July 16, 1957 L. G. DUBUIT 2,799,223

SILK-SCREEN COLOUR PRINTING MACHINE

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Fig. 1

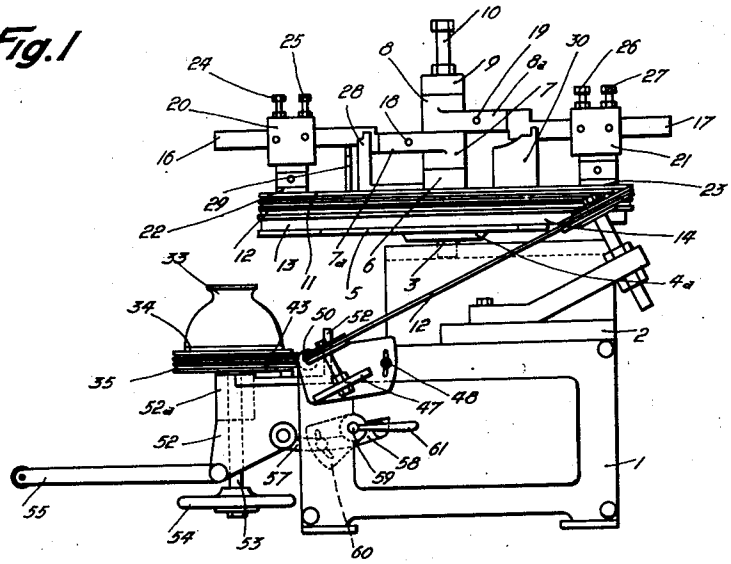
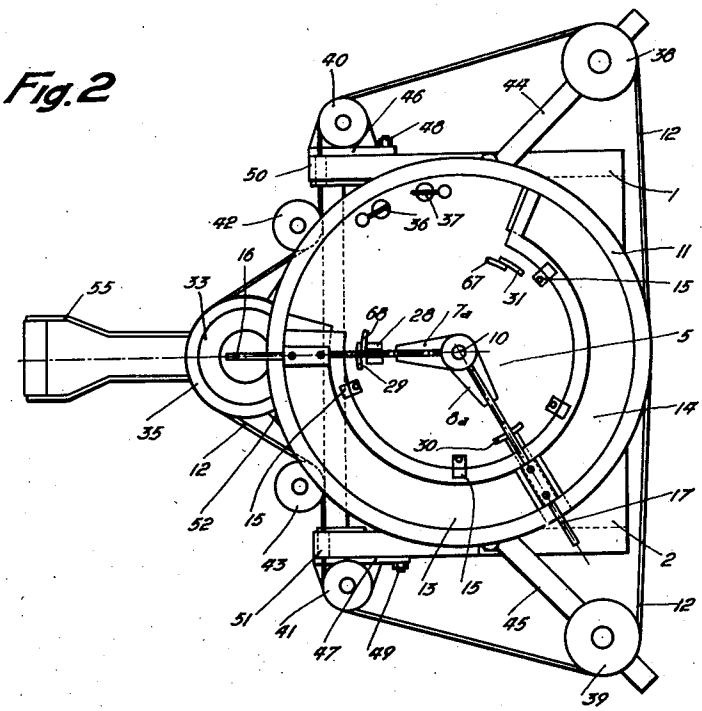


Fig. 2



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Fig. 3

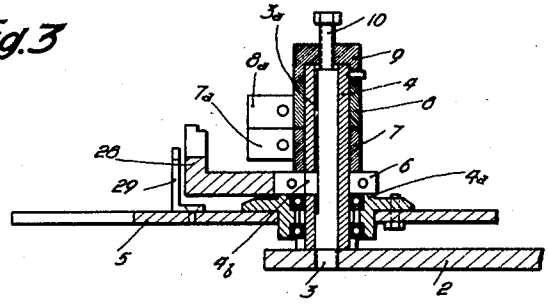


Fig. 4

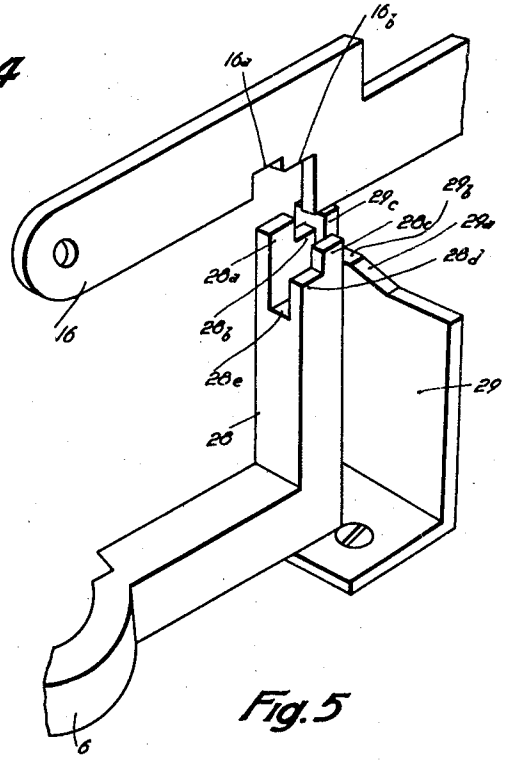
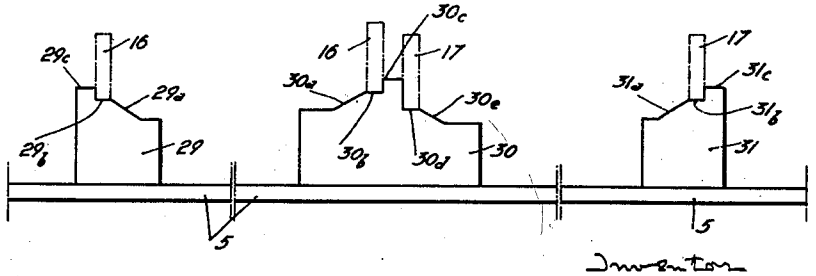


Fig. 5



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Fig. 6

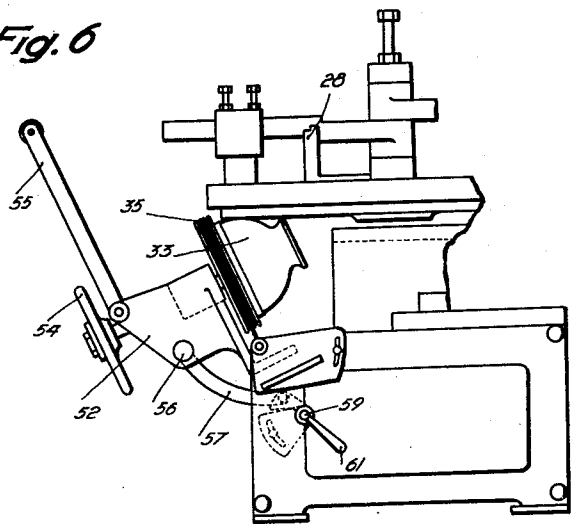


Fig. 7

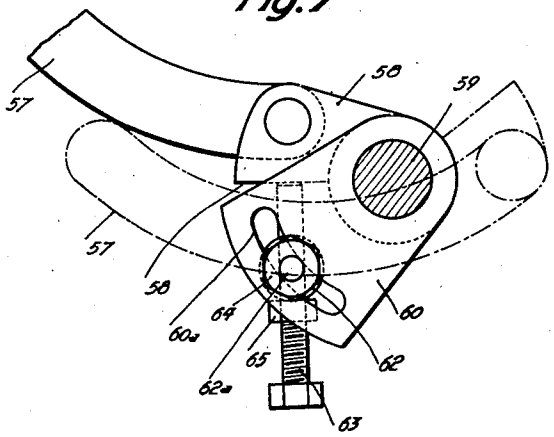
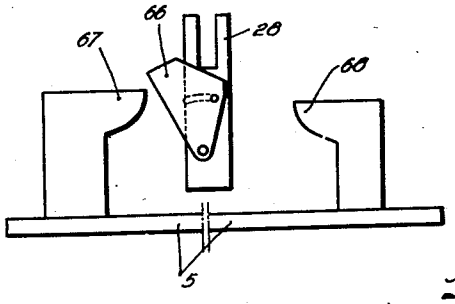


Fig. 8



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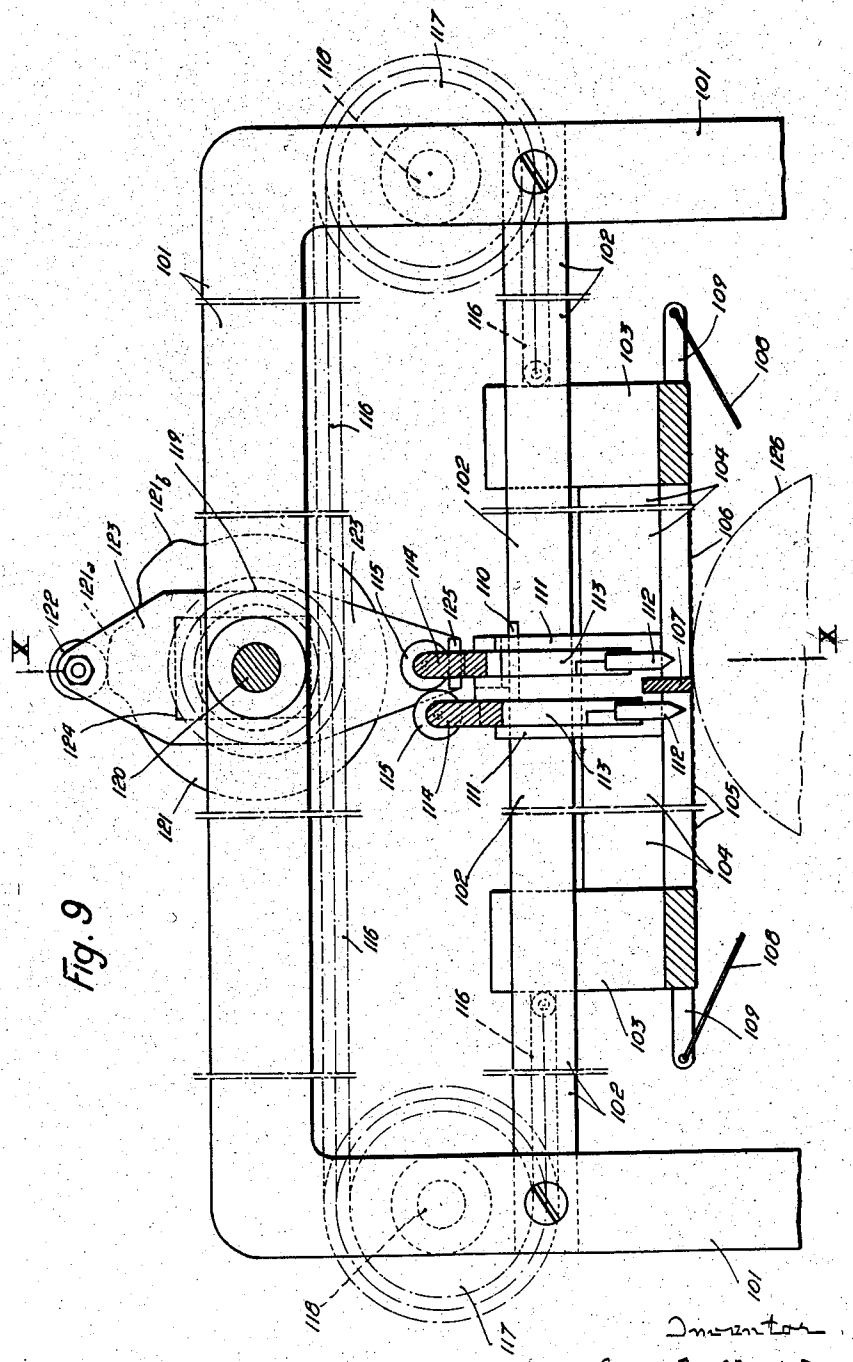


Fig. 9

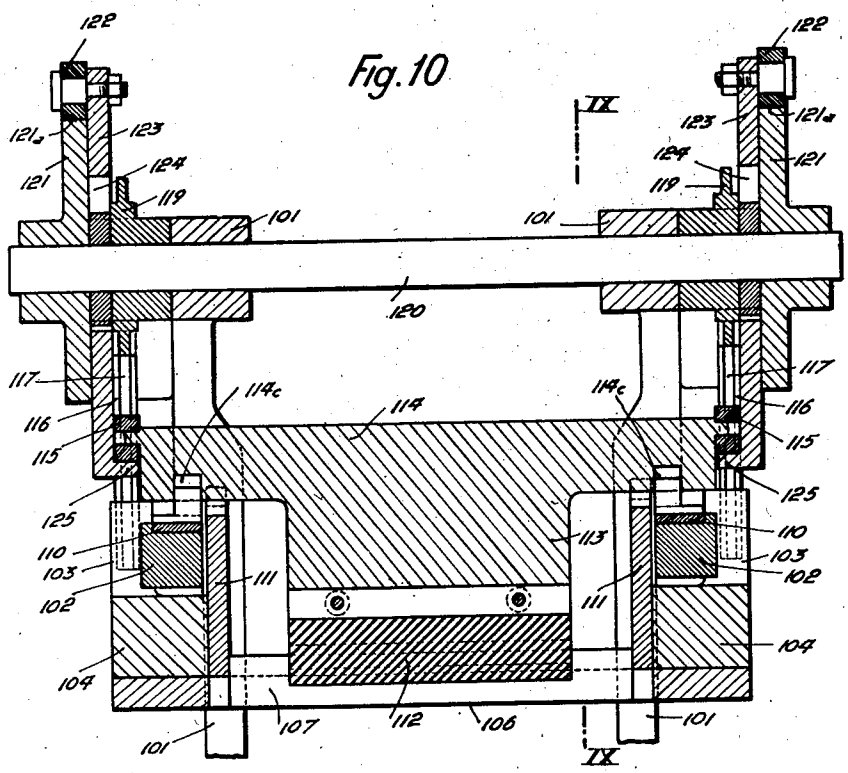
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Fig. 10



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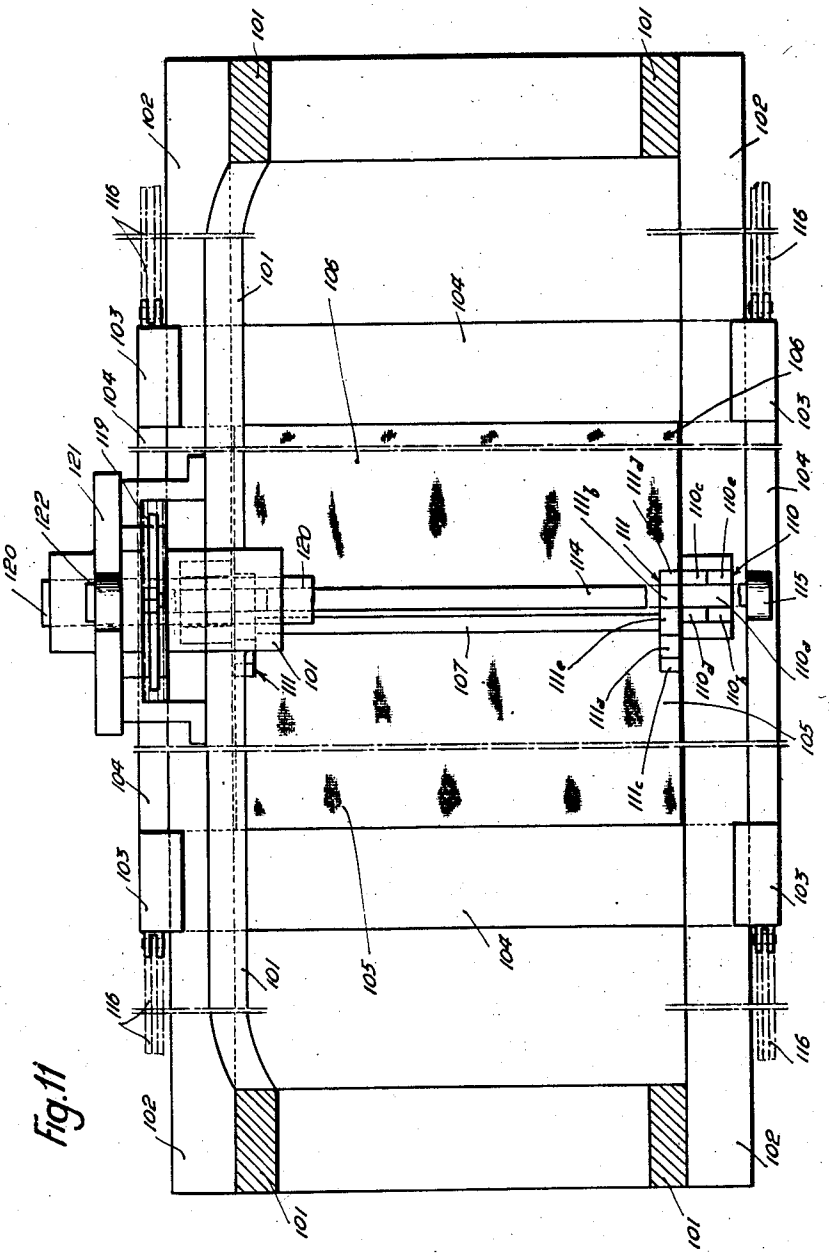


Fig.11

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Fig. 12

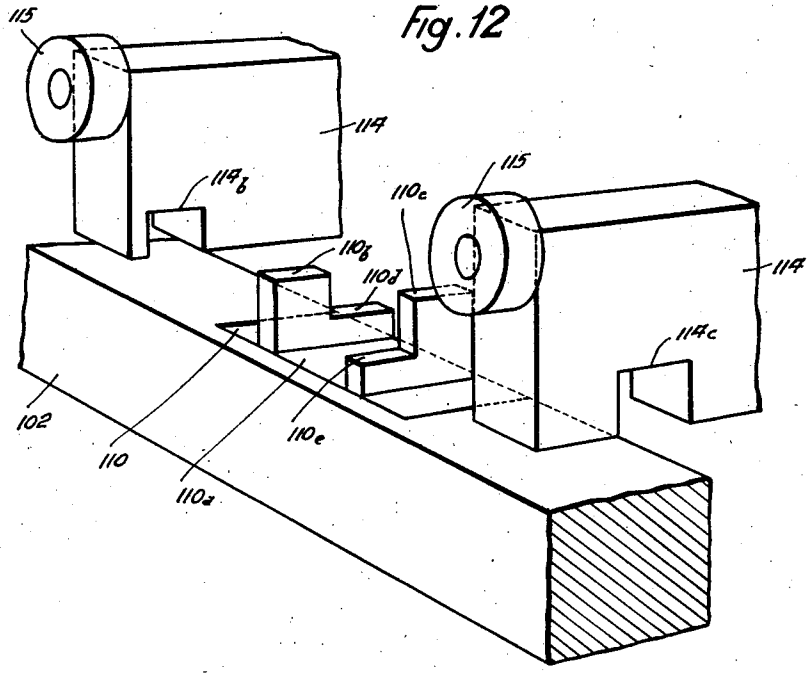
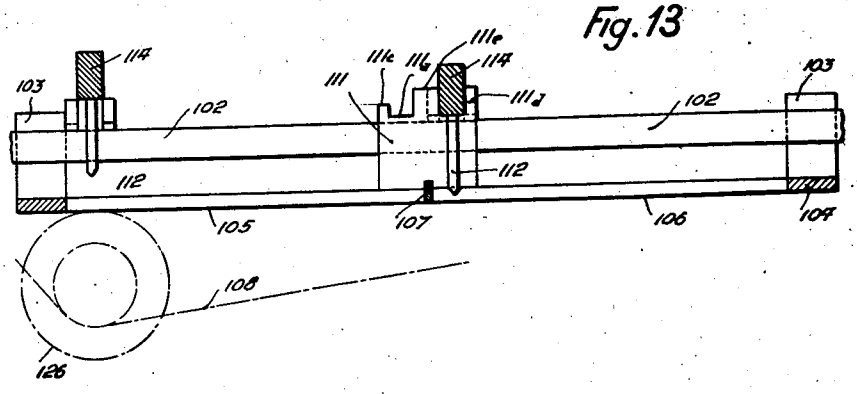


Fig. 13



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Fig. 14

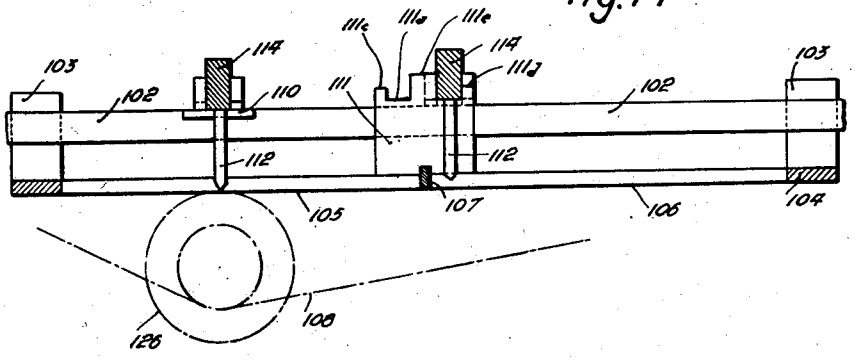


Fig. 15

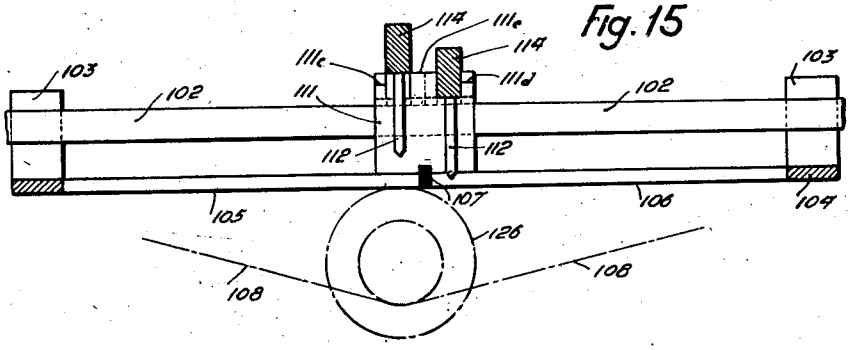
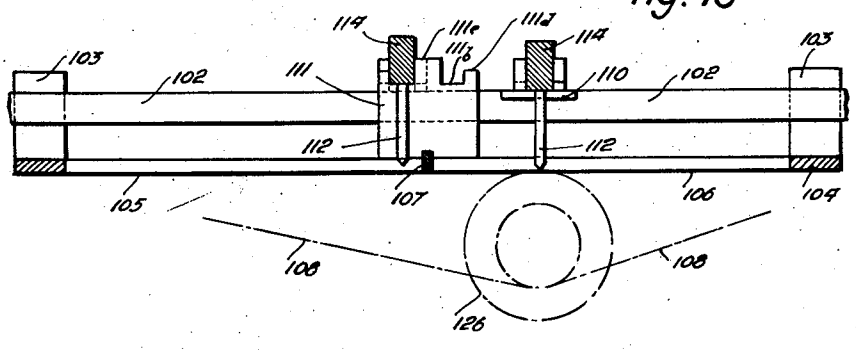


Fig. 16



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United States Patent Office 2,799,223 Patented July 16, 1957

2,799,223

SILK-SCREEN COLOUR PRINTING MACHINE

Louis Gilbert Dubuit, Paris, France

Application June 16, 1953, Serial No. 362,111

Claims priority, application France June 17, 1952

6 Claims. (Cl. 101—115)

My invention relates to multicolor stenciling machines for printing upon objects having a curved surface for example of cylindrical, conical or similar shape.

The object of my invention is to provide a machine which will permit an extremely rapid and clean printing in two or more colours.

Printing may be effected on objects made of ceramic bisque in using usual inks such as glycerine inks, the bisque immediately absorbing the colour and making it possible to directly proceed with the next printing without any intermediate drying operation.

Thermo-fluid mixture inks may also be used; such inks are melted on the screen and solidify immediately when deposited on the surface of the object thus allowing an immediate application of the next printing. The use of such inks is indispensable when nonporous materials such as glass have to be printed upon.

A machine according to the present invention substantially comprises a stationary frame, a stencil screen carriage mounted on said frame for reciprocating movement from one extreme position to the opposite position, a stencil screen assembly mounted in said carriage to reciprocate therewith and comprising at least two screens in a common plane adjoining each other end to end in the direction of their reciprocation for successive printing operations, a supporting assembly for an article to be printed upon and having a curved surface in tangential rolling line contact with said screens, driving means rotating said assembly and reciprocating said carriage in mutual timely relation, a squeegee for each screen mounted transverse to the direction of the reciprocation of the screens to cooperate in rest position above said tangential rolling line contact with the respective screen, a holder for each squeegee positioned transversely to the screens and displaceable in a direction conforming to that of the reciprocating screens, each holder also adjustable in a direction vertical to the plane of the screens to bring the squeegee attached thereto in and out of operating position at the start and the end, respectively, of its printing operation; a stationary catch member adapted to temporarily receive and hold one holder with the squeegee attached thereto in operative rest position relative to the screen passing thereunder, a camlike support mounted upon the reciprocating carriage opposite the ends of each screen; each camlike support adapted to deliver a squeegee holder in inoperative position to the stationary catch member and to receive therefrom the holder previously held therein; and means actuated by said driving means in timely relation to the reciprocation of the screens to transfer in succession holders from said supports into said catch member, and vice versa, and to effect the said vertical adjustments of such holder in and out of operating position at the start and at the end, respectively, of each printing operation.

The said and other objects of my invention will be more fully understood from the following specification when read with the accompanying drawing in which two embodiments are illustrated in the drawing.

Fig. 1 is a side elevational view of an embodiment of a machine for multicolor printing upon articles such as bowls, the holder of the object being in its rest position.

Fig. 2 is a plan view of said machine.

Fig. 3 is a sectional view of a detail of my machine.

Fig. 4 is a perspective view of another detail of my machine.

Fig. 5 is a diagrammatic view of the cams used in my machine.

Fig. 6 is a side elevational view of the machine while the object-holding frame is in operative position.

Fig. 7 shows, on a larger scale, the device for locking said frame in operative position.

Fig. 8 is a front view of the device controlling the placing of the squeegee-carrying arms into operative position.

Fig. 9 is a vertical sectional view, through line IX—IX of Fig. 10 of a machine for the printing in two colours of cylindrical objects.

Fig. 10 is a vertical sectional view through line X—X of Fig. 9.

Fig. 11 is a plan view of the same machine, the superior part of the machine being taken off.

Fig. 12 is an enlarged perspective view of a portion of the machine.

Fig. 13 is a diagrammatical view of the position of the squeegees, while the screen-carrying plate being at one end of its run.

Figs. 14, 15 and 16 are similar views corresponding to various successive positions of the screen-carrying plate.

As shown in Figs. 1, 2 and 3 my new machine comprises a frame **1** surmounted by a table **2** which carries a centrally located pivot **3** provided with a lining **4** secured thereto by a key **4***b* engaging a groove **3***a*. A stencil screen carriage such as a circular plate **5** is rotatably mounted upon said pivot **3** by means of a hub **4***a*. A collar **6** which supports a two-pronged fork or saddle member **28** is secured to said lining **4** above said hub **4***a* and above said collar **6** two sleeves **7** and **8** provided with brackets **7***a*, **8***a*, respectively, are rotatably mounted on said lining **4**. A cap **9** secured to said lining and being provided with an adjusting screw **10** bearing against the upper face of said pivot **3** insures said collars **7**, **8** against axial displacement.

The circular carriage plate **5** is provided with a circumferential rim **11** having grooves to be engaged by at least two loops of a cable **12**. An opening having the shape of a ring sector extends in said plate **5** close to said rim **11** and serves to receive the stencil screens **13**, **14** which have conforming shapes of ring sectors and are secured to said plate **5** by clamping, gripping or similar means **15**.

In the brackets **7***a*, **8***a* of the sleeves **7**, **8** are two arms **16**, **17**, respectively, swingably mounted upon pins **18**, **19**. These arms **16**, **17** hold the squeegees **22**, **23**, respectively, for example by means of U-shaped slides **20**, **21**, the position of which upon the arms being adjustable horizontally and vertically relative to the screens **13**, **14** by screws **24**, **25** and **26**, **27**.

The stationary collar **6** carries a catch member adapted to temporarily receive and hold one of the said two holding arms **16**, **17** with its respective squeegee in respective rest position relative to the screens passing thereunder. Said catch member as illustrated in Fig. 4 consists of a two-pronged fork or saddle member **28** having prongs or branches separated by a seat **28** said prongs or branches being provided with staggered castellations or ridges **28***a*, **28***b*, **28***c*, **28***d* for cooperation with notches **16***a* and **16***b* of different depth arranged in each arm **16**, **17** holding a squeegee. The manner and purpose of this cooperation will be later described in detail.

The said arms **16**, **17** may be set manually into work-

ing position. However, my new machine permits a completely automatic operation. To this effect I provide camlike supports 29, 30, 31 for the said arms 16, 17 to cooperate with said castellations or ridges and said notches in the manner illustrated in Fig. 5. These camlike supports 29, 30, 31 are mounted upon the carriage plate 5 opposite the ends of each screen 13, 14 as shown in Fig. 2. The two outer cams 29, 31 are symmetrically shaped each having a sloping portion or ramp 29*a*, 31*a*, a flat or neutral portion 29*b*, 31*b*, and a stop finger 29, 31*c*, respectively. The middle cam 30 shows a combination of the shapes of said outer cams and comprises a first sloping portion or ramp 30*a*, a first flat or neutral portion 30*b*, a stop finger 30*c*, a second flat or neutral portion 30*d* and a second sloping portion or ramp 30*e*.

The article 33 to be printed upon is held by a supporting assembly which includes an expansible mandrel 34 mounted upon a rotatable drum 35 which is circumferentially grooved to be engaged and actuated by the cable 12 which also engages the grooved rim 11 of the carriage plate 5 as described above to rotate or reciprocate said drum 35 and said plate 5 in mutual timely relation. The said cable 12 is guided between said drum 35 and said rim 11 by grooved pulleys 38, 40, 42, and 39, 41, 43, respectively, and its ends are secured to carriage plate 5 for example by screws 36, 37 (Fig. 2). The said pulleys 38 and 39 are supported by arms 44 and 45 secured to the frame table 2 to guide the cable 12 into the grooves of said plate rim 11. The pulleys 40 and 41 are held by supports 46 and 47 which are pivotably mounted on hollow shafts 50 and 51 upon the machine frame 1, the cable 12 passing through said hollow shafts. The desired position of said supports 46 and 47 which are provided with elongated slots may be adjusted by screws 48 and 49 passing therethrough as illustrated in Fig. 1. The pulleys 42 and 43 guide the cable 12 into the grooves of the drum 35 and are held in a frame 52 tiltably mounted on said hollow shafts 50 and 51. The said frame 52 is provided with a bearing 52*a* which rotatably holds a shaft 53 associated with said drum 35 and having a hand wheel 54. This hand wheel 54 when actuated will rotate not only the drum 35 but also the rim 11 of the carriage plate 5 with the screens 13 and 14 mounted therein.

The expansible mandrel 34 may be actuated in any known manner for example by a sheath slidingly mounted on drum shaft 53 for displacement in axial direction by a lever 55. A fairly powerful spring, not shown, tends to hold the mandrel 34 in expanded position.

The drum 35 mounted upon frame 52 while in its initial position shown in Fig. 1 receives the article to be printed upon for example the bowl 33 as shown. Thereupon the frame 52 is tilted about the shafts 50, 51 into the working position shown in Fig. 6. At this time several adjustments are required to insure a proper relative position of said article and the screens 13, 14. First, the position of the carriage plate 5 above the frame table 2 has to be set by means of the adjusting screw 10 described above. Second, the screens 13, 14 have to be positioned in the carriage plate 5 by means of the clamping means 15 as described above. Third, the proper contacting relation of the article 33 and the screens 13, 14 has to be adjusted. This adjustment is effected by a locking device shown in Figs. 1, 6 and 7 and operating as follows:

The drum supporting frame 52 is provided with a link rod 57 articulated thereto upon axle 56, the other end of said link rod being jointed to a crank member 58. This crank member 58 which is provided with a plane stop face 58*a* is keyed upon shaft 59 rotatably mounted in the machine frame 1. The said stop face 58*a* cooperates with a stop screw 63. This screw passes through a stone 62 slidably mounted in a curved slot 60*a* of a sector shaped plate 60 which is turnably mounted on said shaft 59. The said stone 62 which is provided with a threaded tenon 62*a* may be secured in said slot 60*a* in any adjusted position by a nut 64 while said stop screw 63 is secured by a

lock nut 65. As shown in solid lines in Fig. 7 the link rod 57 is safely locked and thus the drum frame 52 held rigidly in the working position illustrated in Fig. 5.

To remove the article 33 after having been printed upon and to substitute another article the drum frame 52 is being tilted from the position shown in Fig. 5 to that shown in Fig. 1 by rotating the shaft 59 to bring the crank arm 58 into the position shown in Fig. 7 in dotted lines whereby the frame 52 is freed to swing about its shafts 50, 51.

It will be well understood, however, that many other suitable adjusting and locking devices for said drum frame may be used.

My machine described above with reference to Figs. 1 through 8 operates as follows:

At the start of the printing operation the arm 16 supporting one of the squeegees is placed upon the flat portion or landing 29*b* of the outer cam 29 and the other arm 17 supporting the other squeegee upon the flat portion or landing 30*d* of the central cam 30 (Figs. 2 and 5). Said location of arm 16 places the same between the prongs or branches of the stationary fork or saddle member 28. It should be noted that in Fig. 1 the arms 16 and 17 are shown in extended position to make the illustration better readable.

By actuating the handwheel 54 the drum 35 with the article 33 to be printed upon are rotated and carriage plate 5 is rotated as well by the cable 12. The rotation of plate 5 causes arm 16 which is held within the fork cleft or rest 29*b* to slide downward along ramp 29*a* of cam 29 and deeper into said seat thus bringing the squeegee 22 into its working position relative to the screen 13 and holding the squeegee 22 in such working position until the entire screen 13 passed thereunder and the first printing operation has been concluded. At this time the approaching central cam 30 attacks the arm 16 by its sloping ramp 30*a* lifting said arm 16 until the same comes to rest upon the flat landing 30*b* located so high above the carriage plate 5 that the notch 16*a* in said arm avoids the castellation or ridge 28*a* upon said fork 28 and said arm 16 is contacted by the stop finger 30*c* of the central cam 30 to be driven along in nonoperative position.

While cam 30 attacks arm 16 as described above arm 17 resting upon the landing 30*d* of said cam moves over the castellations or ridges 28*c*, 28*d* of one prong or fork 28 but is retained by the castellation 28*a* upon the other prong or fork 28 and slides downward into the fork cleft 28*e* bringing thus squeegee 23 into and holding the same in its working position relative to screen 14 until the entire screen 14 passed thereunder and the second printing operation has been concluded. At this time the approaching cam 31 attacks the arm 17 by its sloping ram 31*a* lifting said arm 17 until it contacts the stop finger 31*c* and is held in rest position upon the landing 31*b* which is not high enough above the carriage plate 5 to let the arm 17 pass over the castellations or ridges 28*a*, 28*c* of the fork 28. The arm 17 being now locked between said castellations 28*a*, 28*c* and stop finger 31*c* of the last cam 30 brings the machine to a standstill. Thereafter the machine may be used for printing in reverse direction, the squeegee 23 upon arm 17 operating first with screen 14 and the squeegee 22 upon arm 16 operating thereafter with screen 13.

In case that thermo-fusible mixtures are used the printing has to be done in one direction only and the arms 16, 17 have to be held out of working position relative to the screens 13, 14 when the machine after completing the printing in one direction is brought back into the initial position. This may be effected by the device illustrated in detail in Fig. 8. This device comprises a switch tongue 66 pivoted with its lower end upon the fork 28 and having inclined upper faces as shown which will lift one or the other arm 16 or 17 when the tongue is tilted. To this effect stop 67, 68 are located upon the carriage plate 5 close to the outer cams 29, 31 as shown in Fig. 1.

Figs. 9–16 show another embodiment of my invention namely a machine for printing upon articles having a cylindrical surface.

This machine comprises a frame **101** supporting two square-sectioned parallel bars **102** on which a carrier **104** is slidingly mounted, by means of blocks **103**. Said carrier **104** supports two silk screens **105** and **106**, the lower surfaces of which are situated in the same plane and which are separated by a low wall **107**. Under the bars **102** the frame **101** bears a device for rotatively supporting a substantially cylindrical object to be printed upon such device not shown in the drawing being of the type described in my U. S. Patent No. 2,757,606. This supporting device is so rotated that the peripheral speed of the object to be printed is equal to the linear speed of carrier **104**; such rotation is effected by means of a cable **108** the ends of which are attached to arms **109** extending at either ends of carrier **104** and which wind around a not shown pulley attached the rotating part of the supporting device of the object to be printed upon.

On each of the bars **102** and above the said supporting device a member **110** is fixed which includes a notch **110***a*, the median plane of which coincides with the vertical plane of the axis of rotation of the object to be printed. Said notch **110***a* is being limited on either side by projecting parts **110***b* and **110***c* in which are respectively provided depressed portions **110***d* and **110***e*, of a same height, in order that portion **110***d* be opposite the highest part of projection **110***b* whereas reciprocally, portion **110***e* is opposite the highest part of projection **110***c* (Fig. 12).

Carrier **104**, on both its longitudinal sides, bears in line with the low wall **107** which separates both screens **105** and **106** two members **111** rising along and inside bars **102** and each provided with two notches **111***a* and **111***b*, located on either side of the separating wall **107**. These notches are laterally limited by respective projections **111***c*, **111***d* which are at a higher level than the depressions **110***c*, **110***d* of members **110**, and are separated by a projection **111***e* of a greater height, whereas the bottom of said notches is at level with depressions **110***d*, **110***e* of members **110**, said notches having the same width as notch **110***a* of member **110**.

To each screen **105**, **106** corresponds a rubber-squeegee **112** of a known type passing the ink through the screen while sweeping over the latter. This squeegee is maintained in a support **113** which forms at its upper part a bar **114** which is transverse to the carrier **104** and the length and thickness of which are such that it may engage in notches **110***a* of members **110** fixed on rails **102** as well as in notches **111***a* or **111***b* of members **111** fast with carrier **104**. Transverse bar **114** of squeegee **112** corresponding to screen **105** bears at both ends in its lower part castellations **114***b* the position, width and depth of which are such that, when said bar **114** rests in notches **111***a* of members **111** and that its upper face is consequently at level with the bottom of redans **110***d* of members **110**, said bar **114**, in moving parallelly to itself under the effect of the movement of carrier **104** may pass above projecting parts **110***b* which limit on one side notches **110***a* of said members **110**, whereas it stops on projecting parts **110***c* which limit the other side of said notches **110***a*. Also, the transverse bar **114** of squeegee **112** corresponding to screen **106** bears on both its ends in its lower part castellations **114***c* the position, width and depth of which are such that under the same conditions as above described with regard to bar **114** supporting squeegee **112** corresponding to screen **105**, said bar **114** bearing squeegee **112** corresponding to screen **106** may pass above projecting parts **110***c* which limit notches **110***a* of member **110** on one side whereas they stop against the projecting parts **110***b* limiting the other side of said notches **110***a*. On another hand, both transverse bars bear at either ends a roller **115**.

At both ends of carrier **104** are respectively fixed the ends of two chains of transmission **116** which pass over

pinions **117** fixed on shafts **118** rotatively mounted in frame **101** at the respective ends of longitudinal bars **102**. Said chains also cooperate with two pinions **119** fixed on a shaft **120** rotatively mounted in frame **101** the axis of said shaft **120** being in the vertical plane of the axis of rotation of the object to be printed. On said shaft **120** are also fixed two cams **121** each bearing two bosses **121***a*, **121***b*. Each cam **121** cooperates with a roller **122** rotatively mounted on a slider **123**, vertically guided in sliders **124** fast with frame **101**. At the lower part of sliders **123** is provided a nose-piece **125** which is made to engage under rollers **115** borne by the corresponding ends of bars **114** which support squeegee **112**. Cams **121** are such that, on the one hand, when rollers **122** rest upon the circular part of said cams, the sliders are in a position in which bar **114**, which they support through the intermediary of rollers **115**, is sufficiently lowered in order that the corresponding squeegee **112** be in contact with its screen and that, on another hand, when rollers **122** are lifted by bosses **121***a* or **121***b*, bar **114**, the rollers **115** of which are engaged by nose-pieces **125** of sliders **123** be also lifted above projections **111***c* and **111***d* which limit laterally notches **111***a* and **111***b* of members **111**, but at a level below that of projections **111***e* separating said notches. The diameter of pinions **119** is such that cams **121** accomplish a rotation when carrier **104** is displaced of a length equal to that of a screen **105** or **106**. The pinions **119** are in mesh with chains **116** so that, on behalf of the action of bosses **121***a*, **121***b* on rollers **122** of sliders **123**, bars **114** supporting squeegees **112** are lifted a first time when, one of said bars resting in notches **110***a* of members **110**, the notches **111***a* or **111***b* of members **111** fast with carrier **104** are on the point of coinciding with said notches **110***a* in coming towards the transverse axis of the machine and, a second time, when, resting in notches **111***a* or **111***b* of members **111**, said notches **111***a* or **111***b* are ready to leave the coincidence with said notch **110***a* in moving away from the transverse axis of the machine.

My machine as illustrated in Figs. 9–16 operates in the following manner:

It is supposed that carrier **104** is at one end of its run (for example to the right hand side of Figs. 9 and 11) and that the object to be printed, indicated by dotted line **126**, is in contact with screen **105** supplied with ink corresponding to one of the colours to be printed, and bar **114** of the corresponding squeegee **112** is engaged in notches **110***a* of members **110**. Bosses **121***a* of cams **121** are in the vertical median plane of the machine and maintain rollers **122** with the sliders **123** lifted up, bar **114** engaged in notch **110***a* being thus also lifted up so that corresponding squeegee **112** should not be in contact with screen **105** (Fig. 13).

Carrier **104** is then moved on bars **102** from right to left of Figs. 9 and 11, such displacement being effected either by pushing carrier **104** by hand, or by driving, by means of a motor not shown, one of the shafts bearing pinions **117** engaging chains **116**. Simultaneously the object **126** to be printed upon is rotated at a peripheral speed equal to the linear speed of carrier **104**. As soon as the displacement of said carrier starts, cam **121** starts turning and bosses **121***a* liberate rollers **122** from sliders **123**. Said sliders come down, so as bar **114**, which falls at the bottom of notch **110***a*, the corresponding squeegee **112** thus contacting screen **105** (Fig. 14) and the printing on the object **126** takes place in the manner known in the silk-screen printing method, the drawing or the inscription corresponding to the free meshes of screen **105** thus being printed on the object, in the colour of the ink which fills the screen.

During the displacement of carrier **104** members **111** carried by the latter get closer to the vertical median plan of the machine, in which bar **114** of the acting squeegee **112** is located. When projections **111***c* limiting notches **111***a* of said members **111** are on the point of engaging

opposite notches **110***a*, bosses **121***b* of cams **121** lift rollers **122** with sliders **123** thus in turn lifting bar **114** resting in said notches **110***a*, and placing the same in slots **111***a* of member **111**. The bottom of said notches **111***a* being at level with depressions **110***d*, bar **114** thus located in the notches **111***a* may laterally escape from notches **110***a* and be driven by members **111** as the carrier **104** moves on (Fig. 15).

On the other hand bar **114** which supports squeegee **112** cooperating with screen **106**, was initially supported in notches **111***b* of members **111**. When, as carrier **104** keeps on moving, said notches **111***b* arrive in coincidence with notches **110***a*, bosses **121***a* of cams **121** lift again rollers **122** with sliders **123**, which in turn lift bar **114** which was resting in notches **111***b*, thus disengaging said bar from said notches. Said bar abuts against projecting parts **110***b*, laterally limiting notches **110***a* and stops, while the carrier keeps on moving and carries away members **111** (Fig. 16). As soon as the latter have passed notch **110***a*, boss **121***a* again liberates sliders **123**, and bar **114**, being lifted by the latter, falls at the bottom of notch **110***a*, which enables the corresponding squeegee **112** to cooperate with screen **106** in order to print the second colour of the screen.

When the carrier reaches the other end of its run, bosses **121***b* of the cams lift again sliders **123**, so that bar **114** is lifted from squeegee **112** which operates on screen **106**. This squeegee thus passes above the pad of ink which it was previously pushing forward, in order to allow this ink to be taken in charge again when the carrier is moved in the opposite direction. Carrier **104** thus occupies the position which is opposed to the initial position and, after elimination of the printed object and introduction of a new object to be printed upon, the same operations start all over again while the carrier is being moved in the opposite direction.

Having shown and described two embodiments of my invention to illustrate the application of the principles thereof, it will be well understood that my invention may be otherwise embodied without departing from such principles.

What I claim is:

1. In a multicolor stenciling machine of the type described, the combination comprising a stationary frame, a stencil screen carriage mounted on said frame for reciprocating movement from one extreme position to the opposite position, a stencil screen assembly mounted in said carriage to reciprocate therewith and comprising at least two screens in a common plane adjoining each other end to end in the direction of their reciprocation for successive printing operations, a supporting assembly for an article to be printed upon and having a curved surface in tangential rolling line contact with said screens, driving means rotating said assembly and reciprocating said carriage in mutual timely relation, a squeegee for each screen mounted transverse to the direction of the reciprocation of the screens to cooperate in rest position above said tangential rolling line contact with the respective screen, a holder for each squeegee positioned transversely to the screens and displaceable in a direction conforming to that of the reciprocating screens, each holder also adjustable in a direction vertical to the plane of the screens to bring the squeegee attached thereto in and out of operating position at the start and the end, respectively, of its printing operation; a stationary catch member adapted to temporarily receive and hold one holder with the squeegee attached thereto in operative rest position relative to the screen passing thereunder, a camlike support mounted upon the reciprocating carriage opposite the ends of each screen; each camlike support adapted to deliver a squeegee holder in inoperative position to the stationary catch member and to receive therefrom the holder previously held therein; and means actuated by said driving means in timely relation to the reciprocation of the screens to transfer in succession holders from said supports into said catch member, and vice versa, and to effect the said vertical adjustments of such holder in and out of operating position at the start and at the end, respectively, of each printing operation.

2. In a multicolor stenciling machine of the type described according to claim 1 the combination comprising a stop member mounted upon the carriage at each extreme end of the screen assembly and a latchlike member mounted upon the catch member, said latchlike member adapted to be actuated by one of said stop members to prevent the squeegee holders to assume their operative position within the catch member during the movement of the carriage in one direction, and by the other stop member to release said latchlike member to permit the holders to assume their operative position within the catch member during the movement of the carriage in the other direction.

3. In a multicolor stenciling machine of the type described, the combination comprising a stationary frame, a stencil screen carriage mounted on said frame for linear reciprocating movement from one extreme position to the opposite position, a stencil screen assembly mounted in said carriage to reciprocate therewith and comprising at least two screens in a common plane adjoining each other end to end in the direction of their reciprocation for successive printing operations, a supporting assembly for an article to be printed upon and having a curved surface in tangential rolling line contact with said screens, driving means rotating said assembly and reciprocating said carriage in mutual timely relation, a squeegee for each screen mounted transverse to the direction of the reciprocation of the screens to cooperate in rest position above said tangential rolling line contact with the respective screen, a holder for each squeegee positioned transversely to the screens and displaceable in a direction conforming to that of the reciprocating screens, each holder also adjustable in a direction vertical to the plane of the screens to bring the squeegee attached thereto in and out of operating position at the start and the end, respectively, of its printing operation; a stationary catch member adapted to temporarily receive and hold one holder with the squeegee attached thereto in operative rest position relative to the screen passing thereunder, a camlike support mounted upon the reciprocating carriage opposite the opposing edges of adjoining screens; each camlike support adapted to receive squeegee holders associated with said adjoining screens and to hold said holders in inoperative position, and means actuated by said driving means in timely relation to the reciprocation of the screens to transfer in succession holders from said supports into said catch member, and vice versa, and to effect the said vertical adjustment of such holder in and out of operating position at the start and at the end, respectively, of each printing operation.

4. In a multicolor stenciling machine of the type described, the combination comprising a stationary frame; a pivot thereupon; a stencil screen carriage mounted on said pivot for reciprocating swing movement from one extreme position to the opposite position; a stencil screen assembly mounted in said carriage to reciprocate therewith; said screen assembly comprising at least two screens in a common plane adjoining each other end to end in the direction of their reciprocation for successive printing operations and forming at least part of an annulus concentrical with said pivot; a supporting assembly for an article to be printed upon and having a curved surface in tangential rolling line contact with said screens; driving means rotating said assembly and reciprocating said carriage in mutual timely relation; a squeegee for each screen mounted transverse to the direction of the reciprocation of the screens to cooperate in rest position above said tangential rolling line contact with the respective screen; a holder for each squeegee positioned transversely to the screens and displaceable in a direction conforming to that of the reciprocating screens; each holder also ad-

justable in a direction vertical to the plane of the screens to bring the squeegee attached thereto in and out of operating position at the start and the end, respectively, of its printing operation; a stationary catch member adapted to temporarily receive and hold one holder with the squeegee attached thereto in operative rest position relative to the screen passing thereunder; a camlike support mounted upon the reciprocating carriage opposite the ends of each screen; each camlike support adapted to deliver a squeegee holder in inoperative position to the stationary catch member and to receive therefrom the holder previously held therein; and cam means actuated by said driving means in timely relation to the reciprocation of the screens to transfer in succession holders from said supports into said catch member, and vice versa, and to effect the said vertical adjustment of such holder in and out of operating position at the start and at the end, respectively, of each printing operation.

5. A multicolor stenciling machine of the type described according to claim 1 wherein the said stationary catch member comprises a two pronged fork or saddle member, the prongs having symmetrical castellations or ridges and the holders associated with adjoining screens

having notches conforming to the castellations or ridges of one of said prongs, respectively, in order to permit one holder to pass one of said prongs only and thus to move in and out of said catch member from one side thereof exclusively.

6. In a multicolor stenciling machine of the type described according to claim 1 the combination comprising an expansible mandrel adapted to hold the article to be printed upon, a support for said mandrel rockingly mounted on the stationary machine frame, means to swing said support relative to the carriage; and adjustable stopping means locking said support when the mandrel with said article is in working position relative to the screens.

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