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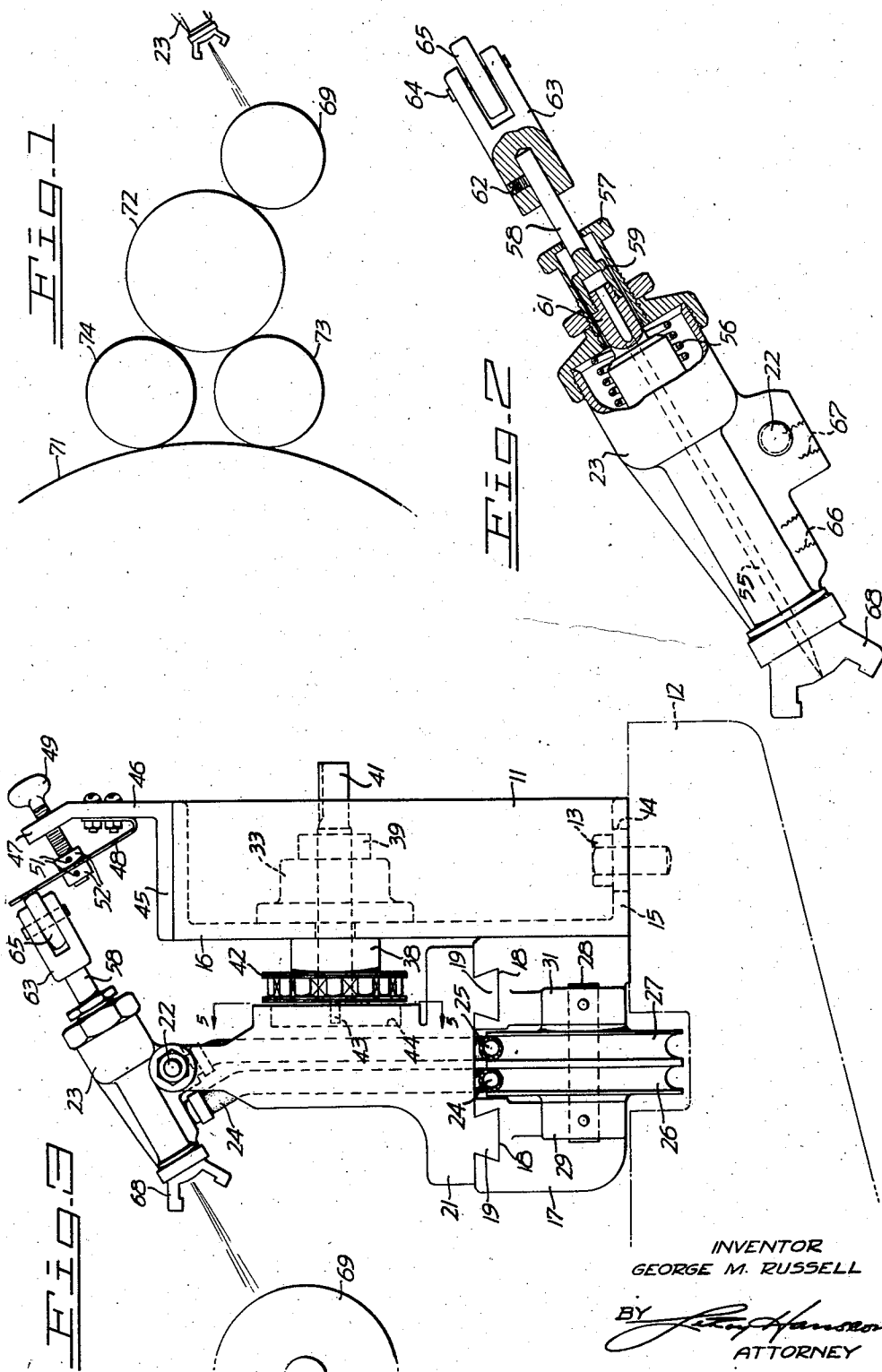
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2,408,449

FLUID FOUNTAIN FOR PRINTING PRESSES

Filed Sept. 13, 1943

2 Sheets-Sheet 1



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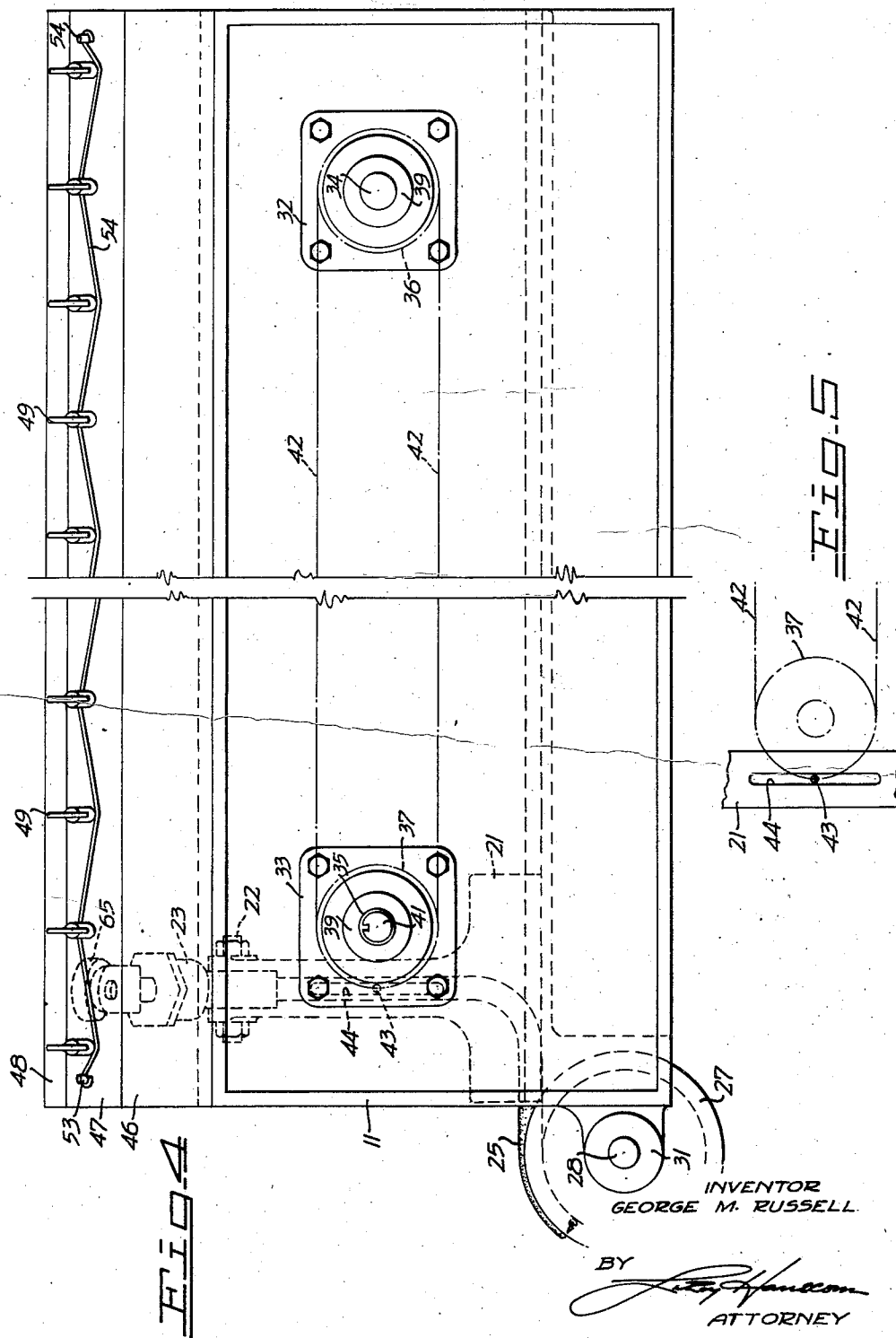
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UNITED STATES PATENT OFFICE

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FLUID FOUNTAIN FOR PRINTING PRESSES

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6 Claims. (Cl. 101-147)

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This invention relates in general to so-called fountains for indirectly applying ink or ink repellants to the plate of a printing press through suitable intermediate rollers.

The surfaces of all printing plates, whether planographic or intaglio, consist of printing and non-printing areas. When printing from these plates, the printing areas must be maintained coated with a film of ink and the non-printing areas maintained free of ink. For this latter purpose, an ink repellant, such as, for example, water or mercury, is applied continuously to the non-printing areas.

The term "printing" as herein used, refers not only to letters and numerals, but also includes any pictorial matter, and is used to denote all types of printing, in which an ink repellant is applied to the printing plate or plates.

In a plate containing only text, that is, words and/or numbers, the printing areas and non-printing areas are fairly uniformly distributed across the face of the plate, and consequently satisfactory printing can be obtained by the uniform application across the face of the plate of the desired ink and ink repellant. However, when the plate includes or is entirely made up of pictorial matter, the printing and non-printing areas are not uniformly distributed across its face. In other words, the density of the printing areas varies throughout the face of the plate and depends entirely upon the subject matter or representations appearing thereon.

The problem therefore arises, of distributing the ink and ink repellant over the face of the plate in relation to the density of the printing areas and non-printing areas contained thereon. A greater amount of ink must be applied to the more dense areas, and also a greater amount of ink repellant.

In an attempt to distribute ink and ink repellants over the surface of a printing plate in substantially the proportion in which they are required, fountains have been developed which consist of a manifold mounted adjacent and parallel to one of the transfer or ductor rolls of the press. The manifold is provided with a plurality of spaced, valve-controlled apertures or nozzles by which controlled quantities of ink or ink repellant are delivered to a transfer or ductor roll, and from such roll to the printing plate usually through a series of intermediate rolls. Since the liquid has its source at spaced points along the fountain, it is applied to the ductor roll either in spaced bands or in overlapping bands, the latter condition usually prevailing when the liquid is

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sprayed on the ductor roll from spaced nozzles carried by the manifold. In either case, the result, in so far as properly distributing ink or an ink repellant to the plate is concerned, is unsatisfactory.

In general, the object of this invention is the provision of a fountain for the distribution of either ink or an ink repellant to the ductor roll of a printing press in accordance with the density of the printing areas of the printing plate, and which does not result in the deposition of the liquid on the rolls in bands or zones.

More specifically, the object of this invention is the provision of a printing press fountain comprising a bed adjustably secured adjacent one of the ductor rolls of the press, and on which is made to travel a carriage provided with a continuously controlled liquid feed.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of the present specification is outlined in full. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in a plurality of forms.

Referring to the drawings:

Figure 1 diagrammatically illustrates the location of my fountain with respect to the ductor or dampening rolls and printing plate or cylinder of a printing press.

Figure 2 is a side elevation partly in section of a spray gun forming a part of my fountain.

Figure 3 is an end elevation of a fountain embodying the objects of my invention.

Figure 4 is a rear elevation of the fountain illustrated in Figure 3.

Figure 5 is a partial section taken on the line 5-5 of Figure 3.

As best shown in Figure 3, a fountain embodying the objects of my invention and particularly designed for the distribution of water to the ductor dampening roll of a lithographic printing press, comprises a channel 11 adapted to rest on the frame 12 of a lithographic press. The channel 11 is adjustably secured to the frame by bolts 13 extending through slots 14 formed in the lower flange 15 of the channel and threaded to the frame 12.

Welded, bolted or otherwise rigidly secured to the lower forward face 16 of the channel 11 is a carriage bed 17 provided on its upper face with

a pair of parallel dovetail grooves 18. Slidably disposed on the carriage bed 17 and secured thereto by dovetail lugs 19 engaged in the dovetail grooves 18 is a carriage 21.

Adjustably pivoted to the upper portion of the carriage 21, by a bolt 22, is a spray gun 23 arranged to communicate with a suitable source of air under pressure through a hose 24, and with a source of water through a hose 25. Both of these hoses pass downwardly through the carriage 21 to its lower side and then over a pair of guide rollers 26 and 27 journaled on a pin 28, extending through spaced ears 29 and 31 and forming part of the carriage bed 17. Obviously the hoses 24 and 25 must be of sufficient length to permit the carriage and its associated spray gun to traverse the length of the carriage bed.

Bolted to the inner face of the channel 11 are a pair of longitudinally spaced bearings 32 and 33, and journaled within these bearings are shafts 34 and 35 provided at their outer ends with sprocket wheels 36 and 37 each formed with a hub 38 for maintaining the sprocket in spaced relation with respect to the outer face of the channel. Secured to the inner end of each of the shafts 34 and 35 is a collar 39, which together with the hubs 38, serves to hold the shafts against longitudinal displacement. The free end of the shaft 35 terminates in a keywayed stub shaft 41 by means of which a flexible coupling may be secured thereto for driving the sprocket 37 through any suitable means, such as an electric motor mounted on either the channel 11 or the frame 12. Disposed about the sprocket wheels 36 and 37 is a sprocket chain 42, and secured to one of the links of this chain is a pin 43, the free end of which extends into a vertical slot 44 formed in the carriage 21. It will therefore be seen, that continuous movement of the chain either in a clockwise or counter-clockwise direction will cause the carriage 21, due to the engagement of the pin 43 within the vertical slot 44, to reciprocate back and forth on the carriage bed 17. Assuming that as viewed in Figures 4 and 5, the sprocket chain 42 is traveling in a clockwise direction, the movement of the pin 43 within the slot 44 causes the carriage 21 to move to the right until the pin 43 reaches the horizontal center line of the sprocket wheel 36. The continued movement of the pin will then cause the carriage 21 to move to the left until it again reaches the position shown in Figures 4 and 5, at which time one cycle will have been completed.

The upper flange 45 of the channel 11 is provided with a vertical extension 46 formed with a forwardly inclined portion 47. Bolted or otherwise secured to the vertical extension 46 is a cam plate 48 preferably made of a readily deformable material such as lead. Threaded in spaced relation along the forwardly inclined portion 47 are a plurality of uniformly spaced screws 49, the free ends of which pass through the cam plate 48. Secured to each of the screws 49 on either side of the cam plate 48 by pins 51 are collars 52. For the purpose of maintaining the screws in any predetermined set position, there is secured to either end of the back of the extension 47 pins 53, and secured to these pins is a taut wire 54 passing first under one of the screws 49, and then over the next screw, and so on.

The spray gun 23, as best shown in Figure 2, with a slight modification is identical to the spray gun manufactured by the DeVilbiss Company, of Toledo, Ohio, and identified in the DeVilbiss Bulletin No. 234A, of April 1, 1939, as the W. O. spray

gun. In a gun of this type, the nozzle or valve opening is controlled by means of a needle 55, which is urged to its closed position by means of a compression spring 56. Ordinarily the upper end of the needle 55 terminates within the nipple 57, but to adapt this gun for the purposes of this invention, a stem 58, provided at its lower end with an internally threaded sleeve 59, is threaded to the upper end of the usual piston rod 61, and takes the place of the fluid needle retaining cap ordinarily threaded over the upper end of the piston rod. The free end of the stem 58 passes through an aperture formed in the fluid inlet nipple 57, and has secured to its outer end by means of a set screw 62, a forked fitting 63. Journaled on a pin 64, carried by the forked end of the fitting 63, is a cam follower 65 in the form of a roller. The spray gun 23 is provided with an air hose connection 66, to which the hose 24 is secured, and with a water hose connection 67, to which the hose 25 is secured. In accordance with standard practice, the free end of the gun terminates in an air cap 68, which serves to produce a flat spray. The passage of air through the gun serves two purposes. First, it serves resiliently to urge the needle 55 against the action of the spring 56 to its fully opened position, and secondly, due to the aspirator action of the gun, it serves to draw water or other fluid into and through the gun. For this purpose, the gun of the type described requires an air pressure of about fifteen pounds, although this depends to a large extent on the strength of the spring 56.

The cam follower 65 is adapted to travel in contact with the deformable cam plate 48, and accordingly any deformations in the cam plate 48 occurring in the locus or line of travel of the cam follower 65 serve to regulate the opening formed in the needle valve of the spray gun. If then the contour of the cam surface of the deformable plate 48 is correlated to the density of the non-printing areas of the printing plate 71 of the press, it will be seen that the quantity of water delivered to the ductor dampening roll 69 by the spray gun 23 will likewise be correlated to the density of the non-printing areas occurring across the printing plate. Since the valve opening of the gun nozzle increases on the rearward movement of the needle and its associated cam follower 65, rearwardly extending depressions should be made in the deformable cam plate 48 by properly adjusting the screws 49 in line with those zones of the printing plate on which the greatest amount of water or other ink repellant is desired. It should be particularly noted that the air pressure to which the gun is subjected serves resiliently to maintain the cam follower 65 in contact with the cam plate 48. The sensitivity of the gun to the rearward movement of the needle may, of course, be controlled by the shape of the point of the needle and its seat.

In accordance with standard practice, the water from the gun 23 is applied to the ductor roll 69, and then through several intermediate rolls 72, 73 and 74 to the printing plate or cylinder 71.

Although the above device has been particularly described with reference to a fountain for distributing water or other ink repellant to a printing plate, the device may also be used for distributing ink to the ink rollers of a press in accordance with the density of the printing areas appearing thereon. Also it is to be noted that the use of a spray is not essential, and that either drops or a light stream of water may be made to fall upon the ductor roll 69. In either case, the

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amount of water delivered to the ductor roll is, of course, controlled through the action of the cam follower 65 and the cam plate 48.

From the above description, it will be noted that due to the continuous travel of the carriage 21 across the face of the ductor roll 69, either water or ink may be distributed thereon without the formation of more or less distinct bands or zones of water or ink, and without any overlapping bands or zones such as result from the use of a plurality of spaced but stationary sprays.

Further, by the use of my fountain, it is possible to eliminate a great deal of costly driving and adjusting mechanism required in connection with fountains of the type now in general use.

I claim:

1. In a printing press, the combination of a frame; a removable printing means mounted therein, said printing means having spaced-apart ink-repellant areas thereon; dampening means in rolling contact with said printing means; means for applying an ink-repellant material to said dampening means in amounts and in spacing to conform substantially to said spaced-apart ink-repellant areas on said printing means, said means including a spraying head which moves back and forth across said dampening means, a deformable cam means arranged adjacent the path of travel of said head to control the amounts and spacing of said ink-repellant material applied thereon, and adjustable means for changing the shape of said cam means as required, whereby the amount and spacing of the ink-repellant spray may be made to conform substantially to the ink-repellant areas on said printing means.

2. In a printing press, the combination of a frame; a removable printing means mounted therein, said printing means having spaced-apart ink-repellant areas thereon; means for applying an ink-repellant material to said printing means in amounts and in spacing to conform substantially to said spaced-apart ink-repellant areas on said printing means, said means including a spraying head which moves back and forth across said printing means, a deformable cam means arranged adjacent the path of travel of said head to control the amounts and spacing of said ink-repellant material applied thereon, and adjustable means for changing the shape of said cam means as required, whereby the amount and spacing of the ink-repellant spray may be made to conform substantially to the ink-repellant areas on said printing means.

3. In a device for printing from ink-repellant plates, the combination of removable printing

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means having ink-repellant surfaces thereon of different sized spaced-apart areas; means for applying to said areas an ink-repellant material, said means including a spraying head, and means for moving said head back and forth for a distance sufficient for the repellent material sprayed therefrom to cover said areas; means for varying the amount of material sprayed from said head, said means including an adjustable control band which may be bent as required to vary its contour in accordance with the ink-repellant areas on the removable printing means inserted in the device and thereby control the variation in amount of repellent material sprayed on said printing means.

4. In a device for printing from ink-repellant plates, the combination of removable printing means having ink-repellant surfaces thereon of different sized spaced-apart areas; means for applying to said areas an ink-repellant material, said means including ductor dampening rolls in operative contact with said printing means, a spraying head, and means for moving said head back and forth for a distance sufficient for the repellent material sprayed therefrom to cover the areas on said rolls corresponding to the ink-repellant areas on said printing means; means for varying the amount of material sprayed from said head, said means including an adjustable control band which may be bent as required to vary its contour in accordance with the ink-repellant areas on the removable printing means inserted in the device, to control the variation in amount of repellent material applied on said printing means.

5. In a printing press having ink repellent printing means, the combination of an ink repellent spraying head mounted to move back and forth in spaced general alignment across said printing means, and adjustable relatively fixed means associated with the head and cooperating therewith throughout the extent of its movement for varying the amount of repellent supplied at any place on said printing means.

6. In a printing press having ink repellent printing means, the combination of an ink repellent spraying head mounted to move back and forth in spaced general alignment across said printing means, an adjustable cam means mounted adjacent the path of travel of said head and cooperating therewith throughout its back and forth movement to control the quantity of repellent sprayed therefrom, and adjusting means for changing the contour of the said cam means as required to vary the amount of repellent supplied at any place on said printing means.

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