June 7, 1932. W. R. RESPESS 1,861,610

PRINTING METHOD AND APPARATUS

Filed May 2, 1930 3 Sheets-Sheet 1

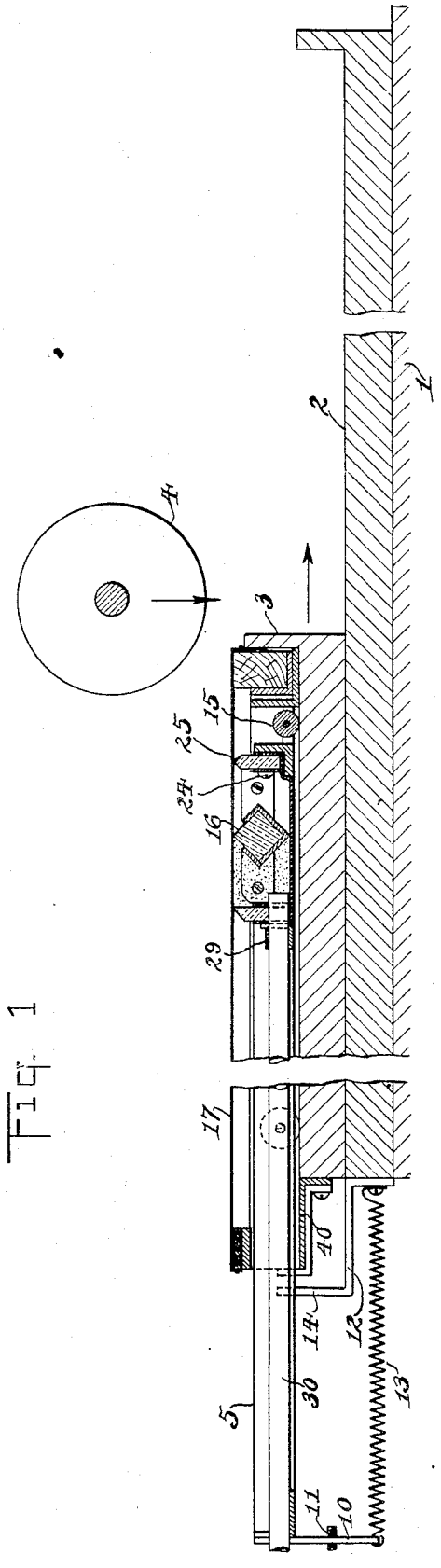


Fig. 1

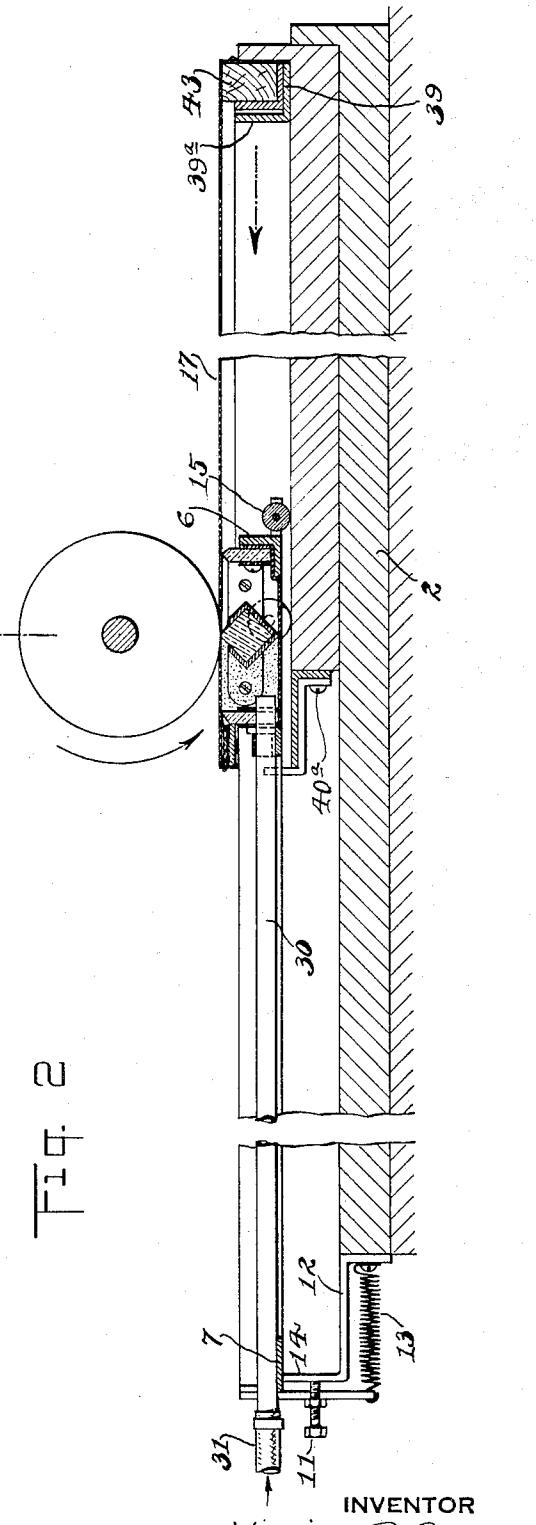


Fig. 2

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PRINTING METHOD AND APPARATUS

Filed May 2, 1930 3 Sheets-Sheet 2

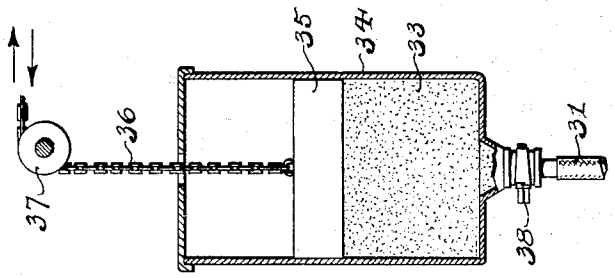


Fig. 5

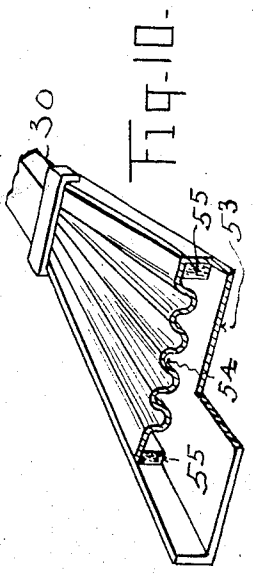


Fig. 10.

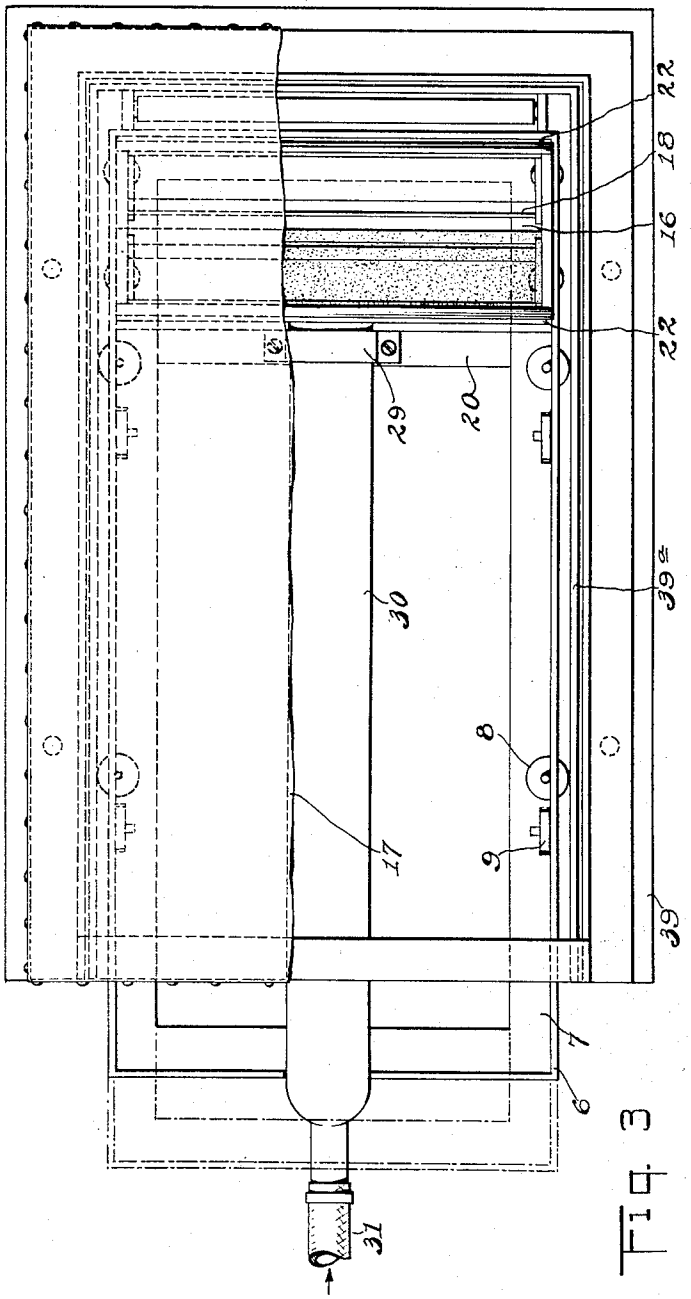


Fig. 3

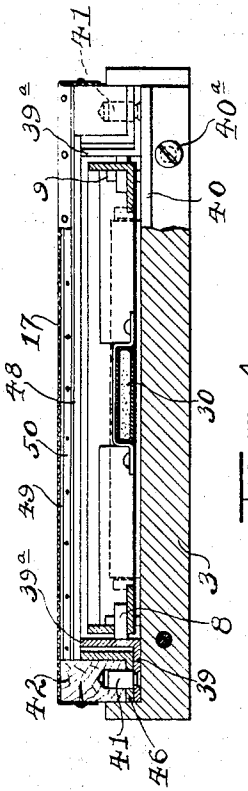


Fig. 4

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PRINTING METHOD AND APPARATUS

Filed May 2, 1930 3 Sheets-Sheet 3

Fig. 6.

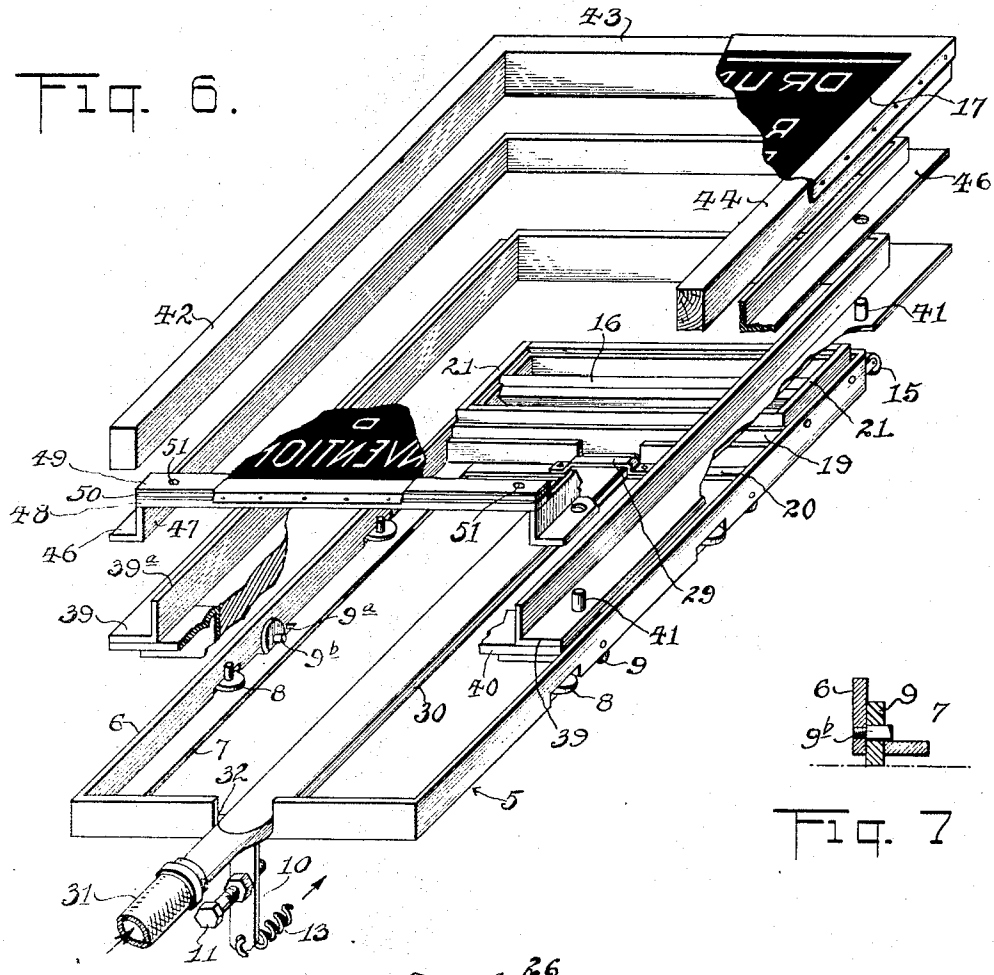


Fig. 7

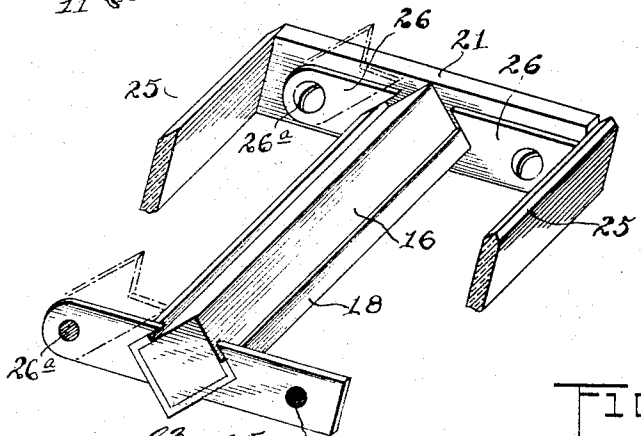


Fig. 8

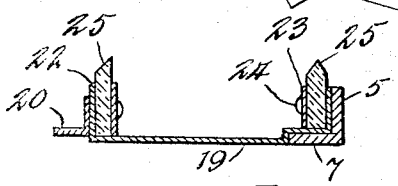


Fig. 9.

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UNITED STATES PATENT OFFICE

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PRINTING METHOD AND APPARATUS

Application filed May 2, 1930. Serial No. 449,168.

This invention relates to printing methods and apparatus, and with particularity to a machine for printing under control of a stencil or printing blank.

Various methods of employing stencils or printing blanks have heretofore been suggested for use in multi-color printing or other allied fields. However, these prior art devices possess certain inherent disadvantages which it is the object of the present invention to overcome. In printing machines of the stencil-controlled type it is necessary that the ink, paint or other printing medium be transferred or passed through the stencil in an absolutely clean, non-blurred and uniform manner. This is especially true in the case of color printing, since there must be produced sharp delineations between the different color sections of the print.

In one type of machine the ink or paint has been fed or distributed over the stencil and forced therethrough onto the receiving surface by means of a roller or other similar device. Due to this method of distribution the ink or paint is not transferred to the receiving surface in what may be termed sharply defined "linear elements", but is undesirably and non-uniformly spread due to the rolling action and the weight of the ink itself. In this type of machine also the stencil surface is subjected to excessive wear, especially where a woven stencil such as silk is employed. To overcome these and other disadvantages it has been suggested to employ what may be termed reciprocating "squeegees" in the form of sharp edges of rubber or other resilient material. Thus in one known type of machine the stencil is in the form of a sheet of silk stretched across a stencil frame and the squeegee or ink distributor is reciprocated across the upper face of the stencil so that the ink or paint is forced downwardly through the pores of the stencil. As a result of this arrangement the supply of ink or paint is brought into contact with the upper surface of the silk by gravity, and the knife edge of the squeegee in reciprocating serves to force the ink or paint through the pores of the silk. Because of the top-feed of the ink or paint, uniform results are not attainable. This lack of uniformity is due to several causes. For example, the quantity of ink actually passed through the pores of the silk stencil will in a great measure depend upon the consistency of the ink itself, and also upon the quantity or supply of ink in the ink reservoir. Since the supply will at times vary, the weight of the ink itself pressing on the stencil will likewise vary and produce corresponding variations in the printing.

Accordingly it is one of the principal objects of this invention to provide a novel method of feeding or supplying ink, paint or other printing medium to a stencil surface.

In achieving this and other objects it is proposed to feed the ink or paint upwardly against and through the stencil to avoid gravity or weight pressure of the paint or ink. As a result of this method of supplying the printing medium the same may be maintained under extremely accurate and light pressure against the lower surface of the stencil. Preferably this pressure is so adjusted as to just prevent the ink or paint from being forced through the pores of the stencil when the squeegee is not functioning to press the ink through the stencil in the printing operation.

Another object of the invention is to provide a novel method of forcing ink, paint or other printing medium through a porous stencil carrier.

Another object of the invention is to provide a printing machine of the reciprocating stencil type together with adjustable means for accurately controlling and gauging the quantity of ink or paint that is forced through the stencil.

Another object of the invention is to provide a printing machine of the reciprocating-stencil rotary-platen type together with means for accurately controlling the printing registry between the platen and the stencil.

Another object of the invention is to provide a reciprocating stencil and novel type of chase therefor which is adapted to be used in conjunction with any type of flat upper bed press or rotary platen printing machine.

A feature of the invention relates to a novel

type of chase for printing machines having one or both ends thereof open to receive a reciprocating squeegee and ink supply frame.

Another feature of the invention relates to the combination of a reciprocating stencil frame and an ink or paint reservoir mounted beneath said frame and adapted to be reciprocated relatively to said frame.

Another feature relates to a printing machine of the stencil-controlled type having a reciprocating stencil together with an ink reservoir mounted for reciprocating movement beneath said stencil, and means for supplying ink to said reservoir under pressure.

A further feature of the invention relates to a stencil controlled press having a reciprocating squeegee and means for controlling the pressure on the ink supply in accordance with the reciprocating movement of the squeegee.

A further feature of the invention relates to a novel type of stencil controlled printing machine.

Another feature relates to the organization, arrangement and relative location of parts which go to make up an efficient, economical and accurate printing machine of the stencil-controlled type.

Other features and advantages not specifically enumerated will be apparent after a consideration of the following detail descriptions and the appended claims.

While the invention will be described hereinafter as embodied in one particular type of printing machine, namely one employing a horizontal reciprocating stencil and a rotary platen, it will be understood that the invention is not limited thereto, but is capable of embodiment in a variety of machines, including vertical, semi-vertical and flat bed presses. Accordingly it is to be understood that the following disclosure is intended merely as an illustration of one preferred manner of achieving the inventive objects. Furthermore, only sufficient portions of a press will be disclosed as are sufficient to enable a clear understanding of the invention to be attained.

Referring to the drawings;

Figure 1 of the drawings shows in a partial sectional elevation the relation between the reciprocating stencil and carrier and the rotary platen. This figure shows the stencil in its extreme position.

Fig. 2 is a view similar to that of Fig. 1, but shows the stencil in its extreme backward position and the platen in its downward or printing position;

Fig. 3 is a top plan view of the chase, stencil frame, and ink or paint supply means according to the invention;

Fig. 4 is a left-hand end view partly in section of the mechanism shown in Fig. 3;

Fig. 5 is a detail view of one part of the mechanism for controlling the pressure on the ink or other printing medium;

Fig. 6 is an exploded perspective representation of the component parts of the press-bed, chase, frame, printing stencil, and ink reservoir according to the invention;

Fig. 7 is a detail view of the manner of mounting the rollers for the ink-supply carriage.

Fig. 8 is a detail perspective view partly in section showing one manner of mounting the removable squeegee or ink distributing member according to the invention;

Fig. 9 is a detail of the ink reservoir;

Fig. 10 shows a modified manner of distributing the ink or other printing medium to the ink-box.

Referring more particularly to Figs. 1 and 2 the numeral 1 represents part of the main frame of any standard type of printing machine. Rigidly attached in any suitable manner to the frame 1 is a press bed 2 which serves as a support for the reciprocating carriage or chase 3, having its forward end open for purposes hereinafter described. Numeral 4 represents any standard type of rotary platen which carries the paper or other print receiving surface. Platen 4 is adapted to be rotated in the direction of the arrow by any suitable mechanism (not shown) in timed relation with the reciprocation of the carriage 3. Platen 4 is also raised and lowered to and from printing positions as indicated by the vertical arrows. Inasmuch as mechanism for achieving these functions is well known in the printing art, therefore a description thereof is not deemed necessary at this point. Supported for rolling movement on the member 3 is a frame or ink carriage 5 (Fig. 6) which may be of metal or other suitable material, said frame being substantially rectangular in shape and comprising vertical and horizontal flanges 6 and 7 respectively. Each of said flanges 6 carries a set of bearing rollers 8 which bear against the side walls of the member 3 as shown more clearly in Fig. 3. The frame 5 also carries a set of rollers 9 for supporting said frame on the surface of member 3.

Fig. 7 shows one economical manner of mounting the rollers in the frame 5. Thus in the case of rollers 9, the horizontal flange 7 is provided with notches 9^a wherein the rollers 9 are positioned. A sub-shaft 9^b is provided for each roller and is threaded or otherwise mounted in the flange 6. Thus the rollers are securely held against displacement and are free to rotate.

As shown more clearly in Figs. 1, 2 and 4, the front end of frame 5 is provided with a downwardly depending arm 10 in which is mounted the adjustable stop screw 11. Fig. 1 shows the frame 5 in its extreme forward position, and in order to prevent said frame from tilting when in this position, a bracket 12 is attached to the bed 2 to provide the requisite support. The frame or carriage 5 normally tends to move towards the right

(Fig. 1) under control of a tension spring 13 which has one end attached to the arm 10, and the other end attached to the fixed bed 2. The movement of frame 5 under control of spring 13 is limited by the engagement of stop screw 11 with the upwardly extending portion 14 of bracket 12. The purpose of the adjustable screw 11 is to provide means for insuring accuracy of register between the printing surface on platen 4 and the stencil 17, as hereinafter described. Attached to the rear end of frame 5 is a transverse roller 15 which rides on the surface of the carriage bed 3 to support the frame 5 when the bed is in its extreme rear position, as shown in Fig. 2. Thus the roller 15 may serve to adjustably regulate the pressure between the squeegee 16 and the stencil 17. The roller 15 provides means for "making ready" or correcting imperfections resulting in low or high spots in a stencil by building up the diameter of the roller 15 by means of strips of paper or other material wrapped around said roll. The squeegee 16 is preferably in the form of a rubber prism which is mounted in a correspondingly shaped frame 18. As will be seen clearly in Fig. 8, the frame 18 has a corner cut away to allow the corresponding edge of the squeegee 16 to protrude therethrough. The squeegee frame 18 is preferably made of springy metal and mounted in a readily removable manner, as shown clearly in Fig. 8, and described hereinafter.

Referring more particularly to Figs. 3, 6 and 8 and 9, it will be seen that the ink carriage 5 carries at its rear portion a reservoir for the ink, paint or other printing medium. This reservoir comprises the bottom 19 which may be formed out of a piece of sheet metal bent to the shape shown in Fig. 9, adapted to rest on the rear horizontal flange 7 of frame 5 and on a transverse strip 20 across the frame 5. Disposed between the vertical sides 6 of frame 5 and the member 19 are two strips 21 of resilient material such as rubber, felt or hair or fibre brush. Clamped to the front and rear walls 22 of the reservoir by metal strips 23 and screws 24 are strips 25 of relatively soft material, such as felt, cardboard, rubber, hair, fibre or the like. The purpose of these strips is twofold, namely to provide a bridging support for the stencil 17, also to serve as cleaning or wiping members for the stencil, and to confine the ink or paint as it is being forced through the stencil, as will be described hereinafter. For this purpose it is preferred to make the upper edges of one or both of the strips 25 in tapered form. Each of the side walls of the reservoir has attached thereto a pair of arms 26 the ends of which are recessed, as shown more clearly in Fig. 8 to engage the corresponding edges of the frame 18 to prevent turning and other accidental displacements of the squeegee during the printing operation. One of the arms of each pair is pivotally attached as by a pivot screw 26^a while the other arm of each pair is held fixed by a screw 26^b and serves to clamp the associated strip 21 to the flange 6. All that is necessary therefore to remove the squeegee is to rotate the members 26 to the position indicated in dotted lines in Fig. 8, whereupon squeegee 16 may be lifted out of position. Instead of replacing the removed squeegee with an entirely new one, it will be obvious that the squeegee may be removed from the frame 18 and turned around to present a new edge 27 to the stencil. Connected through the front wall of the reservoir and fastened to the transverse strip 20 by means of a bracket 29 there is a flattened conduit 30 which is coupled by a flexible hose 31 to a source of ink, paint or printing medium. The forward end of the conduit 30 rests in and is supported by the front wall of the frame 5 and in order that the conduit may not interfere with the reciprocating movement of the frame 5, it is preferred to seat the conduit in a cutout portion 32 of the frame, as shown clearly in Fig. 6. The ink or printing medium is adapted to be fed into the reservoir under pressure and also preferably this pressure is controlled by the movement of the bed 3. In other words while the chase 3 and the stencil 17 are moving towards the right (Figs. 1 and 2) and effecting a printing operation, the ink or printing medium is preferably maintained under pressure for the purpose hereinafter described. While on the other hand when the chase and stencil are returning to the left during the non-printing movement it is preferred to reduce this pressure or even create a suction in the conduit 30. While any automatic means may be provided for creating this alternate pressure and suction on the ink supply in timed relation to the reciprocating movement of the stencil, it is preferred to employ an arrangement such as schematically illustrated in Fig. 5. In this figure the supply of ink or printing medium 33 is contained in a suitable container 34 which may be mounted at any convenient point near the machine. If desired, the container 34 may be mounted above the level of the printing reservoir in order to take advantage of the weight of the printing medium itself. However, it will be understood that this is not necessary, and that the container 34 may be mounted even below the level of the ink in the printing reservoir. In either case member 34 is provided with a reciprocating plunger 35 which is coupled by any suitable linking mechanism such as the flexible chain 36 and pulley 37 to an arm or other element (not shown) which is operated in timed relation with the reciprocating movement of the chase 3. Inasmuch as the mechanism for reciprocating the chase 3 is well known in the art, the manner of coupling the chain 36 as above mentioned will be obvious,

and further description thereof is not believed necessary. Suffice it to say, however, that the link mechanism between the plunger 35 and the operating mechanism for chase 3 is such that when the chase moves towards the right (Fig. 1) the plunger 35 is allowed to descend, thus subjecting the ink supply to the required pressure, and conversely, when the chase is moving towards the left (Fig. 2) the plunger 35 is raised and creates a corresponding suction within the chamber 34. The chamber 34 may be provided with any suitable valve 38 to cut off the supply of ink when such may be desired for any purpose such as cleaning the stencil, reservoir, etc.

Referring more particularly to Fig. 4, there is shown in detail the manner in which the ink carriage 5 is guided through and runs in the open ended chase 3. From this figure it will be seen that the chase 3 has attached thereto an open ended frame made up of horizontal flanges 39 and vertical flanges 39^a against which the sets of rollers 8 and 9 of the frame 5 bear. In order to attach the frame to the bed 2 of any standard press said frame is provided with a flanged cross piece 40 which is attached to the chase 3 by means of screws 40^a.

Rigidly fastened in the horizontal flange portions 39 are sets of centering pins 41 for accurately locating the stencil frame with respect to the press-bed. While a set of four pins is shown in the drawings, it will be understood that a greater or lesser number may be employed. The pins 41 are adapted to register with corresponding openings in the stencil frame which will now be described.

As shown more clearly in Figs. 4 and 6, the stencil 17 is preferably in the form of a sheet of silk, gauze or other finely woven material which is stretched across a rectangular frame comprising the wooden strips 42, 43 and 44, to which the stencil 17 may be fastened in any suitable manner, as by tacks 45, or if desired, the stencil may be fastened to the frame portions 42, 43 and 44. The frame members 42, 43 and 44 are rigidly attached to a corresponding metal frame comprising the horizontal flanges 46 and the vertical flanges 47; thus there is provided what may be termed an open-ended stencil frame, and in order to give the frame the necessary lateral rigidity the front end thereof is provided with a tie member comprising a pair of metal strips 48 and 49 between which is placed a strip of wood 50, the three strips being united to form a single member by means of suitable screws or bolts 51. The purpose of providing the wood insert 50 is to enable the stencil 17 to be tacked or otherwise fastened to the front of the frame, and at the same time the metal strips 48 and 49 render the stencil frame laterally rigid. While this form of tie rod is preferred, it will be understood that any other equivalent manner of uniting the open ends of the stencil frame may be provided. Thus the stencil 17 may be clamped between two strips that are adapted to be fastened across the frame in any suitable manner. The frame with the stencil thus attached thereto is positioned over and around the vertical flanges 40 and the horizontal flanges 46 of the stencil frame rest upon the corresponding horizontal flanges 39 of the chase frame, it being understood that the pins 41 in the chase frame register with the corresponding openings 52 of the stencil frame.

Referring to Fig. 10 there is shown a modified manner of conducting and distributing the ink or printing medium to the ink box. The conduit 30 instead of leading directly to the ink box is adapted to be coupled to a "flared" multiple conduit comprising a tapered metal member 53 having a flat bottom, and a tapered corrugated metal member 54, the lower faces of the corrugations resting upon the member 53 to provide a plurality of separate conducting channels for distributing the ink uniformly throughout the length of the ink box. A rubber gasket 55 is provided between the edges of members 53 and 54 to prevent the ink leaking, it being understood that the members 53 and 54 are fastened together in any convenient manner so that the corrugated top 54 may be readily removed for cleaning. If desired, the ink box may be formed integrally or as an extension of the member 53 as indicated in Fig. 10. This method of distributing the ink within the ink box is highly important where thick or heavy ink or paint is employed and results in a more uniform feed to the face of the stencil.

Method of operation

With the foregoing detail description in mind it is believed that the method of operation will now be clear. The receiving surface upon which the design, print or other marking is to be impressed is wrapped around the platen 4, and held thereon in any suitable manner, said platen being in its uppermost position as indicated in Fig. 1, and the chase 3 being in its extreme forward position as in Fig. 1. The appropriate stencil having the desired markings thereon and being mounted on a frame, as hereinabove described is set in place on the chase and the power turned on. The stop screw 11 will have been previously adjusted so that when the chase 3 moves towards the right and the stop screw 11 engages the member 12 the stencil is in registry with the proper portion of the surface of the platen 4, and upon further movement of the chase 3 and the platen 4, the ink reservoir and squeegee 16 are stationary while the stencil and chase continue to move toward the right. As the platen engages the straight edge of the squeegee it places an additional slight pressure on the stencil surface

causing the same to be slightly depressed where it engages the straight edge of the squeegee. As a result of this slight depression ink is forced by dragging or rubbing action, out of the reservoir and through the stencil onto the receiving surface of platen 4. The platen and stencil moving at the same velocity there is pull or drag exerted on the silk stencil.

The ink is forced through the stencil in what may be termed sharply defined successive linear strips, the sharpness of definition being produced by the exceedingly slight deformation of the stencil surface and the resiliency of the straight edge of member 16. As the stencil continues to move toward the right, the tapered upper edge of the resilient strip 25 being in light contact with the stencil surface, removes the ink therefrom and returns it to the reservoir. When the chase reaches its extreme rear position as indicated in Fig. 2, the platen 4 begins to rise and thereupon the stencil is returned to its original forward position. As the stencil is thus being returned, the plunger 35 is caused to rise as hereinabove described, creating a suction on the ink column and thus preventing any ink being accidently forced through the stencil.

When the different colors are to be printed, it will be obvious that a corresponding stencil will be employed for each color and that different color ink will be employed in the reservoir. Furthermore, it will be understood that the reservoir may be divided laterally into two or more separate sections each connected to a different color ink supply, and that consequently the printing may be effected simultaneously in a plurality of colors.

While specific apparatus and methods of operation have been disclosed herein, it will be understood that the invention is not limited thereto. Thus instead of employing a rotary platen any other type of platen may be employed. Similarly instead of reciprocating the stencil and employing a stationary squeegee, it will be understood that the stencil may be stationary and the squeegee move beneath the surface of the stencil, so long as the engagement of the squeegee with the platen causes ink to be forced upwardly through the stencil onto the receiving surface. Furthermore, while a printing press of the horizontal bed type is shown in the drawings, it will be understood that the broad features of the invention are applicable to other types of presses. For example, an inclined bed or even a vertical bed may be employed, so long as the ink supply is under pressure and the ink is normally maintained under just sufficient pressure against the surface of the stencil to prevent it flowing therethrough and the actual forcing of ink therethrough is produced by the relative movement between a resilient straight edge and the face of the stencil.

Other details may be changed without departing from the spirit and scope of the invention. Thus instead of employing a single prismatic member 16 mounted between the walls of the reservoir and in addition employing flexible strips 25 it will be understood that a pair of members similar to member 16 but spaced apart may be employed for the successive function of forcing ink through the stencil and of cleaning the stencil after the printing is effected.

Furthermore, while a square shaped member 16 is shown, it will be understood that a resilient member having any other desired cross section may be employed so long as a resilient straight edge is presented in contact with the lower face of the stencil.

Furthermore, while a chase having one end open and a stencil frame having one end open is shown, it will be understood that both ends of either the stencil frame or of the chase may be open if desired.

Other changes and modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. The method of printing which comprises supplying a flowable printing medium beneath a printing blank and forcing said medium through said blank onto a receiving surface in successive linear strips.

2. The method according to claim 1 in which the medium is forced through the blank in an upward direction.

3. The method of printing which comprises feeding a liquid printing medium to the lower face of a printing blank, positioning a receiving surface in contact with the upper face of said blank, and applying pressure to successive linear strips of said blank to force the printing medium therethrough onto said surface.

4. The method of printing which comprises feeding a supply of printing medium under pressure to the lower face of a porous stencil and producing relative movement between a straight edged member and the lower face of the stencil to cause an accurately defined quantity of printing medium to be forced through said stencil onto a receiving surface.

5. The method of printing which comprises forcing a quantity of a flowable printing medium upwardly against the face of a porous stencil, adjusting the pressure on said medium to maintain it in light contact with the face of said stencil without being forced through the pores thereof, and producing relative movement between a resilient edged member and the face of said stencil to force the printing medium therethrough.

6. The method of printing which comprises positioning an ink reservoir beneath a porous stencil, producing relative movement between said reservoir and the surface of said

stencil at the same time keeping the surface of the ink in light contact with said stencil, and subjecting said stencil to an additional pressure at the printing point to force ink from said reservoir through said stencil onto a receiving surface.

7. The method of printing which comprises positioning a reservoir containing a flowable printing medium beneath a porous stencil, and forcing the medium from said reservoir upwardly through said stencil in successive sharply defined linear strips.

8. The method of printing which comprises positioning a porous stencil between a receiving surface and a moving ink supply, and forcing ink upwardly from said supply through said stencil onto said receiving surface.

9. The method according to claim 8 in which the stencil is reciprocated and the receiving surface is brought into contact with said stencil in sharply defined linear strips.

10. The method according to claim 8 in which the ink supply and stencil are subjected to relative displacements during printing.

11. The method of printing which comprises positioning a column of printing medium beneath a porous stencil and moving a stencil above and in contact with a resilient straight edge to force a limited quantity of printing medium upwardly through the stencil.

12. The method according to claim 11 in which the column of printing medium is normally forced into light contact with the underface of the stencil, and the movement of the stencil in contact with the straight edge serves to force the printing medium through the pores of the stencil.

13. In a machine of the character described the combination of a printing blank, a quantity of printing medium, and means for feeding said printing medium upwardly through the printing blank in successive linear strips.

14. In a machine of the character described the combination of a printing blank, a column of printing medium, means for maintaining said medium in light contact with the undersurface of said stencil, and means for forcing said medium through said printing blank.

15. In a machine of the character described the combination of a stencil, an ink reservoir mounted beneath said stencil, and means for feeding ink from said reservoir upwardly to said stencil in successive linear strips.

16. In a machine of the character described the combination of a stencil, an ink reservoir mounted beneath said stencil, means for maintaining the ink in said reservoir normally in light contact with the underface of said stencil, and means for producing relative displacements between said reservoir and the underface of said stencil.

17. In a machine of the character described the combination of a porous stencil, an ink reservoir mounted beneath said stencil, means for maintaining the ink in said reservoir normally in light contact with the underface of said stencil, and means for reciprocating said stencil across said reservoir.

18. In a machine of the character described the combination of an open ended chase, a frame adapted to pass through the open end of said chase, and an ink reservoir carried by said frame.

19. In a machine of the character described an open-ended chase, a porous stencil supported on said chase, a frame adapted to pass through the open end of said chase and beneath said stencil.

20. In a machine of the character described the combination of an open-ended chase, a porous stencil mounted in said chase, an ink reservoir supported by said chase beneath said stencil, and means for producing relative movement between said stencil and said ink reservoir.

21. A machine according to claim 20 in which the ink reservoir is provided with means for maintaining the ink therein under pressure.

22. In a machine of the character described the combination of a chase, a stencil supported in spaced relation from said chase, an ink reservoir mounted for sliding movement in the space between said stencil and chase, means for moving said stencil relatively to said reservoir, and means responsive to said movement for forcing ink from said reservoir upwardly through said stencil.

23. A machine according to claim 22 in which the means for forcing the ink upwardly through the stencil includes a resilient straight edged member mounted beneath the stencil.

24. In a machine of the character described the combination of an open-ended chase, a printing platen, an ink reservoir mounted for movement on said chase, and means for forcing ink from said reservoir upwardly towards said platen.

25. In a machine of the character described the combination of an open-ended chase, a frame mounted for movement within said chase, an ink box carried by said frame, and means for supplying ink under pressure to said ink box.

26. A machine according to claim 25 in which the ink box is provided with walls of resilient material, one of said walls having a tapered upper edge and adapted to contact with a stencil to remove excess ink therefrom and to return it to the ink box.

27. In a machine of the character described the combination of a chase, an ink reservoir mounted for movement on said chase, a printing platen cooperating with said chase, means for bringing said reservoir into accurate printing registry with said platen, and means

for moving said chase without changing the registry between said reservoir and platen.

28. In a machine of the character described the combination of a printing platen, a chase, an ink reservoir carriage mounted for movement on said chase, means for moving both said carriage and chase during the initial movement to bring said reservoir in printing registry with said platen, means thereupon effective to stop further movement of said reservoir without stopping the movement of said chase.

29. In a machine of the character described the combination of a chase adapted to be moved back and forth on a printing bed, an ink reservoir carried by said chase, and means for alternately increasing and decreasing the pressure on the ink in said reservoir.

30. A machine according to claim 29 in which the pressure on the ink is alternated in synchronism with the movement of said chase.

31. A machine according to claim 29 in which the pressure on the ink is increased during the forward movement of the chase and is decreased during the backward movement of the chase.

32. In a machine of the character described, the combination of an open-ended chase, a porous stencil carried by said chase, an ink reservoir beneath said stencil, and a rotary platen above said stencil.

33. An ink-box for machines of the character described comprising a container portion having a resilient strip attached to a wall thereof to serve as removing means for excess ink on a stencil, and to return said excess ink to the ink-box.

34. In a machine of the character described an ink-box having resilient strips attached to opposite walls thereof to serve as a bridging support for a porous stencil, and means mounted within said box between said strips and serving to force ink upwardly through the stencil when the same contacts with a printing platen.

35. A machine according to claim 34 in which the ink forcing means includes a prismatic member of resilient material.

36. An ink-box for machines of the character described having a prismatic member of resilient material removably mounted in the side walls thereof.

37. An ink-box according to claim 36 in which the means for removably mounting the prismatic member includes a pair of notched arms pivotally attached to the side walls of said box.

38. In a machine of the character described the combination of an open ended chase, an ink-supply carriage adapted to pass through the open end of said chase, said carriage having roller bearings.

39. In a machine of the character described the combination of an open-ended chase, a plurality of centering pins carried by said chase, and a stencil frame having openings adapted to register with said pins.

40. A stencil frame comprising two side members, an end member, the other end of said frame being open to receive a moving ink carriage.

41. A stencil frame according to claim 40 in which the end and side members comprise wooden strips backed by metal strips.

42. In a mechanism of the class described the combination of a box for containing a limited supply of printing medium, a conduit leading to said box, and means between said conduit and box for distributing the medium uniformly within said box.

In testimony whereof I have hereunto set my hand on this 25th day of March A. D., 1930.

WILLIAM R. RESPESS.