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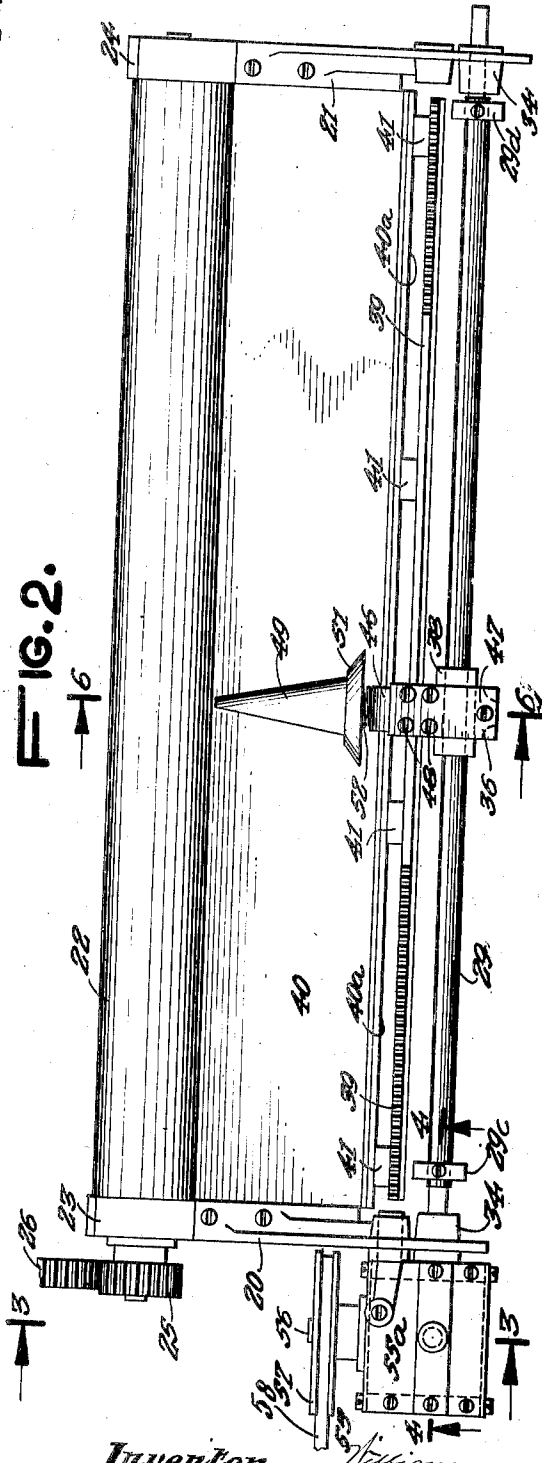
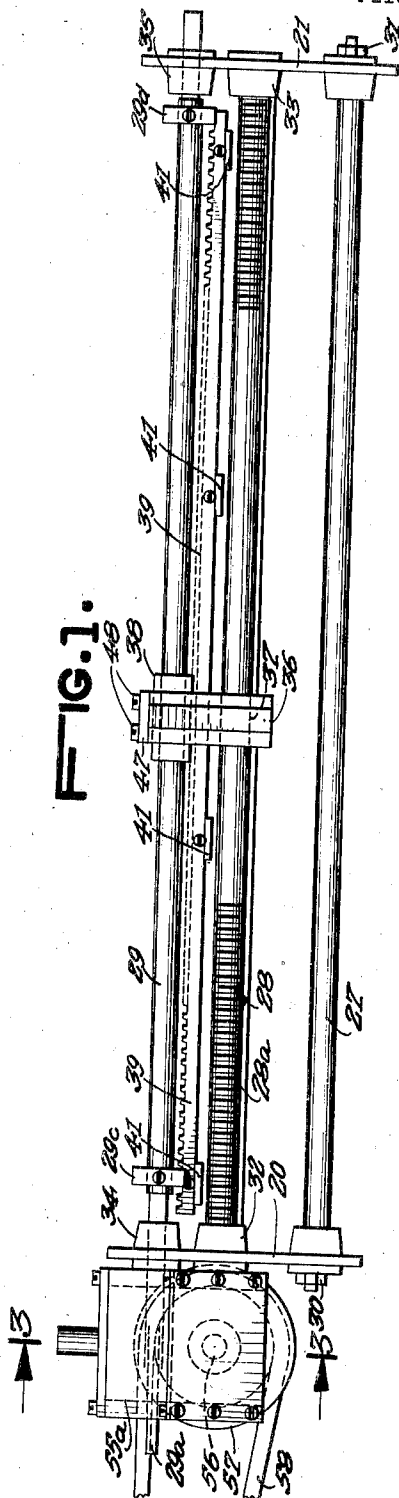
W. GEGENHEIMER

2,234,754

INK FOUNTAIN MIXER AND AGITATOR

Filed Nov. 25, 1939

3 Sheets-Sheet 1



*Inventor*

William  
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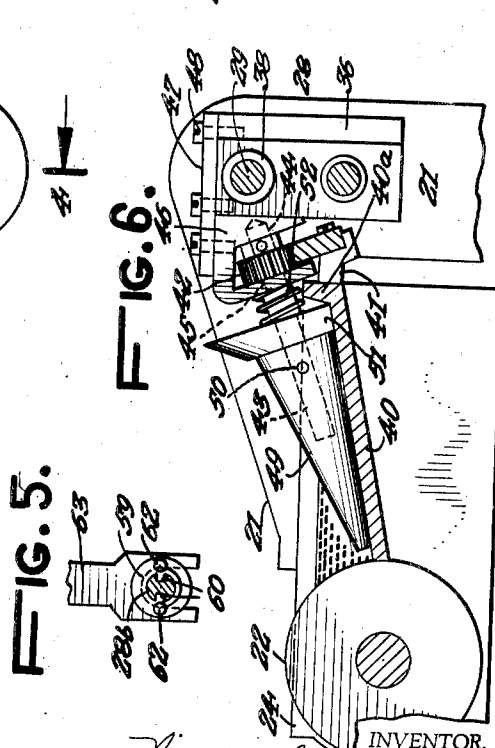
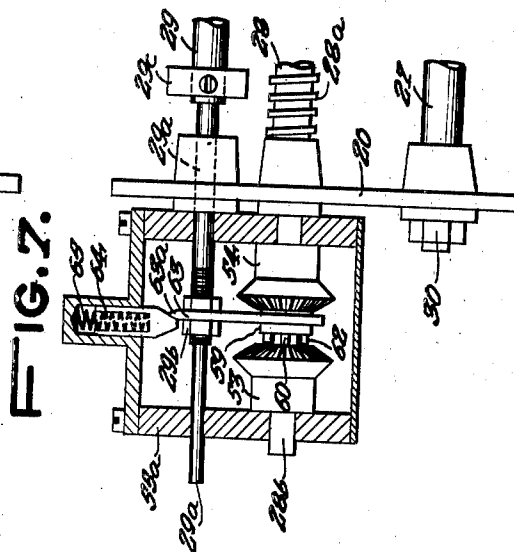
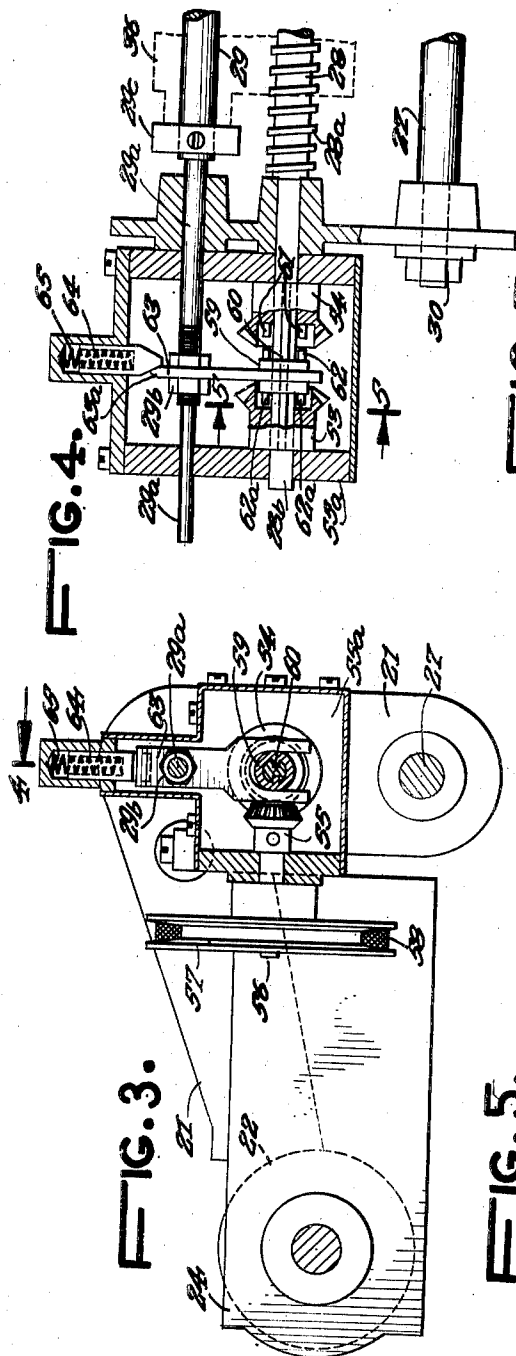
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# INK FOUNTAIN MIXER AND AGITATOR

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3 Sheets-Sheet 2



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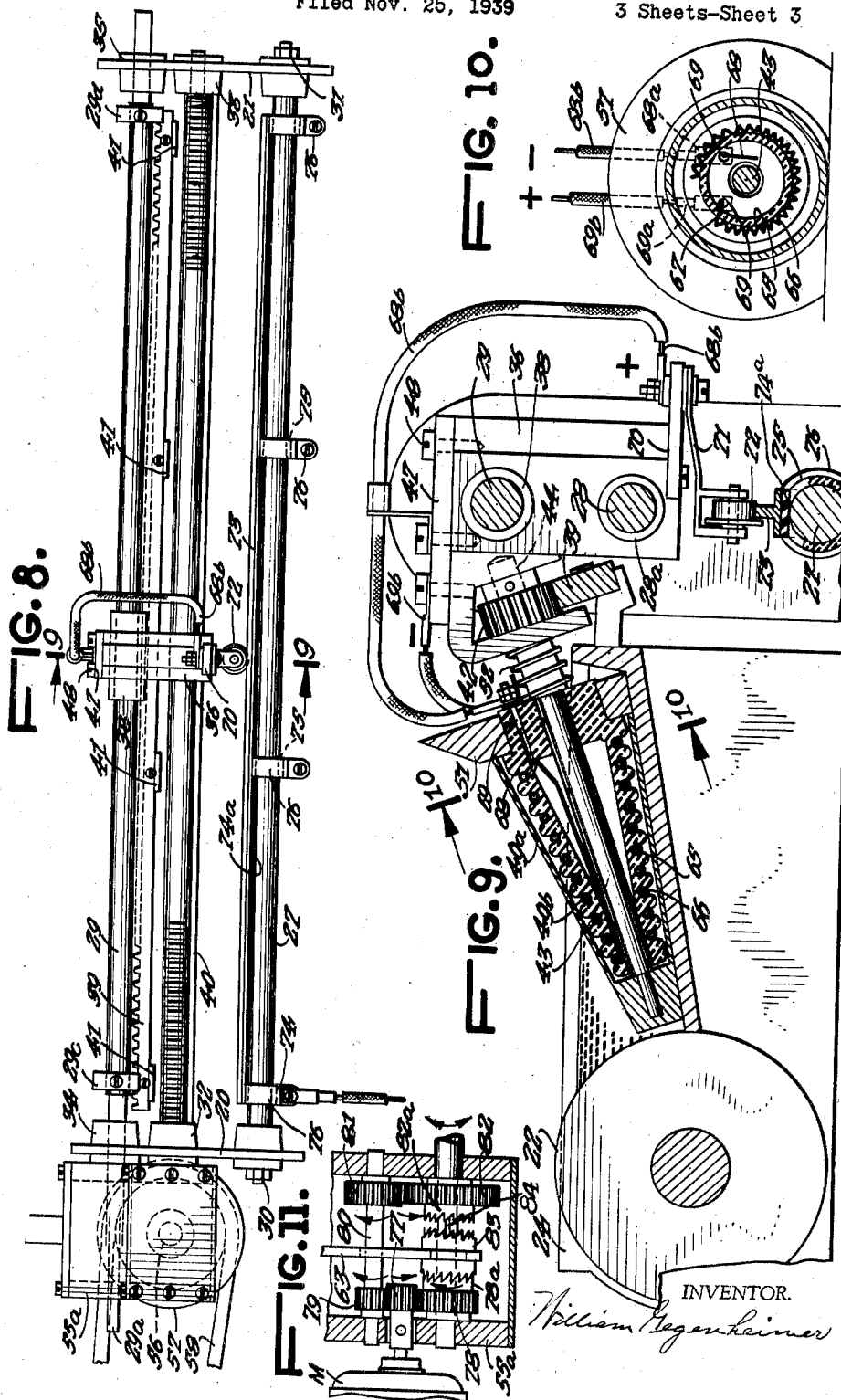
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INK FOUNTAIN MIXER AND AGITATOR

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3 Sheets-Sheet 3



## UNITED STATES PATENT OFFICE

2,234,754

## INK FOUNTAIN MIXER AND AGITATOR

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12 Claims. (Cl. 101—364)

This invention relates to ink fountain mixers or agitators and especially of the kind used for mixing and agitating inks used for printing processes in printing presses and for mixing chemicals used in offset presses.

One object of this invention is to provide an ink agitator that will mix and agitate printing inks and at the same time, will feed ink continuously to the fountain ink roller.

Another object of this invention is to provide a printing ink agitator that will readily agitate and feed inks that are usually difficult workable inks like aluminum inks, gold inks etc.

Another object of this invention is to provide an ink mixer in combination with a heater for preheating difficult workable inks to facilitate their continuous feed to the fountain feed roller.

A further object of this invention is to provide a cone-shaped revolving mixer which will act as well as a mixer and agitator and at the same time will maintain continuous feeding of the ink to the fountain ink roller.

A further object of this invention is to provide a cone-shaped agitator which will act as a mill as well as a mixer.

A further object of this invention is to provide a cone-shaped mixer and feeder that will be inexpensive to manufacture, easy to install and safe to operate.

Further objects will be seen as the description of the accompanying drawings will proceed.

Referring to the drawings:

Fig. 1 is a front view of the ink mixer showing the lead screw used to operate the cone-shaped agitator.

Fig. 2 is a plan view of Fig. 1, showing the cone-shaped agitator and other details of the mixer.

Fig. 3 is a section on the line 3—3 of Fig. 1, showing the arrangement used for operating the lead screw.

Fig. 4 is a section on the line 4—4 of Fig. 2 and Fig. 3, showing the bevel gears used for operating the lead screw and the arrangement for changing the direction of movement of the cone-shaped agitator.

Fig. 5 is a sectional detail view taken on the line 5—5 of Fig. 4.

Fig. 6 is a partial sectional view taken on the line 6—6 of Fig. 1, showing the cone-shaped agitator.

Fig. 7 is a view showing another position of parts shown in Fig. 4.

Fig. 8 is a modification showing a front view of ink agitator used in connection with a heater unit.

Fig. 9 is a section taken on the line 9—9 of Fig. 8, showing the heating wiring imbedded inside the cone-shaped agitator.

Fig. 10 is a section on the line 10—10 of Fig. 9, showing the manner in which the heater wire is imbedded in the cone-shaped porcelain heater.

Fig. 11 is a modification of the mechanism for reversing the direction of rotation of the threaded shaft shown in Figs. 3, 4 and 7 in this case spur gears are used in place of bevel gears.

Referring to Fig. 1, 20 and 21 are a pair of side frame castings which are attached to the frame of the printing press proper (not shown.) A fountain feeding roller 22 rotates in bearings 23 and 24, which are also located in the side frame of the printing press. The roller 22 is rotated through the medium of a gear 25 which in turn is rotated through a driving gear 26 and operated by the printing press driving motor.

A set of three shafts 27, 28 and 29 are attached to the side frames 20 and 21. The shaft 27 is anchored to the side frames 20 and 21 at 30 and 31 its purpose is to keep said frames spaced apart in rigid upright position. The shaft 28 which comprises a screw thread 28a is rotated in bearings 32 and 33 in the side frames 20 and 21. The shaft 29 is slidably mounted inside bearings 34 and 35 of the side frames 20 and 21.

The threaded shaft 28 fits into a thread 37 in a slidably mounted block 36 which is moved to the right or to the left depending of the direction of rotation of the threaded shaft 28. A sleeve 38, through which the sliding shaft 29 runs, is located at the upper portion of the block 36.

A gear rack 39 is secured to the ink fountain bed 40 by the brackets 41. A spur gear 42 is fastened to a driving shaft 43. The shaft 43 rotates in bearings 44 and 45 which are located in the bracket 46. The bracket 45 is fastened to the block 36 through a plate 47 and screws 48. It is understood that the bracket 46, plate 47 and the block 36 can also be made of one piece.

The cone-shaped agitator 49 is attached to the driving shaft 43 through a pin 50. A tapered flange 51 is loosely held by the shaft 43. A spring 52 presses the flange 51 against the cone-shaped agitator 43. The flange 51 prevents the ink from running over the fountain back edge 40a.

The threaded shaft 28 is rotated through the medium of a pair of bevel gears 53 and 54 and a bevel pinion 55. The bevel gears 53 and 54 turn loosely on the extension 28b of the shaft 28. Both gears are operated simultaneously by the bevel pinion 55 so that one bevel gear rotates clockwise and the other anticlockwise. The bevel

pinion 55 is pinned to a driving shaft 56 which is rotated by a V-belt wheel 57 and a V-belt 58.

Through the rotation of the threaded shaft 28 the casting 36 is moved to the right or left depending on the direction of rotation of the shaft 28. By connecting the shaft 28 to one of the bevel gears 53 or 54 the shaft 28 is rotated clockwise or anticlockwise. The bevel gears 53 and 54 are connected to the extension 28b of the shaft 28 through the medium of the slidably mounted sleeve 59 which slides in a key-way 60 of the shaft extension 28b.

The bevel gears 53 and 54 have a pair of pins 61. The pins 61 contact pins 62 which are located on the sleeve 59. The sleeve 59 is joined to a forked arm 63 which is anchored to the shaft extension 29a of the shaft 29 by the nuts 29b.

The shaft 29 has a pair of limiting sleeves 29c and 29d. When the casting 36 reaches the limiting sleeves 29c of the shaft 29 the further movement of the casting 36 will cause the shaft 29 to slide. This motion will move the forked arm 63 respectively the sliding sleeve 59 and disconnect the pins 61 of the bevel gear 54 and will engage the pins 62a of the sliding sleeve 59 to the pins 61 of the bevel gear 53. As both bevel gears rotate in opposite directions to each other this operation will change the rotation of the shaft 28, thus the casting 39 will move now in the opposite direction. The same operation will occur when casting 39 will reach the limiting sleeve 29d on the opposite side of the shaft 29. To keep the forked arm 63 in position a plunger 64 contacts the upper part 63a of the forked arm 63 the plunger 64 is under the influence of the spring 65. The plunger 64 will keep the arm 63 locked in place until the shaft extension 29a is shifted to the opposite side. In this case the plunger 64 will be raised and fall on the other side of the forked arm 63. This operation repeats itself every time the shaft 29 slides to the right or to the left.

In Figs. 8, 9 and 10, is shown a modification of the ink fountain mixer shown in Fig. 1. Referring to Fig. 9, the cone-shaped agitator 40a is hollow. A cone-shaped porcelain heater plate 65 is inserted into the hollow cone-shaped agitator 40a. A heater wire 66 is wound around the porcelain heater plate 65. The ends 67 and 68 of the heater wire 66 are inserted through terminal holes 69 in the cone-shaped porcelain heater plate 65 and are fastened to terminals 68a and 69a. The terminal 69a is grounded to the machine proper at 69b. The other end 68a is connected through a lead wire 68b to an insulated plate 70, which is located at the bottom of the casting 36. A forked spring 71 is attached to the plate 70 and is in electrical connection with the wire 68b. A flanged roller 72 is attached to the opposite end of the forked spring 71. The roller 72 runs on a rail 73 which is electrically connected to the electric current at the terminal 74. The conductor rail 73 is insulated from shaft 27 by an insulating bar 74a secured to said rail, as well as by rings 75 of insulating material interposed between clamps 76 and said shaft. The clamps 76 serve to fasten the conductor rail 73 to the shaft 27.

Fig. 11 shows a modification of the mechanism shown in Figs. 3, 4 and 7. In this case the bevel gears 53 and 54 used for changing direction of rotation of the threaded shaft 28 are replaced by spur gears. The extension shaft 28b has a spur gear 78 which has a coupling member 78a. Another spur gear 82 which has a coupling member

82a is also fitted over the shaft extension 28b. Both gears 78 and 82 are loosely attached to the shaft extension 28b. The gear 78 is operated directly by the motor M and through an intermediate gear 77. The gear 82 is rotated indirectly through the gear 79 which is rotated by the gear 77 and the gear 81. The gear 81 is connected to the gear 79 by the connecting shaft 80. A coupling sleeve 83 is slidably mounted on the shaft extension 28b in the key-way 84 shown in Figure 11. As the gear 78 rotates clockwise the shaft 28 will also rotate clockwise while the coupling sleeve 83 is connected to the coupling member 78a. When the coupling sleeve 83 is connected to the coupling member 82a of a gear 82 the shaft 28 will rotate anticlockwise due to the anticlockwise rotation of the gear 82.

#### Operation

Referring to Figs. 1, 2 and 3 the cone-shaped agitator 49 is attached to the shaft 43 which is connected to a spur gear 42. When the threaded shaft 28 is rotated by the set of bevel gears 53, 54 and 55 which are located inside the gearbox 55a the block 36 is moved to the left or to the right depending on the direction of rotation of the shaft 28. As the driving shaft 43 rotates inside bearings of the bracket 46 which is attached to the block 36 the spur gear 42 which is attached to the shaft 43 and is in mesh with the gear rack 39 will be rotated and turn the cone-shaped mixer 49. The block 36 will advance to the left or to the right until it reaches one of the limiting sleeves 29c or 29d (depending on the direction of rotation of the thread shaft 28). The further movement of the block 36 will slide the shaft 29 until the forked arm 63 is moved. This operation will disengage the sleeve 59 from one of the bevel gears 53 or 54 and connect same to the other bevel gear. As one bevel gear turns, clockwise and other anti-clockwise this shifting of the sleeve 59 will change the direction of rotation of the shaft 28 and make the block 36 move in the opposite direction. This operation will repeat itself as long as the shaft 28 is in operation.

The cone-shaped agitator 49 is rotated clockwise or anti-clockwise depending on the direction of motion of the block 36. The cone shaped flange 51 serves to prevent the overflow of ink over the fountain back edge.

The action of this rotary cone-shaped mixer is an improvement over other types of ink mixers and agitators as the cone when revolving acts as a mill as well as a mixer.

Referring to Figs. 8, 9 and 10 the arrangement shown is used for inks that are difficult workable ink and usually require reheating. To this purpose a cone-shaped porcelain heater plate 65 is placed inside the cone-shaped agitator 49a. An electric wire is wound around the porcelain heater and is connected to the ground and to an electric conductor rail 73. The conductor rail is attached to the shaft 27 of the mixer proper through the clamps 76. The rail 73 is insulated from the shaft 29 by the insulated bar 74a and the insulated rings 75.

As the block 36 moves to the right or to the left the flanged roller 72 which contacts the conductor rail 73 is moved along with the block 36. The roller 72 supplies current to the heater wire 66 through the lead wire 68b.

Electric current is supplied to the heater wire 66 simultaneously with the start of operation of the electric driving motor employed to operate the cone-shaped mixer. When the motor is shut

off, the current supplied to the heater wire is discontinued. This is required to make it sure that no excessive heat is supplied to the ink at one place of the ink fountain while the mixer is not operated. It is understood that the current to the heater wire can be discontinued independently of the operation of the driving motor through the use of a separate switch.

It is obvious that my invention is susceptible to numerous modifications without departing from the spirit of the invention, and it is intended that my invention be limited only by the scope of the appended claims.

What I claim is:

1. In a mixer of the class described for mixing, agitating and feeding ink or the like to a fountain feed roller, said mixer including a cone-shaped agitator member, said cone-shaped member being hollow, means included in said mixer for rotating said agitator member clockwise or anti-clockwise and means included for moving said agitator member to the left or to the right; a cone-shaped porcelain heat plate inserted into said cone-shaped agitator, electric heater wires wound around said cone-shaped heater member, said heater wires electrically connected to an electric circuit, said circuit including a conductor rail and a current feed roller for supplying current to the heater wire aforesaid.

2. In a mixer or agitator of the class described for mixing and agitating inks or the like, said mixer including a cone-shaped roller for mixing said ink, a driving shaft also included in said mixer, said cone-shaped roller being attached to said driving shaft, said driving shaft having a spur gear attached thereto, a gear rack attached to said mixer and in mesh with said spur gear; a threaded shaft also included in said mixer, a slidable movable block operating on said threaded shaft, bearings in said slidable movable block, said driving shaft rotating in said bearings, means included in said mixer for rotating said threaded shaft in clockwise or anti-clockwise direction, said means including a pair of driving spur gears, said spur gears loosely attached to said threaded shaft, a prime mover for operating said threaded shaft also included, said prime mover rotating one of said driving gears directly by means of a gear, said prime mover rotating the other driving spur gear indirectly by means of an intermediate gear, the operation of said prime mover transmitting a clockwise motion to one of said driving spur gears and an anti-clockwise motion to the other driving spur gear, and means included for alternatively changing the direction of rotation of the threaded shaft aforesaid.

3. In a mixer or agitator for printing inks or the like including a fountain bed and a fountain feed roller, a cone-shaped agitator for mixing and agitating the ink, a spur gear fastened to said cone-shaped agitator, a gear rack attached to said fountain bed and in mesh with said spur gear, a thread shaft mounted on said mixer, a slidably movable member operating on said shaft, said cone-shaped agitator being rotatably attached to said member, means provided on said mixer to rotate said threaded shaft, and means provided to reverse the direction of rotation of the threaded shaft aforesaid.

4. In a mixer or agitator for printing inks or the like including a fountain bed and a fountain feed roller, a cone-shaped agitator member for mixing and agitating the ink, gear means for rotating said agitator member, and a gear rack

attached to said fountain bed and in mesh with said gear means; and means for changing the direction of rotation of said agitator member, said means including a slidably movable member, said agitator rotatably attached to said movable member, said agitator member rotating clockwise when said slidably movable member moves to the right, said agitator member rotating anti-clockwise when said slidably movable member moves to the left.

5. In a mixer or agitator of the class described including a cone-shaped agitator member, a shaft attached to said member, a spur gear attached to said shaft, a gear rack attached to said mixer and in mesh with said spur gear; a slidably movable member, said shaft rotatably attached to said member, a threaded shaft fitted into a threaded portion of said slidable member, means for rotating said shaft in a clockwise or anti-clockwise direction, said slidable member being moved to the left or to the right depending on the direction of rotation of said threaded shaft; the direction of movement of said slidable member transmitting rotating motion to said shaft and to said cone-shaped agitator respectively, said cone-shaped agitator rotating clockwise when said slidable member moves to the right, said cone-shaped member rotating anti-clockwise when said movable member moves to the left.

6. In a mixer or agitator of the class described for mixing and feeding ink or the like to a fountain feed roller, said mixer including a cone-shaped agitator member, a driving shaft having a spur gear and attached to said cone-shaped agitator member, and a gear rack attached to said mixer and in mesh with said spur gear; a slidably movable member, a threaded shaft fitted into a threaded portion of said slidably movable member, a pair of side frames attached to said mixer, bearings in said side frames rotatably mounting said threaded shaft, a pair of bevel gears loose on said threaded shaft, a bevel pinion in mesh with said bevel gears, a prime mover rotating said bevel pinion to transmit a clockwise rotating movement to one of said bevel gears and an anti-clockwise rotating movement to the other bevel gear, said pair of bevel gears rotating said threaded shaft clockwise or anti-clockwise respectively, and means provided for changing the direction of rotation of the threaded shaft aforesaid.

7. The same structure as set in claim 2, said means for changing the direction of rotation of said threaded shaft including a slidably movable bar, a forked arm attached to said movable bar, a clutch member operated by said forked arm, said clutch member being slidably attached to said threaded shaft and being engaged alternatively with one or the other of said pair of driving spur gears, said slidably movable bar being operated by the movement of said slidable movable block, said block being moved by the rotative motion of the threaded shaft aforesaid.

8. In an ink mixer, a fountain bed, a block movable relative to said bed, an agitator carried by said block and extending into said bed, means whereby said agitator will be rotated simultaneously with movement of said block, and means for moving said block.

9. In an ink mixer, a fountain bed, a block movable longitudinally of said bed, an agitator carried by said block and projecting therefrom into said bed, means for rotating said agitator in clockwise or counter-clockwise direction according to the direction of travel of said block, and means for moving said block.

10. In an ink mixer, a fountain bed, a block movable longitudinally of said bed, an agitator carried by said block and projecting therefrom into said bed, means for rotating said agitator in 5 clockwise or counter-clockwise direction according to the direction of travel of said block, means for moving said block, and means operable when said block has moved a predetermined distance in one direction for automatically reversing its 10 direction of travel.

11. In an ink mixer, a fountain bed, a block movable relative to said bed, an agitator rotatably carried by said block and projecting into said bed, a fixed rack-bar, a gear on said agitator

engaged with said rack-bar, and means for moving said block.

12. In an ink mixer, a fountain bed, a cone-shaped agitator roller extending into said bed, means for bodily moving said roller relative to 5 said bed, means for alternately rotating said roller in clockwise or counter-clockwise direction simultaneously with the movement of said roller, and a flange carried by said roller disposed adjacent to an edge of said bed to prevent ink 10 flowing over said edge during operation of said roller.

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