

July 13, 1926.

1,592,440

E. J. BRASSEUR
DUPLICATING MACHINE

Filed March 16, 1926

3 Sheets-Sheet 1

Fig. 1.

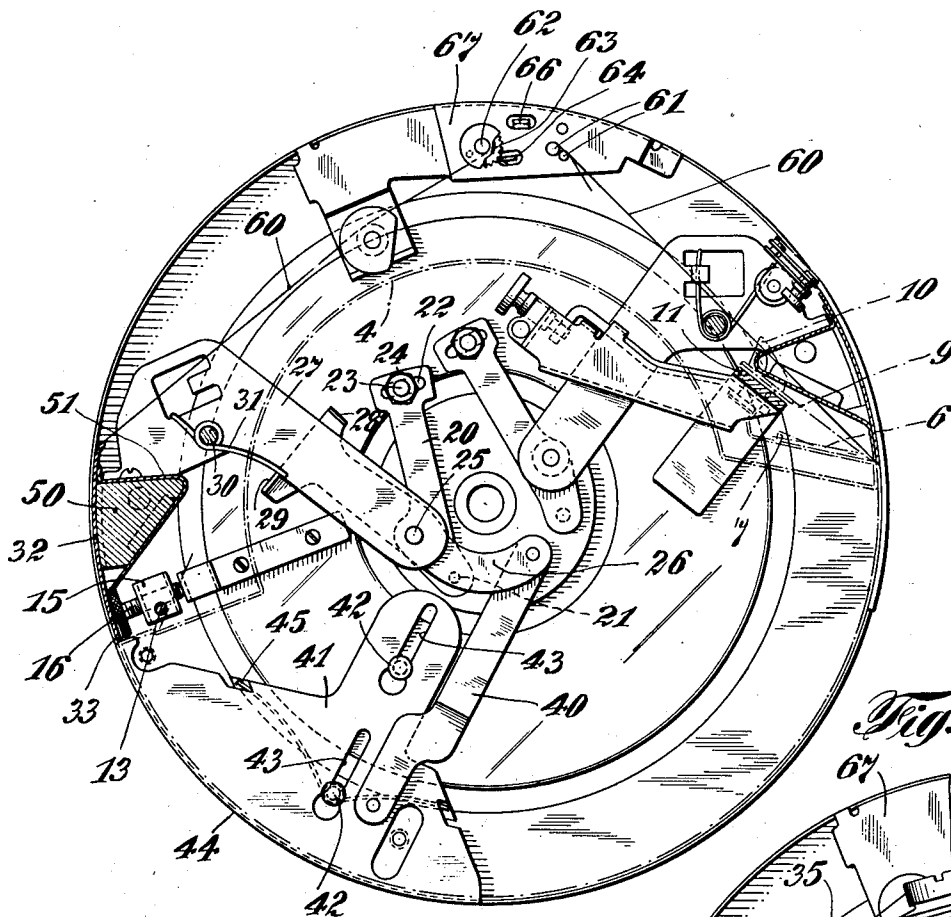


Fig. 2.

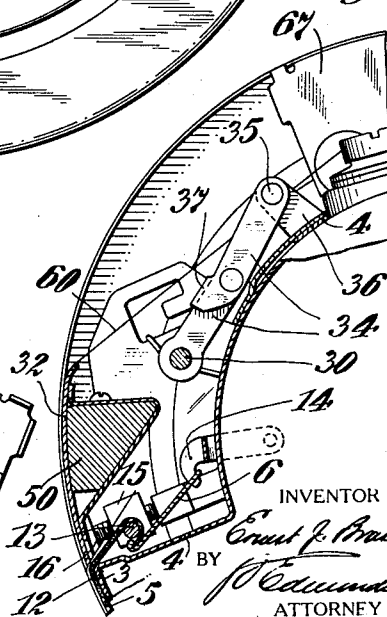
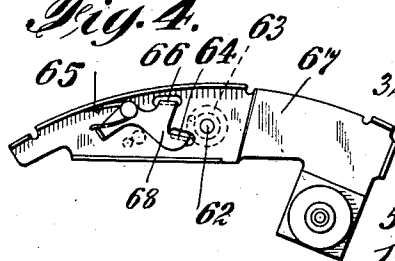


Fig. 4.



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3 Sheets-Sheet 2

Fig. 3.

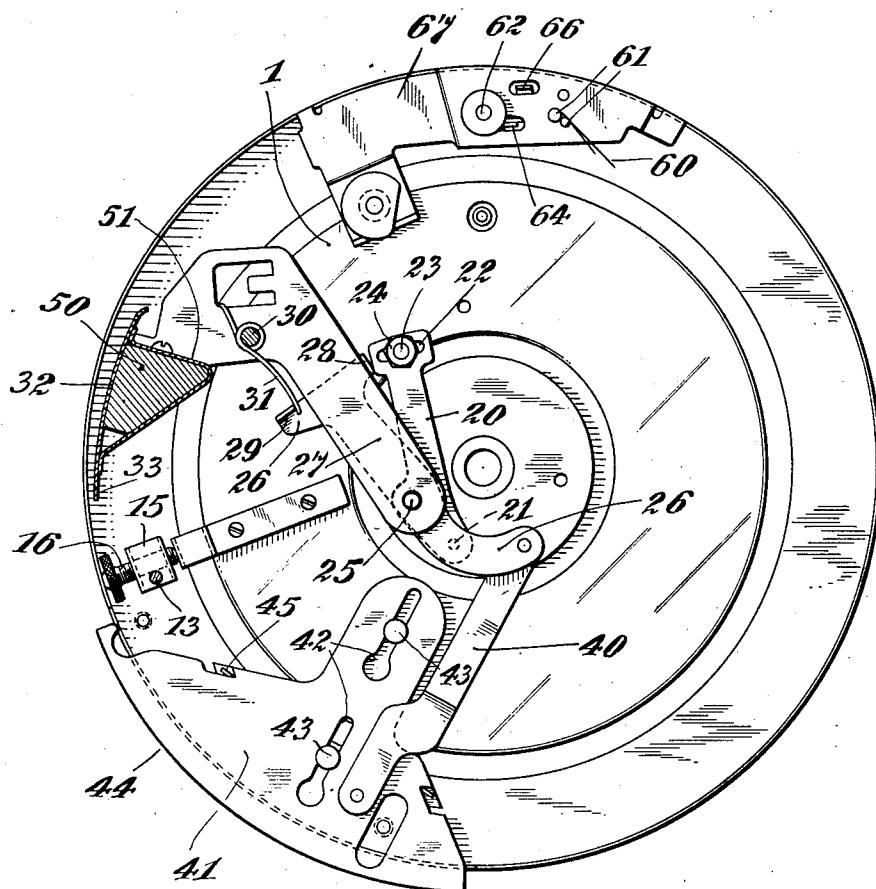
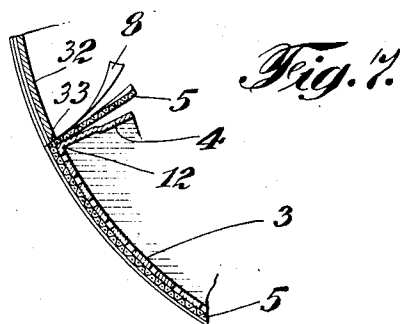


Fig. 4.

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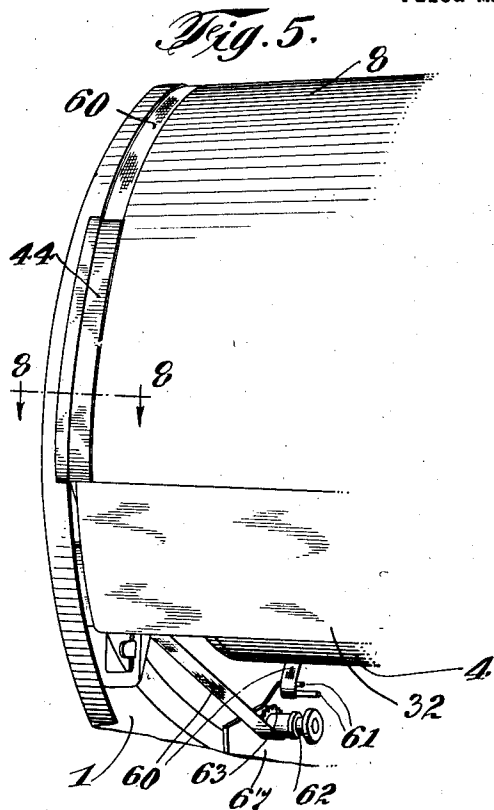
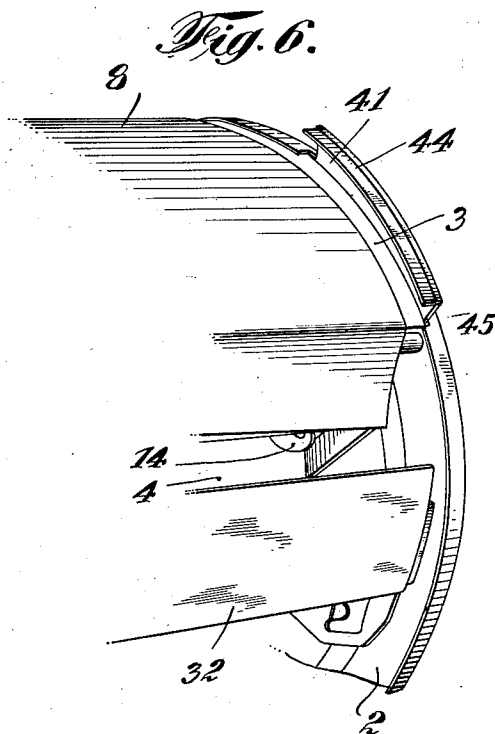
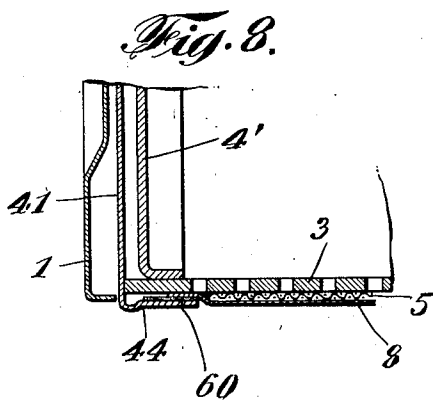
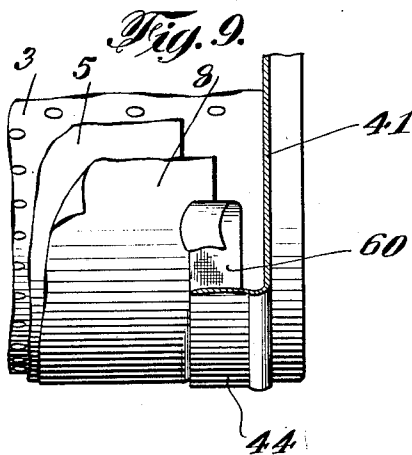
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DUPPLICATING MACHINE

Filed March 16, 1926

3 Sheets-Sheet 3



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Patented July 13, 1926.

1,592,440

UNITED STATES PATENT OFFICE.

ERNEST J. BRASSEUR, OF CHICAGO, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DUPLICATING MACHINE.

Application filed March 16, 1926. Serial No. 95,030.

This invention relates to duplicating machines, and more particularly relates to stencil duplicating machines of the rotary type.

In an application filed by me October 3, 1925, for rotary stencil duplicating machines, Serial No. 60,158, I have disclosed an ink pad provided at each end with a metal plate provided with perforations, and a rotatable drum or cylinder which is provided with means for holding this pad on the cylinder, and also provided with means for clamping a stencil sheet on the cylinder over the ink pad.

When a print is made, an impression roller presses the sheet to be printed upwardly against the revolving stencil sheet. This pressure of the impression roller when rolling over the stencil and ink pad tends to cause an accumulation of ink between the pad and the stencil at the bottom or trailing ends. If the stencil is not clamped tightly at the end of the printing space, this accumulated ink is apt to work its way out at the extreme end of the stencil and to drip therefrom. If the bottom of the stencil is so tightly clamped against the ink pad that no ink can work its way out at this end, the ink, nevertheless, will find its way out at the sides of the stencil, unless the sides of the stencil are also sealed to the diaphragm. Any ink thus finding its way out from between the ink pad and stencil will dirty the machine and is apt to get onto the work, with the result that frequent cleaning of the machine is necessitated.

This invention differs from my said prior application in that it includes the provision of improved means for clamping the stencil sheet and ink pad about one inch above the extreme bottom edge, between the end of the perforated diaphragm and a movable clamp so tightly that no ink will find its way out, and means for clamping the side edges of the stencil sheet part way up from said movable clamp with an arcuate flange held tightly against the surface of the perforated diaphragm, thereby sealing the pad edges.

Beside the possibility of leakage from the accumulation of ink between the stencil and the ink pad, there is also the possibility of leakage between the ink pad and diaphragm. This invention also contemplates the sealing of the side edges of the stencil sheet for their entire length on the dia-

phragm so as to prevent leakage between the side edges of the ink pad, diaphragm and stencil.

Accordingly, the principal objects of this invention include the provision in a rotary duplicating machine of means for preventing ink from exuding past the bottom and side edges of the stencil sheet, and for causing any accumulation of ink between the pad and the stencil to be returned inside of the cylinder. A further object of this invention is to provide stencil attachment means which insures a clean and inkless margin along the bottom edge of the stencil sheet, so that the stencil sheet may be grasped at this end for handling, without grasping a dirty or inked portion of the sheet. A further object of this invention is to provide simple, durable and easily operable mechanism for accomplishing said objects. Other objects of this invention will be in part obvious and in part pointed out hereinafter.

The stencil clamping mechanism is particularly well suited for association with a stencil duplicating machine drum of the character disclosed in my said prior application, wherein the drum carries a perforated diaphragm, behind which is a sealed ink compartment, the ink pad and stencil being carried over this diaphragm and ink being flowed upon the inside of the diaphragm so as to permeate the ink pad for delivery through the stencil onto the work. In accordance with the present invention, I provide a clamp mechanism for clamping the stencil sheet near its bottom edge so tightly against the ink pad and diaphragm that no ink will find its way past the line of clamping during the operation of the machine. I also provide clamp mechanism for clamping the side edges of the stencil sheet so tightly against the diaphragm that no ink can pass beyond these clamped portions. I provide means whereby these clamping mechanisms may be adjusted readily and easily into clamping position and out of clamping position to permit the ready removal or replacement of stencil sheet or ink pad. I preferably provide a single manual member whereby these clamping mechanisms may be adjusted simultaneously and in unison. I also preferably provide means whereby the clamping mechanisms may be adjusted to vary the clamping action. Also, but option-

ally, I provide means for clamping the side edges of the stencil sheet for their entire length so tightly against the diaphragm that no ink can pass out.

5 In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings, forming a part of this application and illustrating certain possible embodiments of my invention. Referring to the drawings, 10 Fig. 1 is a view of the inner side of one of the cylinder walls, showing the improved clamping mechanism mounted thereon, certain parts being shown in section; Fig. 2 15 is a sectional view of a fragment of the stencil drum, showing the manual member for operating the clamping mechanisms; Fig. 3 is similar to a portion of Fig. 1, but shows the clamping mechanisms in released positions; Fig. 4 is a view showing the reverse 20 side of the clamping strip tensioning member from that shown in Fig. 1; Fig. 5 is a diagrammatical perspective view of a fragment of the cylinder, showing the stencil sheet clamped upon the cylinder; Fig. 6 is 25 a diagrammatical perspective view of a fragment of the cylinder, showing a stencil sheet unclamped thereon; Fig. 7 is an enlarged sectional detail of a fragment of the construction, showing the manner in which 30 the bottom of the stencil sheet and ink pad is clamped against the diaphragm; Fig. 8 is an enlarged sectional view of a detail, showing the manner in which the side edges 35 of the stencil sheet are clamped against the diaphragm; and Fig. 9 is a fragmentary view, partly in section and partly broken away, showing the relative location of a side clamp, sealing strip, stencil sheet, ink 40 pad and diaphragm. Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring to the drawings, the drum includes side walls 1 and 2, to which is sealed 45 the perforated diaphragm 3 and arch member 4 which forms a sealed ink compartment behind the diaphragm. The ink pad comprises a strip of suitable fabric 5, to each end of which is attached a metal plate 6 50 provided with perforations. This ink pad covers the diaphragm 3, and at its leading end is secured to the cylinder by placing the perforations in its end plate 6 into engagement with suitable hooks 7 carried on the 55 cylinder. The stencil sheet 8 is placed over the ink pad so as to cover the same, and its stub 9 is placed in engagement with suitable hooks or buttons 10 supported on a cross bar 11, which is carried on the cylinder. This 60 portion of the mechanism is not made the subject-matter of this application. The bottom edges of the ink pad and stencil sheet extend beyond the bottom end of the diaphragm 3, which is shouldered at this end, 65 as at 12. The fabric at this end of the ink

pad is turned around a rod 13 which extends between the side walls of the cylinder, and the end plate 6 of the pad is engaged at one end beneath this rod, and its perforations are engaged on hooks 14 carried on the cylinder, whereby the ink pad is held tightly 70 stretched over the diaphragm. The rod 13 is supported at each end in a bracket 15, which is in threaded engagement with a screw 16, which is rotatably held in fixed 75 position on each cylinder wall, so that the rod 13 can be raised and lowered by turning these screws, whereby slack in the ink pad may be taken up and whereby it may be stretched tightly over the diaphragm. Rod 80 13 is inside of the periphery of the cylinder, so that the ink pad will bend over the diaphragm shoulder 12. The stencil sheet also bends over the shoulder 12 of the diaphragm. The shoulder 12 should be formed 85 as near as possible to the last row of holes in the diaphragm.

An adjusting lever 20 is pinned, as at 21, to each side wall of the cylinder. Each lever 90 has a slot 22 through which engages a screw 23 secured to the cylinder, whereby each lever may be locked in adjusted position by means of a nut 24. Each lever has a pin 25, on which is pivoted a lever 26 and a 95 clamp arm 27. One end of lever 26 is provided with projections 28 and 29, which confine the arm 27 therebetween. A rod 30 extends between the clamp arms 27, and on each end of this rod is a spring 31 which 100 engages the arm 27 and the projection 29 of lever 26 for a purpose which will be brought out hereinafter. A clamp plate 32, attached at each end to the arms 27, extends across the cylinder, and is so positioned 105 that its forward edge 33 may be brought tightly against the shoulder 12 of the diaphragm 3 to clamp the stencil sheet and ink pad tightly thereagainst. A toggle link 34 is pivoted at one end to rod 30 and at its 110 other end to a pin 35 carried on a bracket or lug 36 secured to the compartment wall 4. This toggle link has a finger portion 37, whereby the toggle may be collapsed to draw the rod 30 and the clamp arms 27, 115 carrying the clamp plate 32, away from the diaphragm 3, and whereby the toggle may be extended to force the edge 33 of the clamp plate 32 tightly against the diaphragm shoulder. Preferably, when the toggle is fully extended, the rod 30 is bent 120 to resiliently maintain clamping action of the clamp 32 against the diaphragm.

The other end of each lever 26 is pivoted to one end of a link 40, which, in turn, is 125 pivoted to a side clamp member 41 slidably retained on each cylinder wall by means of headed pins 42, which engage through key-hole slots 43 in these side clamp plates 41. Each side clamp plate has an arcuate flange 130 or portion 44, which is in alignment over

the side edge of the stencil sheet and diaphragm for a space directly rearwardly of the diaphragm shoulder 12. The peripheral flanges of the cylinder side walls are recessed, as at 45, to permit the insertion of these side clamps between the outer cylinder walls and the side walls 4' of the sealed ink compartment behind the diaphragm. It will be readily apparent that when the clamp arms 27 are retracted, they will engage the projection 28 of lever 26 and cause the side clamps 41 to move outwardly of the cylinder, thus raising the clamping portions 44 away from the stencil sheet and diaphragm. When the clamp arms 27 are moved toward the diaphragm, as by extending toggle 34, these arms will engage the projections 29 of lever 26 and cause the clamps 41 to move into the cylinder and to bring the clamping portions 44 tightly against the stencil sheet and diaphragm, thus clamping the engaged portions of the stencil sheet so tightly against the diaphragm that no ink can pass outwardly therebetween. The springs 31 aforementioned apply supplementary pressure on the clamping segments 41.

Each segment clamp 41 is also engaged by a spring 45, which is mounted on one of the studs 42 so that the segment clamps will close against spring pressure.

Preferably, a casting 50 is secured to the under-surface of the clamp plate 32, and is positioned within a U-shaped member 51, which is fastened to the underside of plate 32. When the clamp is actuated into closed position, the momentum of this counterweight is eased by the pressure of the springs. The springs 45 are balanced to this counterweight, and when the segment clamps 41 are at rest on the diaphragm, the space between the projections 28 and 29 allow each segment 41 to seat independently at a time when the clamp plate 32 is not quite fully closed. The final closing movement of the clamp plate 32 imposes the pressure of springs 31 as a supplementary closing pressure on the segments 41. This construction permits the clamp 32 to be opened and to have it stay open, and if, by chance, the operator should forget to close the clamps and begin to operate the machine, the counterweight 50 will impart motion to the segments 41 to close them beyond interference with any part of the machine.

In addition to thus sealing the bottom and side edges of the stencil sheet and ink pad against the passage of ink, the edges may be sealed further for their entire length by means of strips 60 of any suitable material, which at one end may be anchored between two pins 61 carried on each cylinder wall, then placed over the edge of the stencil sheet underneath the segment clamp flange 44, over the clamp plate 32, and engaged on a

tensioning shaft or button 62, whereby the strip may be tightened so as to press tightly downwardly upon the engaged stencil edge to prevent ink from passing outwardly underneath the clamped portion. The tensioning screw 62 is preferably provided with a knurled button or disk 63, which is engaged by a suitable pawl 64, which is pressed into engagement with the disk 63 by means of a suitable spring 65. If desired, the pawl device 68 may be provided with a finger portion 66, whereby the ratchet may be withdrawn from the knurled disk 63 and the tensioning shaft 62 turned to unwind the strip 60 and permit its removal from the machine. Preferably, the said means for positioning and tightening the binding strips on the machine are mounted on separate insert members 67, which are adapted to be secured to the cylinder walls.

It is believed that the operation of the apparatus is apparent from the foregoing. To secure a stencil on the machine, its stub is first engaged in the ordinary manner and the stencil carefully laid over the ink pad. The side binding strips 60 may then be applied and tensioned in the manner aforesaid, and then, by merely extending the toggle link 34 by manipulating the manual member 37, the end clamp 32 and the side clamps 44 are brought so tightly into engagement with the stencil sheet and diaphragm that no ink can find its way outside of the clamped portions. Any ink which tends to accumulate at the bottom edge of the stencil sheet between it and the ink pad will be forced through the ink pad and diaphragm holes into the interior of the cylinder. The clamping action at the bottom of the sheet is such that there will be a clean margin at the bottom of the sheet which is free of dirt and ink, so that the operator may grasp this end of the sheet without dirtying his fingers or being obliged to take hold of a surface on which there is ink, as has been necessary heretofore.

As many changes could be made in the above construction and as many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

When the machine is idle, a protective covering sheet may be substituted for or placed over the stencil, and clamped to the cylinder.

What I claim is:—

1. In an apparatus of the character described, the combination with a rotatable drum having a diaphragm, an ink pad over the diaphragm and a stencil sheet over the ink pad, of means for pressing the stencil

sheet and ink pad near their bottom ends so tightly against the diaphragm that no ink may pass between the stencil sheet and ink pad where they are so pressed against the diaphragm.

2. In an apparatus of the character described, the combination with a rotatable drum having a diaphragm, an ink pad over the diaphragm and a stencil sheet over the ink pad, of means for pressing the stencil sheet at its side edges so tightly against the diaphragm that no ink may pass beyond the edges of the stencil sheet where they are so pressed against the diaphragm.

3. In an apparatus of the character described, the combination with a rotatable drum having a diaphragm, an ink pad over the diaphragm and a stencil sheet over the ink pad, of mechanism, disposed across the stencil sheet and ink pad at the bottom ends thereof and over the stencil sheet along the side edges thereof, for pressing the stencil sheet and ink pad across their bottom portions, and portions of the side edges of the stencil sheet, so tightly against the diaphragm that no ink can pass beyond the said portions when pressed against the diaphragm.

4. In an apparatus of the character described, the combination with a rotatable drum having a diaphragm, an ink pad over the diaphragm and a stencil sheet over the ink pad, of mechanism, disposed across the stencil sheet and ink pad at the bottom ends thereof and over the stencil sheet along the side edges thereof, for pressing the stencil sheet and ink pad across their bottom portions and portions of the side edges of the stencil sheet so tightly against the diaphragm that no ink can pass beyond the said portions when pressed against the diaphragm, said mechanism being adjustable into and out of said pressing engagement with the stencil sheet.

5. In an apparatus of the character described, the combination with a rotatable drum having a diaphragm, an ink pad over the diaphragm and a stencil sheet over the ink pad, of mechanism, disposed across the stencil sheet and ink pad at the bottom ends thereof and over the stencil sheet along the side edges thereof, for pressing the stencil sheet and ink pad across their bottom portions and portions of the side edges of the stencil sheet so tightly against the diaphragm that no ink can pass beyond the said portions when pressed against the diaphragm, said mechanism being adjustable into and out of said pressing engagement with the stencil sheet, and a single manual member whereby said adjustments may be effected.

6. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon having a shouldered

bottom edge, an ink pad and a stencil sheet both superimposed on said diaphragm and having their bottom ends overlying said diaphragm shoulder, and mechanism, including a clamp plate movable edgewise against said diaphragm shoulder to clamp the stencil sheet and ink pad tightly between the diaphragm shoulder and clamp, for preventing ink from passing between said stencil sheet and ink pad where they are so clamped.

7. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon, an ink pad and a stencil sheet both superimposed on said diaphragm, and mechanism, including a clamp overlying a side edge of the stencil sheet and movable inwardly of the drum against the diaphragm to clamp the stencil sheet tightly against the diaphragm, for preventing ink from passing beyond the clamped portions of said stencil sheet.

8. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon having a shouldered bottom edge, an ink pad and a stencil sheet both superimposed on said diaphragm and having their bottom ends overlying said diaphragm shoulder, and mechanism, including a clamp plate movable edgewise against said diaphragm shoulder to clamp the bottom ends of the stencil sheet and ink pad thereagainst, and a sector clamp at each side of the drum, each over a side edge of the stencil sheet and movable inwardly of the drum against the diaphragm to clamp side portions of the stencil sheet tightly against the diaphragm, for preventing the passage of ink beyond the said clamped portions.

9. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon having a shouldered bottom edge, an ink pad and a stencil sheet both superimposed on said diaphragm and having their bottom ends overlying said diaphragm shoulder, and mechanism, including a clamp plate movable edgewise against said diaphragm shoulder to clamp the bottom ends of the stencil sheet and ink pad thereagainst, and a sector clamp at each side of the drum, each over a side edge of the stencil sheet and movable inwardly of the drum against the diaphragm to clamp side portions of the stencil sheet tightly against the diaphragm, for preventing ink from passing beyond said clamped portions of the stencil sheet and ink pad, said bottom and side clamps being movable in unison into and out of clamping position.

10. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon having a shouldered bottom edge, an ink pad and a stencil sheet both superimposed on said diaphragm and having their bottom ends overlying said di-

aphragm shoulder, mechanism, including a clamp plate movable edgewise against said diaphragm shoulder to clamp the bottom ends of the stencil sheet and ink pad there-
 5 against, and a sector clamp at each side of the drum, each over a side edge of the stencil sheet, movable inwardly of the drum against the diaphragm to clamp side portions of the stencil sheets tightly against the
 10 diaphragm, for preventing ink from passing beyond said clamped portions of the stencil sheet and ink pad, said bottom and side clamps being movable in unison into and out of clamping position, and means, in-
 15 cluding a counterweight associated with said clamp plate, whereby rotation of said drum tends to move said clamp plate toward the diaphragm and to draw said sector clamps into the drum.

20 11. In an apparatus of the character described, in combination, a rotatable drum, a diaphragm thereon having a shouldered bottom edge, an ink pad and a stencil sheet both superimposed on said diaphragm and
 25 having their bottom ends overlying said diaphragm shoulder, and mechanism, including a clamp plate movable edgewise against said diaphragm shoulder to clamp the stencil sheet and ink pad tightly between
 30 the diaphragm shoulder and clamp, for preventing ink from passing between said stencil sheet and ink pad where they are so clamped, said diaphragm having a row of holes adjacent its shoulder through which
 35 ink accumulated between the stencil sheet and ink pad may pass to the inside of the drum.

12. In an apparatus of the character described, the combination with a rotatable
 40 drum and a diaphragm thereon having a shouldered bottom edge, of a clamp plate cooperating with said shoulder of the diaphragm and a sector clamp slidably mounted at one side of the cylinder and having a
 45 clamp portion overlying a side edge of the stencil sheet, an arm secured to said clamp plate, and a lever connected with said sector clamp, said arm and lever being pivoted on a common pivot and having interlocking
 50 engagement, whereby said clamp plate and sector clamp are movable in unison toward and away from the diaphragm into and out of clamping position thereagainst.

13. In an apparatus of the character described, the combination with a rotatable
 55 drum and a diaphragm thereon having a shouldered bottom edge, of a clamp plate cooperating with said shoulder of the diaphragm and a sector clamp slidably mounted at one side of the cylinder and having a
 60 clamp portion overlying a side edge of the stencil sheet, an arm secured to said clamp plate, and a lever connected with said sector clamp, said arm and lever being pivoted
 65 on a common pivot and having interlocking

engagement, whereby said clamp plate and sector clamp are movable in unison toward and away from the diaphragm into and out of clamping position thereagainst, said interlocking engagement between said levers
 70 permitting a slight extent of relative movement therebetween, and spring means compensating for said relative movement.

14. In an apparatus of the character described, the combination with a rotatable
 75 drum and a diaphragm thereon having a shouldered bottom edge, of a clamp plate cooperating with said shoulder of the diaphragm and a sector clamp slidably mounted at one side of the cylinder and having a
 80 clamp portion overlying a side edge of the stencil sheet, an arm secured to said clamp plate, and a lever connected with said sector clamp, said arm and lever being pivoted on a common pivot and having interlocking en-
 85 gagement, whereby said clamp plate and sector clamp are movable in unison toward and away from the diaphragm into and out of clamping position thereagainst, a member secured to said cylinder for adjustment
 90 thereon, and said common pivot point of said arm and lever being mounted on this adjustable member.

15. In an apparatus of the character described, the combination with a rotatable
 95 drum having a diaphragm, and an ink pad and stencil sheet superimposed on said diaphragm, of a narrow strip of material secured to the cylinder and overlying a side edge of said stencil sheet, said strip being
 100 tightened against the diaphragm, whereby the edges of the stencil sheet are pressed against the diaphragm so tightly that no ink can pass beyond the side edges of the stencil sheet where it is so pressed against the dia-
 105 phragm.

16. In an apparatus of the character described, the combination with a rotatable
 110 drum having a diaphragm, and an ink pad and stencil sheet superimposed on said diaphragm, of a narrow strip of material secured to the cylinder and overlying a side edge of said stencil sheet, said strip being
 115 tightened against the diaphragm, whereby the edges of the stencil sheet are pressed against the diaphragm so tightly that no ink can pass beyond the side edges of the stencil sheet where it is so pressed against the diaphragm, means for anchoring one end
 120 of said strip to the cylinder, and means for anchoring the other end of the said strip to the cylinder, said last-mentioned means being adjustable to tighten said strip against the diaphragm.

17. In an apparatus of the character de-
 125 scribed, the combination with a rotatable drum having a diaphragm, and an ink pad and stencil sheet superimposed on said diaphragm, of a narrow strip of material secured to the cylinder and overlying a side
 130

edge of said stencil sheet, said strip being tightened against the diaphragm, whereby the edges of the stencil sheet are pressed against the diaphragm so tightly that no
5 ink can pass beyond the side edge of the stencil sheet where it is so pressed against the diaphragm, means for anchoring one end of said strip to the cylinder, and means for anchoring the other end of said strip to the
10 cylinder, said last-mentioned means being adjustable to tighten said strip against the diaphragm and including a rotatable shaft provided with a ratchet wheel and a spring-pressed pawl device cooperating with said
15 ratchet.

18. In an apparatus of the character de-

scribed, the combination with a rotatable drum having a diaphragm of an ink pad superimposed on the drum and having an end extending beyond the end of the dia- 20 phragm, a rigid plate secured to said end of the ink pad, means on the cylinder engaging said plate, and a rod intermediate said diaphragm end and said plate engaging means, said ink pad being folded around 25 said rod and the inner end of said plate interlocking behind said rod, said rod being adjustable on the cylinder whereby the slack in the ink pad may be taken up.

This specification signed this 6 day of 30 March, 1926.

ERNEST J. BRASSEUR.