

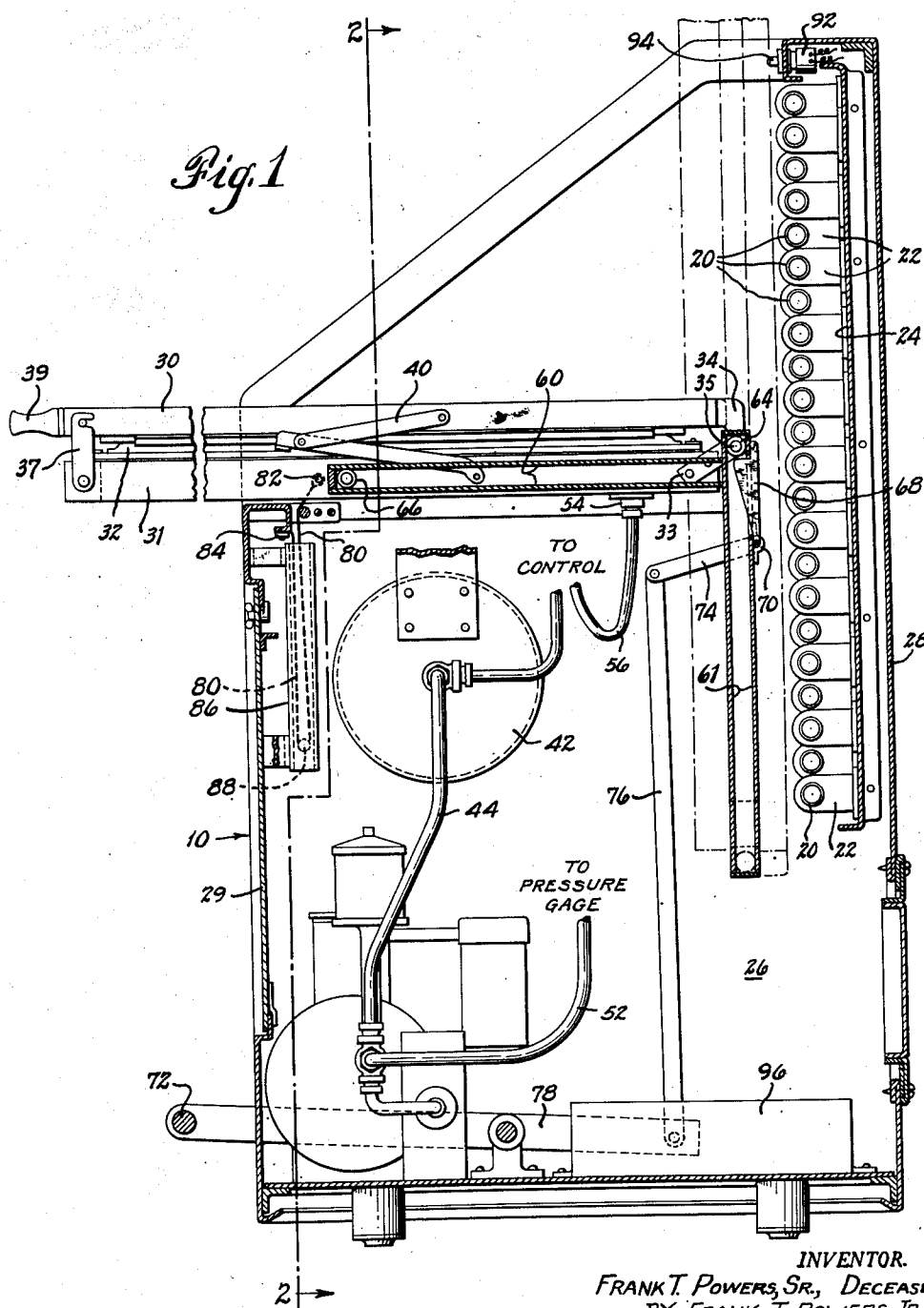
Dec. 19, 1950

F. T. POWERS, SR
PHOTOMECHANICAL PRINTER

2,534,794

Filed Oct. 2, 1948

2 Sheets-Sheet 1



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ATTORNEYS.

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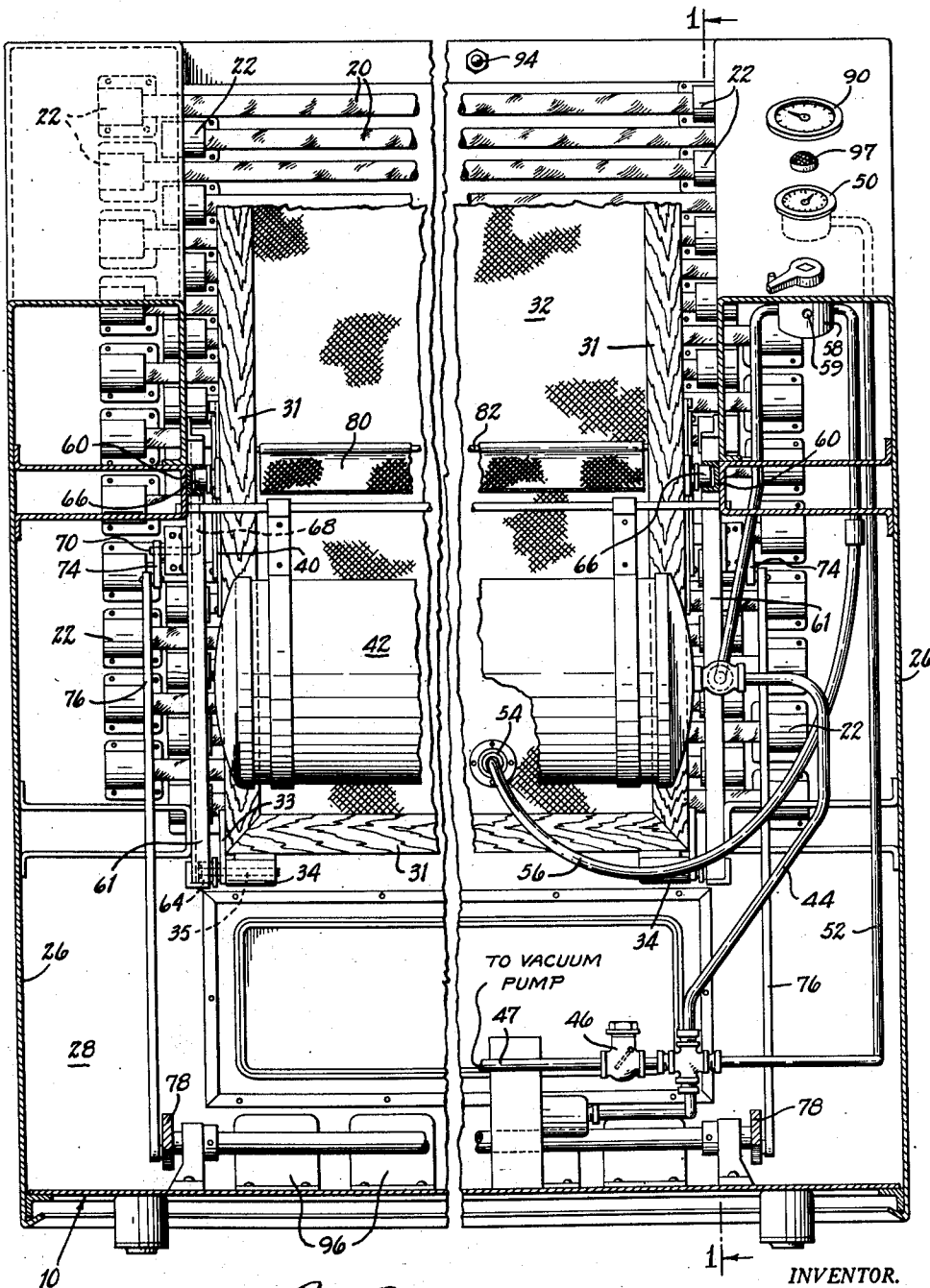


Fig. 2

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2,534,794

PHOTOMECHANICAL PRINTER

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4 Claims. (Cl. 95-73)

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The present invention relates to a novel and improved photomechanical printer for exposure of a photomechanical resist to a negative or positive of the copy to be reproduced.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a vertical section, with parts broken away of a typical and illustrative embodiment of the present invention; and

Figure 2 is a vertical section taken on the line 2-2 of Figure 1.

The present invention has for its object the provision of a novel and improved photomechanical printer for exposing a sensitized plate to an image to be reproduced, for instance for the exposure of a sensitized sheet of metal to a negative image in the photoengraving process. A further object of the invention is the provision of an improved photomechanical printer which is unusually compact, is simple and rapid in its operation and is particularly adapted for use with fluorescent lamps as the light source. Still another object of the invention is the provision of a photomechanical printer in which the relatively large printing frame and the relatively heavy printing plate and negative are securely held in loading position or in exposure position and may be moved from one position to the other with ease and are finally positioned closely adjacent to the source of light.

In accordance with the present invention, there is provided a vertical bank or a line series of long, narrow, closely adjacent tubular light sources such as fluorescent lamps which are adapted to form a large illuminated area of substantially uniform light intensity, this bank of lamps being located at the back of the printer, and being suitably connected to the usual starting and ballast means, as well as to suitable timing means for controlling the duration of their illumination and thereby the extent of the exposure. Movable toward and from the lamp bank, and from a hori-

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zontal loading position forward to a vertical exposure position, is a printing frame. In its vertical position the printing frame is parallel to the general plane of the bank of lamps and slightly spaced therefrom and the lamps are sufficiently close together so that the exposure of the plate to the negative is substantially uniform. For this purpose trackways are provided one pair at either side of the printing frame and the printing frame is formed with projecting supporting members which engage in and are slidable along the trackways. The trackways are so formed that as the printing frame is pushed forward it moves from a horizontal to a vertical position with a slight lowering of its center of mask. Means are also provided in one of the trackways for holding the printing frame in loading position against accidental movement, and the slight lowering of the center of mask tends to hold the printing frame in its vertical or exposure position. The printing frame is preferably hinged for loading and unloading and is provided with vacuum means for securely pressing the sensitized metal plate against the negative during exposure. Blind means are also provided for preventing the escape of excessive light from the lamps during the exposure thereby preventing accidental fogging of sensitive material outside the machine and permitting the machine to be used more safely or more closely to other photoengraving apparatus.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiment of the invention as shown in the accompanying drawings, the printer comprises a casing 10 on the back wall of which are supported a large number of horizontally extending, long, narrow, tubular light sources such as fluorescent lamps or other gaseous discharge lamps 20 supported in their sockets 22 which are slightly staggered so as to permit the use of as many lamps as possible within a given area, thereby increasing not only the intensity of the illumination but also the uniformity of the illumination. Behind the bank of lamps 20 is mounted a flat, white reflecting surface 24 which is adapted to increase slightly the effective output of the lamps. The lamps thus arranged provide a vertical wall or bank of light source adjacent and parallel to which a printing frame may be held for exposure of the photosensitive material.

The casing 10 is provided with end walls 26 of metal, with a back panel 28, and a removable

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front panel 29 which largely enclose the light sources and prevent an excessive amount of stray light from being given off by the printer.

The printing frame used in connection with the preferred embodiment of the invention is of substantially conventional construction and comprises a front frame member 30 provided with the usual plate glass and a backing member 31 provided with a rubber vacuum blanket 32 which may be sealed around its edges to the glass of the frame member 30, the negative or positive to be reproduced and the sensitized metal plate to be exposed being positioned between the frame members 30 and 31 and held in close contact with each other by the suction exerted through the use of the blanket 32. The frame members 30 and 31 are hinged together by means of the bracket members 33 and 34 and pivot rod 35 so that the plate glass frame member 30 may be swung toward or away from the vacuum member 31 for loading or unloading of the frame. Latch means 37 are provided for initially holding the frame members 30 and 31 together prior to the full application of suction to the blanket 32, and frame member 30 is provided with a handle portion 39 for convenience in lifting the frame member. A toggle support member 40 is pivotally connected to the frame members 30 and 31 so that the frame member 30 may be held in raised position while the backing frame member 31 is maintained in a horizontal position.

Conventional suction means are provided for the blanket 32 and comprise vacuum reserve tanks 42 interconnected by pipe 44 and connected through check valve 46 to a vacuum pump by pipe 47. Pipe 44 also is connected to a vacuum gauge 50 by pipe 52 and the tank 42 is connected to a suitable exhaust support 54 on the blanket by means of flexible tube 56 through a control valve 58 which control valve is also provided with an air bleed opening 59 providing for admission of air to the blanket when suction is not being applied.

Means are provided for supporting the printing frame in a horizontal position for loading and unloading and in a vertical position parallel to and adjacent the bank of lamps during exposure, and for moving the frame from one position to the other. As embodied there are provided a pair of trackways at either side of the printing frame each pair comprising a horizontal trackway 60 and a vertical trackway 61, the vertical trackways 61 being close to the bank of lamps 20, and at the forward ends of the trackways 60. The trackways 60 and 61 are suitably fastened to the framework of the casing 10 so as to provide a rigid support for them. At each side of the frame there are a pair of projecting supporting members adapted to travel in the trackways 60 and 61. These supporting means are preferably in the form of rollers and the forward rollers 64 are rotatable at the ends of the hinge rod 35 while the other rollers 66 are rotatably mounted on studs which project from the backing frame 31. The rollers 65 are aligned with each other and are preferably spaced from the rollers 64 slightly more than half the length of the frame 31 thereby placing them slightly to the left of the center of gravity of the frame, as shown in Figure 1. In this way, the printing frame is substantially balanced, and only a slight effort is needed to raise it from exposure position to the loading position shown in Figure 1, while the return motion to exposure position is exerted by gravity due to the fact that the cen-

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ter of mass of the printing frame assembly drops slightly as the rollers 64 move downwardly in their track 61 and the rollers 66 move forwardly in their tracks 60. In the loading position the rollers 66 are slightly lower than the rollers 64, this difference in elevation being just enough to compensate for the fact that trackway 60 abuts the track 61 and rollers 66 cannot enter the trackway 61.

Detent means are provided for holding the printing frame in loading position as shown in Figure 1 and for this purpose the forward edge of trackway 61 is cut away to receive detent member 68 which is pivoted at 70 on the trackway and is connected to a releasing pedal 72 by means of arm 744, link 76 and the pivoted lever 78. Detent 68 is shaped so that its lower portion provides an inclined surface engageable with the corresponding roller 64 so it will be automatically displaced as the frame is returned to loading position from exposure position, and the linkage and lever systems are so proportioned that the detent 68 is normally held in latching position by gravity.

In order to prevent the escape of excessive light from the cabinet during exposure, a curtain 80 of opaque flexible material extends the full width of the printing frame and is attached to the printing frame by means of a rod 82, and its other end is made fast to the cabinet by clamping bar 84. The curtain is stored in a narrow well 86 formed on the side of the cabinet and is returned to its place and allowed to pay out therefrom by means of the weighted rod 88 supported in the looped portion of the curtain.

Means are provided for controlling the time of exposure and comprise a conventional time switch 90 adapted to shut off the supply of current to the lights after the desired exposure has been accomplished. Also in the light circuit is a switch 92 adapted to be closed when the printing frame is fully moved to exposure position, the upper part of the frame 30 contacting with the switch closing plunger 94 so as to prevent the lights being normally operated when the printing frame is in other than exposure position. Conventional ballast for starting means 96 are provided for the fluorescent lights 20 and may be connected thereto in the usual manner.

In the operation of the illustrative embodiment the operator need only place the sensitized metal to be exposed on the blanket 32, cover it with the desired negative, close the printing frame and latch it with the latch 37. Thereafter the operator opens the valve 58 to apply suction to the blanket bringing the negative and metal plate into firm uniform contact with each other. When good contact has been achieved, the operator depresses pedal 72 thereby releasing the detent 68 so that the frame may move to its vertical exposure position. With the frame in this position switch 92 is closed and the time of exposure may be regulated by setting the time clock 90. After the exposure has been completed as is shown by the pilot light 97, the operator pulls the frame towards him, using handle 39 and tilts it until the rollers 64 are engaged and held by detents 68. Thereafter valve 58 is moved to discontinue the vacuum and allow air to bleed through port 59 to destroy the vacuum in the printing frame so it may be opened.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims

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without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. In a photomechanical printer wherein a series of tubular light sources are vertically aligned and a substantially rectangular printing frame is provided for carrying a sensitized material and an image to be reproduced by exposure to said light sources, means for moving said frame from a horizontal loading position to a vertical exposure position comprising a vertical track at each side of said frame parallel and in close proximity to said vertically aligned light sources, a horizontal track at each side of said frame positioned with its forward end at the upper portion of said vertical track, a pair of supports projecting oppositely from each side of the frame, said supports being slidably shifted from its horizontal position to a vertical position, said vertical position being in close proximity and in proper parallel photomechanical printing alignment with respect to said vertically aligned tubular light sources.

2. A photomechanical printer according to claim 1, in which one of said pairs of supports is positioned at the forward end of said frame and is adapted to be slidable in said vertical tracks and the other pair of supports is positioned nearer the rear than the front end of the frame and is slidable in said horizontal tracks.

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3. A photomechanical printer according to claim 1, including a switch and timer for controlling the light sources, the switch being closed by movement of the printing frame to the exposure position.

4. A photomechanical printer according to claim 1 in which the vertical tracks are provided with releasable latching means for holding the frame in position for opening and closing the frame.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,920,399	Jones	Aug. 1, 1933
2,169,271	Michael	Aug. 15, 1939
2,170,622	Sussin	Aug. 22, 1939
2,189,233	Vanderweld	Feb. 6, 1940
2,390,497	Campbell	Dec. 11, 1945
2,394,966	Floyd	Feb. 12, 1946

FOREIGN PATENTS

Number	Country	Date
326,379	Great Britain	Mar. 13, 1930