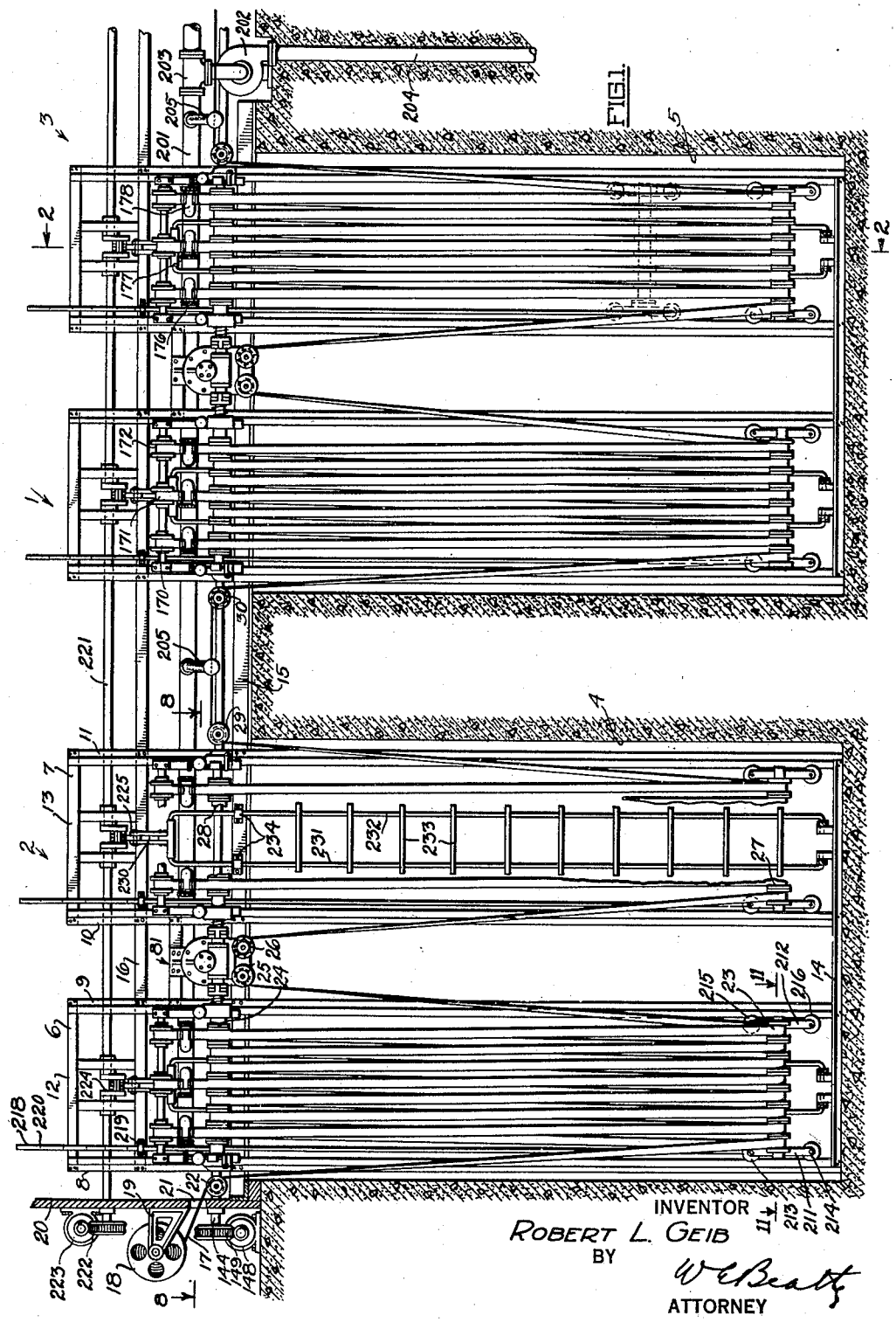
May 11, 1937. R. L. GEIB 2,079,849

FILM DEVELOPING MACHINE

Filed Nov. 25, 1935 4 Sheets-Sheet 1

FIG. 1.



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FILM DEVELOPING MACHINE

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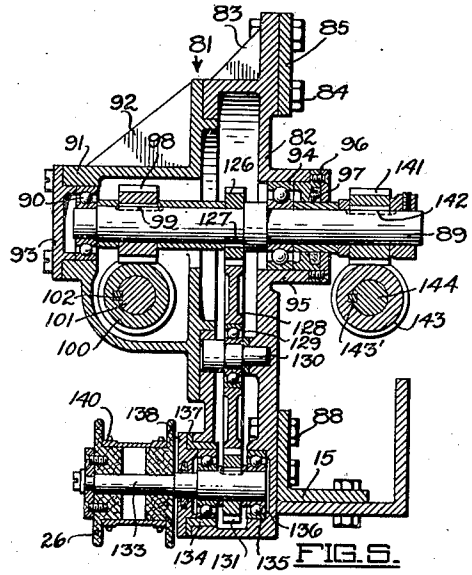


FIG. 5.

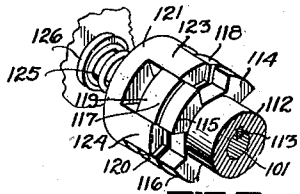


FIG. 6.

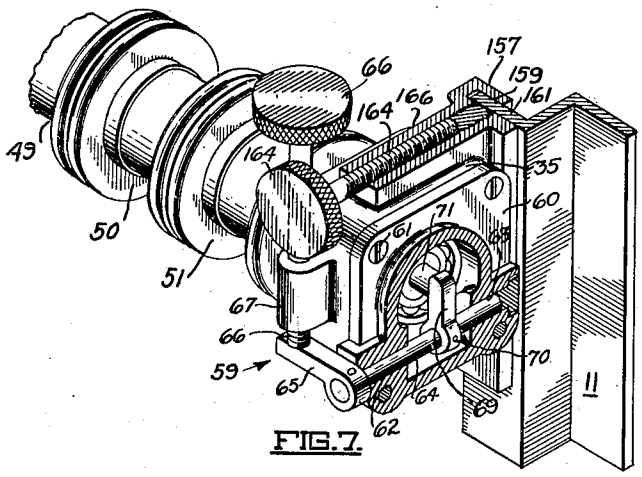
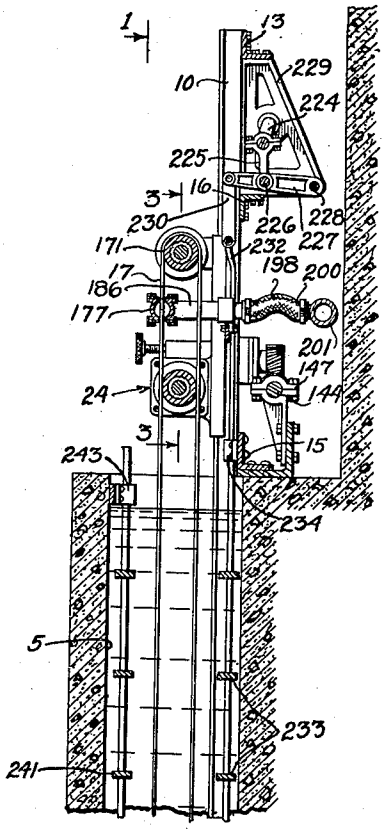


FIG. 7.



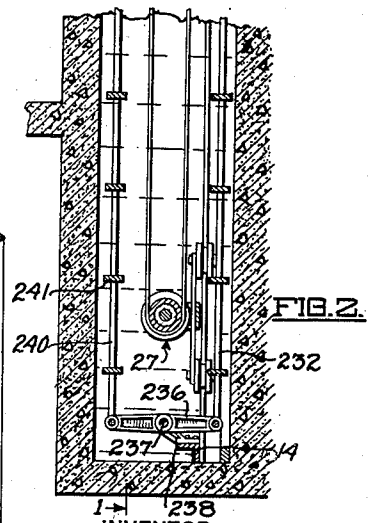


FIG. 2.

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FILM DEVELOPING MACHINE

Filed Nov. 25, 1935 4 Sheets-Sheet 3

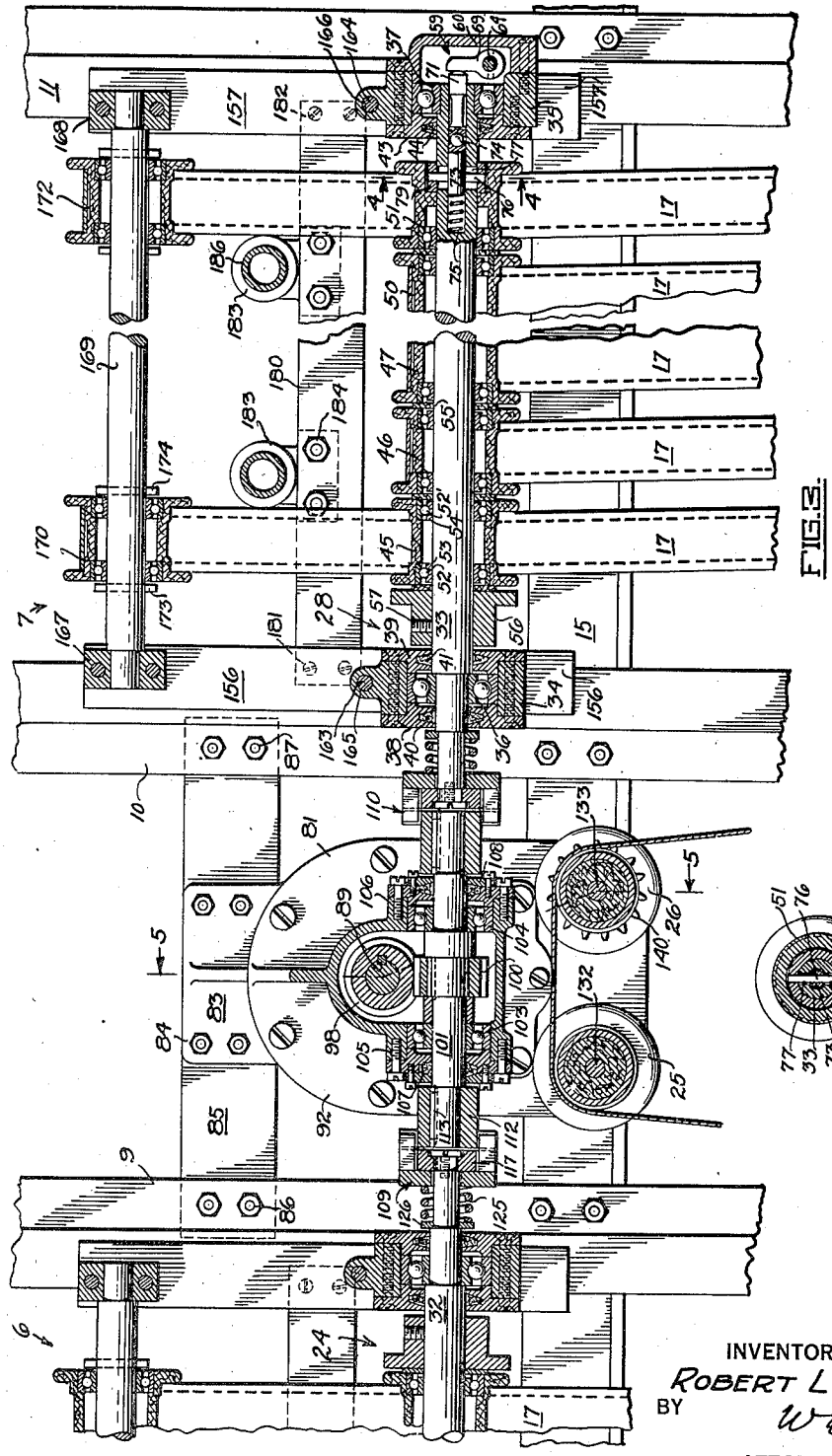


FIG. 3.

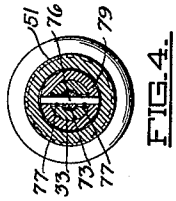


FIG. 4.

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FILM DEVELOPING MACHINE

Filed Nov. 25, 1935 4 Sheets-Sheet 4

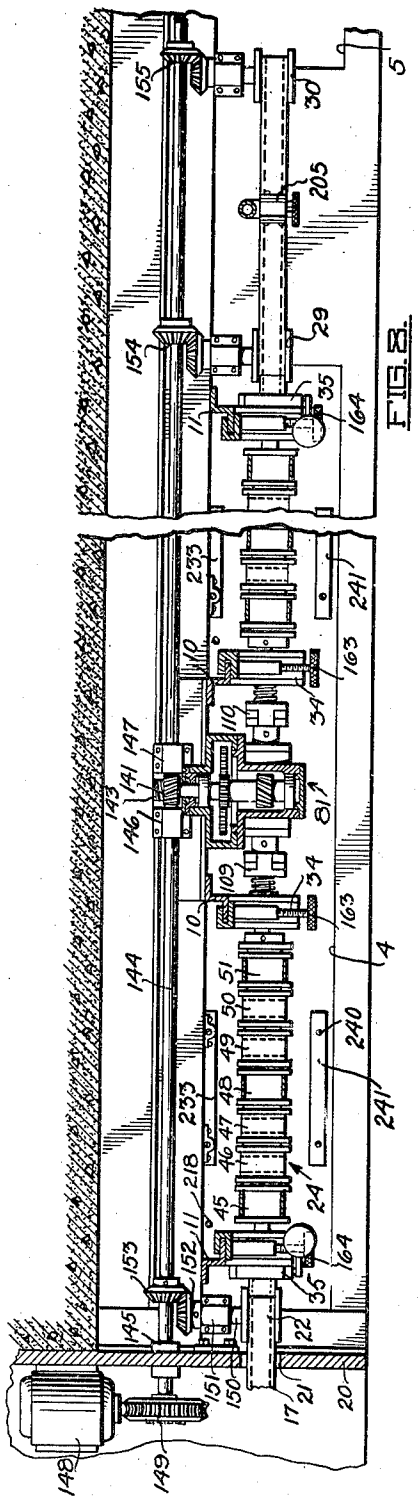


FIG. 8.

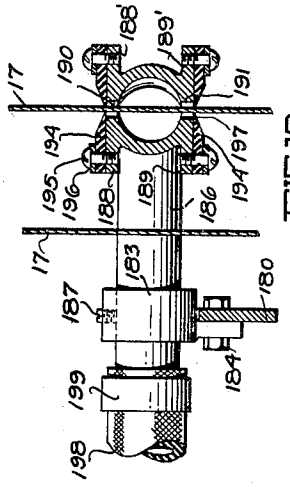


FIG. 10.

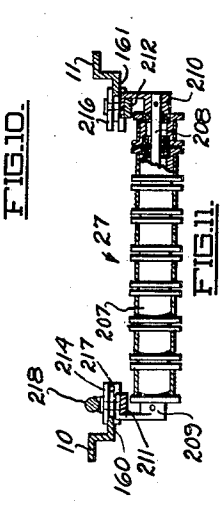


FIG. 11.

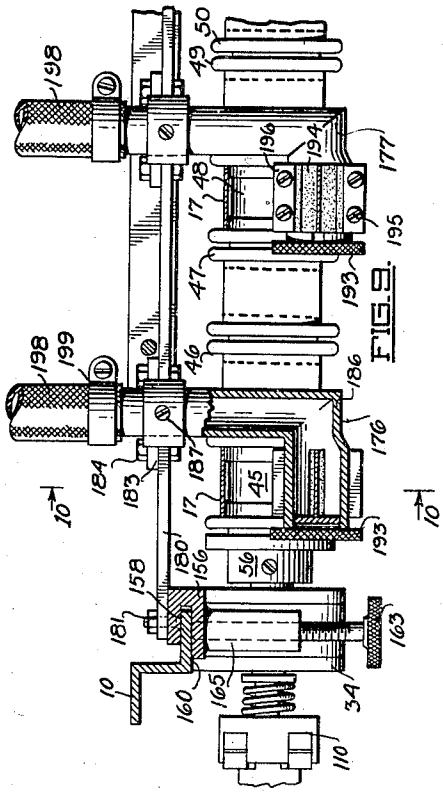


FIG. 9.

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Patented May 11, 1937 2,079,849

UNITED STATES PATENT OFFICE

2,079,849

FILM DEVELOPING MACHINE

Robert Lewis Geib, Los Angeles, Calif., assignor to Warner Brothers Pictures, Inc., New York, N. Y., a corporation of Delaware

Application November 25, 1935, Serial No. 51,417

12 Claims. (Cl. 95—94)

This invention relates to the art of photographic film processing and more particularly to automatic film processing machines for developing motion picture film.

The general practise in devoloping and treating negative or positive motion picture film after it has been exposed is to pass the film through a series of processing tanks, containing different solutions, that is, the film is first passed through a developing solution to develop the images, thence through a fixing solution such as hypo, through a rinsing solution to remove adhering particles of the various chemical solutions and finally, if desired, through dye-toning and toning baths from whence it is led to a drying compartment where the moisture is removed from the emulsion. The finished film is collected upon reels to be stored or sent to the cutting rooms to be cut and edited.

In automatic film developing machines, the film is continuously run in a helical or spiral fashion through the various consecutive treating solutions mentioned above. Upper and lower sets of rollers are placed in each of the tanks to support the film in elongated loops therearound. Driving means is provided to move the film thru the various tanks and this preferably comprises one set of the supporting rollers, usually the upper set. By so driving a whole set of film supporting rollers, instead of merely one roller or sprocket at the exit of the film from the tank, the tension or strain on the film is materially decreased, thus decreasing the stretch and the tendency of breaking the film as well as a general weakening of the film. However, the film as it passes through the various treating solutions or drying compartments continually changes its length. That is, when traveling through the liquid the film constantly stretches until it reaches a certain limit and while traveling through the drying compartment it shrinks back to its normal length. Due to the fact that a portion of the film which has been in the tank for some time has stretched more than a portion which has just entered the tank, it will be seen that the successive loops of film within the tank will tend to increase in length.

It therefore becomes an object of the invention to compensate for the stretch or shrinkage of the film and thus maintain the film at a normal tension.

This is accomplished by frictionally driving the individual film rollers of one set so as to allow for slight slippage of each individual roller relative to each other. An adjustment for friction is provided whereby the driving torque applied to each driven roller may be adjusted for different speeds or lengths of film.

Another object of the invention is to facilitate threading and changing of the length of the film within a film treating tank.

This is accomplished by providing the film driving rollers with a releasing mechanism whereby they may be uncoupled from their driving means so as to rotate freely. Thus when the film is to be threaded over the various rollers or when the film length is to be changed within the solution the releasing mechanism is operated to allow the rollers to rotate freely so that the film may be passed around the various driven rollers without causing it to slide over the surface of these rollers as it is being adjusted.

A still further object of the invention is to allow the film spool heads, which are provided to support and guide the film within the treating tank, to be raised above the liquid level of the treating tank for threading of film or for cleaning purposes.

This is accomplished by providing stationary guides in the film treating solution along which the film heads are adapted to be guided. The upper driven spool head has a disengageable coupling whereby it may be disengaged from its driving shaft and allowed to be moved upward along the guides sufficiently to permit the lower idle spool head to be raised above the surface of the treating solution.

Referring more particularly to the drawings:

Fig. 1 is a sectional elevation view of a preferred embodiment of my invention and is taken along the line 1—1 of Fig. 2.

Fig. 2 is a transverse sectional view of the film treating machine and is taken along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary view of the upper part of one of the units and is taken along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a transverse sectional view of the main drive gear box and is taken along the line 5—5 of Fig. 3.

Fig. 6 is a perspective view of the spool head coupling member and is shown in a disengaged position.

Fig. 7 is a perspective view with parts broken away to show the construction of the frictional film spool drive adjustment.

Fig. 8 is a sectional plan view of the film treat-

ing machine and is taken along the line 8—8 of Fig. 1.

Fig. 9 is a fragmentary sectional plan view showing the construction of the suction devices for removing the adhering particles of the solution from the surface of the film.

Fig. 10 is a sectional view through one of the suction devices and is taken along the line 10—10 of Fig. 9.

Fig. 11 is a plan sectional view of one of the lower film spool heads and is taken along the line 11—11 of Fig. 1.

More particularly describing the invention, reference is to be had to Figs. 1 and 2 wherein the film treating machine generally indicated at 1, comprises a number of separate units identical with each other, two of which are shown at 2 and 3. The units 2, 3, etc., are mounted within a number of solution tanks 4, 5, etc. These tanks contain the necessary chemical solutions required to process the film. For example, the tank 4 may contain a developing solution, tank 5 a fixing or hypo solution, the next tank (not shown) a rinsing solution, etc. Each of the units 2 and 3 is comprised of a pair of sections 6 and 7. Vertical Z-shaped guide members 8, 9, 10, and 11 form frames for the sections 6 and 7. Cross pieces 12 and 13 are provided at the upper ends of the members 8, 9, 10, and 11. The lower ends of the guide members 8 to 11, inclusive, are attached to a cross piece 14. The frames 6 and 7 of the units 2 and 3 are secured upon an angle member 15 extending the length of the film treating machine which rests on a ledge at the upper rear surface of the tank. A second angle member 16, also secured to each of the sections 6 and 7, is provided above the angle 15.

The film 17 is fed from a supply reel 18 which is journaled within a bracket 19 extending from a wall 20 provided on the left side of the film treating machine. The film 17 is passed through an opening 21 within the wall 20 and is led over a driven film spool 22, thence, under a lower film spool head 23 and over an upper film spool head 24 in a helical fashion. The film 17 is then led over a pair of driven spools 25 and 26 from whence it is passed around the lower film spool head 27 and upper film spool head 28 of the section 7. In passing from one tank to another, i. e. 4 to 5, the film 17 is passed over a second pair of driven film spools 29 and 30.

Referring now to Fig. 3, the upper spool heads 24 and 28 are provided with driven shafts 32 and 33. Each of the shafts 32 and 33 extends within housings 34 and 35 provided at the ends thereof, and is journaled within ball bearings 36 and 37 mounted within the housings 34 and 35. Bearing caps 38 and 39 are provided on either side of the housing 34 and have lubricant seals 40 and 41 therein to retain the lubricant supplied to the bearing 36. An end cap 43 is provided on one side of the housing 35 and has a lubricant seal 44 therein. A series of film spools 45 to 51, inclusive, is provided upon each of the shafts 32 and 33. Each of these film spools is formed of fiber or bakelite and is mounted upon ball bearings 52 and 52', the inner races 53 and 54 of which are slidable along the shaft 33. Friction disks 55, also of fiber or bakelite, are placed between the adjacent ends of each of the film spools 45 to 51, inclusive. A sleeve 56 is secured to the shaft 33 adjacent the left end of the film spool 45. A set screw 57 is provided to clamp the sleeve 56.

As was stated before, one of the features of this invention is to selectively engage or disengage the various film spools 45 to 51, inclusive, with the shaft 33. This is accomplished by the clutch mechanism generally indicated at 59 (Figs. 3 and 7). An enlarged cap 60 is secured to the outer end of the housing 35 as by screws 61 and has a pair of transversely extending bearings 62 and 63 having a stub shaft 64 journaled therein. One end of the shaft 64 extends externally of the cap 60 and is provided with an arm 65 rigidly secured thereto. Arm 65 is adapted to be engaged by an adjusting screw 66 threadably mounted within a boss 67 formed integrally with the housing 35. A second arm 69 is provided on the shaft 64 intermediate the bearings 62 and 63, and is secured thereto by a pin 70. Arm 69 engages a plunger 71 loosely mounted within a bore formed within the right end of the shaft 33. Plunger 71 engages a second plunger 73 through a ball bearing 74 provided therebetween. A compression spring 75 is provided between the end of the plunger 73 and the inner end of the bore 72. A cross pin 76 passes through the plunger 73 and is adapted to slide within diametrically opposed slots 77 formed longitudinally within the shaft 33. The outer ends of the pin 76 are mounted within a ring 79 slidable upon the shaft 33. The ring 79 is seated within a counterbore formed in the spool 51. When the spools 45 to 51, inclusive, are to be driven by the shaft 33, the screw 66 is rotated causing the arm 69 to force the plunger 71 and 73 inwardly and thus forcing the ring 79 in the same direction. This will cause the spool 51 to be forced into driving engagement with the other spools 45 to 50 through the friction disks 55. Ordinarily under operating conditions, the friction between each of the rollers 45 to 51, inclusive, is so adjusted that a slight slippage may occur to compensate for the stretch of the film while passing through the chemical solution.

Referring now to Figs. 3, 5, and 8, I will describe the film driving mechanism. Situated between the vertical guide member 9 of the section 6 and the guide member 10 of the section 7, I provide a gear box 81. The main casting 82 of the gear box 81 has a bracket 83 at its upper end which is attached by bolts 84 to a cross piece 85 extending between the members 9 and 10. Bolts 86 and 87 secure the cross piece 85 to the members 9 and 10. The lower part of the casting 82 is secured by bolts 88 to the angle 15. A transversely extending shaft 89 is journaled within a ball bearing 90 mounted within a housing 91 formed in a forward portion of a cover piece 92. A bearing cap 93 is provided on the housing 91 to retain the bearing 90 in position. The shaft 89 is also journaled on a ball bearing 94 provided within the housing 95 formed on the casting 82. A bearing cap 96 is provided and has a lubricant seal 97. A helical gear 98 is keyed at 99 to the forward end of the shaft 89 and meshes with a similar gear 100 which is secured to a driving stub shaft 101 by means of a key 102. Shaft 101 is journaled at either side of the gear 100 by means of ball bearings 103 and 104 provided within housings 105 and 106 formed on the cover piece 92. End caps 107 and 108 are provided to retain the bearings 103 and 104 in position and to retain lubricant within the gear box 81. Driving connection between the stub shaft 101 and the spool shafts 32 and 33 is made through couplings 109 and 110. As shown in Fig. 6, each of the couplings 109 and 110 is comprised

of a sleeve 112, keyed at 113 to the end of the shaft 101. The end of the sleeve 112 has a series of lugs 114, 115 and 116 formed thereon in quadrants. A disk 117 is rigidly mounted on the end of each of the spool shafts 32 and 33. Disk 117 has a pair of lugs 118, 119 and 120 which are similar to those formed on the sleeve 112. A dog 121 is slidably mounted on the end of each of the shafts 32 and 33 and has projections 123 and 124 formed thereon which are adapted to mesh between the projections 114, 115, 116, 118, 119, and 120. A compression spring 125 is fitted over the shafts 32 and 33 and seats at one end upon the back of the dog 121. The other end of the spring 125 engages a washer 126 secured on each of the shafts 32 or 33. In order to disengage the driven shaft 101 from either of the shafts 32 or 33, for a purpose set forth hereinafter, the dog 121 is pressed backward against the action of the spring 125 so as to assume the position shown in Fig. 6.

A spur gear 126 (Fig. 5) is secured by a key 127 upon the shaft 89 at a point intermediate its ends. Gear 126 meshes with a large idler gear 128 mounted upon a ball bearing 129. Bearing 129 is mounted upon a stud 130 secured within the casting 82. Gear 128 meshes at its lower end with a pair of driven gears 131 which are keyed to spool shafts 132 and 133 of the film driving spools 25 and 26. Shafts 132 and 133 are journaled in ball bearings 134 and 145 provided on either side of the gears 131. Bearing 135 is mounted in an annulus 136 formed in the back face of the casting 82. Bearing 134 is mounted within a sleeve member 137 provided in the forward wall of the casting 82. An end cap 138 is mounted adjacent the bearing 134 to hold the assembly in place and to retain the lubricant within the gear box 81. Although both of the film spools 25 and 26 are driven, only one of these (26) is provided with sprocket teeth 140 to positively drive the film 17 between the two sections 6 and 7.

A helical gear 141 is keyed at 142 to the rear end of the transverse shaft 89 (Figs. 5 and 8) and meshes with a second helical gear 143 which is keyed as at 143' to a main drive shaft 144 extending the entire length of the film treating machine 1. Drive shaft 144 is journaled within bearings 145, 146, 147, etc., and is driven by a motor 148 through a worm gear arrangement 149.

The driven film spool 22 which draws the film 17 from the supply reel 18 is mounted upon a shaft 150, journaled within a bearing 151. A bevel gear 152 is securely mounted upon the shaft 150 and meshes with a similar gear 153 securely mounted upon the drive shaft 144. The film spools 29 and 30 situated between the tanks 4 and 5 are also driven through bevel gear arrangements 154 and 155.

Referring again to Fig. 3, the bearing housings 34 and 35 are formed integrally upon vertical slide members 156 and 157. Slots 158 and 159 (Figs. 7 and 9) are provided along the slides 156 and 157 which serve as guides adapted to slide along the outwardly extending portions 160 and 161 of the guide members 8 and 9 or 10 and 11. Clamping screws 163 and 164 are threadably mounted within bosses 165 and 166 formed integrally with the upper surfaces of the housings 34 and 35. Clamps 167 and 168 are formed at the upper ends of the slides 156 and 157 to hold a stationary shaft 169. Rollers 170, 171, and 172 (Figs. 1 and 3) are mounted directly above the spools 45, 48, 51, respectively. These rollers 170 and 172 are similar to the spools 45 to 51 and are prevented from movement longitudinally of the shaft 169 by any suitable means such as pins 173 and 174 passing through the shaft 169 at either side thereof. Instead of passing around the upper surfaces of the spools 45, 48 and 51 the film is looped over the upper spools 170, 171 and 172.

Referring now to Figs. 1, 3, 9, and 10, suction devices 176, 177, and 178 are applied to each of the film strands passing to the upper film spools 170, 171, and 172. A cross piece 180 is attached at its ends to the slides 156 and 157 by bolts 181 and 182. Brackets 183 are secured to the cross piece 180 by bolts 184 and have apertures at their upper ends to receive the suction devices 176, 177, and 178. Each of these suction devices is comprised of an L-shaped tubing 186. The longer leg of the tubing 186 is slidably received within the aperture of the bracket 183 and is clamped in position by a set screw 187 threadably mounted within the bracket 183. The other leg of the tubing 186 has bosses 188 and 188' on its upper side and bosses 189 and 189' on its lower side. Slots 190 and 191 are provided on the upper and lower sides of the tubing 186 to receive the film 17 passing therethrough. An end cap 193 is threadably mounted in the end of the shorter leg of the tubing 186 and is adapted to be removed for threading of the film. Rubber sealing pieces 194 are provided on each of the bosses 188, 188', 189, and 189'. Screws 195 passing through a washer 196 and the pieces 194 are threadably mounted within the bosses 188, 188', 189, and 189' to hold the pieces 194 in position. The ends of the pieces 194 adjacent the surfaces of the film 17 are feathered as at 197. When suction is applied to the tubings 186, the edges 197 of the rubber pieces 194 are drawn into the position shown in Fig. 10 where they lie in close proximity to the surface of the film 17 and thus prevent a large amount of air from passing at these points. A flexible rubber hose 198 is attached to each of the tubings 186 by a clamp 199 and is attached at its other end 200 (Fig. 2) to a suction pipe 201 extending the length of the film treating machine. As shown diagrammatically in Fig. 1, a suction pump 202 is coupled by means of a T connection 203 to the suction pipe 201. A pipe 204 is provided to pass the spent portions of the solutions which are removed from the surface of the film into suitable scum tanks (not shown). Suction devices 205, similar to those of 176, 177, and 178, are placed between each of the solution tanks, i. e. 4 and 5, to prevent solution from one tank from being carried over into the next succeeding tank and are connected by suitable hoses to the suction pipe 201.

Referring now to Figs. 1, 2, and 11, the lower film spool heads 23 and 27 comprise a series of film spools 207 which are similar to the spools 45 to 51, inclusive, of the upper spool heads 24. The spools 207 are mounted upon a shaft 208 which is secured at its ends within brackets 209 and 210. Brackets 209 and 210 are attached to vertically extending bars 211 and 212. Rollers 213, 214, 215, and 216 are journaled at the upper and lower ends of each of the pieces 211 and 212 and have grooves 217 therein which engage the extending portions 160 and 161 of the guide members 8 and 9 or 10 and 11. Thus it will be seen that the lower spool head 23 or 27 may be allowed to assume any position along the guide members 8 and 9 or 10 and 11 to compensate for the stretch of the film 17 as it passes through the solution.

An indicator rod 218 is secured at its lower end in any suitable manner to the lower film spool head 23 or 27. The upper end of the indicator rod 218 is slidably mounted within a guide bearing 219 secured upon the angle piece 16 and has a scale 220 thereon to indicate the depth at which the spool head 23 or 27 is positioned.

The means for agitating the treating solution as illustrated in the accompanying drawings is disclosed and claimed in a co-pending application of Albert W. Tondreau and Fred W. Gage, Serial No. 51,456, filed November 25, 1935. Referring to Figs. 1 and 2, an agitator shaft 221 extends along the entire length of the machine and is driven through a worm gear arrangement 222 by a motor 223 shown as being mounted upon the wall 20 at the left hand end of the machine 1. Cranks 224 are formed on the shaft 221 at each of the sections 6 and 7. Connecting rods 225 are journaled at one end within the cranks 224 and at the other ends upon pins 226 provided in levers 227. Levers 227 are pivotally mounted at 228 upon supports 229 which also form bearings for the agitator shaft 221. Links 230 are pivotally supported at the forward ends of the lever 227 and support vertically extending agitator rods 231 and 232. A series of spaced paddles 233 is provided along the rods 231 and 232 to circulate the solution within each of the tanks 4, 5, etc. Rods 231 and 232 are slidably mounted within bearings 234 at their upper ends which are secured to the upper angle 15. The lower ends of rods 231 and 232 are pivotally secured to the ends of levers 236. Levers 236 are pivoted at 237 upon brackets 238 supported on the cross pieces 14 of the frames 6 and 7. The forward ends of levers 236 pivotally support agitator rods 240 having paddles 241 attached thereto similar to those of 233. The upper ends of the rods 240 are slidably mounted within bearings 243. Rotation of the agitator shaft 221 causes the paddles 233 and 241 to be reciprocated in opposite directions so as to cause a surging motion of the solution that tends to make it flow across the surfaces of the film 17 and thus wash off the spent portions of the developing or reacting solution.

In threading the film in the film treating machine 1, the friction adjusting screw 66 (Fig. 7) is rotated so as to allow each of the spools 45 to 51, inclusive, to rotate freely upon the shafts 32 and 33. The clamp screws 163 and 164 are then loosened and the coupling 109 or 110 is disengaged so as to allow the entire spool head 24 or 28 to be raised upward a desired amount and clamped there by the screws 163 and 164 thus allowing the lower spool head 23 or 27 to be lifted up out of the solution tank 4. After the film has been threaded over the spool heads 23 and 24 or 27 and 28, the lower spool head is then dropped into the tank to a desired depth. The friction adjusting screw 66 is then rotated until the desired friction is provided between the shafts 32 and 33 and the spools 45 to 51, inclusive.

Due to the fact that each of the units 2, 3, etc., of the film developing machine 1 is driven at a constant speed and at the same speed relative to each other the time required for treating the film within each of the tanks 4, 5, etc., is governed by the length of the film passing through each of the various tanks. The length of time for treating of the film may be determined on the scale 220 provided on the indicator rod 218 which shows the depth of the elevator 23 and consequently the length of film in any of the various tanks at a given moment. When it is desired to change the length of time for treating of the film in any of the tanks 4, 5, etc., the screws 66 within the desired tanks are loosened to allow the spools 45 to 51, inclusive, to rotate freely upon their shafts. The film may then be disengaged from the sprocket teeth of either of the spools 26 or 30 and may be taken up or let out a desired amount and may then be reengaged upon the spools 26 or 30. The adjusting screw 66 is then tightened to secure the desired friction between the upper film spools 45 to 51, inclusive, and their driving shafts 32 and 33.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent, is:

1. In a photographic film treating apparatus, the combination of a drive shaft, a clutch on said shaft, a plurality of film rollers on said shaft, means for engaging and disengaging said rollers with said shaft, and means for varying the degree of engagement of said rollers with said shaft and with each other.

2. A film treating apparatus comprising a drive shaft, film rollers on said shaft and adapted to drive a film thereon, and frictional means for engaging and disengaging said rollers with said shaft, said means also engaging and disengaging said rollers with each other.

3. A film handling apparatus comprising rollers adapted to drive a film thereover, a shaft for said rollers, means for rotating said rollers, said means including frictional means interconnecting said rollers, and means for disconnecting said first mentioned means thereby allowing said rollers to rotate freely in relation to each other and said shaft.

4. A photographic film treating apparatus comprising the combination of drive rollers, said drive rollers being adapted to have a film wrapped therearound, a drive shaft, and means for frictionally engaging said shaft with said drive rollers and for varying the friction of said drive rollers relative to each other and to said shaft.

5. In a photographic film treating apparatus, the combination of a set of drive rollers, there being a film wrapped around said drive rollers, means for frictionally driving said rollers, said means including frictional surfaces interposed between and at the ends of said rollers and means movable longitudinally of the axis of said rollers for varying the driving friction applied to said rollers.

6. In a photographic film treating apparatus, the combination of a drive shaft, drive rollers freely mounted on said shaft, there being a film wrapped around said drive rollers, means on said shaft for frictionally engaging one of said rollers at the end thereof, frictional means interposed between said rollers, and means engageable with the end roller to urge said rollers into frictional engagement.

7. A film treating apparatus comprising in combination, a tank adapted to contain a film treating liquid, stationary upright guides in said tank, upper and lower spool heads individually movable along said guides, a driving shaft positioned above said tank, and means for holding said upper spool head in alignment with said driving shaft and for disconnecting said head from said shaft whereby said head is adapted to be moved along said guides.

8. A film treating apparatus comprising in combination, a tank adapted to contain a film treating liquid, stationary upright guides in said tank, a lower spool head normally below the

liquid level of said tank and movable along said guides, an upper spool head normally secured to said guides above the liquid level of said tank and independent of said lower spool head, and means for allowing said upper spool head to be raised sufficiently along said guides to allow said lower spool head to be independently raised along said guides above the liquid level of said tank.

9. A film treating apparatus comprising in combination, a tank adapted to contain a film treating liquid, stationary upright guides in said tank, upper and lower spool heads independently movable along said guides, a driving shaft above the liquid level of said tank, said upper spool head being normally secured in alignment with said driving shaft, and a coupling between said shaft and said upper spool head whereby said upper spool head may be separately raised to allow said lower spool head to be raised above the liquid level of said tank independently of said upper spool head.

10. A film treating apparatus comprising the combination of stationary guides, a pair of spool heads adapted to have a film wrapped thereabout, said spool heads being independently movable along said guides, a driving shaft for one of said spool heads, and a coupling between said driven spool head and said shaft whereby said head may be moved along said guides independently of said other spool head.

11. A film treating apparatus comprising in combination, a tank adapted to contain a film treating liquid, a lower spool head having a plurality of individually rotatable film rollers, an upper spool head having a plurality of film rollers adapted to be driven frictionally at the ends thereof, a shaft passing through said rollers and means at the ends of said rollers for adjusting the engagement of said rollers with one another and with said driving means, said adjustment being adapted to be made during passage of film through said tank.

12. A film treating apparatus comprising in combination, a tank adapted to contain a film treating liquid, stationary upright guides in said tank, a lower spool head normally below the liquid in said tank and movable along said guides, an upper spool head normally secured to said guides above the liquid level of said tank and independent of said lower spool head, a plurality of spools on said upper spool head adapted to be driven frictionally at the ends thereof, means for frictionally driving all of said spool heads, means for adjusting the driving force of said spool heads during passage of film through said tank, and means for allowing said upper spool head to be raised sufficiently along said guides whereby said lower spool head may be independently raised along said guides above the liquid level of said tank.

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