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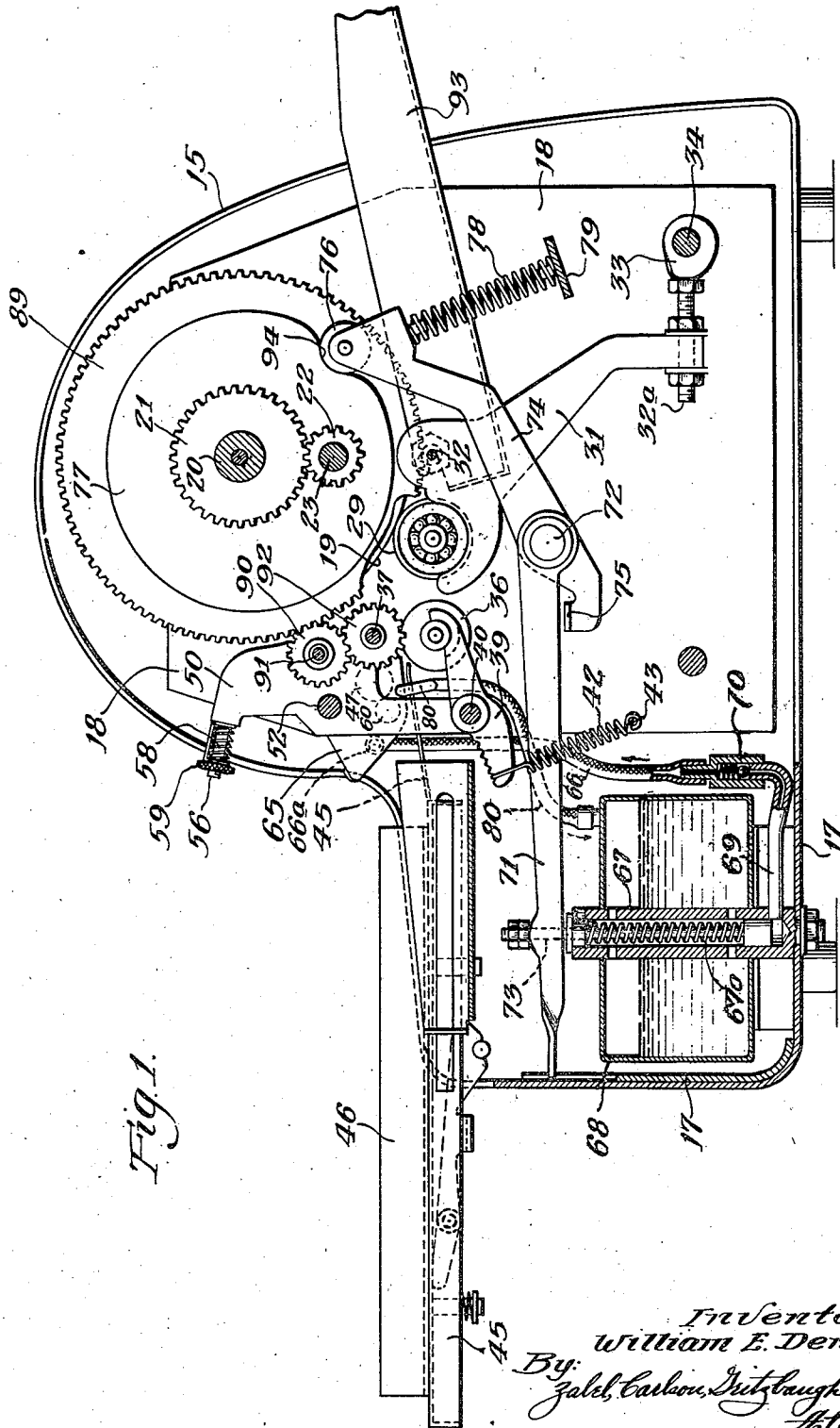
W. E. DENISON

2,277,960

MOISTENING MECHANISM

Filed Nov. 24, 1939

3 Sheets-Sheet 1



Inventor:
William E. Denison
By: J. L. Carlson, Ditzbaugh & Wilson
Attorneys

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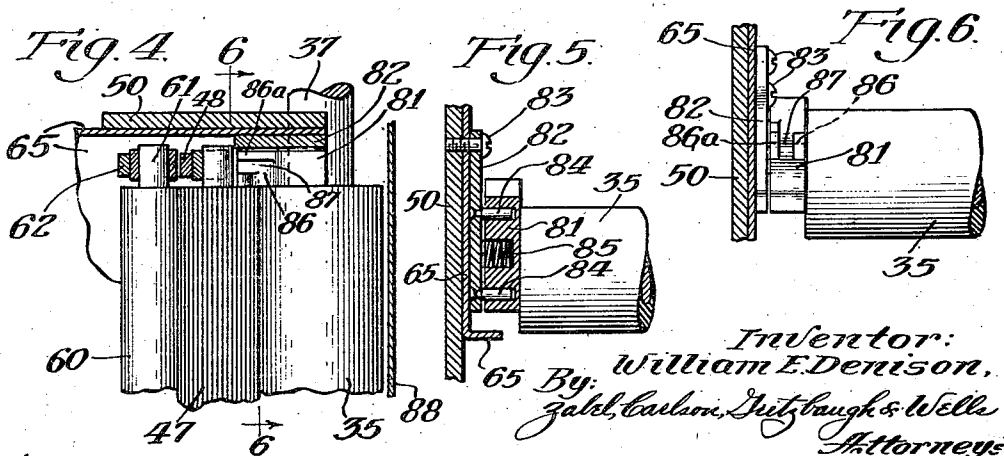
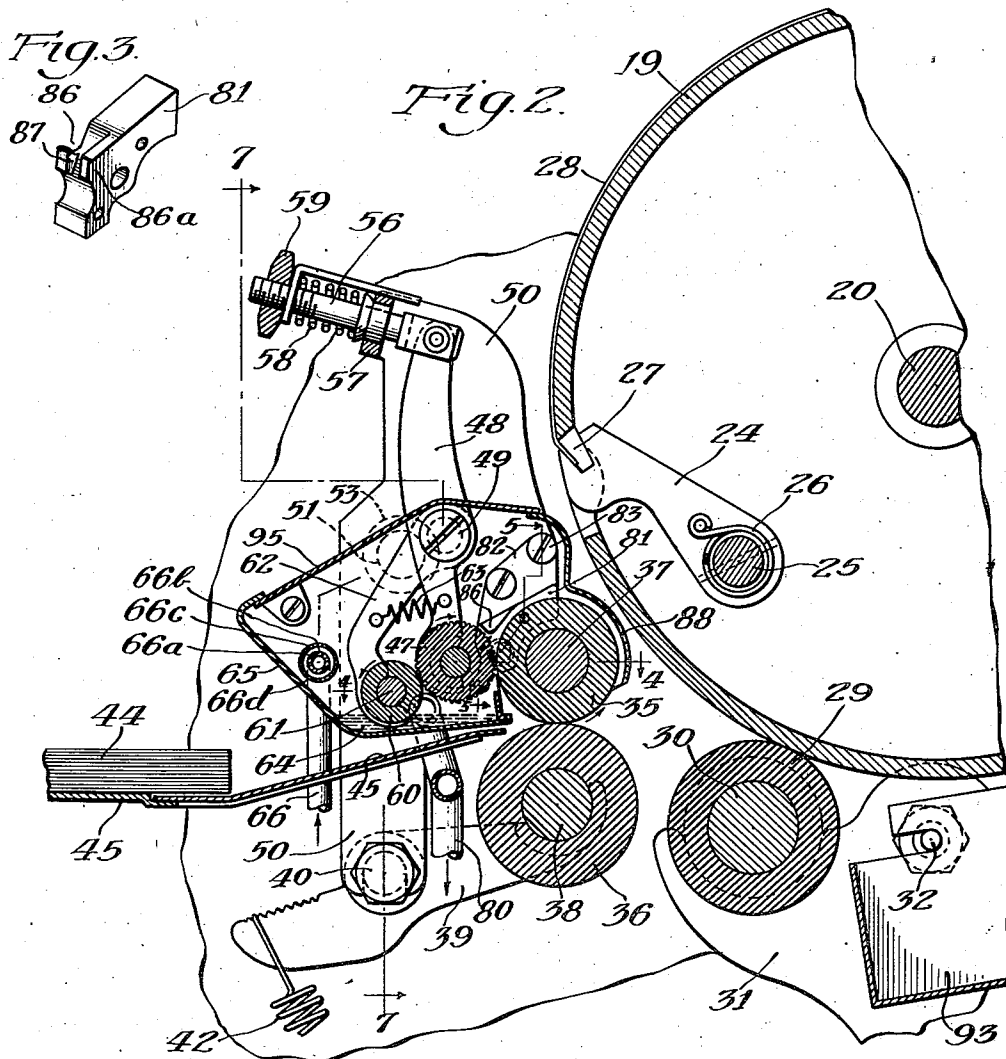
W. E. DENISON

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MOISTENING MECHANISM

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3 Sheets-Sheet 2



Inventor: William E. Denison.
By: J. L. Carlson, J. H. Laugh & Wells
Attorneys

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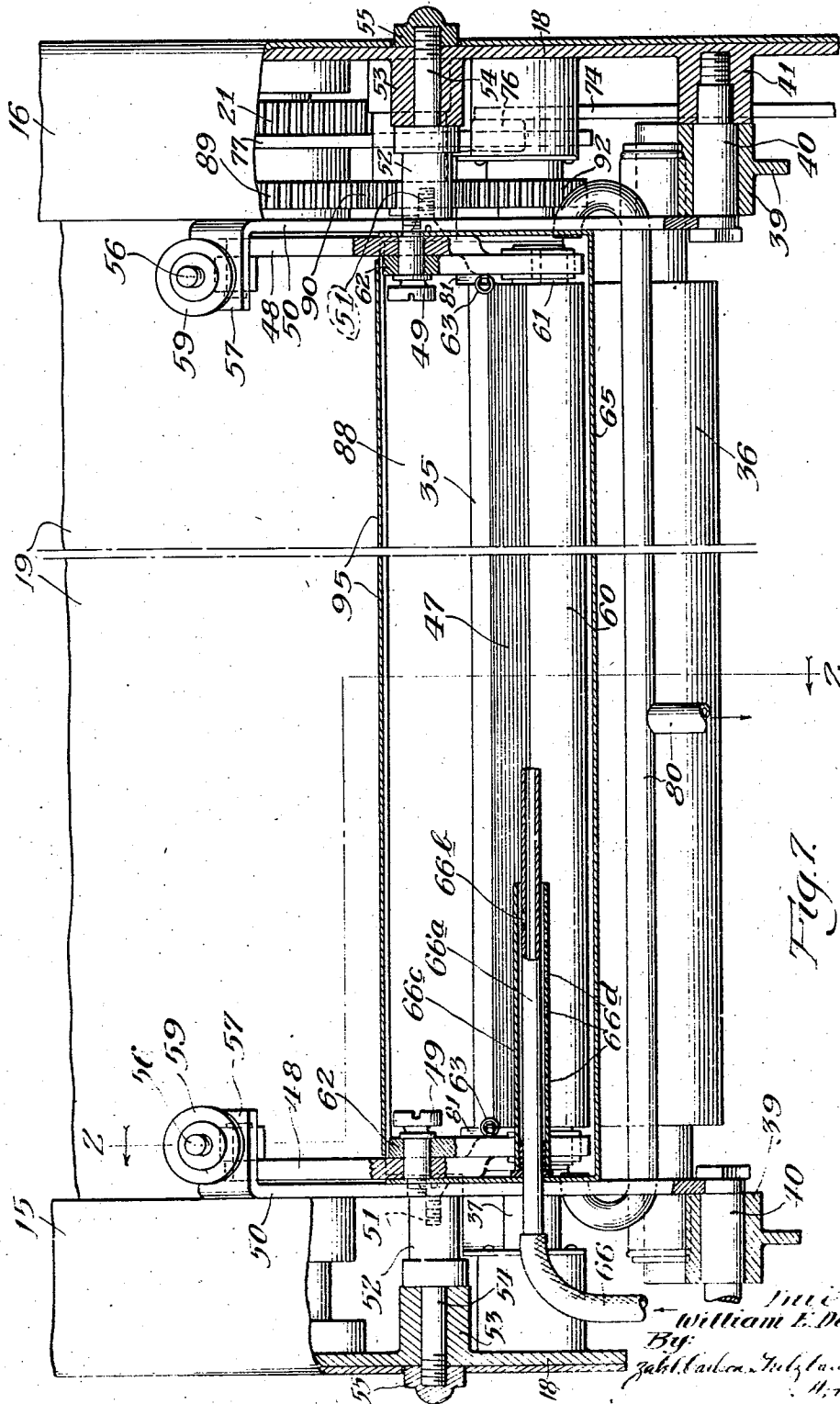
W. E. DENISON

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MOISTENING MECHANISM

Filed Nov. 24, 1939

3 Sheets-Sheet 3



Inventor
William E. Denison
By
John C. L. Co. Inc., New York City
Attorney

UNITED STATES PATENT OFFICE

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MOISTENING MECHANISM

William E. Denison, Chicago, Ill., assignor to
Ditto, Incorporated, Chicago, Ill., a corporation
of West Virginia

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12 Claims. (Cl. 91—50)

This invention relates to moistening mechanisms designed particularly for use in connection with liquid process duplicating machines, in which copy sheets are forwarded into impression relationship with a master sheet carried around by a drum, through the medium of a pair of forwarding rollers to one of which a supply of solvent is fed for application to the face of the copy sheet as it is carried forward to the drum. It is the object of this invention to provide a new and improved form and arrangement of forwarding rollers and cooperating parts by which a film of solvent is applied to a sheet.

In the preferred arrangement shown, the solvent is applied to the combined forwarding and moistening roller by a non-absorbent feeder roller rotating in contact therewith and pressed with an adjustable degree of pressure thereagainst, such feeder roller being furnished with the solvent by an absorbent roller rotating in contact with the feeder roller with its lower portion extending into a supply of the solvent in a receptacle so as to pick up the solvent by actual contact therewith. In this improved arrangement, the absorbent pickup roller is movably mounted with respect to the solvent-feeding roller, being pressed thereagainst by means of springs for insuring the transfer of an ample supply of the solvent to said feeder roller.

In the construction illustrated, an improved form of wiper plate means is employed at the ends of the solvent feeder roller, the wiper plate being shown as having a vent for permitting surplus solvent to run off so as normally to keep the level of the solvent between the moistening roller and the feed roller substantially uniform or at least to prevent the solvent from reaching such a depth as to jeopardize the control of the thickness of the film as applied to the copy sheet.

It is another object of this invention to improve moistening mechanisms in sundry details hereinafter pointed out. The preferred means by which these several objects have been attained are illustrated in the accompanying drawings, in which—

Fig. 1 is a longitudinal vertical sectional view through a duplicating machine embodying the improved moistening mechanism;

Fig. 2 is a longitudinal vertical sectional view on an enlarged scale, being taken substantially at the line 2—2 of Fig. 7;

Fig. 3 is a perspective view of one of the wiping plate members forming parts of the improved mechanism;

Fig. 4 is a horizontal sectional view of one side

portion of the machine taken substantially at the line 4—4 of Fig. 2;

Fig. 5 is a vertical sectional view taken substantially at the line 5—5 of Fig. 2;

Fig. 6 is a vertical sectional view taken substantially at the line 6—6 of Fig. 4; and

Fig. 7 is a cross sectional view taken substantially at the line 7—7 of Fig. 2, with certain of the parts broken away for clearness of illustration.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, 15 and 16 indicate frame members formed of sheet metal pressed into dished form and located at opposite sides of the machine, being connected together at their lower ends by transversely extending frame parts 17. Each of the dished frame members 15 and 16 is provided with a reinforcing plate 18 rigidly secured thereto. A drum 19 of any approved type is rotatably mounted in position between the frame members 15 and 16 by means of a heavy shaft member 20 which is provided with a gear 21 meshing with a pinion 22 for giving the drum 19 the desired rotary movement, such rotary movement being effected preferably by means of a crank or the like (not shown) carried by a stub shaft 23 upon which the pinion 22 is fixedly mounted. As is best shown in Fig. 2, the drum 19 is provided with a series of grippers 24 mounted upon a shaft 25 and normally pressed by springs 26 into operative position with respect to bearings 27 on the drum for holding a master sheet 28 releasably in position upon the face of the drum.

Underneath the drum 19, a platen roller 29 is mounted in position by means of a heavy shaft 30 between two levers 31 pivotally mounted upon pins 32 carried by the frame members 15 and 16. The lower ends of the levers 31 are provided with screw-threaded pins 32a which are rigidly mounted in position on the levers so as to bear at their forward ends against cams 33 rotatably mounted in position by means of a shaft 34. The arrangement is such that upon rotary movement of the shaft 34 the levers 31 are swung about the pins 32 for increasing or decreasing the effective pressure between the platen roller 29 and the drum 19.

The means for forwarding copy sheets into the bite of the drum 19 and the platen roller 29 comprises two rollers 35 and 36 rotatably mounted in position between the frame members 15 and 16 by means of shafts 37 and 38 respectively, such rollers being mounted in cooperative relation with

respect to each other so as to move copy sheets forwardly toward the right in Fig. 2 into the bite of the drum and the platen roller 29.

In the construction illustrated, the shaft 38 for the roller 36 is supported by levers 39 at opposite sides of the machine pivotally mounted at intermediate points by means of machine screws 40 which take into lugs 41 carried by the frame members 15 and 16. Springs 42 are connected between the upper end portions of the levers 39 and pins 43 carried by the frame members 18 for pressing the roller 36 forcibly against the roller 35, the degree of pressure being controlled by the position at which the springs 42 are mounted upon the levers 39 (see Fig. 1).

For supporting a pile of copy sheets 44 in position in rear of the sheet forwarding rollers 35 and 36 for being fed forwardly toward the right in Fig. 2, a table 45 has been provided suitably supported in position with its forward edge portion extending into close proximity to the rollers 35 and 36, as is best shown in Fig. 2. Side bars 46 of any suitable type are adjustably mounted upon the table 45 for holding the sheets 44 in the desired adjusted position upon the table.

The means for applying solvent upon the moistening roller 35 for transfer to a copy sheet fed between the rollers 35 and 36 comprises a feeder roller 47 rotatably mounted between arms or levers 48 pivotally mounted by means of machine screws 49 taking into auxiliary frame plates 50 at opposite sides of the machine. In the arrangement shown, the auxiliary frame plates 50 are mounted upon the frame members 15 and 16 by having notched engagement with the machine screws 40 at their lower end portions, being further secured at their upper end portions by means of machine screws 51 secured in bearing blocks 52 which in turn are secured on lugs 53 by means of screw-threaded pins or bolts 54 having nuts 55 secured on their outer ends, as is clearly shown in Fig. 7. At their upper ends, the levers 48 are provided with screw-threaded bolts 56 (see Fig. 2) which are pivotally mounted upon the levers and extend rearwardly through perforated lugs 57 carried by the plates 50. Upon the rear end portions of the bolts 56 in rear of the lugs 57, coiled springs 58 are mounted, such springs being pressed forwardly by means of thumb nuts 59 mounted by means of screw-threads on said bolts. The arrangement is such that the springs 58 serve to press the roller 47 forwardly toward the moistening roller 35 for controlling the pressure between said two rollers, the degree of pressure being dependent upon the position of the thumb nuts 59 upon the bolts 56.

The means for applying solvent upon the roller 47 comprises a third roller 60 rotatably mounted in position by means of a shaft 61 pressed forwardly toward the right in Fig. 2 by arms or levers 62 pivotally mounted upon the machine screws 49, the arms 62 being yieldingly connected with the lower end portions of the levers 48 by means of coiled springs 63. As is best shown in Fig. 2, the roller 47 is mounted on the same level as that of the roller 35, whereas the roller 60 is mounted at a lower level so as to extend downwardly into a pool 64 of solvent supported in position by a receptacle 65 extending underneath the rollers 47 and 60. Solvent is supplied to the receptacle by means of a pipe 66 to which the solvent is carried under pressure from a pump 67 arranged to take the solvent from a tank 68 and to deliver it through a pipe 69 connected with the pipe 66, with a check valve 70 inter-

posed between said two pipes. In the construction illustrated, the pipe 66 is in the form of a flexible hose connected at its upper end with a metal pipe 66a extending across the receptacle 65 and having one or more openings 66b through its wall for delivering the solvent to a larger pipe 66c surrounding the pipe 66a and having a series of openings 66d through its wall at spaced intervals therealong through which the solvent flows into the receptacle 65.

The pump 67 is operated by means of a lever 71 pivotally mounted on the frame of the machine by means of a machine screw 72, the lever 71 being connected with the piston rod 73 of the pump, as is clearly shown in Fig. 1. A second lever 74 is pivotally mounted by means of the machine screw 72, with a lug 75 thereon engaging the bottom face of the lever 71 so that downward movement of the lever 74 causes upward movement of the lever 71. A roller 76 carried by the lever 74 is actuated by a cam 77 carried by the drum 19 so that the lever 71 is given an upward stroke against the action of the spring 61a of the pump, followed by a downward stroke upon each revolution of the drum, the downward stroke of the lever 74 being effected against the action of a coiled spring 78 mounted between the lever 74 and a frame bar 79. The arrangement is such that upon each operative stroke of the lever 71 solvent is delivered from the tank or receptacle 68 through the pipes 69 and 66 to the receptacle 65.

For controlling the normal depth of the solvent in the receptacle 65, a drain pipe 80 is provided connected at opposite ends with the receptacle 65 at such points as to maintain the level of the solvent well above the lowermost portion of the roller 60 and well below the lowermost portion of the roller 47. As is clearly shown in Fig. 1, the drain pipe 80 is connected at its lower end with the tank or receptacle 68 for returning the surplus solvent to said tank.

At opposite ends of the rollers 35 and 47, wiper members 81 in the form of blocks are mounted so as to bear against the ends of the rollers for wiping surplus solvent therefrom and so as to partially close the space between the rollers 35 and 47. Each of the blocks 81 is mounted in position by means of a plate 82 secured at its upper end by machine screws 83 as is clearly shown in Figs. 2 and 6. As is best shown in Fig. 5, the bearing blocks 81 are slidably mounted upon pins 84 extending inwardly from the plates 82, such bearing blocks being pressed inwardly toward the rollers 35 and 47 by means of coiled springs 85 interposed between the blocks and the plates 82. The arrangement is such that the blocks 81 serve effectively for maintaining a pool of solvent between the rollers 35 and 47.

As is best shown in Fig. 3, each of the wiper members 81 is cut away at its roller engaging face to provide a passage 86 in the form of a notch for permitting surplus solvent when it rises to the level of the notch to flow longitudinally of the rollers 35 and 47 out of the space between the rollers. The face of the block 81 which is next to the rollers extends upwardly above the edge of each roller. The opposite face 86a of the block extends above the notch 86 and prevents liquid from carrying lint, etc. down to the springs 85 and the pins 84. The block 81 is provided with a groove 87 which connects with the notch 86 for directing the escaping solvent away from the meeting line of the rollers and into the receptacle 65.

In front of the roller 35, a shield 88 has been provided for preventing the solvent from splashing onto the drum 19 or the master sheet 28.

The means employed for rotating the moistening roller 35 comprises a large gear 89 fixedly mounted upon the shaft 20 so as to rotate with the drum 19, such gear meshing with a pinion 90 rotatably mounted in position upon a stud 91 carried by the framework, the pinion 90 in turn being in mesh with a pinion 92 carried by the shaft 37 of the moistening roller 35. The arrangement is such that when the drum is driven in counterclockwise direction in Fig. 1, the roller 35 is driven also in counterclockwise direction at substantially the same surface speed so as to carry a copy sheet forwardly toward the right in said Fig. 1 between the roller 35 and the cooperating roller 36. When a sheet is carried forward by the rollers 35 and 36, it is brought thereby into the bite of the drum 19 and the platen roller 29, the parts being driven in such timed relation as to cause the copy sheet to have the desired registration with the master sheet 28, as is well understood in mechanisms of this type. From the drum and the platen roller, the copy sheet passes forward into position in a tray 93. For effecting the desired registration of the copy sheet forwarded by the rollers 35 and 36 with the master sheet 28 on the drum, the cam 77 is provided with a recess 94 at one point in its periphery adapted by engagement with the roller 76 to give the operator a signal, calling for the stoppage of the rotation of the drum for the insertion of a copy sheet into the bite of the forwarding rollers 35 and 36.

In operation, when the drum 19 is stopped in the position as shown in Fig. 1, a copy sheet 44 is fed manually or in any other suitable manner into the bite of the rollers 35 and 36, such sheet being directed into position by the forwardly extending portion of the table 45 and by the bottom face of the receptacle 65. After a sheet has been placed thus in operative position, the drum 19 is again rotated for carrying the copy sheet forward toward the right in said Fig. 1 to the bite of the drum 19 and the platen roller 29 into registration with the master sheet 28 for the duplication of the master sheet subject matter upon the top face of the copy sheet. The amount of ink transferred from the master sheet to the copy sheet depends both upon the amount of solvent carried by the moistening roller 35 and transferred from said roller to the copy sheet and upon the strength of pressure of the platen 29 against the drum. The thickness of the film of solvent upon the roller 35 is controlled largely by the pressure between the feeder roller 47 and said forwarding roller 35, an increase in the pressure by an adjustment of the thumb nuts 59 serving to cut down the thickness of the film of solvent applied upon the moistening roller 35.

The spreader roller 47 and the applicator roller 35 may be resilient, or either of them may be resilient. It is preferable, however, to have the spreader roller of a hard material which can be finished with extreme accuracy in production. Soft or resilient materials are difficult to finish uniformly and accurately in production. It is also preferable to have the spreader roller provided with serrations or ripples running longitudinally of the roller and very fine in nature, that is, .002 inch to .003 inch deep and closely spaced, that is, about .005 inch across and .005 inch apart. The grooves are necessary to bring up a measured amount of liquid sufficient to form

a slight pool at the junction of the spreader and applicator rollers. The applicator roller needs to be resilient when the spreader roller is of hard material. The roller 60 is absorbent so as to pick up a quantity of the solvent from the receptacle 65 for application to the face of the feeder roller 47. The roller 60 is preferably formed of felt, or of sponge rubber with the pores open at the face of the roller, but it may be in the form of a round brush or may be of any other suitable type by which a considerable quantity of solvent is picked up by the roller by actual contact with the solvent in the receptacle so as to be transferred to the feeder roller 47. The roller 47 is desirably of a hard "Roulene" compound, hard rubber, plastic, metal or other suitable hard material that can be finished accurately. The roller 35 in such cases is preferably made of "Perbuna," neoprene or rubber of a "Shore" hardness of 50 to 60. Alternatively the roller 35 may be of the hard materials and the roller 47 of the resilient material. It is also possible to make both rollers of the resilient materials.

The operation of the machine as above described has been found to be highly successful and highly satisfactory, the film of solvent upon the moistening roller 35 for application to the top face of the copy sheet being very even and very easily controlled so as to produce either light or heavy copies as desired. With the roller 47 pressed tightly against the roller 35 through the medium of the pressure regulating means comprising the bolts 56, the indentations in the surface of the roller 47 in the form of longitudinally extending grooves prevent the solvent from running downwardly between the rollers 35 and 47 when said rollers are stationary. For effecting this result, it is necessary that the roller 47 be pressed strongly against the face of the roller 35, since the solvent employed for softening the ink on the master sheet is very liquid and highly penetrative. I have found, however, that with the roller 47 pressed strongly against the roller 35 a substantial amount of the solvent is fed downwardly between the rollers 35 and 47 at the rear face of said roller 35 when said rollers are rotated, the solvent being carried downwardly under pressure in measured amounts within the indentations so as to be applied in the form of a thin even film on the downwardly moving rear face portion of said roller 35 below the line of contact of said roller with the roller 47. An adequate amount of the solvent is fed downwardly for application to the face of a copy sheet for insuring the production of a commercially acceptable copy even when the roller 47 is pressed very tightly against the roller 35, and it will accordingly be appreciated that an adjustment of the parts for normal effective operation can be made quickly and easily by any experienced operator without the necessity for fine or critical manipulation of the adjusting means.

In the arrangement shown, a cover plate 95 is provided pivotally mounted on the receptacle 65 so as normally to close the space between the rear edge portion of the receptacle 65 and the shield plate 88, such cover plate 95 being arranged so as to be capable of swinging upwardly and backwardly out of the way for affording access to the rollers when desired.

While the form and arrangement of parts as shown in the drawings and as above described are preferred, the invention is not to be limited to such construction and arrangement except

so far as the claims may be so limited, it being understood that changes might well be made in the form and arrangement of the parts without departing from the invention.

I claim:

1. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second roller rotatably mounted in engagement with said first-named roller, an absorbent roller rotatably mounted in engagement with said second roller, and means for applying liquid to said absorbent roller for the upwardly moving portion of said second roller and from said second roller to the downwardly moving portion of said first-named roller.

2. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with the rear face portion of said first-named roller, an absorbent roller rotatably mounted in engagement with the rear face portion of said second roller, and a receptacle adapted to hold a quantity of liquid about the lower portion of said absorbent roller in engagement therewith but below the level of said second roller, said second roller having its peripheral surface roughened so as to adapt it to carry a substantial measured supply of liquid downwardly at the rear face of said first-named roller when pressed strongly thereagainst.

3. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller at the rear face thereof, an absorbent roller rotatably mounted in engagement with said second roller at its rear face portion, and a receptacle in rear of said first-named roller adapted to hold a supply of liquid about the lower portion of said absorbent roller in engagement therewith below the level of said second roller so as to have a tendency to establish a pool of the liquid between said second roller and said first-named roller from which a substantial measured amount of liquid is fed downwardly between said second roller and said first-named roller when said rollers are in rotation.

4. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller at the rear face thereof, an absorbent roller rotatably mounted in engagement with said second roller at its rear face portion, and a receptacle extending underneath said second and third rollers in rear of said first-named roller adapted to hold a supply of liquid in engagement with said third roller but below the level of said second roller from which a substantial measured amount of liquid is fed downwardly

between said second roller and said first-named roller when said rollers are in rotation.

5. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller having a smooth surface thereabout, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with the rear face of said first-named roller at about the same level therewith, an absorbent roller rotatably mounted in engagement with the rear face portion of said second roller in position to extend to a lower level than that of the bottom face of said second roller, and means for applying liquid to the lower portion of said absorbent roller below said second roller for transfer to said second roller and thence to said first-named roller, the peripheral surface of said second roller being roughened by a great number of indentations in close proximity to each other for causing said second roller to carry a substantial measured amount of liquid downwardly at the rear face of said first-named roller when said rollers are in rotation and to prevent the downward movement of liquid at said rear face when the rollers are stationary.

6. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second roller rotatably mounted in engagement with said first-named roller and provided with a great number of fine grooves in its face longitudinally of the roller in close proximity to each other, an absorbent roller rotatably mounted in engagement with said second roller, and means for applying liquid to said absorbent roller for transfer to the upwardly moving portion of said second roller and from said second roller to the downwardly moving portion of said first-named roller.

7. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller and provided with a great number of fine grooves in its face longitudinally of the roller in close proximity to each other, an absorbent roller rotatably mounted in engagement with said grooved roller, and a receptacle adapted to hold a quantity of liquid about the lower portion of said absorbent roller in engagement therewith below the level of said grooved roller so as to insure the application of a supply of liquid to the upwardly moving portion of the grooved roller for transfer therefrom to the downwardly moving portion of said first-named roller.

8. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller at the rear face thereof and provided with a great number of fine grooves in its face longitudinally of the roller, an absorbent roller ro-

tatably mounted in engagement with said grooved roller at its rear face portion, and a receptacle in rear of said first-named roller adapted to hold a supply of liquid about the lower portion of said absorbent roller in engagement therewith below the level of said grooved roller so as to insure the application of a supply of liquid to the upwardly moving portion of the grooved roller for transfer therefrom to the downwardly moving portion of said first-named roller whereby there is a tendency to establish a pool of the liquid between said grooved roller and said first-named roller.

9. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller at the rear face thereof and provided with a great number of fine grooves in its face longitudinally of the roller, an absorbent roller rotatably mounted in engagement with said grooved roller at its rear face portion, and a receptacle extending underneath said second and third rollers in rear of said first-named roller adapted to hold a supply of liquid about the lower portion of said absorbent roller in engagement therewith below the level of the grooved roller so as to insure the application of a supply of liquid to the upwardly moving portion of the grooved roller for transfer therefrom to the downwardly moving portion of said first-named roller whereby there is a tendency to establish a pool of the liquid between said grooved roller and said first-named roller.

10. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller, means for applying liquid to the upwardly moving portion of said second roller for transfer to the downwardly moving portion of said first-named roller, and wiper members in the form of blocks pressed yieldingly against the ends of said rollers serving to wipe surplus liquid therefrom and to provide a pool of the liquid in the space between the rollers, each of said blocks being provided with a notch in its rear face a short distance above the bite of the rollers opening sidewise at its inner end into the space between the rollers and opening downwardly at its opposite end for discharging liquid at a point be-

tween the side faces of the block in spaced relation to both of said side faces.

11. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller, means for applying liquid to the upwardly moving portion of said second roller for transfer to the downwardly moving portion of said first-named roller, and wiper members in the form of blocks pressed yieldingly against the ends of said rollers at opposite sides of the machine with the upper portions of their rear faces sloping downwardly and rearwardly serving to cause a pool of the liquid to collect between the rollers, each of said blocks being provided with a groove extending vertically on the rear face of the block with an upwardly opening notch in the wall portion between the groove and the inner face of the block at a point a short distance above the bite of said rollers so as to cause surplus liquid from said space to be directed away from the rollers and at the same time to be kept out of contact with the outer face of the block.

12. In a mechanism for applying a film of moisture to a copy sheet or the like, the combination of a substantially non-absorbent roller, means for rotating said roller, means adapted in cooperation with said roller to carry a sheet forward in contact with the roller, a second substantially non-absorbent roller rotatably mounted in engagement with said first-named roller, means for applying liquid to said second roller for transfer to said first-named roller, plates opposite to the ends of said rollers in spaced relation thereto at opposite sides of the machine and each having at least one pin extending from its inner face toward the rollers, wiper members in the form of blocks having sockets in their outer faces mounted slidably on said pins, and springs mounted in sockets in the outer faces of said blocks serving to press said blocks yieldingly against the ends of said rollers so as to provide a pool of the liquid in the space between the rollers, each of said blocks being provided with a vertically extending groove and an upwardly opening notch communicating with the groove at the side of the block next to the rollers at a point a short distance above the bite of the rollers so as to cause surplus liquid flowing from said space to be directed away from the rollers and at the same time to be directed away from the face of the block in which said sockets are positioned.

WILLIAM E. DENISON.