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2,534,765

LIQUID APPLICATOR FOR DUPLICATING MACHINES

Filed May 6, 1948

4 Sheets-Sheet 1

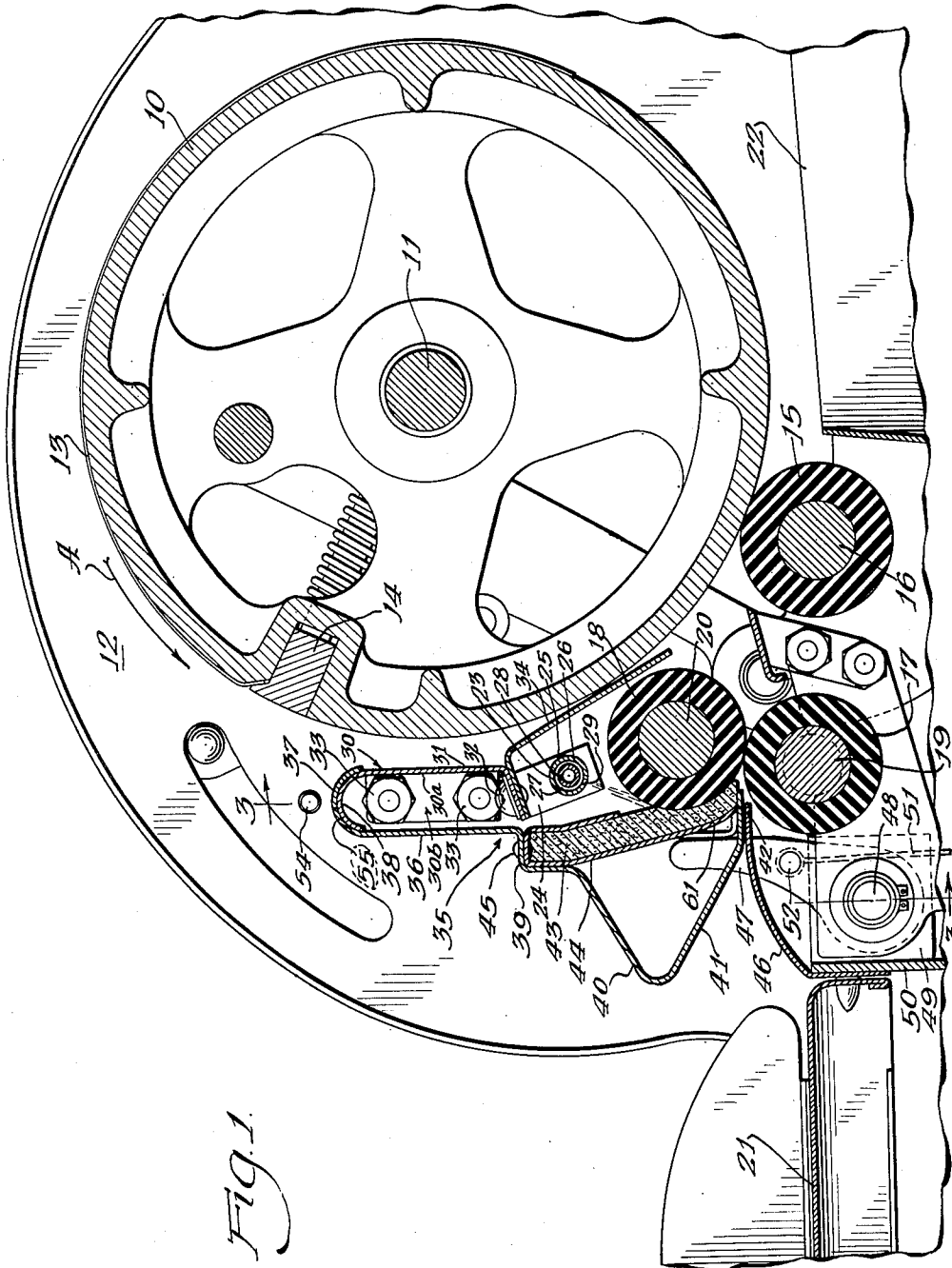


Fig. 1

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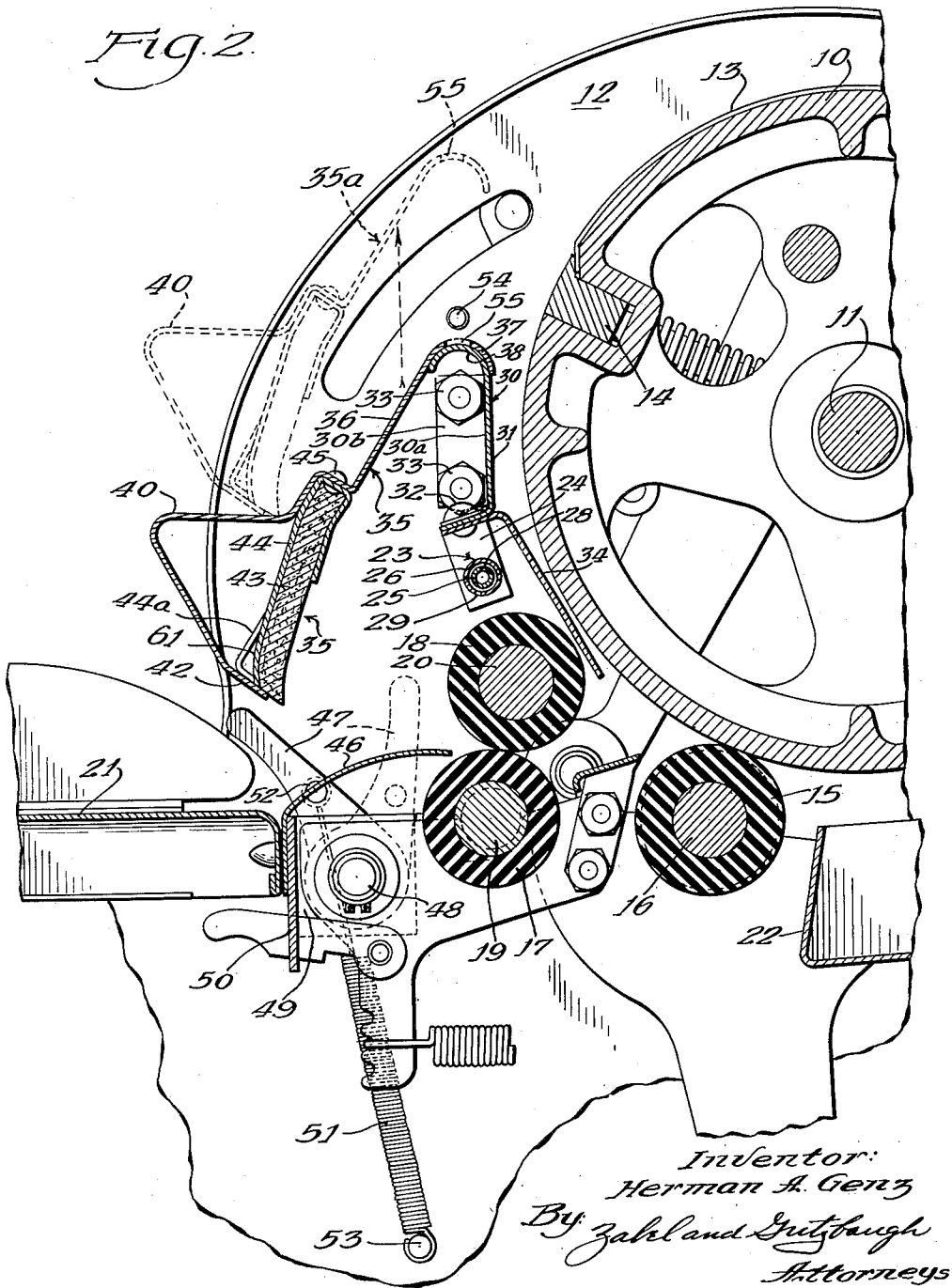
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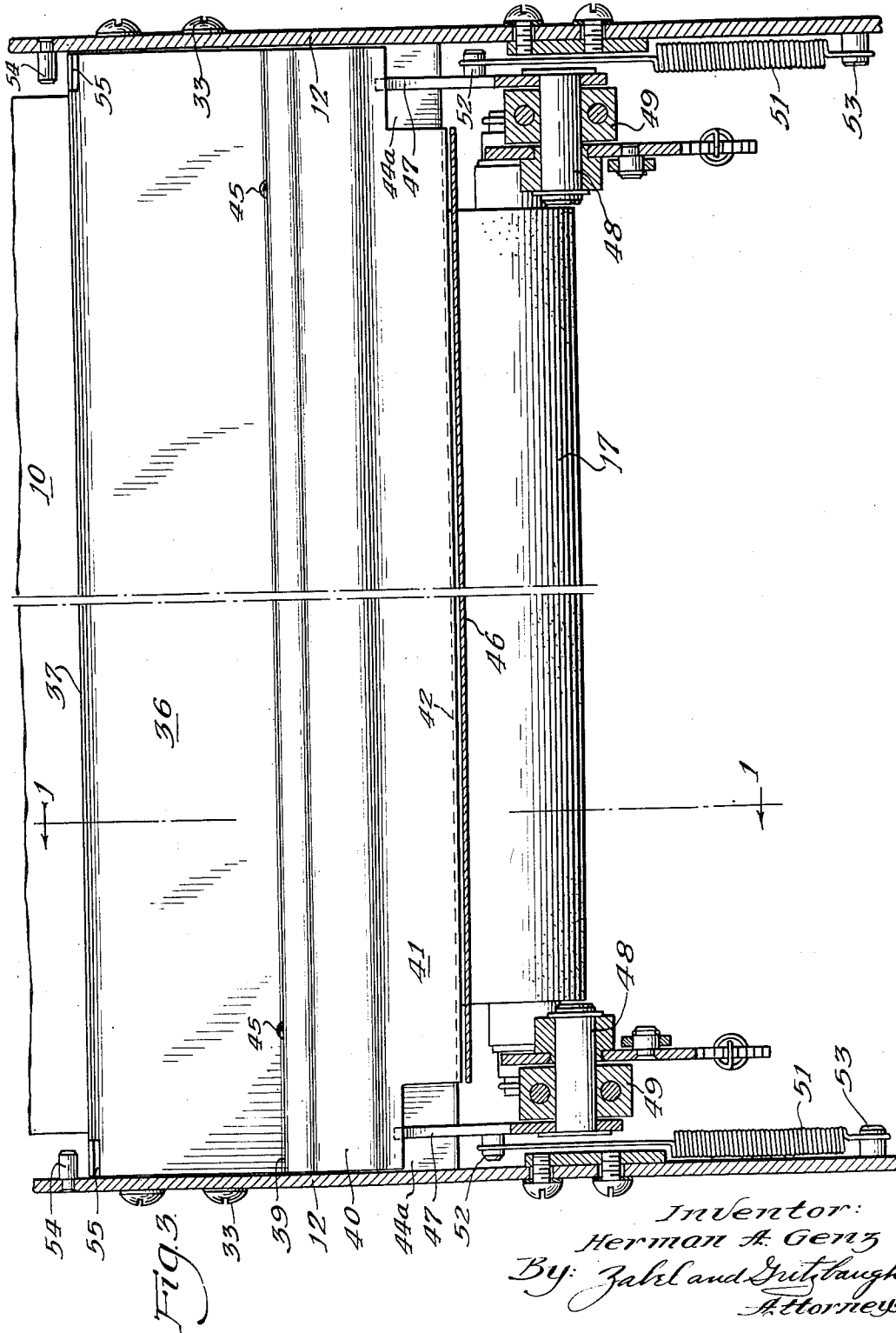
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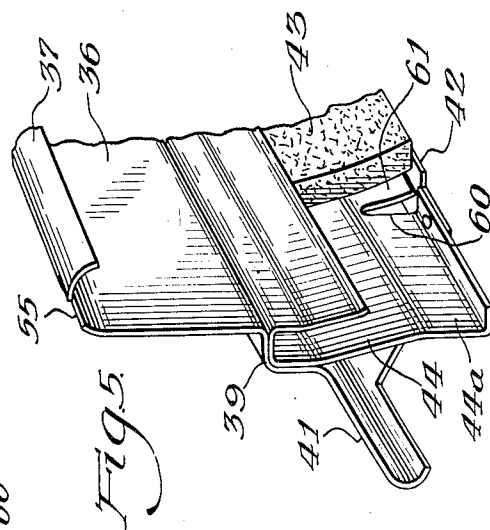
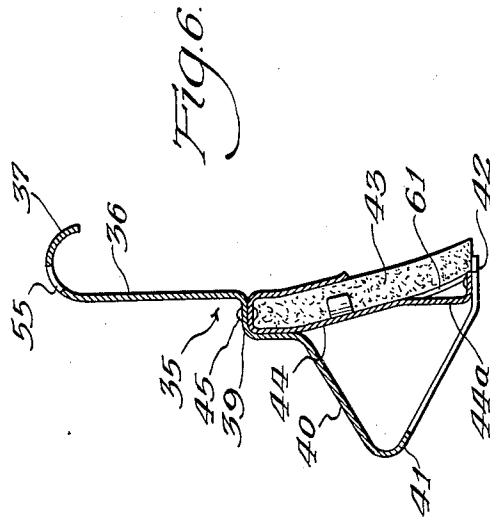
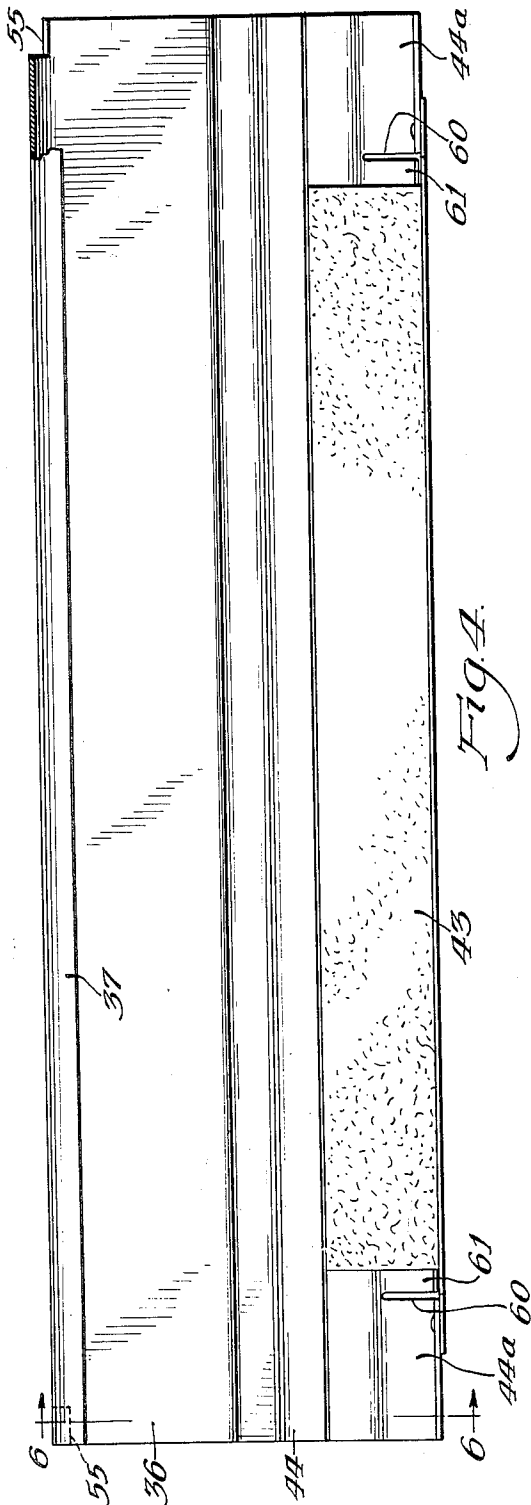
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LIQUID APPLICATOR FOR DUPLICATING MACHINES

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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LIQUID APPLICATOR FOR DUPLICATING MACHINES

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Application May 6, 1948, Serial No. 25,341

3 Claims. (Cl. 91—48)

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The present invention relates to a duplicating machine of the type that employs a moistening roller that wets the paper that is being fed to the machine drum. The drum has mounted thereon a master sheet and the moistened paper fed to the drum is brought into pressure engagement with this master sheet. This results in a transfer onto the moistened sheets of the written or printed material that is contained on the master sheet. The moistening roller operates against a moistening wick which in turn receives a supply of liquid from a fountain.

The present invention has to do primarily with the fountain and moistening wick assembly and in combination with the moistening roller. The wick normally is held firmly against the moistening roller and is arranged to be fed with moistening liquid from the fountain. In order to gain access to the moistening roller the wick assembly must be moved out of the way, but often times this results in damage to the roller and the wick unless the assembly is carefully removed.

It is an object of the present invention to provide a fountain and wick assembly in combination with a moistening roller such that the wick assembly cannot be removed from the machine without first being swung clear of the moistening roller so that while the wick assembly is being removed there is no danger of nicking or otherwise damaging the surface of the moistening roller, or causing the felt to wrinkle at its lower end.

The present invention further provides a fountain and wick assembly in combination with the moistening roller that is simple to construct and operate and yet is highly effective in performing in an efficient manner.

The foregoing constitute some of the principal objects and advantages of the present invention, others of which will become apparent from the following description and the drawings, in which

Fig. 1 is a fragmentary, vertical sectional view through a duplicating machine embodying the present invention, the view being taken along line 1—1 of Fig. 3 and showing the moistening wick assembly disposed in its operative position with the wick pressed against the moistening roller;

Fig. 2 is a view corresponding to Fig. 1 but illustrating the moistening wick assembly in position to be removed from the machine and also in its removed condition;

Fig. 3 is a vertical sectional view through the machine, the view being taken on the line 3—3 of Fig. 1;

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Fig. 4 is a front elevational view of the wick assembly 35 shown in Fig. 1;

Fig. 5 is a partial perspective view of the wick assembly shown in Fig. 4; and

Fig. 6 is a vertical sectional view through the wick assembly, the view being taken on the line 6—6 of Fig. 4.

For purposes of illustration a single embodiment of the invention has been selected, though it is recognized that many changes in this embodiment may be made without departing from the intended scope of the invention.

The present invention is applicable to a standard duplicating machine that includes a drum 10 that is mounted to rotate on a shaft 11. This shaft 11 as is customary is journaled in a pair of spaced side walls 12 (Fig. 3) of the machine and is adapted to receive on its peripheral face a master sheet 13 (Fig. 1) that is locked in place by means of a master sheet clamp 14. Mounted beneath the drum 10 is a pressure roller 15 that is adapted to rotate about a shaft 16 that is likewise journaled in a customary manner in the walls 12 of the machine. This pressure roller 15 engages the peripheral face of the drum 10 and serves to provide pressure contact against the master sheet 13 that is carried by drum 10.

Mounted in front of the pressure roller 15 is a pair of cooperating feed rollers 17 and 18 mounted respectively on shafts 19 and 20. These shafts 19 and 20 are likewise journaled on the spaced walls 12 of the machine.

Mounted at the forward end of the machine is a paper tray partially shown at 21, upon which copy sheets are initially placed for feeding between the feed rollers 17 and 18. The copy sheets are fed one at a time between these feed rollers and are in turn fed between the pressure roller 15 and drum 10, the drum being rotated in the direction of the arrow A during this operation. The copy sheets leaving the drum 10 are deposited in a discharge paper tray 22.

The roller 18 in addition to serving as a feed roller in cooperation with roller 17 also serves as a moistening roller to initially moisten the upper surface of each copy sheet as it passes between the rollers. Mounted above the moistening roller 18 is a fountain 23 that is secured to the machine by means of spaced brackets mounted on the side walls 12 of the machine, one of the brackets being shown at 24 in Fig. 1. The fountain 23 comprises an inner pipe 25 and an outer pipe 26 that is mounted concentrically about the inner pipe so as to provide an annular space or well 27 therebetween. The inner pipe 25 has a

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plurality of apertures 28 spaced lengthwise along the pipe emptying into the annular space between the inner and outer pipes 25 and 26 respectively. The outer pipe 26 has a plurality of apertures 29 spaced lengthwise thereof that serve as nozzles for directing a spray of fluid in a downwardly direction toward the roller 18. A source of fluid (not shown) is connected to the inner pipe 25.

Each of the angle brackets 24 is supported on a wall 12 of the machine by means of an attaching bracket 30 that includes a wall 30a that extends across the machine between spaced walls 12 that is provided with a downwardly extending flange 31 to which each angle bracket 24 is riveted as at 32. Attaching bracket 30 is further provided with flanges 30b, each of which is bolted as at 33 onto one of the walls 12 of the machine. A guard plate 34 is likewise secured to the lower flange 31 of the attaching bracket 30 and extends downwardly to a position between the moistening roller 18 and the drum 10.

Adjacent to the moistening roller 18 is a wick assembly generally indicated at 35 that includes an upwardly projecting plate portion 36 that terminates at its upper end with an arcuate shaped flange 37 that rests on top of a similarly arcuate shaped flange 38 that forms the upper part of the attaching brackets 30. Projecting outwardly from the lower edge of plate portion 36 is a horizontally disposed wick attaching portion 39 and then projecting outwardly from this portion 39 is a paper feed sheet portion 40 that is provided with an inwardly sloping face 41 terminating with a horizontally disposed flange 42 that normally is disposed closely adjacent to the bottom face of the moistening roller 18. A felt wick 43 provided with a cover sheet 44 is riveted as at 45 to the horizontal portion 39 of the wick assembly. Extending upwardly from a cross brace of the machine frame is a plate 46 that terminates directly below the lower horizontal portion 42 of the wick assembly 35 and serves along with the downwardly inclined plate 41 as a paper guide to feed the paper into the bite of rollers 17 and 18.

As shown in Fig. 1 the wick assembly 35 is normally disposed with the wick 43 pressing against the peripheral face of the moistening roller 18. Pressure is exerted against the wick assembly 35 by means of a pair of spaced pressure arms 47 (see Figs. 1 and 3), each of which is mounted on a shaft 48 which in turn is journaled in a bearing block as at 49 on a cross brace of the machine frame indicated at 50. A tension spring 51 is fastened at one end to lug 52 on each arm 47 and at the other end to a lug 53 on the corresponding wall 12 of the machine. As is shown in Figs. 1 and 2 each of the arms 47 can be rotated on its corresponding shaft 48 from a pressure exerting position indicated in Fig. 1 where it exerts a force against the wick assembly 35 to a withdrawn position indicated in solid lines in Fig. 2 where the pressure is out of engagement with the wick assembly. The spring 51 is so disposed in relationship to the shaft 48 of the arm 47 that it firmly holds its corresponding arm 47 in either its withdrawn or its pressure exerting position.

Disposed above the upper arcuate flange 37 of the wick assembly 35 is a pair of lugs or stop pins 54, one of such pins being mounted on each wall 12 as best shown in Fig. 3. The arcuate flange 37 of the wick assembly 35 is provided with a pair of registering slots 55, one slot be-

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ing disposed at each end of the flange 37 closely adjacent to the corresponding stop pins 54. When the wick assembly 35 is disposed in its normal operating position shown in Fig. 1, the registering slots 55 are located slightly in front of the stop pins 54 so that if the wick assembly 35 were to be vertically lifted while in this position, the flange 37 would strike the stop pins 54 and would be prevented from being withdrawn to the extent that the lower horizontal flange 42 of the wick assembly 35 could strike the moistening roller 18. If on the other hand, the wick assembly 35 is rotated in a clockwise direction about the arcuate face 38 to the position shown in solid lines in Fig. 2 the slots 55 become aligned or registered with their corresponding stop pins 54 and then the entire wick assembly 35 may be lifted vertically to the position shown in broken lines at 35a in Fig. 2 where the stop pins 54 have been entirely cleared and then the assembly can be withdrawn from the machine. Before the wick assembly 35 can be rotated to the position shown in solid lines in Fig. 2 the arms 47 must be moved from their pressure exerting positions shown in Fig. 1 to the released position shown in solid lines in Fig. 2. To reapply the wick assembly 35 to the machine the operation just described is reversed so that the assembly is first brought to the machine in the position shown in broken lines 35a in Fig. 2 and then lowered to clear the stop pins 54 until the arcuate flange 37 again rests on flange 38. The assembly 35 is then rotated counterclockwise to the position shown in Fig. 1. The arms 47 are then rotated back to their pressure engaging positions shown in Fig. 1 and the machine is ready for operation.

The fluid issuing from the fountain 23 is spread on the moistening roller 18 by the wick 43. It is to be noted that this wick extends downwardly well around the underside of the moistening roller 18 as is best shown in Fig. 1 and engages the periphery of the roller over a substantial portion of its forward face. Thus when a copy sheet is first fed between the rollers 17 and 18 when the machine is first placed into operation following a period when it has not been used, the moistened face of the roller 18 reaches the bite between the rollers 17 and 18 almost immediately so as to commence moistening the copy sheet automatically at the outset. Thus the upper margin of the first copy sheet is reduced to a minimum.

Again referring to Fig. 1 it is to be noted that the lower roller 17 is disposed forwardly of the upper roller so that the bite between the two rollers is actually disposed forwardly of the center line of the upper roller. This relative disposition of the rollers 17 and 18 further reduces the upper margin of the first copy sheet following a period when the machine has not been operating. This is an important feature of the present invention because a greater portion of the area of the copy sheets is made available for accommodating reproductions from the master sheet.

As a specific example of the effect of offsetting the lower roller 17 with respect to the upper roller 18 it has been found that when employing rollers 17 and 18 that are each approximately one and one-eighth inches in diameter, a fifteen degree offset of the lower roller 17 as shown in Fig. 1 will produce an upper margin of one quarter of an inch on the first copy sheet that is fed through the machine following a period of rest in the machine. This represents a very substantial reproduction in the upper margin over and above

that that has been possible with any previous machine known at the present time.

The wick 43 is supported in the wick assembly 35 in such a manner as to allow the wick to engage the moistening roller 18 to a position well under the front face of the moistening roller. Referring now to Figs. 4 to 6 inclusive the wick 43 is supported in a cover sheet generally indicated at 44. This cover sheet 44 is provided with a backing face 44a that is notched out as shown at 60 adjacent to each end of the wick 43. The area between the spaced notches 60 forms a resilient wick cushion 61 that is bent toward the moistening roller 18 as is best shown in Fig. 1 and is slightly curved at its lower extremity to conform somewhat with the contour of the peripheral face of the moistening roller 18. This wick cushion 61 is resilient and, therefore, serves as a spring-like backing for the wick.

I claim:

1. In a duplicating machine, the combination of a moistening roller, a fountain disposed above the roller, a fixed bracket above the fountain having an arcuate supporting surface thereon, and a wick assembly mounted adjacent to the roller and including a wick and a wick supporting frame having an arcuate bearing member adapted to cooperate with the arcuate supporting surface to mount the frame for swinging movement from a first position with the wick engaging the roller to a second position with the wick disposed outwardly in spaced relationship with the roller, the wick assembly being removable only when in its second position by first being adapted to be lifted with the arcuate bearing member being raised with the arcuate supporting surface, and stop means engaging the wick assembly to limit the lifting movement when the assembly is disposed in its first position.

2. In a duplicating machine, the combination of a moistening roller, a feed roller below the moistening roller and offset in front of the moistening roller but being disposed with its peripheral face against the moistening roller, converging upper and lower paper guide sheets terminating adjacent to the bite between the two rollers, a wick disposed in front of the moistening roller and engaging the face of said last named roller to a position closely adjacent to the bite between the two rollers, and a wick supporting frame

pivotally mounted to swing outwardly at right angles to the axis of the moistening roller, one of said paper guide sheets being supported on and movable with the wick supporting frame.

3. In a duplicating machine, the combination of a horizontally disposed moistening roller, a fountain disposed over the roller, a supporting bracket disposed above the fountain and having an arcuate bearing surface, a stop member disposed above the arcuate bearing surface and spaced therefrom, a wick assembly comprising a supporting frame holding a wick adjacent to its lower end and having a bearing member adjacent to its upper end adapted to be disposed between the bracket and stop member, the bearing member being provided with an arcuate bearing face adapted to rest on and rotate over the first mentioned arcuate bearing surface, the supporting frame being adapted to pivot in a direction transversely of the roller from a position where the wick is disposed closely adjacent to the moistening roller to a spaced position with respect to the roller, the bearing member being adapted to abut against the stop member when the wick assembly is raised while in the position where the wick is disposed closely adjacent to the moistening roller, and registering slot means in the bearing member disposed in alignment with the stop member when the wick assembly is disposed in its position spaced from the moistening roller so that the wick assembly can be raised above the top member only when the assembly is disposed in its spaced position with respect to the moistening roller.

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