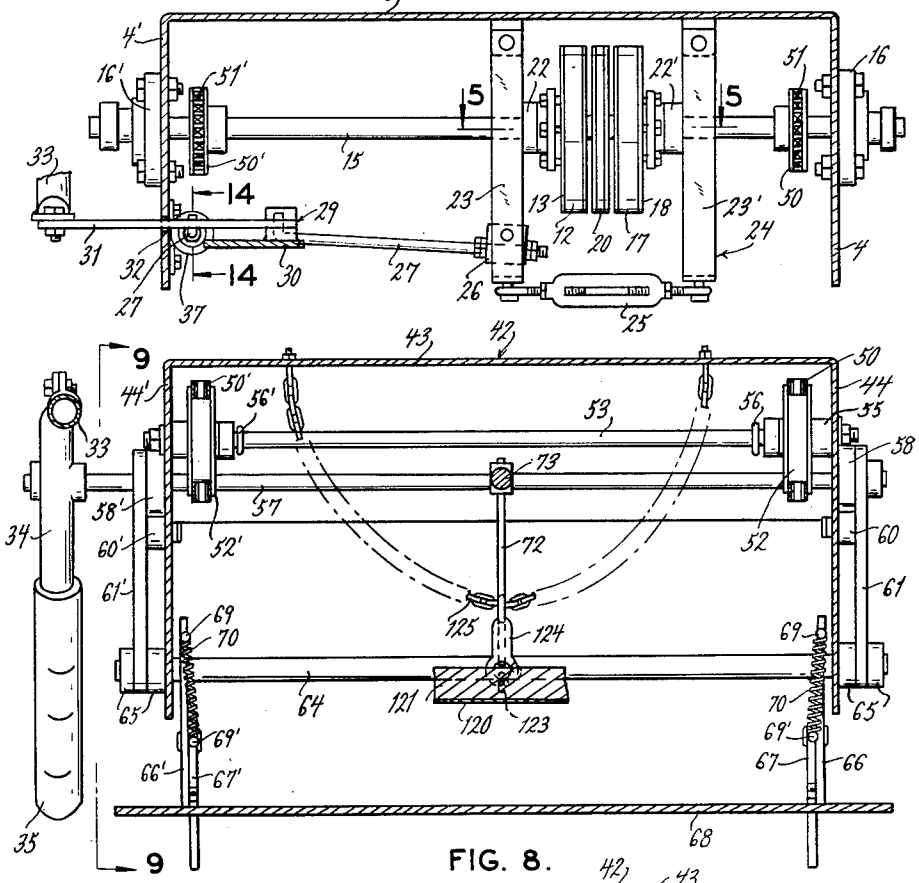


FIG. 8.

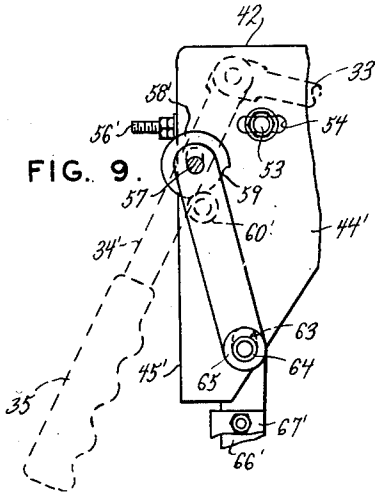


FIG. 9.

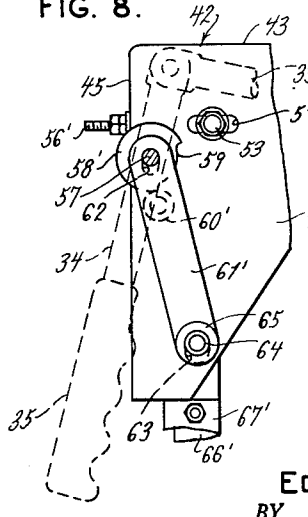


FIG. 10.

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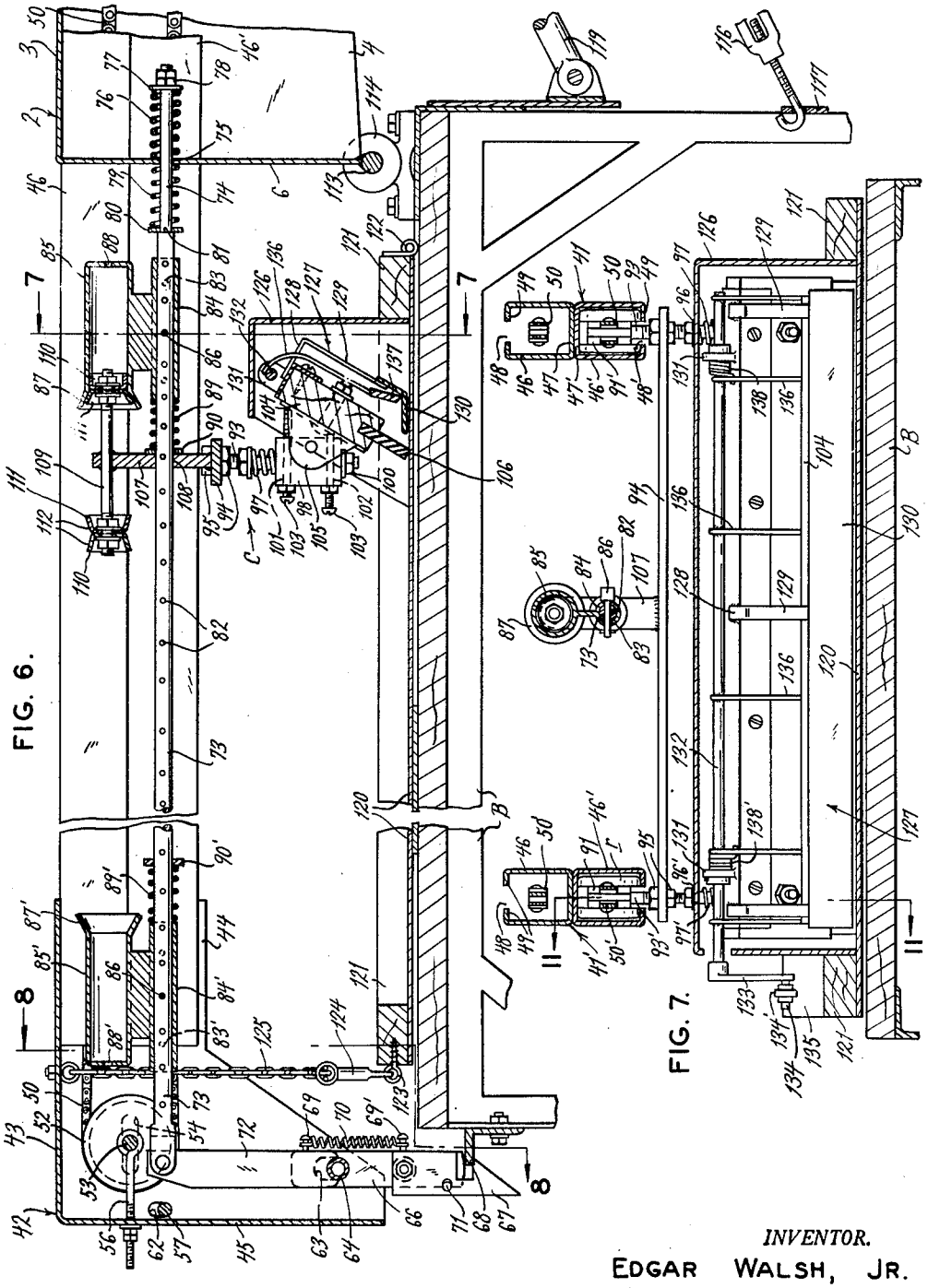


FIG. 6.

FIG. 7.

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United States Patent Office 2,704,510 Patented Mar. 22, 1955

2,704,510

SCREEN PRINTING MACHINES

Edgar Walsh, Jr., St. Louis, Mo., assignor to Eugene Landesman, Clayton, Mo.

Application July 5, 1952, Serial No. 297,292

10 Claims. (Cl. 101—123)

This invention relates in general to printing apparatus and, more particularly, to certain new and useful improvements in screen printing machines.

The primary object of the present invention is to provide a screen printing machine comprising a frame for carrying the operating parts thereof to present an integrated structure which may be mounted upon any suitable work support member and which is adapted, when in installed position, for vertical pivotal movement between substantially horizontal or printing position and tilted or inoperative position.

It is a further object of this invention to provide a screen printing machine having a squeegee for reciprocal traversing movement with the printing being accomplished thereby when the frame is in substantially horizontal position, and novel control means associated with the squeegee for selectively limiting the length of the printing stroke so that work of varying sizes and shapes may be effectively accommodated.

It is an additional object of this invention to provide a screen printing machine having latch means for locking the frame to the work support member during the printing stroke of the squeegee, which means are adapted for disengagement in timed relation to the termination of the printing stroke to allow the frame to swing into inoperative position.

It is a still further object of this invention to provide a screen printing machine having a paint scoop for travel with the squeegee, which is adapted to present paint upon the screen in advance of the squeegee during the printing stroke for even distribution thereof.

It is an additional object of the present invention to provide a screen printing machine having a frame which is so counterbalanced that upon completion of the printing operation it will rock upwardly so that the squeegee will not effect any printing during its return stroke, and will returningly rock downwardly into printing position when be squeegee has completed such return stroke.

It is a further object of this invention to provide a screen printing machine which may be economically manufactured, which is reliable and durable in use, and which may be easily operated.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (four sheets)—

Figure 1 is a side view of a screen printing machine constructed in accordance with and embodying the present invention, showing the squeegee at the beginning and at the end of the printing stroke;

Figure 2 is a transverse sectional view taken along line 2—2 of Figure 1;

Figure 3 is a transverse sectional view taken along line 3—3 of Figure 2;

Figure 4 is a transverse sectional view taken along line 4—4 of Figure 3;

Figure 5 is a transverse sectional view taken along line 5—5 of Figure 4;

Figure 6 is a transverse sectional view taken along line 6—6 of Figure 2;

Figure 7 is a transverse sectional view taken along line 7—7 of Figure 6;

Figure 8 is a transverse sectional view taken along line 8—8 of Figure 6;

Figure 9 is a transverse sectional view taken along line 9—9 of Figure 8;

Figure 10 is a transverse sectional view taken substantially along line 9—9 of Figure 8 showing the connecting link in relative upward position;

Figure 11 is a transverse sectional view taken along line 11—11 of Figure 7;

Figures 12 and 13 are transverse sectional views taken along lines 12—12 and 13—13, respectively, of Figure 11; and

Figure 14 is a transverse sectional view taken along line 14—14 of Figure 4.

Referring now to the drawings which illustrate a preferred embodiment of the present invention, A generally designates a screen printing machine which incorporates a frame 1, of welded sheet metal construction, for supporting the operating parts thereof, whereby the machine A presents a compact unit for installation upon any selected work support member, such as a table B. In its rearward portion, with reference being made to the right hand side of Figure 1, the frame 1 is designed to provide an open-bottomed, box-like housing 2 having a top wall 3, side walls 4, 4', and rearward and forward end walls 5, 6, respectively. Secured to the under face of the top wall 3 is a bracket 7 for suspendingly supporting an electric motor 8 having a shaft 9 upon which are mounted spaced pulleys 10, 11. Trained about the pulley 10 is one end of a straight V-belt 12 engaged at its other end about a sheave 13 fitted runningly, as by a bushing 14, upon a drive shaft 15 extending transversely between, and projecting at its ends through, suitable openings in the side walls 4, 4', said drive shaft 15 being journaled in bearings 16, 16', bolted on said side walls 4, 4', respectively. Trained about the pulley 11 is one end of a crossed V-belt 17, the other end of which extends about a sheave 18 also runningly fitted upon the drive shaft 15, as by a bushing 19, in spaced relation to the sheave 13. Fixedly mounted on the drive shaft 15, as by welding, intermediate the sheaves 13, 18, is a friction clutch plate 20 having leather facings 21, 21', confronting the inwardly presented faces of the sheaves 13, 18, respectively, for selective frictional engagement therewith for transmission of motion to the drive shaft 15. Outwardly of each sheave 13, 18, there is slidably disposed upon the drive shaft 15, a thrust bearing 22, 22', respectively, for abutment on their inner surfaces with bushings 14, 19, respectively, and for contactive engagement on their outer faces with the legs of U-shaped clutch dogs 23, 23', respectively, of a shifter member 24. The legs of each clutch dog 23, 23', are presented on opposite sides of the shaft 15 and are pivotally secured at their upper ends to the under face of housing 2 for lateral swingable movement (see Figures 3 and 4). At their lower ends the clutch dogs 23, 23', are connected to the ends of a turnbuckle adjustment 25 extending therebetween. Secured to clutch dog 23 adjacent its lower end by a link pivot 26 is one end of a clutch shift link 27, the opposite or outer end of which is engaged to the end of the arm 28 of a bell crank 29 fulcrumed upon a bracket 30 fastened to the inner face of the rear end wall 5. The other arm 31 of bell crank 29 projects outwardly through an opening 32 in side wall 4' of housing 2 and at its outer extremity is connected to the rearward end of a control rod 33 which extends forwardly in outwardly spaced relation to the adjacent side of frame 1 for engagement at its forward end to the upper end of an operating lever 34, having a handle grip 35 at its lower end; said lever 34 being mounted for rockable movement at the forward end of frame 1 in a manner to be described more fully hereinbelow.

With reference being now made to Figures 10 and 2 it will be seen that when the lower or handle end of operating lever 34 is rocked downwardly and rearwardly, the upper end thereof will be swung forwardly causing a pull to be applied to the control rod 33 whereby the bell crank 29 is pivoted to cause the shifter member 24 to be swung about the dog pivots so that the clutch dog 23 engages thrust bearing 22 to move sheave 13 into engagement with clutch plate 20 whereby the drive shaft 15 will be rotated in the same direction to that of the motor shaft 9 since the V-belt 12 is straight. Conversely, if the lower or handle end of operating lever 34 is rocked

upwardly and forwardly into the position shown in Figure 9, a rearwardly directed motion or pushing will be effected upon the control rod 33 with the bell crank 29 being pivoted so that the shifter 24 will be swung to bring the clutch dog 23' into engagement with the thrust bearing 22' to shift the sheave 18 into engagement with clutch plate 20 whereby the drive shaft 15 will rotate in a direction opposite to that of the motor shaft 9 since the V-belt 17 is crossed. In normal disposition, the sheaves 13, 18, will be in alignment with pulleys 10, 11. Thus, when the same are shifted into frictional engagement with clutch plate 20, the same will be out of alignment, whereby the sheave 13, 18, as the case may be, opposite to that being moved into engagement will runningly return to aligned relation with its related pulley through the inherent tendency of the belt trained thereon to run between parallel centers, and, consequently, lose engagement with the clutch plate 20 thereby. For normally urging the bell crank 29 into neutral position there is provided within housing 2, a link 36 which is engaged at one end to the arm 31 of bell crank 29, and projects at its other or forward end through a sleeve 37 suitably fixed to the inner face of side wall 4'. Encircling the link 36 in sleeve 37 is a spring 38 which bears at its ends against collars 39, 40, mounted on the link 36 (see Figure 14).

Forwardly of housing 2 the frame 1 comprises a generally open-type box structure formed by a pair of side members 41, 41', and an end or so-called front box 42 having a top plate 43, side plates 44, 44', the latter being welded to the side members 41, 41', respectively, adjacent their forward ends, and an end plate 45 spaced from the forward ends of the side members 41, 41' (see Figure 6). Side members 41, 41', are each formed of a pair of track sections 46, 46', rectangular in cross section having transverse webs 47, 47', respectively, weldedly secured together in back to back relation, so that the track section 46 will be in superimposed relation to the track section 46' (see Figure 7). Each of the tracks 46, 46', is provided with a longitudinal opening 48, 48', in their upper and lower walls respectively, which extend the length thereof whereby the portions adjacent said openings 48, 48', will provide spaced rails, generally designated 49. At their rearward ends the side members 41, 41', project into the housing 2 through openings formed in the opposite sides of the forward wall 6 in immediate adjacency, and secured, to the inner faces of the side walls 4, 4', respectively; said members 41, 41', terminating forwardly of the drive shaft 15 (see Figure 2).

Guidedly extending through the upper and lower tracks 46, 46', of each side member 41, 41', are the upper and lower lengths of drive chains 50, 50', respectively, the rearward ends of which are engaged about sprocket wheels 51, 51', respectively, mounted for rotation upon the drive shaft 15 at opposite ends thereof inwardly of the side walls 4, 4'. The forward ends of the drive chains 50, 50', are trained about sheaves 52, 52', respectively, fixed on opposite ends of an idler shaft 53, extending transversely between the side plates 44, 44', of the front box 42 and being journaled at its ends in slot-like openings 54 formed in each side plate 44, 44'. Secured to the idler shaft 53 on opposite sides of each sheave 52, 52', are collar bearings 55 for maintaining said sheaves 52, 52', in alignment with sprocket wheels 51, 51', respectively. Said idler shaft 53 passes through the eyelets of eye bolts 56, 56', the shanks of which pass through apertures provided in the end plate 45 and have nuts threadedly engaged thereon to permit adjustment of the idler shaft 53 by movement through the slots 54 to assure desired tension of the drive chains 50, 50'.

The operating lever 34 is mounted on one end of a rock shaft 57 which extends through vertical slot-forming openings 62, 62', in the side plates 44, 44', respectively, for spanning the distance between said plates and being relatively movable in said openings 62, 62'. Fixed on each projecting end of the rock shaft 57 are identical cam followers 58, 58', having a notch or recess 59 in their lower peripheral portion for normal engagement with cam disks 60, 60', mounted on the side plates 44, 44' (see Figures 9 and 10), whereby the shaft 57 will be normally disposed at the lower end of said openings 62, 62'. Outwardly of cam followers 58, 58', the rock shaft 57 engages the upper ends of connecting links 61, 61', which, at their lower ends, are engaged to the ends of a rod 64 projecting through apertures 63, 63', similar in all respects to openings 62, 62', provided in the side plates 44, 44', respectively, and extending transversely between said plates proximate their lower ends. Thus, as will be more fully shown below, the rod 64 and shaft 57 will move relatively upwardly in the slots 63, 63', and 62, 62', respectively, upon operation of the cams and cam followers. The connecting links 61, 61', are each maintained against untoward lateral shifting upon the rod 64 by spacer members generally designated 65 fixed upon said rod 64 on opposite sides of said connection links 61, 61'. Rigidly secured to the rod 64 on either end thereof, immediately inwardly of the side sections 44, 44', are vertically presented, parallel latch arms 66, 66', respectively, each having pivotally engaged adjacent its lower end, on the inner side thereof, a latch member 67, 67', respectively, for locking engagement with a latch bar 68 anchored upon the forward end of the table B. Each latch arm 66, 66', and latch member 67, 67', has provided on their forwardly presented margins projecting studs 69, 69', respectively, for securement thereto of the ends of an extension spring 70 for normally biasing the latch members 67, 67', rearwardly. Protruding from each latch member 67, 67', is a transverse stop pin 71 for detaining abutment against the forwardly presented margin of the associated latch arms 66, 66', to limit the rearward pivotal movement of the latch members 67, 67'.

Fixed, as by welding, to the rod 64, at the midpoint thereof, is the lower end of an upstanding arm 72, preferably of flat steel construction, having its upper end fixedly connected to the forward end of a slide rod 73 which extends longitudinally between the side members 41, 41', in parallel relation thereto, and being turned down at its rearward end, as at 74, for projection through an opening 75 in the front wall 6 a short distance into housing 2. Encircling the turned down portion 74 of the slide rod 73, within the housing 2, is a relatively heavy compression spring 76 which bears at its forward end against the inner face of the front wall 6 and at its opposite end against a collar 77 maintained on the slide rod 73 by a nut 78. Forwardly of front wall 6 there is surroundingly disposed upon the turned down portion 74 a relatively light compression spring 79 bearing at its rearward end against the outer face of front wall 6 and at its forward end against a collar 80 abuttingly presented against the shoulder 81 formed by the turning down of portion 74.

Said slide rod 73 is provided substantially throughout its length with a plurality of spaced, transverse bores 82 for selective alignment with opposed openings 83 formed in the lower sleeve-forming portions 84, 84', of a pair of cylindrical detent members 85, 85', respectively, mounted by said sleeves 84, 84', on the slide rod 73 for slidable movement into desired spaced positionment thereon. Removable locking pins 86 are provided for reception in an aligned bore 82 and openings 83 for maintaining the detent members 85, 85', in selected location upon the slide rod 73. At their confronting ends, the detent members 85, 85', are formed to provide flared mouths 87, 87', respectively, and at their opposite ends each has an air hole 88, 88', respectively, drilled centrally in its end wall. Presented for bearingwise abutment against the confronting ends of the sleeves 84, 84', are compression springs 89, 89', respectively, having their opposite ends bearing against collars 90, 90', respectively, adjustably engaged upon the slide rod 73.

Within the lower lengths of each sprocket chain 50, 50', there is engaged a truck member 91, 91', respectively provided at each of its ends with a pair of rollers designated *r*, for movement along the rails 49 of each lower track 46'. Centrally each truck member 91, 91', is provided with a vertically extending sleeve 92, 92', respectively, for receiving the upper ends of support posts 93, 93', of a squeegee carriage, denoted C. Engaged upon the posts 93, 93', in a free fitting manner, for extension therebetween is a crown piece or bar 94 having its ends maintained in horizontal alignment by nuts 95 threaded on each post 93, 93', above and below the crown piece 94. Downwardly from the crown piece 94 there is suitably mounted upon each post 93, 93', a collar 96, 96', respectively, having bearing against its under face the upper end of a compression spring 97, 97', respectively, the lower ends of which bear against the upper surface of a block 98, 98', respectively, fabricated preferably of aluminum, being slidably disposed on each post 93, 93', and each being supported on their under surface by a washer 99 and nut 100 threaded on the lower end of each post 93, 93'. Thus the springs 97, 97', urge the blocks 98,

98', respectively downwardly. Each block 98, 98', is provided with a pair of vertically spaced longitudinally extending taps 101, 102, for threadedly receiving adjustment screws 103, which project through the forward face of the blocks 98, 98', for abutment against a squeegee bar 104, preferably of wood, and extending from side to side of the carriage C with its ends terminating outwardly of the posts 93, 93', and beneath the lower tracks 46'. Mounted in the face of the squeegee bar 104 opposed to the blocks 98, 98', is a pair of yoke-forming brackets 105 engaged for pivotal connection to said blocks 98, 98', as may best be seen in Figure 6. By threading of the adjustment screws 103, the squeegee bar 104 may be presented at an angle to the vertical so that a rubber strip or squeegee 106 received within a groove on the under margin of the bar 104 will assume a like angle.

Weldedly secured to the upper face of the crown piece 94 centrally thereof is the lower end of a vertically presented arm 107 provided with an opening 108 for relative movement therethrough of the slide bar 73 and being fixedly engaged adjacent its upper end to the middle portion of a piston-forming rod 109, axially normal to the arm 107. At each end of the piston rod 109 there is mounted a pair of buffer disks 110, 111, made preferably of leather, and having beveled margins, as at 112, in opposed direction, as is clearly shown in Figure 6. Said pairs of disks 110, 111, are each aligned with a detent member 85, 85', respectively, for shock cushioning movement therein upon traverse of the squeegee carriage C, as will be described hereinbelow.

As may best be seen in Figure 1, there is welded to the bottom margin of the front wall 6 of housing 2 a pintle 113 extending at its ends beyond the side walls 4, 4', for engagement within bearing blocks 114, 114', bolted to the upper face of the table B whereby the printing machine A is fulcrumed for pivotal movement between the upward or unlatched inoperative position shown in Figure 1 and the downwardly, latched, horizontal position shown in Figure 6. Engaged to the rearward end wall 5, substantially centrally thereof and proximate its lower margin is one end of a heavy extension spring 115 projecting forwardly and downwardly, having its forward, lower end engaged to a turnbuckle 116 which is, in turn, engaged to a brace 117 upon the table B. Thus, by adjustment of the turnbuckle 116 the tensioning of the spring 115 may be controlled for proper counterbalancing of the machine A for purposes to be described hereinbelow. Secured centrally to a bar 118 extending transversely between the side walls 4, 4', and suitably secured at its ends thereto is the upper end of a shock absorber member 119, the lower and forward end of which is engaged to the table B. Thus, by operation of said shock absorber 119, untoward jarring of the machine A upon swinging thereof about its fulcrum will be prevented.

Provided for disposition upon the upper surface of the table B is a screen 120 having a frame 121 which is adapted for pivotal engagement at its rearward margin to the table B as at 122, whereby the screen 120 may be elevated at its forward end to permit the insertion of blank work sheets therebeneath. The screen 120 may be of suitable fabric or, if desired, may be replaced by a stencil. Provided on said screen 120 may be a single design or a plurality of designs for more than one color, for transference to the blank work sheet; said design portions being pervious to coloring matter, which is customarily a paint-like material. At its forward end the frame 121 is centrally provided with an eyelet 123 for engagement to a latch member 124 which is secured to a chain 125 depending from the under surface of top plate 43; said chain 125 and latch 124 are of such combined length that when the machine A is in upwardly tilted position, as shown in Figure 1, the screen frame 121 will be out of axial horizontal parallelism with the machine A and will, thus, be suspended slightly below the forward portion of frame 1.

Provided at the rearward end of the screen 120 and supported by the adjacent portions of the frame 121 is an upstanding paint guard or receptacle 126 to prevent overflow of the paint when the same is directed rearwardly during the printing stroke of the squeegee carriage C or upon upward swinging of the screen 120 when the machine A is rocked into the position shown in Figure 1.

To assure proper presentation of paint to the squeegee 106 for even distribution across the screen 120 there is provided a scoop assembly 127 comprising spaced angle members 128 secured to the upper surfaces of the squeegee bar 104 for disposing one of its flanges 129 in spaced parallel relation to the normally rearward face of the bar 104. Fixed to the lower portions of the flanges 129 is a transversely extending tray 130 spaced from the squeegee 106 and inclined toward same so that paint thereon may flow through gravity for presentation immediately in advance of the squeegee 106, as it travels rearwardly. Mounted on the upper surface of the squeegee bar 104 are spaced bearing members designated 131 for journaling therein of a shaft 132. Engaged to one end of said shaft 132 is the upper end of a link 133 having secured to its lower end an outwardly projecting arm 134 upon which is fixed a cam follower 134' disposed for engagement with a cam block 135 mounted on the screen frame 121 adjacent its forward end.

Welded to the shaft 132 are the upper ends of a plurality of spaced wires 136 which are supportingly connected to a wiper blade 137 disposed within the tray 130 for sweeping movement thereacross, as will be discussed hereinbelow. Engaged about the shaft 132 are a pair of helical twist springs 138, 138', the ends of which abut against the bearings 131 and adjacent wires 136 (see Figure 13) to bias the shaft 132 so that the wiper blade 137 will be normally disposed at the rearward side of tray 130, remote from the discharging margin thereof.

In order to describe the operation of the machine A, which is cyclical in nature, it will be presumed that the machine A is in downward latched position as shown in Figure 6, with the squeegee carrier C disposed at the forward end of the machine, the buffer disks 110, 111, being engaged within the cylindrical detent member 85'. With the motor actuated, the operator will grasp the handle grip 35 of lever 34 and push the lower end thereof downwardly and rearwardly to cause the sheave 13 to engage the friction clutch 20 whereby rotation of the drive shaft 15 will effect movement of the drive chains 50, 50'. The lower lengths of said chains 50, 50', will travel rearwardly causing the truck members 91, 91', to be moved along the rails 49 thereby carrying the squeegee carrier C rearwardly with sweeping by the squeegee 106 of the printing paint over the design portion of the screen 120 for imprinting of the designs on the blank work sheet.

By such downward rocking of the handle end of the lever 34, the cam followers 58, 58', will be rotated so that the cams 60, 60', respectively, will move relatively out of the notches or recesses 59 and onto the adjacent peripheral portion of said follows 58, 58', whereby the forward end of frame 1 will be rocked downwardly with the rock shaft 57 and rod 64 abutting against the upper ends of the slot-like openings 62, 62', 63, 63' (see Figure 10). The depth of the notches or recesses 59 thus determine the extent of such rocking of the frame 1. This action serves to bring the squeegee 106 into tight, pressure-producing contact with the screen 120, as shown in Figure 11.

The length of the printing stroke or rearward traverse of the squeegee carrier C will be determined by the movement of the piston rod 109 within the cylindrical detent member 85 whereby the buffer disks 110, 111, will snugly engage the walls thereof in compression of the air therein, with pressure relief through the air hole 88, all in the manner of a dashpot. The force of the impact of the buffer disks 110, 111, and the detent member 85 will be transmitted to the slide rod 73 causing same to move linearly rearwardly in compression of the springs 76, 79. This movement of the slide rod 73 will cause the arm 72 to be pulled rearwardly at its upper end whereby the rod 64 will be rocked with consequent tilting of the latch arms 66, 66', to effect pivotal movement of the latch members 67, 67', into unlocked position. The operator will then release the lever 34 to permit same to return to neutral position. With the spring 115 properly adjusted, the machine A will have its center of gravity shifted rearwardly by the arrival of the squeegee carrier C at the end of its printing stroke so that upon unlocking of the latch members 67, 67', in the manner just described, the machine A will pivot about its fulcrum with the rearward portion swinging downwardly and the forward frame portion swinging upwardly into the position shown in Figure 1. The screen 120 will be swung upwardly about its pivot 122 by such upward rocking of the machine A, however, because of the combined length of the chain 125 and latch 124, the screen 120 will hang sufficiently beneath the squeegee 106 to prevent unauthorized contact therebetween. With the machine A in upper unlocked or inoperative position, the fully printed work sheet may be removed and a blank

readily placed into position for the next printing operation.

The operator will next rock the operating lever **33** into the position shown in Figure 9 so that the sheave **18** will be brought into engagement with the friction clutch **20** to cause the drive chains **50**, **50'**, to move in a reverse direction whereupon the squeegee carrier C will move forwardly for return to initial or starting position, with such forward travel being determined by engagement of the appropriate buffer disks **110**, **111**, within the cylindrical detent member **85'**. The machine A is so counterbalanced that upon arrival of the squeegee carrier C at its starting point the center of the gravity will have shifted so that the forward end of the machine A will descend causing the latch member **67**, **67'**, to engage the latch bar **68** whereby the machine A will be presented in substantially horizontal position with the screen **120** resting upon the table B in covering relation to the newly inserted blank work sheet. It will thus be seen that as the squeegee carrier C moves forwardly the machine A will be slowly rocking downwardly at its forward end until it is in fully latched position upon completion of the return stroke of the squeegee carrier C.

As stated above, the detent members **85**, **85'**, may be mutually disposed upon the slide rod **73** to present any selected distance therebetween whereby the extent of the printing stroke of the squeegee carrier C will be determined. Consequently, if the particular area of the screen **120** containing the design to be transferred was relatively small, the detent members **85**, **85'**, would be commensurately positioned so that the squeegee carrier C would traverse a distance corresponding to the extent of the design during the printing stroke. It will thus be seen that by utilization of the detent members **85**, **85'**, unnecessary travel of the squeegee carrier C is eliminated and the machine A is provided thereby with marked versatility for accommodating designs or printing portions of varying lengths and widths. Furthermore, it is to be noted that the squeegee carrier C can be readily adapted for operation with screens of various dimensions. For instance, if an elongated relatively narrow screen were to be utilized, a squeegee bar having a corresponding narrow rubber strip or squeegee could be inserted in the carrier C for printing traverse along the narrow screen. In view of the above, it is apparent that the machine A is highly adaptable for use with an extensive variety of blank work material, as well as screens or stencils of different dimensions.

The scoop assembly **127** will operate as follows, upon actuation of the machine A: Upon arrival of the squeegee carrier C at the end of the printing stroke, paint held on the screen within the paint guard **126** will be scooped up by the tray **130** and held thereon, as the machine tilts upwardly into unlatched position, by the upward movement of the said tray **130**. Thus, the paint will remain on the tray **130** as the carrier C is returned to starting position with the cam **134'** clearing the cam block **135** on such return movement due to the slight upward disposition of the frame **1** with regard to the table B prior to actuation of the lever **34**. When the operator rocks the lower end of lever **34** downwardly for commencement of the printing stroke, the cam follower **134'** will engage the upper, straight surface of cam **135** whereupon the shaft **132** will be rocked against the pressure of the springs **138**, **138'**, with consequent sweeping movement of the wiper blade **137** across the face of the tray **130**, from the normally rearward end thereof to the discharge end thereof, to cause the paint held thereon to be wiped off for discharge immediately in advance of the squeegee **106**. The cam follower **134'** will thus travel down the inclined face of cam block **135** to permit the shaft **132** to return to normal position under the load upon the springs **138**, **138'**, with restoration of the wiper blade to the normally rearward portion of the tray **130**. Thus, by the unique operation of the scoop assembly **127**, paint will be positively and assuredly presented to the squeegee **106** for effective printing in an even manner.

Thus, the machine A presents a compact unit which may be easily installed upon any suitable work support that the user may have. It is to be particularly noted that the drive means are contained within the housing **2** which is integral with the frame **1** so that a user would have no involved installation problems, such as is present in currently used machines of this type wherein motors must be separately mounted, and drive chains and the like properly connected before operation can be instituted. The counterbalancing means provided in machine A assure proper printing action and permit insertion of blank work sheets at the appropriate juncture. Thus, an operator of such a machine need not be particularly skilled since all that is required is the mere placing of the blank work sheet and the appropriate movement of the lever, as discussed hereinabove, since the machine A will automatically position itself properly at all times.

It should be understood that changes and modifications in the form, construction, arrangement and combination of the several parts of the screen printing machine may be made and substituted for those herein shown and described without departing from the nature and principle of the present invention.

What I claim and desire to secure by Letters Patent is:

1. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, a double-headed piston-forming member provided on said squeegee carrier and axially parallel to the line of movement of the squeegee carrier, a rod mounted in said frame in parallel relation to the piston-forming member for relative movement therealong of the squeegee carrier, and a pair of opposed cylindrical detent members selectively positionable upon said rod for engagement with opposite heads of said piston-forming member for determining thereby the extent of traversing movement of the squeegee carrier.

2. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, a double-headed piston-forming member provided on said squeegee carrier and parallel to the line of movement of the squeegee carrier, a rod mounted in said frame in parallel relation to the piston-forming member for relative movement therealong of the squeegee carrier, and a pair of cylindrical detent members having confronting flared mouth portions for reception of opposite heads of said piston-forming member for arresting movement of the squeegee carrier, said detent members being selectively positionable upon said rod whereby the extent of travel of the squeegee carrier can be optionally determined.

3. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, a double-headed piston-forming member provided on said squeegee carrier, a rod provided in said frame for relative movement therealong of the squeegee carrier, a pair of opposed detent members selectively positionable upon said rod for engagement with opposite heads of said piston-forming member for determining the extent of travel of said squeegee carrier, said rod being mounted for linear movement upon engagement of said detent members by the piston-forming member, latch means for locking said frame to the work support surface, and means connecting said rod and said latch means for effecting disengagement of same upon linear movement of said rod when one of said detent members is engaged.

4. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, a paint scoop device mounted on said squeegee carrier for movement therewith and comprising a tray disposed adjacent the squeegee for receiving paint, a shaft journaled in bearings upon the squeegee carrier, a wiper blade supported by said shaft for disposition on said tray, resilient means for urging said shaft into position for disposition of the wiper blade at the end of said tray remote from the squeegee, and cam means for rocking said shaft at a predetermined point of travel of said squeegee carrier in order to cause said wiper blade to be moved across said tray for discharge of paint held thereon to deliver same to the screen as the squeegee commences its printing stroke.

5. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actu-

ating said squeegee carrier, a slide rod provided in said frame, cooperating motion interdicting members for determining the extent of travel of said squeegee carrier, said slide rod being adapted for movement upon engagement of said cooperating motion interdicting members, latch means for locking said frame to a work support surface, and means connecting said slide rod and latch means for tripping said latch means upon movement of said slide rod in one direction.

6. A screen printing machine comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, a slide rod provided in said frame, cooperating motion interdicting members for determining the extent of travel of said squeegee carrier, said slide rod being adapted for movement upon engagement of said cooperating motion interdicting members, at least one latch member for locking said frame to the work support surface during printing operation, a link secured to said slide rod, and means connecting said link and said latch member for tripping said latch member upon movement of said slide rod in one direction.

7. A screen printing machine for disposition upon a work support surface comprising a frame, a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, an abutment member provided on said squeegee carrier, a rod provided in said frame for relative movement therealong of the squeegee carrier, a pair of opposed detent members provided on said rod for engagement with said abutment member for determining the extent of travel of said squeegee carrier, said rod being mounted for linear movement upon engagement of said detent members by the abutment member, at least one latch member for locking said frame to the work support surface during printing operation, a link secured to said rod, and means connecting said link and said latch member for tripping of the latter upon linear movement of said rod when one of said detent members is engaged.

8. A screen printing machine as described in claim 3 wherein the latch disengaging means include a link secured to said rod, a cross rod extending transversely of the frame, said link being secured to said cross rod, at least one latch arm secured to said cross rod, a latch member pivotally engaged to said latch arm, and a resilient member connected at its ends to said latch arm and latch member.

9. A screen printing machine for demountable disposition upon a work support surface comprising a frame, a squeegee carrier mounted in said frame for traversing movement to present a squeegee supported thereby

for printing engagement upon a screen, drive means for actuating said squeegee carrier, a slide rod provided in said frame, means for mounting said frame upon the work support surface for rockable movement in a vertical plane between horizontal or operative position and raised or inoperative position, cooperating motion interdicting members for determining the extent of travel of said squeegee carrier, said slide rod being adapted for movement upon engagement of said cooperating motion interdicting members, latch means for locking said frame to the work support surface when the said frame is in horizontal or operative position, means connecting said slide rod and latch means for tripping said latch means upon movement of said slide rod in one direction, and counterbalancing means associated with said frame for causing upward pivotal movement thereof into raised position upon tripping of said latch means.

10. A screen printing machine for demountable disposition upon a work support surface comprising a frame, a squeegee supported thereby for printing engagement upon a screen, drive means for actuating said squeegee carrier, an abutment member provided on said squeegee carrier, a rod provided in said frame for relative movement therealong of the squeegee carrier, means for mounting said frame upon the work support surface for rockable movement in a vertical plane between horizontal or operative position and raised or inoperative position, a pair of opposed detent members provided on said rod for engagement with said abutment member for determining the extent of travel of said squeegee carrier, said rod being mounted for linear movement upon engagement of said detent members by the abutment member, at least one latch member for locking said frame to the work support surface during printing operation, a link secured to said rod, and means connecting said link and said latch member for tripping of the latter upon linear movement of said rod when one of said detent members is engaged, and counterbalancing means associated with said frame for causing upward pivotal movement thereof into raised position upon tripping of said latch means.

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