Nov. 13, 1956 S. C. HOLLY 2,770,191

SQUEEGEE AND FRAME MOUNTING FOR STENCIL PRINTING MACHINES

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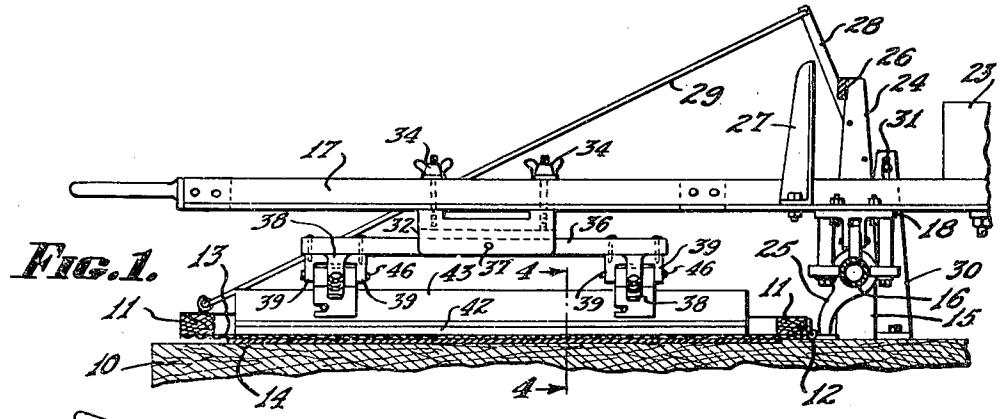

FIG. 1.

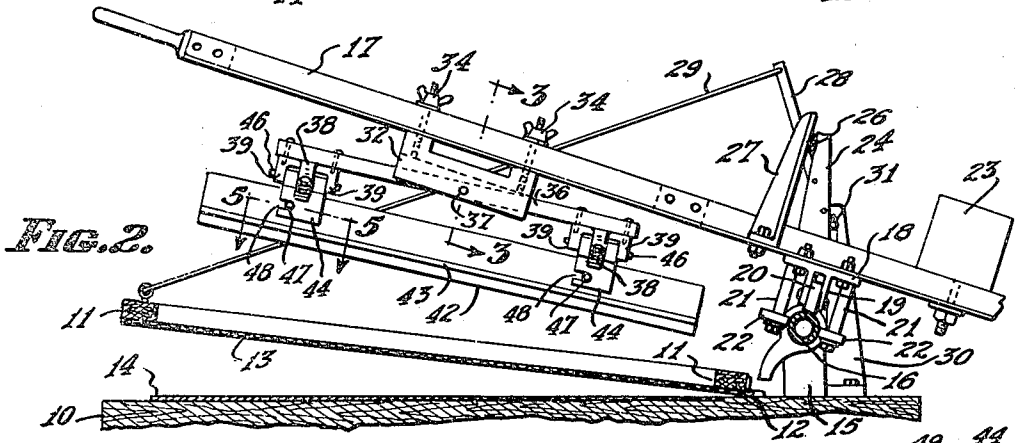

FIG. 2.

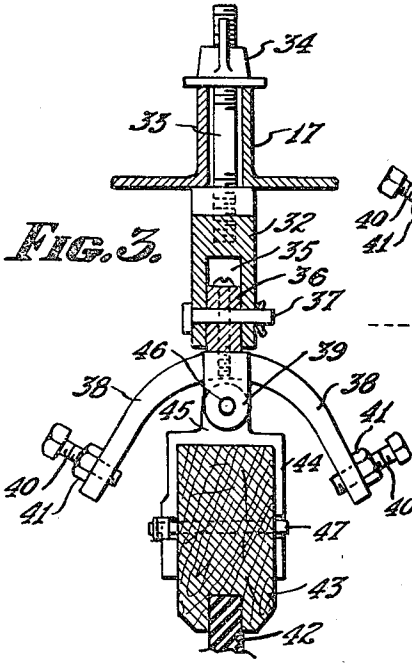

FIG. 3.

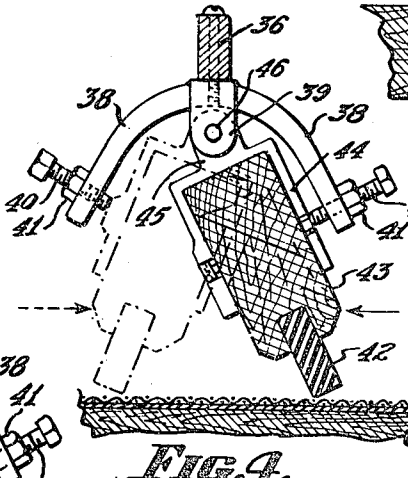

FIG. 4.

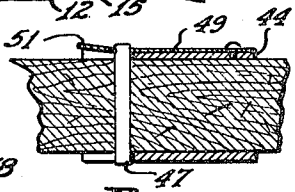

FIG. 5.

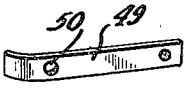

FIG. 6.

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SQUEEGEE AND FRAME MOUNTING FOR STENCIL PRINTING MACHINES

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4 Claims. (Cl. 101—126)

This invention relates to stencil printing machines and more particularly to the mounting of the frame and squeegee.

The conventional stencil printing machine is generally mounted on a printing table and comprises a frame over which a piece of silk is stretched and which can be raised or lowered for the purpose of placing printing material thereunder. A stencil is applied to the silk screen and a body of printing color is placed on top of the screen. The printed color is then forced through the interstices of the silk in the regions where the stencil is open to produce an image on the printing material. The printing color is forced through the silk screen by means of a squeegee which is moved alternately back and forth across the screen frame.

It has been customary in recent years to provide rails at the back of the machine and to mount a squeegee bar for movement back and forth on such rails. A squeegee was secured to the squeegee bar and the squeegee bar was counterweighted so that, when the bar was released, it would automatically be raised from the screen and means were then provided to raise the screen also.

It is an object of the present invention to provide a novel mounting for the squeegee and the squeegee bar which is simpler and easier to manipulate than has been the case in existing apparatus.

It is another object of the invention to provide a mounting whereby uniform pressure is exerted on the squeegee from end to end so that smooth and even impressions will be made on the printing material.

Yet another object of the invention involves the mounting of the squeegee itself which will permit the squeegee to rock so that a sharp corner of the squeegee will be presented to the screen at each stroke in order that sharp, clean impressions will be obtained.

These and various other objects of the invention which I shall point out in more detail hereinafter or which will be apparent to one skilled in the art to which this invention relates, upon reading these specifications, I accomplish by that certain construction and arrangement of parts of which I shall now describe an exemplary embodiment.

Reference is made to the drawings forming a part hereof and in which:

Figure 1 is a transverse vertical cross sectional view through a machine according to my invention showing the squeegee in its operative position.

Figure 2 is a view similar to Figure 1 showing the squeegee and screen in raised position.

Figure 3 is a greatly enlarged cross sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a similarly enlarged cross sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a similarly enlarged fragmentary cross sectional view taken on the line 5—5 of Figure 2; and

Figure 6 is a perspective view of a squeegee-retaining spring.

Briefly, in the practice of my invention, I provide, along

the rear of the machine, a single cylindrical or tubular rail. The squeegee bar is provided with a carriage constituted of a number of rollers which ride on the rail. An abutment on the squeegee bar is arranged to cooperate with a lever pivoted on the rail and connected to the screen to raise the latter after the squeegee has been raised off the screen. The squeegee itself is mounted in a pair of stirrups in a pivotal manner so that it can rock during operating movement of the squeegee in either direction to present a sharp edge of the squeegee to the screen. The squeegee mounting yokes in turn are connected together and pivotally mounted on a bracket carried by the squeegee bar, so that pressure applied centrally of the squeegee is transmitted uniformly throughout the length thereof.

Referring now in greater detail to the drawings, a conventional printing table is indicated at **10** and a screen frame **11** is secured to the printing table by means of push-pin hinges **12**. The frame **11**, as is well known in the art, will be covered with a silk or metallic screen **13**. The material to be printed, in the form of a sheet of paper or board, is indicated at **14** and is placed in suitable guides on the printing table **10**.

At the rear of the printing table I provide a pair of upright standards **15** between which the tubular rail **16** is mounted.

The squeegee bar is indicated generally at **17**, and is T-shaped in cross section, as best seen in Figure 3. A plate **18** is bolted to the bar **17** and is provided with brackets **19** in which are mounted rollers **20** and with the studs **21** carrying the rollers **22**. It will be understood that the structure represented by the reference numerals **19** to **22** is duplicated at each end of the plate **18**, so that there are two rollers **20** riding on the rail **16** and four rollers **22** to take the lateral thrust in the tilted position of Figure 2. By virtue of the mounting just described, the squeegee bar **17** is arranged to be moved longitudinally of the rail **16** with great ease.

A counterweight **23** is adjustably mounted at the rear of the squeegee bar **17** to bias the squeegee bar to the position of Figure 2.

When the squeegee bar is released and moves under the influence of counterweight **23** from the position of Figure 1 to the position of Figure 2, the screen frame **11** is also raised after the squeegee itself has cleared the screen. This is accomplished as follows. A pair of bell crank levers **24** are pivotally mounted on the rail **16**. A relatively long arm extends upwardly from the rail **16** and a relatively short foot **25** extends downwardly below the rail **16**. The foot **25**, by contact with the table **10**, limits the counterclockwise movement of the lever **24** as seen in Figures 1 and 2. The levers **24** are connected across the top by a bar **26** which is adapted to be abutted by a finger **27** bolted to the squeegee bar **17**. Arms **28** are suitably secured to the levers **24** and suitable wires, ropes, or rods **29** extend between the extremities of the arms **28** and the front portion of the screen frame **11**. It will be clear that regardless of the position of the squeegee bar **17** along the rail **16**, when the squeegee bar is released and rocks upwardly, the finger **27** will abut the bar **26** and cause the levers **24** to rock in a clockwise direction, transmitting a pull through the members **28** and **29** to the screen frame **11**. This action, however, is delayed by the spacing between the finger **27** and the bar **26** whereby the screen is not raised until after the squeegee has been raised off the screen.

Brackets **30** are mounted on the table **10** and carry the adjustable pins **31** which serve as stops for the levers **24** to limit the upward movement of the screen, as shown in Figure 2.

Coming now to the mounting of the squeegee on the squeegee bar, a bracket **32** is secured to the bar **17** by bolts

33 and wing nuts 34. The bracket 32 is slotted as at 35 to accommodate a toggle bar 36 which is pivotally mounted on the member 32 by means of the pin 37. The bar 36 is of course mounted with the pin 37 centrally of its length.

At each end of the bar 36 there is secured a yoke structure comprising a pair of long arcuate arms 38 and a pair of short arms 39. The arms 39 serve for the actual mounting of the squeegee in a pivotal manner while the arms 38 are provided with adjusting screws 40 and lock nuts 41 for limiting the amount of tilting movement of the squeegee.

The squeegee proper is indicated at 42 and is mounted in a suitable wooden holder 43. At points equally spaced from opposite ends of the member 43 there are pinned the channel-shaped clips 44 having the upstanding lugs 45. The lugs 45 extend upwardly between the short arms 39 and are pivotally mounted by means of the pins 46. Thus, when the squeegee bar is raised, as in Figure 2, the squeegee hangs straight down as seen in Figure 3. When the squeegee bar is lowered to the position of Figure 1 and the squeegee is moved toward the left, the squeegee will pivot about the axis 46, as shown in solid lines in Figure 4, and when the squeegee is moved toward the right it will pivot to the broken line position of Figure 4. The pivoting movement is, of course, limited by the screws 40.

As pointed out above, the members 44 were assembled to the squeegee holder 43 by means of pins. These pins are indicated at 47. The clips 44 are provided with the slots 48 to accommodate the pins 47 so that the squeegee, as seen in Figure 2, may be moved toward the left until the pins 47 clear the slots 48, whereupon the squeegee and its holder are removed from the clips 44. In order to lock the squeegee holder in position against accidental removal, I provide the spring member 49 having the hole 50, as shown in Figure 6. The member 49 is suitably secured to one side of the clip 44 and the hole 50 engages the pin 47. When it is desired to remove the squeegee, the turned up end 51 of the spring member 49 is raised so that the hole 50 clears the pin 47 and the squeegee holder may then be simply slipped out as above described. It will be understood that it is only necessary to provide one member 49 to insure that the squeegee holder is held in position against accidental displacement.

It will be understood that various modifications of detail may be made while still retaining the beneficial advantages of the present invention and without departing from the spirit thereof. I, therefore, do not intend to limit myself to various details described herein except as set forth in the claims which follow.

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

1. A squeegee and frame structure for screen printing machines wherein a screen frame is hingedly mounted on a printing table, comprising a single cylindrical rail extending between standards at the rear of said table, a counterweighted squeegee bar having a carriage arranged to ride on said single rail and rockable thereabout, a pair of bell-crank levers pivotally mounted on said rail and each having one leg extending downwardly and normally resting on said table and another leg extending upwardly, a bar connecting the said other legs, said squeegee bar carrying an abutment arranged to abut said bar upon upward movement of said squeegee bar but out of contact therewith in the operating position of said squeegee bar, and a connection between the said other legs and the free edge of said frame, whereby after a degree of upward movement of said squeegee bar, said screen is raised from said table upon further upward movement of said squeegee bar.

2. The structure of claim 1, wherein said carriage comprises a pair of rollers adapted to ride on said single rail in the operating position of said squeegee bar, and pairs of rollers having their axes at 90° to the axes of said first mentioned rollers, one pair riding on the front of said single rail and the other pair riding on the rear of said single rail, whereby said carriage may ride along said single rail and rock thereabout.

3. A squeegee mounting for screen printing machines having a tiltable squeegee bar, comprising a toggle bar mounted on said squeegee bar centrally of the length of said toggle bar for rocking movement in the same vertical plane as said squeegee bar, a pintle bracket at each end of said toggle bar, a clip rockably mounted in each of said pintle brackets by means of a pintle parallel to said toggle bar, a squeegee holder mounted in said clips, each of said pintle brackets having a stop arm extending to each side of said squeegee holder to limit the tilting thereof in either direction, said clips being of a size to snugly receive said squeegee holder, said clips being provided with bayonet slots and said squeegee holder being provided with pins engageable in said bayonet slots, and a latch associated with one at least of said bayonet slots to engage the respective pin to prevent accidental displacement of said squeegee holder.

4. A structure according to claim 3, said latch comprising a leaf spring member normally lying flush with a side of said squeegee holder and having a pin engaging element.

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