Sept. 2, 1958 H. W. GEGENHEIMER 2,849,952

INK FOUNTAIN MIXER

Filed March 16, 1956 2 Sheets-Sheet 1

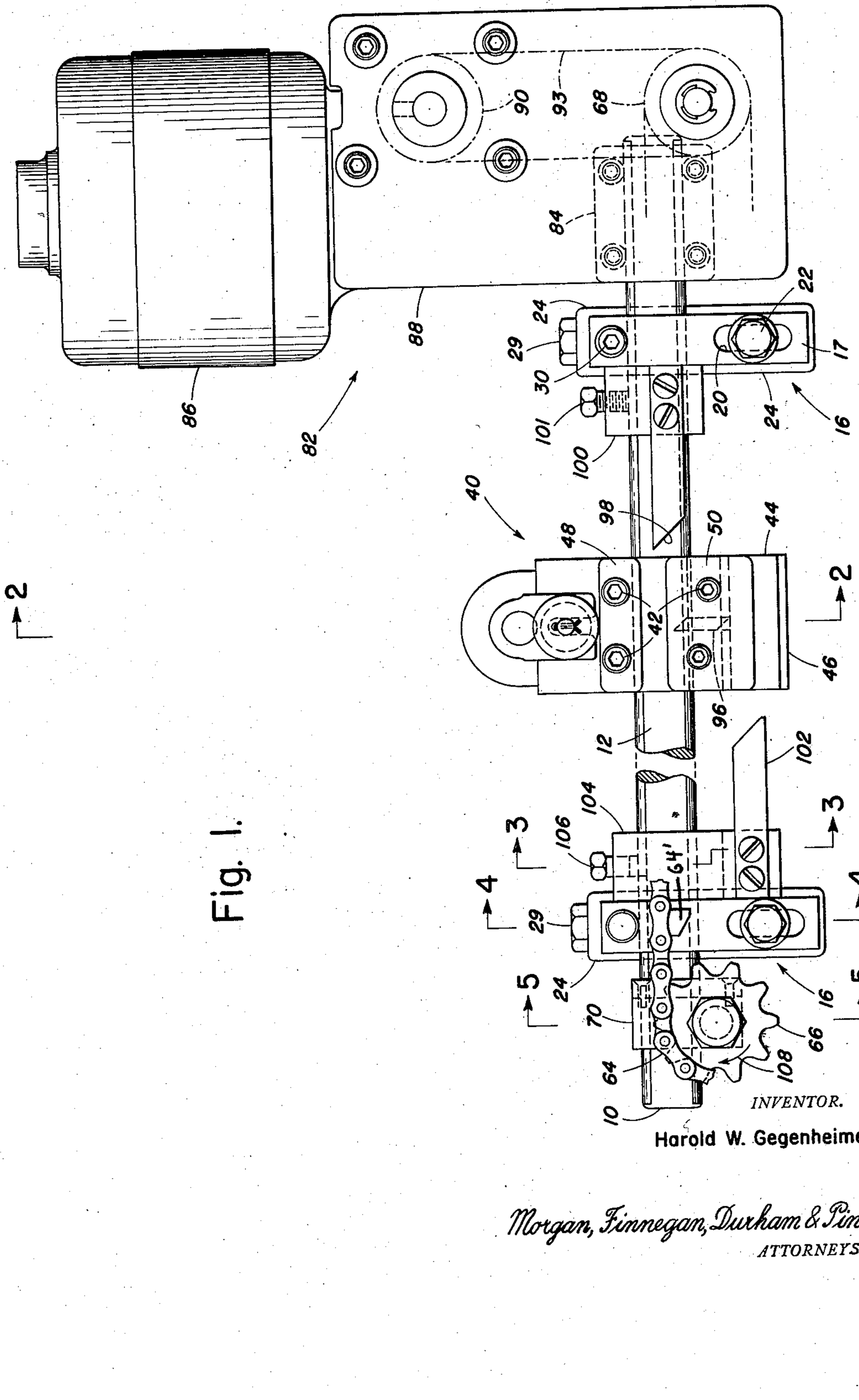

Fig. 1.

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Fig. 4.

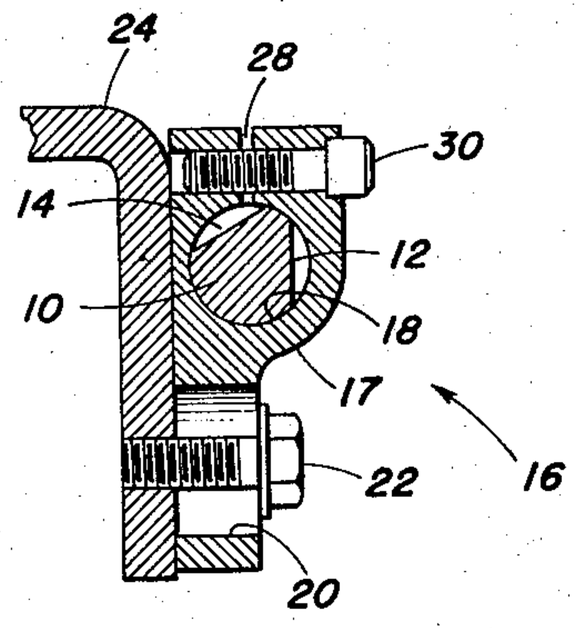

Fig. 2.

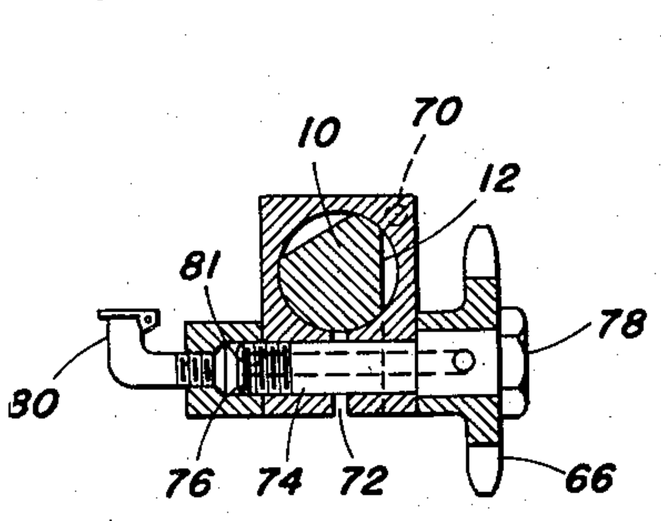

Fig. 5.

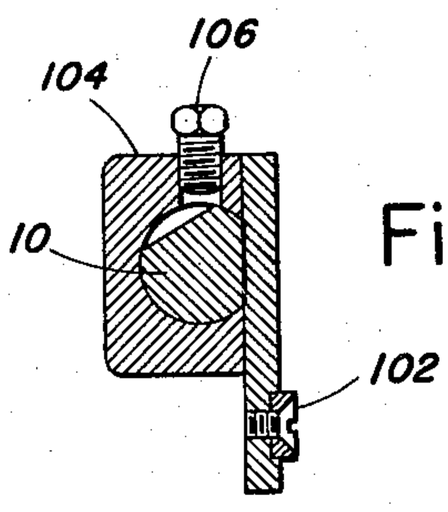

Fig. 3.

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INK FOUNTAIN MIXER

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8 Claims. (Cl. 101—364)

This invention relates to mixers for ink fountains and has particular relation to such mixers employed with printing presses to maintain the ink which is fed to the inking rolls in proper condition and insures uniform feeding.

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.

In the drawings:

Figure 1 is a front elevational view of the improved ink fountain mixer or agitator of the present invention and shows the various elements that make up this improved mixer mounted on the elongated rack member;

Figure 2 is a sectional view taken along line **2—2** of Figure 1 showing the disposition of the conical mixer within the ink fountain and the manner in which the carriage of the mixer is mounted upon the elongated rack member;

Figure 3 is a sectional view taken along line **3—3** of Figure 1 showing the detailed construction of the mounting for a cam member;

Figure 4 is a sectional view taken along line **4—4** of Figure 1 and shows the construction of the mounting brackets for the entire mixer organization; and

Figure 5 is a sectional view taken along line **5—5** of Figure 1 and shows in detail the construction of the idler sprocket and its mounting upon the elongated rack member.

It is recognized that ink fountain mixers of the type employing a conical shaped or frustum mixing member that is positioned in juxtaposition to the bed of the ink fountain and is simultaneously reciprocated through a given distance and rotated about its axis is generally superior to other types of known mixers with regard to maintaining the ink properly mixed and continuously and uniformly fed to the fountain ink rolls as well as acting as a mill to maintain the ink in a fine suspension. However, heretofore the fountain ink mixers of this type have been of such a construction or design that they required what may be termed a "tailor-made" installation for each different printing press and even when properly designed for the particular press installation of the mixer was still a rather substantial task necessitating the drilling of many holes and mounting of much equipment upon the frame of the printing press. In accordance with the novel organization of this invention this difficulty with regard to installation is completely overcome.

The present invention has for its object the provision of an improved ink fountain mixer of the type employing a conical mixing member that is reciprocated through a given distance while being simultaneously rotated about its axis. Another object is to provide such an improved ink fountain mixer that is mounted upon the printing press solely by means of a pair of spaced mounting brackets which are adapted to be secured to the frame of the printing press in an extremely simple and expeditious manner. A further object is to provide such an improved ink fountain mixer that is readily adjustable for use with different printing presses with the entire mechanism of the mixer being mounted upon an elongated rack member which is supported solely by a pair of support brackets which are adjustable both longitudinally and rotatatively with respect to this rack. A still further object of the invention is to provide such an improved ink fountain mixer wherein the spaced brackets are provided with slots elongated in a direction laterally of the rack member so as to provide for limited adjustment of the ink fountain mixer in this lateral direction after the same is secured to the frame of the printing press. Another object of the invention is to provide such an improved ink fountain mixer which in addition to being simple to mount upon the printing press and adjustable for use with different printing presses is extremely simple and economical in construction and yet highly reliable in its operation.

The mixer of the present invention is of unitary construction in that all of the elements are assembled into an operating unit with this unit then being secured to the printing press in its operative relation with the ink fountain of the press so that it is effective to maintain the ink therein properly mixed and in proper condition for feeding to the fountain ink roller, with this assembled unit being adjustable for use with different types and sizes of printing press organizations.

In accordance with the illustrative and preferred embodiment of the invention there is providsd an elongated rack member which is of generally cylindrical configuration, although it is provided with a flattened surface throughout its length as well as being provided with gear teeth to form the rack of a rack and pinion drive. This elongated member is supported solely by a pair of spaced brackets which are bored to receive this member and which extend laterally of the member. By means of these brackets the entire mixer is mounted upon the printing press with each of the brackets being made up of a pair of members, one of which is provided with an elongated slot through which a bolt or capscrew is inserted for attachment to the other member with the slots permitting limited adjustment in a direction laterally of the elongated member. The connection between the brackets and the elongated member is such that the elongated member may be adjusted about its axis relative to the brackets and the brackets may be adjusted longitudinally of the rack member with means being provided to positively secure the brackets to the rack member in any desired adjusted position.

Mixing of the ink in the ink fountain is accomplished by a mill assembly which includes a conical mill rotatably carried by a carriage which is mounted solely upon the elongated rack and in a manner which permits the assembly to move longitudinally along the rack but prevents it from moving or rotating around the rack. The mill is rotated in response to movement of the assembly along the rack with suitable gearing being provided for this purpose including a pinion in engagement with the rack. Continuous reciprocation of the mill assembly along the rack is provided by a motor driven drive mechanism which is mounted solely upon the elongated rack and includes an endless chain positioned between a pair

of sprockets one of which is driven by an electric motor through a suitable speed reducer. This chain passes in close proximity to the carriage of the mill assembly which is provided with a cam actuated pawl member movable from a position where it is engaged with one run of the chain to a position where it is engaged with the other run of the chain to thereby drive the mill assembly first in one direction and then in the other direction along the elongated rack. Cam members are secured to the rack and are effective to cam this pawl member from one of its driving positions to the other so that a continuous reciprocation of the carriage is had with the positioning of the cam members determining the amplitude of this reciprocation.

Thus all of the mechanism of the novel mixer of this invention is mounted upon the elongated rack member and in mounting the mixer upon the printing press it is merely necessary to secure the spaced brackets to the frame of the press in any desired manner, as by bolting with the adjustment afforded by the elongated slots in the brackets and the rotation of the rack member relative to the brackets being effective to properly position the mill within the ink fountain in a variety of installations of different designs.

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 to the drawings, wherein like reference characters are used throughout to designate like elements, the illustrative and preferred embodiment of the invention shown therein comprises the cylindrical rack **10** having an outwardly facing flattened surface **12** and a generally upwardly facing row of teeth **14** (Figures 2 and 4). Support for the rack **10** is derived solely through the brackets **16** which includes a member **17** that is provided with bore **18** within which the rack is received. These members **17** of the brackets **16** are provided with elongated slots **20** through which extend cap screws **22** by means of which these members are secured to the L shaped arm **24** which forms a portion of the bracket and which is adapted to be secured to the upper face **26** of frame **27** of the printing press in any suitable manner as by means of bolts **29** or the like. The members **17** are slotted at **28** to form in effect a pair of jaws between which the rack **10** may be firmly clamped, with cap screws **30** being effective to draw the two sections or jaws of this member of the bracket into clamping relation. The construction of member **17** is such that upon loosening cap screw **30** rack **10** may be rotated within bore **18** to any desired rotative position and the entire bracket may be adjusted longitudinally of the rack while tightening of this cap screw positively secures the bracket to the rack member. By means of the elongated slots **20** limited adjustment of the rack relative to the frame of the printing press may be had in a direction laterally of the axis of the rack or as viewed in Figure 2 a vertical direction. The ink within fountain **32** is maintained properly mixed and in proper condition for feeding to the ink roller **34** by conical mixer **36** which is positioned immediately above the bed **38** of the fountain and is continuously reciprocated generally throughout the length of the fountain while at the same time being rotated about its axis. This conical mixer **36** is supported from rack **10** through the medium of carriage **40** which is mounted upon the rack in a manner such that it may move along the rack but is prevented from moving or rotating about the rack and includes frame **41** bored to receive rack **10**. Secured to the rear face of frame **41** by cap screws **42** is plate member **44** which has its inner surface in engagement with the flat surface **12** provided on rack **10** thereby preventing rotation of frame **41** about the rack. The lower portion of plate member **44** is bent outwardly to form support lip **46** for supporting and guiding a portion of the chain drive mechanism described hereinafter and by which the carriage is reciprocated along rack **10** with members **48** and **50** spaced outwardly from plate member **44** by spacers **52** and secured in place by cap screws **42** also being effective to guide this chain of the drive mechanism. Coaxial with and extending from conical mill **36** is shaft **54** to which the mill is secured by set screw **56** with the outer end of this shaft being received in the spaced bearings **58** provided in frame **41**. Rotation of the conical mill is produced in response to movement of carriage **40** along rack **10** through the medium of a suitable gear train which includes idler pinion **60** mounted on shaft **62** which is secured to carriage **40** and pinion **63** which is secured to shaft **58** and disposed intermediate the spaced bearings **58**. The idler pinion is intermeshed with the teeth **14** of rack **10** and with pinion **63** so that a rack and pinion drive is established for rotating shaft **54** and accordingly mill **36**. Bearing member **58** is fed over a threaded stud **58A** which projects from carriage **40**, and is secured thereto by the thumb nut **58B** so that by removing the thumb nut **58B**, the ink mixing cone **36** and bearing assembly may be removed.

Continuous reciprocation of carriage **40** along rack **10** is provided through the motor driven endless chain **64** which is positioned between idler sprocket **66** and driving sprocket **68** with the upper run of the chain being received intermediate the guide members **48** and **50** of carriage **40** while the lower run passes intermediate the guide member **50** and support lip **46** of plate member **44**. Idler sprocket **66** is supported from rack **10** by means of support block **70** which is bored to receive the rack and is slotted at **72** so that it may be firmly clamped to the rack in any desired position, with this being accomplished by means of the threaded shaft member **74** which is threadedly received within bore **76** provided in this support block. By tightening down upon this shaft member block **70** is securely clamped to rack **10** while when this shaft member is loosened the block may move along or about the rack. The outer end of shaft member **74** is enlarged to provide a bearing surface upon which is received sprocket **66** with the hexagonal head **78** of the shaft member retaining the sprocket in position and facilitating adjustment of the shaft member. Lubrication of the bearing surface is provided through fitting **80** with the lubricant passing through the channel **81** provided in the shaft member and extending to the bearing surface. The drive for chain **64** is provided through the motor assembly **82** which is supported solely by rack **10**, being mounted on the end of the rack through the mounting brackets **84**, shown in dotted lines in Figure 1. This motor assembly includes an electric motor **86** mounted upon upstanding plate **88** and operative to drive sprocket **90** through speed reducer **92**. The driving sprocket **68** is driven from sprocket **90** through chain drive **93** which is interposed between sprocket **90** and sprocket **94** with this lateral sprocket being mounted upon the same shaft as driving sprocket **68**.

Reciprocation of carriage **40** is accomplished by alternately interconnecting opposite runs of endless chain **64** with the carriage and for this purpose carriage **40** is provided with pawl member **96**, shown in dotted lines in Figure 1, which is movable from a position where it engages the upper run of chain **64** and is free of the lower run to the position where it engages the lower run and is free of the upper run, with this pawl member being frictionally held in its desired position by any suitable means such as a spring press detent, not shown. The pawl **96** is cammed from its upper position in engagement with the upper run of chain **64** to its lower position in engagement with the lower run of the chain by cam **98** which is supported from rack **10** by means of support block **100** adjustably secured to the rack by means of cap screw **101** while movement of pawl **96** from its lower to its upper operative positon is provided by cam **102** which is likewise supported from rack **10** through a support block **104** adjustably received upon the rack

and held in position by cap screw **106**. Chain **64** is driven through motor assembly **82** in the direction indicated by arrow **108** so that when pawl **96** is in engagement with the chain-carried lug **64'** at the upper run of chain **64** carriage **40** is moved to the right as viewed in Figure 1. Upon contacting cam **98** pawl **96** is disengaged from the upper run of the chain and is engaged with the lug **64'** at the lower run of the chain so that carriage **40** is moved to the left until the pawl engages cam **102** which again moves it to its upper operating position disengaged from the lower run of the chain and engaged with the upper run of the chain. Thus carriage **40** is continuously reciprocated along rack **10** through an amplitude which is determined by the location of the cams **98** and **102** and of course conical mill **36**, which is carried by the carriage, is likewise continuously reciprocated as well as being rotated about its axis through the rack and pinion drive mechanism.

Since the entire mixer assembly of this invention is mounted upon rack member **10** and since this rack member may be adjusted relative to support brackets **16** both in a direction longitudinally of the rack member and rotatively about the axis of the rack member and since slots **20** in the member **17** of the bracket provides limited lateral adjustment of the rack the mixer is readily adaptable to many different designs of printing presses with the mounting of the mixer upon the press being extremely simple requiring only the attachment of arm **24** of the mounting brackets **16** to the press by means of cap screws **29** or in any other manner desired.

The invention in its broader aspects is not limited to the specific mechanism shown and described but departures may be made therefrom, within the scope of the accompanying claims, without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. In a mixer for ink fountains the combination of an elongated member, said member being supported solely by a plurality of brackets connected to and extending laterally from said member and adapted to be attached to the side frames of the ink fountain of a printing press, a mill assembly mounted solely on said elongated member and including a carriage and a conical mill supported thereby, said mill assembly being movable along said elongated member and having means engageable with said member for rotating the conical mill in response to such movement, means by which said conical mill may be adjusted relative to the brackets about an axis parallel with the direction of movement of the mill assembly along the elongated member, said last named means being operative to retain said conical mill and brackets in desired adjusted rotative positions, and motor means supported solely by said elongated means and constructed and arranged to continuously reciprocate said mill assembly along said member.

2. The organization defined by claim 1 wherein the means by which said conical mill may be adjusted relative to the brackets is connected to the brackets.

3. The organization defined by claim 2 wherein the elongated member is generally cylindrical and is received within a complementary bore provided in each of the brackets and wherein said means by which said conical mill may be adjusted relative to the bracket means is effective in one position to positively secure said bracket means to said member and in another position is effective to allow said bracket means to move longitudinally of and about said member.

4. The organization defined by claim 1 wherein said elongated member is provided with a longitudinally extending flat surface and the carriage has a surface complementary to and in engagement with said flat surface and which is effective to prevent rotation of the carriage about said member.

5. The organization of claim 1 wherein each of the brackets is provided with means operative to provide for limited adjustment of the elongated member in a direction laterally thereof after the brackets are secured to a suitable frame member.

6. The organization of claim 5 wherein the means operative to provide said limited adjustment includes a connection in the form of an elongated slot through which a bolt means extends.

7. The organization of claim 1 wherein said motor means includes a motor driven endless chain supported on a pair of spaced sprockets secured to the elongated member so that both runs of the chain pass in juxtaposition to said carriage, a movable driving member carried by said carriage and operative to alternately engage opposite runs of the chain so that said carriage moves with said runs, and cam means disposed at the extremities of reciprocation of the carriage and operative to cam the drive means from engagement with one run of the chain and into engagement with the other run.

8. In an ink fountain mixer of the type having a conical mill adapted to be continuously reciprocated within the ink fountain in juxtaposition to the bed thereof the combination of a rack, said rack being supported solely by a plurality of brackets extending laterally from said rack and adapted to support the same from a suitable frame member, said brackets being connected to said rack in a manner which permits relative rotational and longitudinal adjustment of the brackets relative to said rack but provides for fixedly securing the brackets to the rack in desired adjusted positions, a mill assembly supported solely on said rack and including a carriage mounted on the rack in a manner providing for reciprocal movement therealong but preventing angular movement about the rack, a conical mill carried by said carriage and means for rotating the mill about its axis in response to reciprocation of the carriage along the rack including a pinion intermeshed with the rack, and motor means supported solely by said rack and constructed and arranged to continuously reciprocate said mill assembly along said member.

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