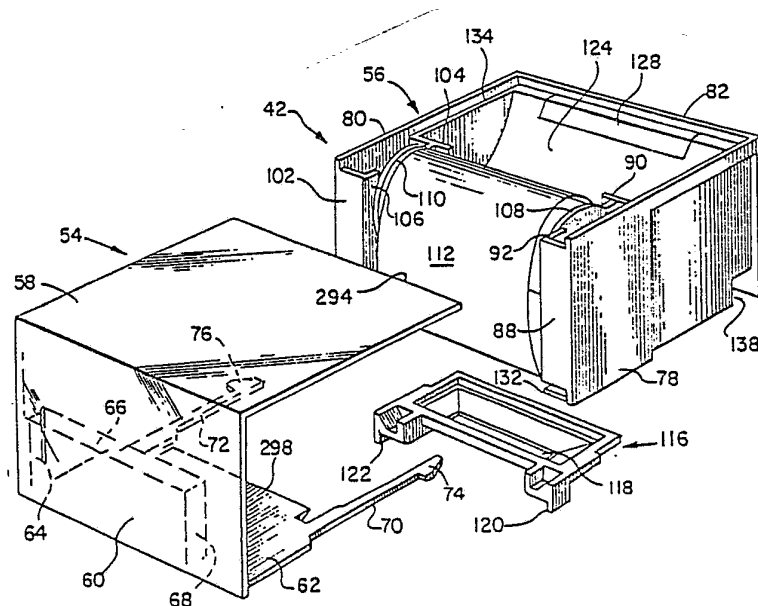




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(54) Title: FILM PROCESSING KIT



(57) Abstract

There is a need for an apparatus wherein amateur photographers can process their own rolls of transparency film. Disclosed is a kit (42) for use in an apparatus for processing a roll of transparency film (142), preferably of the 35 mm format. The kit comprises a housing including two sections (54, 56) movable between open and closed positions, enclosing a roll of sheet material (112), a container (124) of processing liquid, and a dispenser (116) for applying a coating of processing liquid to one side of the sheet material.

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FILM PROCESSING KITTechnical Field

This invention relates to a kit for use in apparatus for processing rolls of transparency film.

5 Background Art

The kit is to be placed into a film processor in which its contents are used for processing a roll of transparency film preferably of the 35mm format. By means of the kit and the processor such
10 film may be processed and developed into slides, even colored slides without recourse to a film processing laboratory. The kit is to be inexpensive as it is to be disposed of after it has been used; and it is to be simple and easily loaded into the
15 processor, requiring as few steps as possible for its operation.

Lately, there have been several disclosures relating to amateur photographers processing their own rolls of film. For example, U.S. Patent
20 Nos. 4,272,178, 4,212,527, and 4,167,318 disclose film assemblages including a film cassette containing a roll of 35mm transparency film, a length of sheet material and a container of processing liquid, the cassettes being such that the film may
25 be processed "instantly". After the film has been exposed in a conventional 35mm camera, it is



placed in a film processor for processing. One disadvantageous feature of this system is that the film can accommodate a relatively small number of frames only, as in addition to the film itself the cassette
5 contains sheet material used in the processing of the film. The outer dimensions of the cassette must, of course, be such that it fits into a conventional 35mm camera.

Other systems, such as those described in
10 U.S. Patent No. 4,309,100 and on pages 53 and 54 of RESEARCH DISCLOSURE, dated January 1981, show processors wherein the sheet material and processing liquid do not form components of the film assemblage. Instead, each element is individually
15 mounted in the processing apparatus and operatively associated with the other elements to permit processing of the film. Such a system is open to the possibility that the operator improperly connects or positions the different elements, e.g., he may
20 install the roll of sheet material such that its gelatin coated surface faces away from rather than toward the processing liquid dispenser. Further, after the processing operation, a problem arises in respect of the disposing of the processing residue,
25 i.e., the remaining liquid and used sheet material, which may be toxic or caustic and must in any case be handled with care.

The art has also shown the roll of sheet material and the processing liquid incorporated in a
30 disposable film processing kit (U.S. Patent No. 4,307,955). While this kit solves many of the problems discussed above, it still leaves room for improvement. For example, the molding of the processing liquid container as an integral part of
35 the housing and the filling of the same with the



liquid adds to the cost of the kit. Further, if the processing liquid were, for some reason unsuited for the film, the entire kit would be useless, by comparison with a kit which could be opened and to
5 replace the processing liquid container for one containing the proper fluid.

DISCLOSURE OF THE INVENTION

The instant invention relates to a disposable kit which is specifically adapted for use
10 within a film processing apparatus for processing of an exposed roll of film, preferably of the 35mm format, as soon after its exposure as desired, without the photographer having to resort to a processing laboratory. The kit includes a housing
15 defined by first and second sections, a length of sheet material which is wound about a roller, a rupturable container of processing liquid and a processing liquid dispenser. Normally, the two housing sections are latched in a closed position
20 wherein they substantially fully enclose the other elements of the kit. The first section includes a channel into which a kit opening and closing member of the film processor may be inserted during loading of the kit into the film processor. The other
25 elements are mounted within the second section. After the kit has been loaded into the processor and the two sections have been unlatched, the kit opening and closing member is actuated thereby moving the first section away from the second
30 section which subjects the container of processing liquid to a container rupturing mechanism. After the container is ruptured, its contents flow into the dispenser. The dispenser applies a coating of the liquid to a coated surface of the sheet material
35 as the sheet material is withdrawn from the housing.



The sheet material is then married with the exposed film bringing the processing fluid and the photo-sensitized layer of the film together in a laminate which is wound upon a take-up roller until visible
5 images are formed in the film. The sheet material roller is then driven to rewind the sheet material fully into the housing while the film is being stripped therefrom and is rewound onto its spool. The kit opening and closing member then moves the
10 first section into its closed position thereby fully enclosing the residue of the processing operation, i.e., any remaining processing liquid and the used sheet material. The processor may then be opened to remove the kit to be safely discarded.

15 An object of the invention is to provide a disposable film processing kit which may be opened and closed by a member of a film processing apparatus.

20 Another object of the invention is to provide a disposable film processing kit which may be opened by a member of the processor in preparation of a processing operation and which is closed by the member subsequent to the processing operation thereby enclosing the residue of the processing operation.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the apparatus possessing the construction, combination
30 of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which is indicated in the claims.



BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, references should be had to the following detailed description taken in connection with the accompanying drawings wherein:

5 Figure 1 is a perspective view of a preferred embodiment of the invention;

Fig. 2 is a side elevational view of the apparatus of Fig. 1, the apparatus being shown with its loading door in a closed position, certain parts being omitted or sectioned for clarity;

Fig. 3 is an enlarged side elevational view, partly in section, of a portion of the apparatus of Fig. 1;

15 Fig. 4 is an exploded perspective view of a lost motion system;

Fig. 5 is a schematic representation of the apparatus' power transmission system and its relation to various other elements which are part of or usable with the instant invention;

Fig. 6 is a partly exploded perspective view of a disposable film processing kit which is especially adapted for use with the apparatus shown in Fig. 1; and

25 Fig. 6a is a side elevational view of a portion of the film processing kit.

BEST MODE FOR CARRYING OUT THE INVENTION

Figs. 1 and 2 show a preferred form of apparatus 10 for processing a roll of exposed film the film preferably being of the 35mm transparency film. The apparatus 10 comprises a housing 12 having a loading door 14 pivotally coupled at one end by a pair of pins 16 (only one shown) which extend outwardly from opposite side walls 18 and 20 of the housing 12 and are received by apertures 22



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(only one shown) in the loading door 14. Movement of the loading door 14 into its closed position (Fig. 2) renders the housing 12 lighttight.

A generally planar support 24 extends
5 between the side wall 18 and a side wall 26 of a gearbox 28. The support is provided with a first opening 30 through which a spring-biased plate 32 extends, a second opening 34 through which a portion of a roller 36 penetrates, and a third opening 38
10 through which a portion of a take-up roller 40 extends. The roller 36 and the take-up roller 40 are mounted for rotation about their axes by means not shown.

The apparatus 10 also includes means for
15 locating a film processing kit 42 into its proper position relative to other elements of the apparatus 10. These means include an L-shaped flange 44 which extends inwardly from the side wall 26, an arm 46 which extends at a right angle to a rack 48 (Fig.
20 4), a pair of cams 50 (only one shown) located adjacent opposite sides of the horizontal support 24, and a plate 52 which extends along the side wall 18.

The film processing kit (Fig. 6) includes a housing consisting of a first section 54 and a
25 second section 56 which telescopically receives the first section 54. The first section includes a top wall 58, an end wall 60, and a bottom wall 62. The end wall 60 (Fig. 2) includes a passageway 64 formed by a generally horizontal flange 66 and a vertical
30 flange 68 for receiving the arm 46 of the rack 48. The bottom wall 62, which has a length slightly less than half that of the top wall 58, includes a laterally spaced pair of fingers 70 and 72 the ends of which are provided with tapered latching members
35 74 and 76, respectively.



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The second section 56 includes a pair of side walls 78 and 80 interconnected at one end by an end wall 82. A gently curving wall 84 extends between the side walls 78 and 80 and slopes downwardly from the top of the end wall 82 to a point where it terminates in a generally vertical wall 86. Two flanges 88 and 90 extend from the side wall 78 to a point where they are interconnected by a wall 92 (Fig. 6a). The wall 92 has a U-shaped opening 94 therein. A pair of resilient fingers 96 and 98 integral with the wall 92, extend into the U-shaped opening. The fingers 96 and 98 may be spread apart so that the end of a roller 100 can be pushed between them into the U-shaped opening 94. The fingers 96, 98 then snap back and exert a drag force on the end of the roller 100. Two flanges 102 and 104 extend from the opposite side wall 80 to a point where they are interconnected by a wall 106 having a U-shaped opening (not shown) therein for receiving the opposite end of the roller 100. The roller 100 has a pair of annular flanges 108 and 110 which may be positioned between the walls 92 and 106. A strip of sheet material 112, e.g., a polyester film having a gelatin coating on one side, is coiled about the roller 100. One end of the strip is secured to the roller 100 and the other end 114 may be releasably attached to an exterior surface of the end wall 82. An opening (not shown) is located in wall 80 in alignment with the end of the roller 100 so that a drive member may protrude through the opening into engagement with the roller 100.

Also mounted in the second section 56 is a processing liquid dispenser 116. The dispenser has a nozzle 118 and a pair of laterally spaced flanges 120 and 122 which restrain sidewise movement of the



sheet material 112 as it passes beneath the nozzle 118. The nozzle 118 has a length which is less than the width of the sheet material 112 and is approximately equal to the distance between laterally spaced sprocket holes in a strip of 35mm film, i.e. 2.5 cm.

A container 124 having a rupturable end 126 is supported on the wall 84, e.g., by adhesive tape 128. The container 124 holds a supply of viscous processing liquid 130 in a quantity sufficient to coat substantially the entire length of the sheet material 112.

Flanges 132 extend inwardly from the bottom of the side walls 78 and 80 (only one shown). They function to guide the lateral edges of the bottom wall 62 as the second section 56 is mated with the first section 54 for closing the kit 42. A recessed area 134 extends around portions of the side walls 78 and 80 and the end wall 82 and cooperates with the tops of the flanges 88, 90, 102 and 104 to receive the edges of the top wall 58. As the edge of the top wall 58 moves into engagement with the end wall 82, the latching members 74 and 76 are first squeezed toward each other by two flanges 136 (only one shown) which respectively protrude from the side walls 78 and 80. The members 74 and 76 then spring outwardly to grab the right side (Fig. 2) of the flanges 136 thereby locking the two sections 54 and 56 in the closed position, with the bottom wall 62 holding the sheet material 112 in sealing relation to the nozzle 118. The latching members 74 and 76 may be disengaged from the flanges 136 by the cams 50 in the apparatus 10 as the kit is being loaded into the apparatus. During loading the cams 50 enter into a pair of apertures 138 (only one



shown) located respectively in the side walls 78 and 80, and force the latching members 74 and 76 inwardly toward each.

The apparatus 10 further includes means for supporting a film cassette 140 in which a roll of developable transparency film 142 is wound upon a rotatable film spool 144. One end of the film is secured to the film spool 144; the opposite end 146 extends to the exterior of the cassette through a withdrawal slot 148. The support means include a rounded flange 150 for receiving one end of the generally cylindrical film cassette 140, and a pair of supports 152 and 154.

A power transmission 156 is mounted within the gearbox 28. The transmission (Fig. 5) 156 comprises a first power path including a gear 158 fixedly attached to a shaft 160 which, in turn, is fixedly connected with the take-up roller 40. It also comprises a second power path including gears 162, 164 (compound), 166, 168 and 170. A gear 172 is mounted on a shaft 174 for limited axial movement between a first position wherein it is in drivable engagement with the second power path and a second position (shown in Fig. 5) wherein it is in drivable engagement with the first power path. The gear 172 is normally biased into engagement with the gear 158 and may be moved in the direction of the arrow 176 into engagement with the gear 162 by a bell crank 178. A slotted drive member 180 extends from the face of the gear 170 and protrudes through an opening 182 in the wall 26 of the gearbox 28 where it may drivingly engage a pair of tabs 184 and 186 (Fig. 2) integrally formed with the roller 100. A similar drive member 188 extends from the face of the gear 166 and protrudes through an aperture in



the side wall 26 where it may drivingly engage the end of the film spool 144. A clutch 190 is coupled between the gear 166 and its drive member 188 to allow slippage therebetween when the roller 100 and
5 film spool 144 are driven, to compensate for differences in the increasing diameters of the roll of sheet material 112 and of the film 142. The gear 168 is mounted for limited linear movement along its shaft 192. The gear is biased out of engagement
10 with the gear 166 when the take-up roller 40 is driven and it may be moved in the direction of the arrow 194 into driving engagement with the gear 166 by a cam 196 on the side of the rack 48 as will be explained. The input to the transmission 156
15 includes a hand crank 198 attached to the shaft 174 where the shaft 174 protrudes through the side wall 20 of the apparatus 10.

The operation of the bell crank 178 will now be described with reference to Fig. 3. The
20 take-up roller 40 is shown in phantom lines. The bell crank 178 and a juxtaposed link 200 are located within the gearbox 28. The transmission 156, except for its gear 172, has been omitted for clarity. The bell crank 178 and the link 200 interrelate with the
25 rack 48 to provide a plurality of functions. The bell crank 178 is pivotally coupled to a wall of the gearbox 28 by a pin 202 which extends outwardly from the bell crank 178. One arm 204 of the bell crank 178 includes a latching surface 206 which is movable
30 into engagement with a lip 208 formed on the interior surface of an end wall 210 of the loading door 14 to lock it in its closed position. Another arm 212 of the bell crank 178 includes a pair of downwardly converging legs 214 and 216 which are
35 joined at their ends where there is provided a cam



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5 follower 218. The cam follower 218 extends at a
right angle to a plane containing the legs 214 and
216 through an arcuate slot (not shown) in a side
wall 220 to a point where its end terminates in a
10 cam slot 222 provided in the rack 48. The upper
left end of the arm 212 includes a U-shaped portion
224 with inclined camming surfaces 226. The U-
shaped portion 224 serves to move the gear 172
against its spring bias out of engagement with the
15 gear 158 and into engagement with the gear 162 when
the bell crank 178 is rotated in a clockwise direc-
tion about its pivot pin 202. The link 200 is
pivotally mounted intermediate its ends on a pin 228
which extends between the side walls 26 and 220 of
20 the gearbox 28. One end of the link 200 has a cam
follower 230 which extends at right angles thereto.
The cam follower 230 protrudes through another
arcuate slot (not shown) in the side wall 220 and
terminates at a location within a second cam slot
25 232 in the rack 48. The rack 48 is supported by
means (not shown) between the side wall 220 and a
side wall 234 of the loading door 14. One end of
the rack 48 is cut away at 236 to avoid the shaft 74
of the crank 198 when the rack 48 is moved into the
position shown in Fig. 3.

The rack 48 may be moved between a first
position (Fig. 3) and a second position (Figs. 2 and
5). The mechanism for moving the rack 48 comprises a
30 manually operable lever 238 which is connected with
a sector gear 240. Both lever 238 and gear 240 may
be freely rotated on a shaft 242 which is journaled
in the side walls 234 and 244 of the loading door
14. The teeth of the sector gear 240 may mesh with
a set of teeth 246 in the top edge of the rack 48
35 when the loading door 14 is in its closed position.



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The sector gear 240 is provided with an aperture 248 adapted to receive a pin 250 which extends radially from the shaft 242 to define a lost motion connection between the lever 238 and a processing fluid container rupturing mechanism 252. The mechanism 252 is integrally formed with the shaft 242 and comprises a pair of arms 254 and 256 which rotatably support a roller 258 between them.

In the operation of the apparatus 10 a closed kit 42 is positioned into it in such a manner that the drive member 180 engages the drive flanges 184 and 186 of the sheet material roller 100, the arm 46 of the rack 48 extends into the passageway 64, and the cams 50 enter the apertures 138 in the side walls 78 and 80 of the second section 56. The cams 50 thus release the latching members 74 and 76 from their respective flanges. The leading end 114 of the sheet material is detached from the end wall 82 of the kit 42 and is trailed across the roller 36 and attached to a pin 260 which extends from a section 262 of the take-up roller 40. Fig. 1 shows that the section 262 is pivotally connected by a hinge 264 to a second section 266 of the take-up roller 40. The second section 266 includes flanges 268 and 270 at opposite ends thereof for guiding the sheet material 112 and the film 142 onto the take-up spool 40 during clockwise rotation of the latter. Next, the film cassette 140 with the exposed roll of film 142 is loaded into the apparatus 10 such that the drive member 188 engages the end of the film spool 144 and the members 152 and 154 support the film cassette 140 as shown in Fig. 2. The leading end 146 of the film 142 is then attached to the pin 260 in such a manner that the emulsion side of the film 142 faces the gelatin coated surface of the sheet



material 112. The leading ends 114 and 146 of the sheet material 112 and the film 142, respectively, are each provided with an aperture (not shown) for attachment to the pin 260. The leading ends 114 and 5 146 are fastened to the pin 260 by pivoting the second section 266 into superposition with the first section 262 such that an aperture 287 in the first section receives the pin 260. The loading door is then closed which moves a roller 272 into engagement 10 with the film 142 and presses it against the sheet material 112 so that both are pressed against the roller 36. The journals 274 of the roller 272 are suitably supported in the ends of a pair of supporting arms 278 and 280 extending from the loading 15 door 14. The closing of the loading door 14 also moves the teeth of the sector gear 240 into mesh with the gear teeth 246, and a latch pin 282 extending from the loading door 14 into the gearbox 28 20 door 14 is closed, the inside of the apparatus is rendered lighttight and the components assume the position shown in Fig. 3. The gearbox 28 is recessed at 243 to accommodate the shaft 242, and the door 14 is cut away at 245 to provide clearance for the 25 shaft of the crank 198 when the door 14 is in the closed position.

Processing of the film 142 is initiated by turning the lever 238 from its idle position shown in Fig. 3 to a processing position shown in Fig. 2. 30 Initial rotation of the lever 238 towards the processing position is immediately transferred to the rack 48 by way of the teeth of the sector gear 240 and the rack 48 is moved to the left, or rearwardly, as viewed in Figs. 2 and 3. As the rack 48 moves to 35 the left, the cam slots 222 and 232 therein cause



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the bell crank 178 and the link 200 to rotate in a counterclockwise direction about their respective pivots 202 and 228. The rotation of the bell crank 178 results in its U-shaped portion 224 moving downwardly out of engagement with the gear 172. The gear 172 under its spring bias thus returns to its position in engagement with the gear 158 (Fig. 5). At the same time the latching surface 206 of the bell crank 178 rotates through an opening 285 in the gearbox 28 into latching relationship with the lip 208 thereby precluding accidental opening of the loading door 14. The rotation of the link 200 moves a pawl 286 integral with the link 200, out of engagement with the teeth of the gear 172 to free it for subsequent counterclockwise rotation. The pawl 286 is held out of engagement with the gear 172 by the latch pin 282 which enters a recess 290 in the top of the link 200, until the latching door 14 is opened. Clockwise rotation of the gear 172 is prevented by a second pawl 288 which extends from the top wall of the gearbox 28 into engagement with the teeth of the gear 172. The rearward movement of the rack 48 also moves the cam 196 to enable the gear 168 to move under its spring bias, along the shaft 192 to a position where it is disengaged from the gear 166. Furthermore, the rearward movement of the rack 48 causes its arm 46 to move the first section 54 of the kit 42 away from the second section 56 to open the kit before the rupturing mechanism 252 is rotated toward the container 124. The second section 56 is kept in its position by the cams 50.

After the lever 238 has been rotated through approximately twenty-three degrees, the right side (Fig. 2) of the aperture 248 in the sector gear 240 engages the pin 250. Continued



rotation of the lever 238 toward the processing position not only continues the rearward movement of the rack 48 but also commences rotation of the rupturing mechanism 252 toward its position shown in
5 Fig. 2. Because of the lost motion connection between the lever 238 and the pin 250, the roller 258 moves into the kit 42 as its top wall 58 moves out of interference therewith. The roller 258 engages the container 124 and by increasing the
10 pressure on the processing liquid 130 causes the end 126 of the container to rupture. Further clockwise rotation of the roller 258 about its pivot pin 242 forces the processing liquid from the container 124 into the dispenser 116.

15 Once the lever 238 is in the position, shown in Fig. 2, the crank 198 is rotated in the direction of the arrow 292 thereby driving the gear 158 to rotate the take-up roller 40 in a clockwise direction (Fig. 2). As the take-up roller 40 rotates
20 the sheet material 112 is withdrawn from its roller 100, moves past the nozzle 118 of the dispenser 116, against which it is resiliently urged by the plate 32 so that a uniform coating of the processing liquid 130 may be applied thereto, and then toward
25 the bite of the rollers 36 and 272 where it is married with the film 142 which is being withdrawn from its cassette 140 at the same time. The rollers 36 and 272 press the gelatin coated surface of the sheet material 112 into engagement with the emulsion
30 side of the exposed film 142 to form a laminate comprised of a layer of processing liquid 130 sandwiched between the sheet material 112 and the exposed film 142. The laminate is then wound upon the take-up roller 40. When the sheet material 112
35 and/or the film 142 have been completely uncoiled



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from their respective supports, but not detached therefrom, the resultant increase in tension in the laminate is automatically fed back to the crank 198 thereby signaling the operator to stop rotating the crank 198. To prevent any damage to the apparatus or the laminate, a slip clutch 294 may be coupled between the shaft 174 and the crank 198 so that further rotation of the crank 198 by the operator is not transferred to the shaft 174. The laminate is then allowed to remain upon the take-up roller 40 for a time, e.g. one minute, sufficient for visible images to be formed in the laminate, preferably in the film 142.

After the processing of the visible images within the laminate has been substantially completed, the lever 238 is rotated in a counterclockwise direction (Fig. 2) toward its non-processing or idle position. The rotation immediately drives the rack 48 forwardly toward the take-up roller 40 while moving the first section 54 of the kit 42 back into closing relationship with the second section 56. The initial rotation of the lever 238 is not transferred to the rupturing mechanism 252 because of the lost motion connection; the mechanism 252 is moved, however, by an edge 298 of the top wall 58 of the first section 54 engaging the undersurface 296 of the mechanism and pivoting it upwardly until the left side of the aperture 248 engages the pin 250 and completes the movement of the rupturing mechanism 252 out of the kit 42 before it closes. An edge 298 of the bottom wall 62 of the first section 54 is beveled to cooperate with a radius 300 on the spring biased plate 32 so as to urge the plate 32 downwardly so that the edge 298 may pass to a point where the bottom wall 62 seals the nozzle



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118. Movement of the rack 48 to its forward or post processing position shown in Fig. 3, also results in clockwise rotation of the bell crank 178 due to the cam slot 222 and cam follower 218 relationship. Thus
5 the end 206 of the arm 204 pivots out of latching relation with the lip 208 and the U-shaped section 224 moves upwardly into contact with the gear 172, the cam surface 226 of section 224 moving the gear 172 out of engagement with the gear 158 and into
10 engagement with the gear 162. Furthermore, the cam 196 on the rack returns the gear 168 into its engagement with the gear 166. The position of the link 200 remains unchanged, however, since the pin 290 maintains it in a position where the pawl 286 is
15 held, against the bias of the free end 306 of a spring, out of engagement with the teeth of the gear 172.

When the lever 238 has reached its post processing position, the crank 198 may be rotated in
20 the same direction as before, i.e., in the direction of the arrow 292. This power input is directed to the second power path through the gear 172 thereby rotating the sheet material roller 100 and the film spool 144 in a clockwise direction (Fig. 5). The
25 rotation of the roller 100 and the film spool 144 withdraws or unwinds the laminate from the take-up roller 40. As the laminate emerges from the left side (Fig. 2) of the rollers 36 and 272, the film 142 is stripped from the sheet material 112 and
30 rewound upon the film spool 144 and the sheet material 112 is rewound upon its roller 100. As described in U.S. Patent 4,309,100, in a preferred type of film the photosensitive or emulsion layer of the film 142 exhibits greater adhesion to the sheet
35 material 112 than to the next adjacent layer of the



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film. Thus stripping the sheet material 112 from the film 142 removes the emulsion layer as well, increasing visual acuity and brightness of the resultant positive transparency and enhancing its stability by virtue of the removal of any residual processing reagent in the emulsion. For further details of the film, reference may be had to U.S. Patent No. 3,682,637.

Withdrawing the laminate from the take-up roller 40 causes the latter to rotate in a counter-clockwise direction, as viewed in Fig. 2. As the last convolution of the laminate is removed from the take-up roller 40, the portion of the laminate extending between the bite of the rollers 36 and 272 and the free end of the second section 266 of the take-up roller 40 assumes an angle which would pivot the second section 266 about the hinge 264 and free the ends 114 and 146 of the sheet material 112 and the film 142 from attachment to the take-up roller 40. Rotation of the crank 198 is continued for a few turns after the operator feels the release of the end of the laminate from the take-up roller 40 so as to completely rewind the end 114 of the sheet material 112 into the kit 42. The loading door 14 may then be opened thereby releasing the link 200 for movement back into the position shown in Fig. 3. The kit 42 may be removed and safely discarded with all materials used in the processing of the film 142 being safely enclosed in the kit. At this time, the film cassette 140 may be removed from the apparatus and the processed film removed therefrom for subsequent cutting and mounting of the individual scenes.

In an alternative embodiment, the visible images could be formed in the sheet material. In that case the film would comprise a photosensitive



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layer through which the exposure would be made, and a base which may or may not be transparent. The sheet material would comprise a transparent base and an image receiving layer. After exposure of the film, the surface of the sheet material containing the image receiving layer would be coated with the processing liquid and brought into superposition with the side of the film through which the exposure had been made. This may involve reversing the orientation of the film cassette from the position shown in Fig. 2 to place the image receiving layer into contact with the emulsion side of the film. After the sheet material has been rewound on its spool, the spool could be removed and the individual scenes in the sheet material would be cut and mounted for subsequent viewing.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.



CLAIMS:

1. A kit (42) for use in an apparatus (10) for processing a roll of transparency film (142) comprising:
- 5 a housing including first and second sections (54, 56) coupled to each other for movement between open and closed positions;
- a container (124) of processing liquid (130) supported within the second section (56) the
- 10 container (124) having a rupturable section (126);
- a processing liquid dispenser (116) located adjacent the rupturable section (126) of the container (124) the dispenser (116) including a nozzle (118) for ejecting the processing liquid
- 15 (130);
- a roller (100) rotatably supported within the housing;
- a strip of sheet material (112) wound upon the roller (100) with a first end secured to the
- 20 roller and a second end (114) which extends to a position in engagement with the nozzle (118), and thence to the exterior of the housing, the sheet material (112) being adapted to be partially withdrawn from the housing and superposed with the
- 25 exposed film (142) to form a laminate having a coating of processing liquid therebetween; and
- the first section (54) further includes means cooperable with a component (46) of the film processing apparatus (10) for moving the first
- 30 section (54) from the closed position to the open position to render the container (124) accessible to a rupturing mechanism (252) of the film processing apparatus (10) for rupturing the container whereby the processing liquid flows into the dispenser for
- 35 application to the sheet material through the nozzle



as the sheet material is withdrawn from the housing.

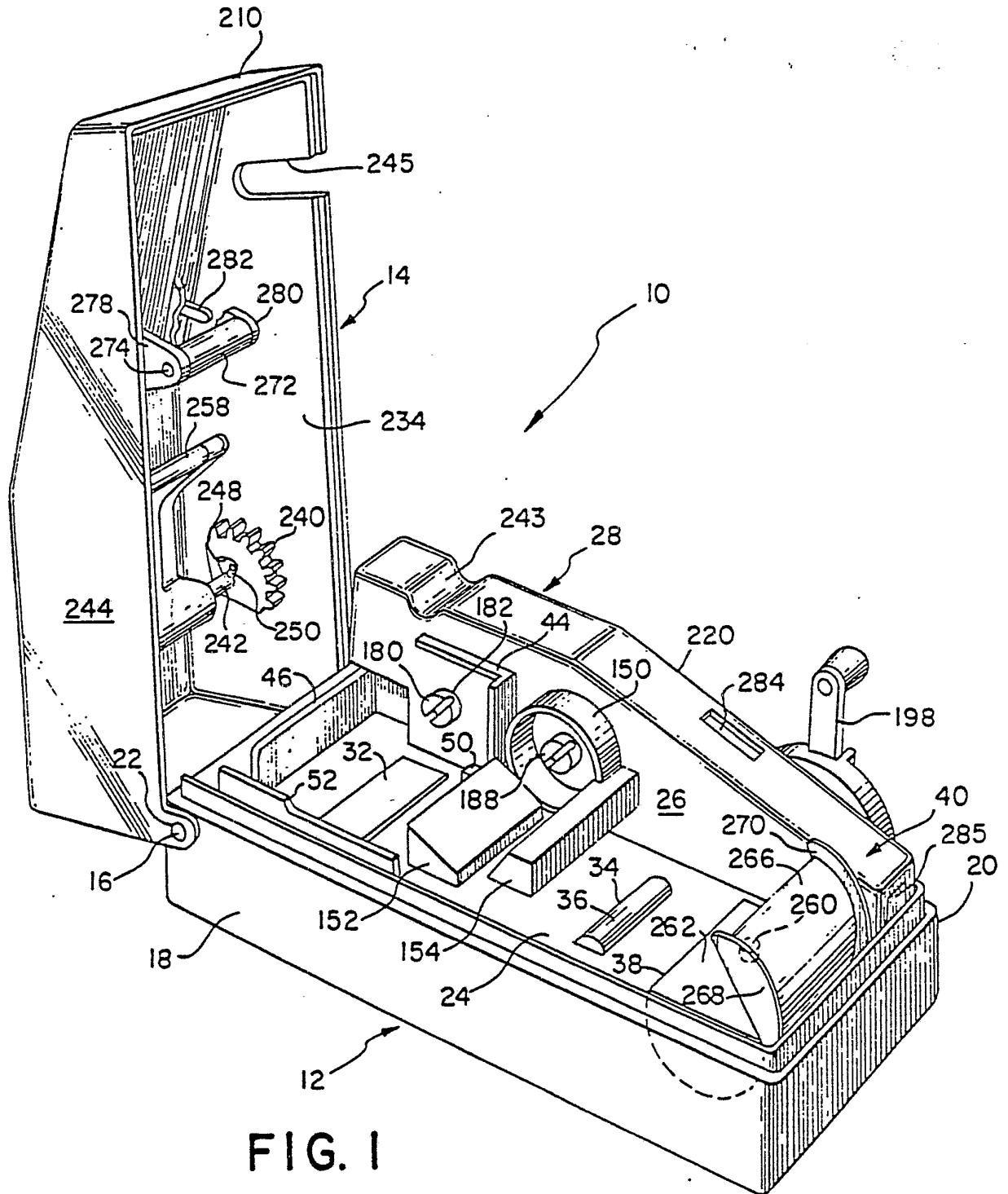
2. A kit as defined in claim 1 wherein the first section (54) further includes latching means cooperable with the second section for
5 releasably latching the first and second sections (54, 56) in the closed position.

3. A kit as defined in claim 2 wherein the latching means is constructed to be moved into an unlatched position in response to the kit (42)
10 being loaded into the film processing apparatus.

4. A kit as defined in claim 1 wherein the roller (100) includes means adapted to be driven by a component of the film processing apparatus in a direction completely to withdraw the second end of
15 the sheet material into the housing subsequent to its use in processing the film.

5. A kit as defined in claim 4 wherein the first and second sections of the housing, when in the closed position, substantially enclose any
20 processing liquid residue thereby permitting the safe disposal of the kit subsequent to its use in the film processing apparatus.

6. A processing kit as defined in claim 1 wherein the first section includes means engageable
25 with the rupturing mechanism (252) for moving it toward the exterior of the housing as the first section is moved from the open position to the closed position.



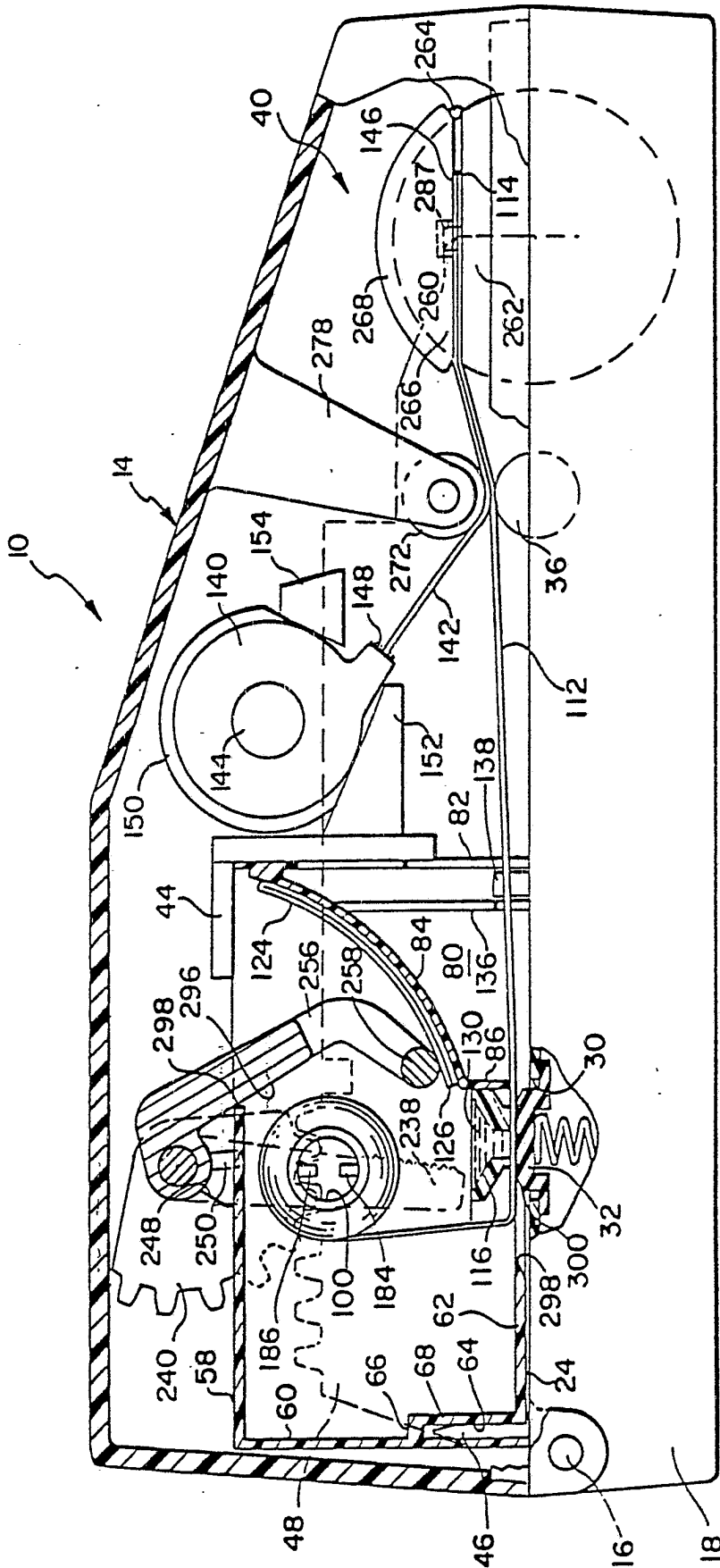


FIG. 2



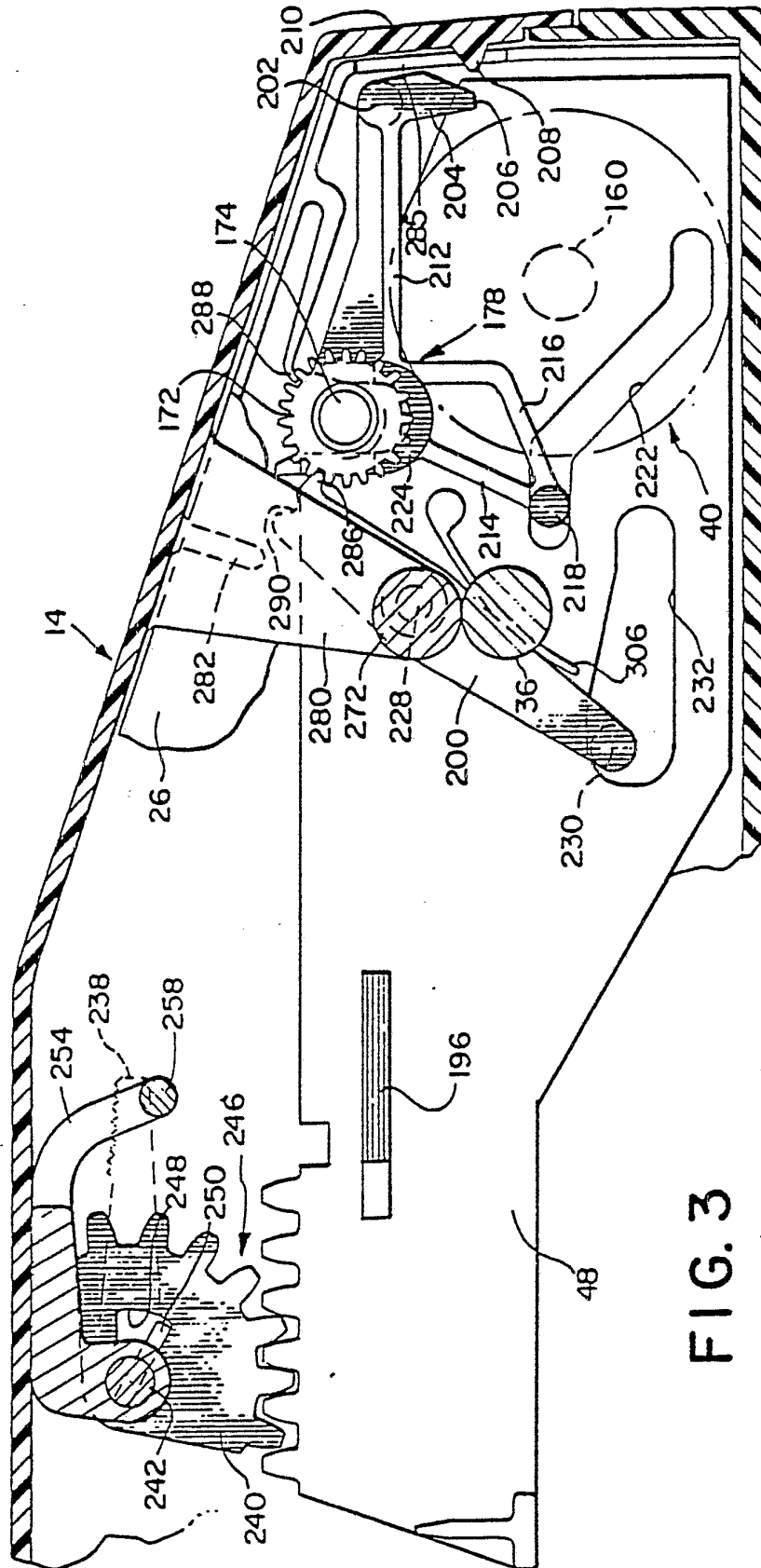


FIG. 3



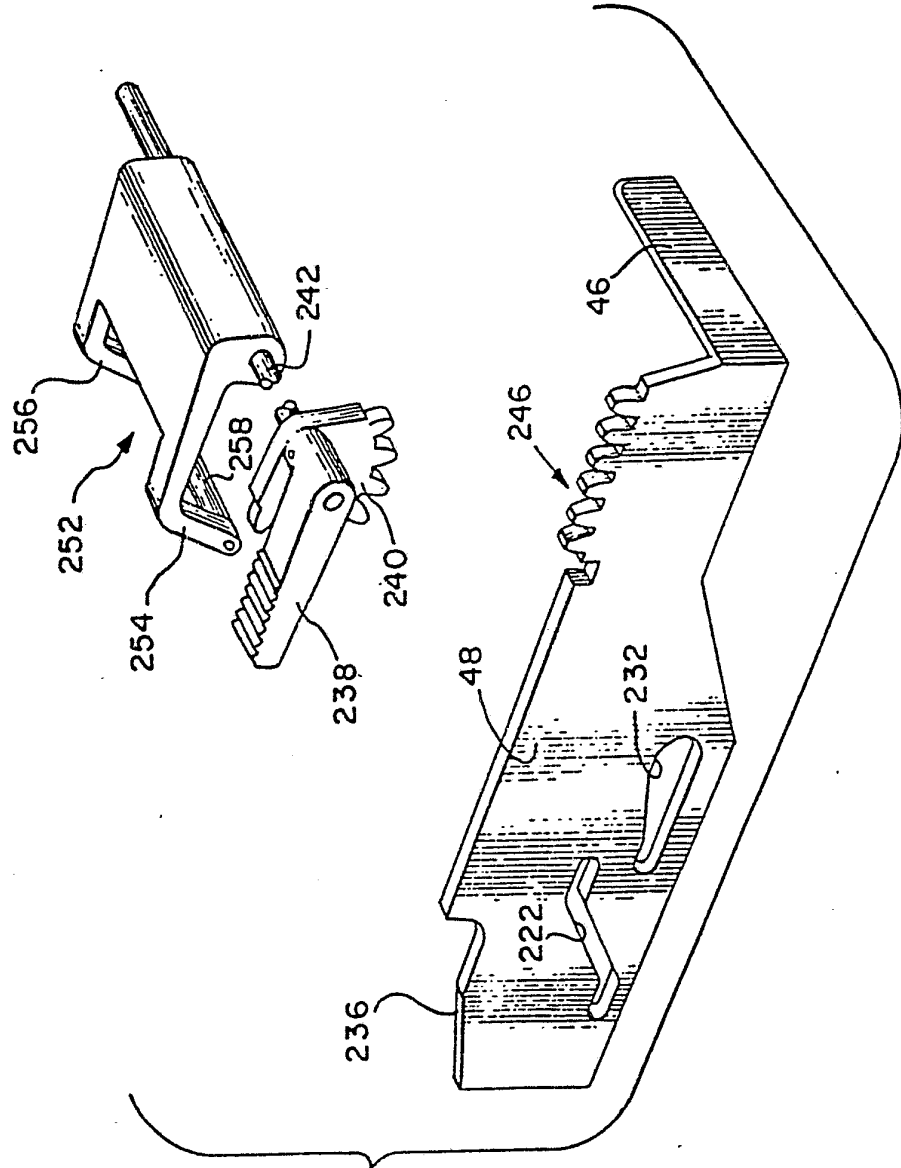


FIG. 4



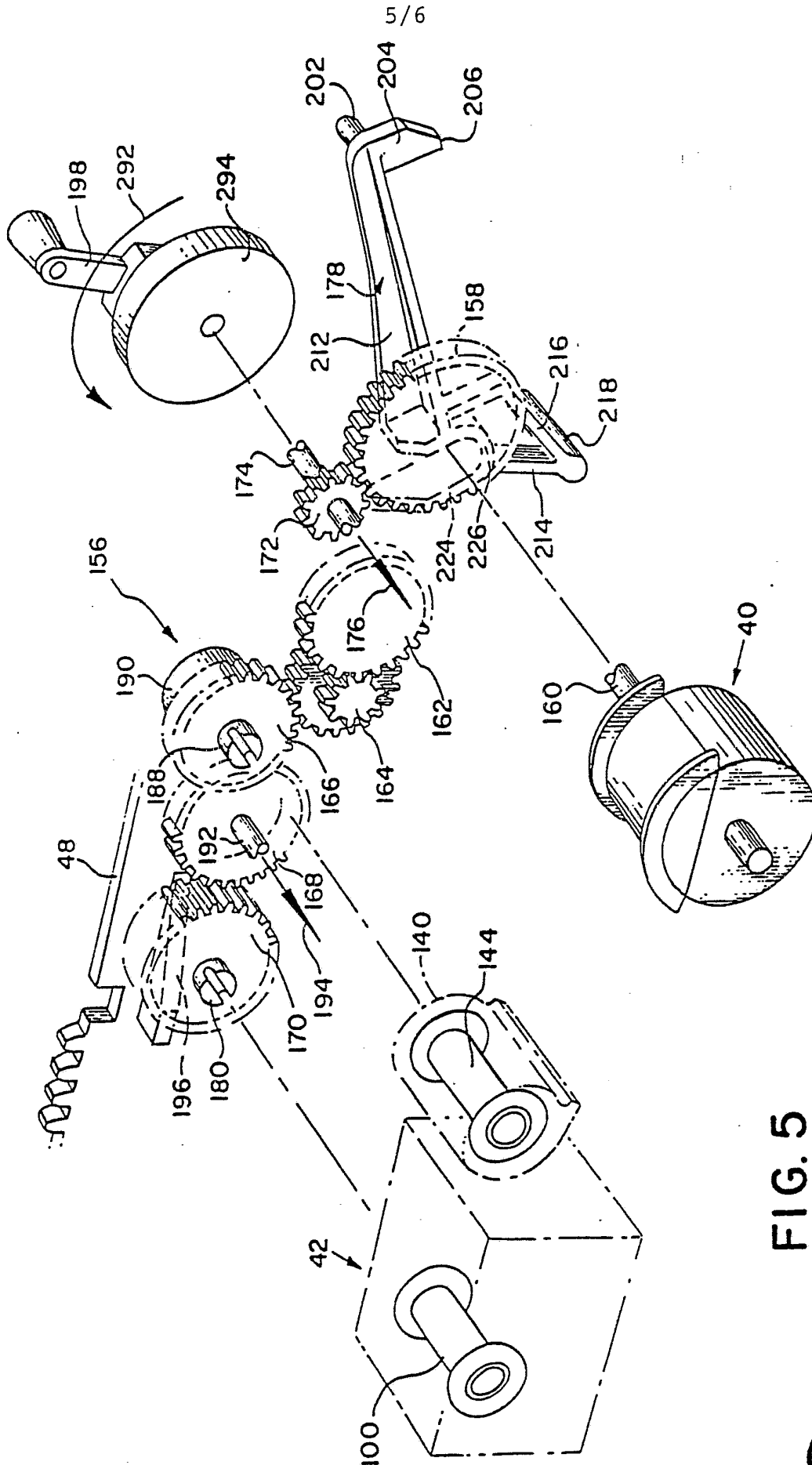


FIG. 5



INTERNATIONAL SEARCH REPORT

International Application No PCT/US83/00281

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC Int CL ² G03D 5/02, G03D 5/06 US CL 354/304, 354/318		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
US	354/83, 84, 85, 86, 87, 303, 304, 305, 317, 318	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
A	US, A 3,307,468 PUBLISHED 7 MARCH 1967 BRIBER	1
A	US, A 3,483,809 PUBLISHED 16 DECEMBER 1969 SCHMIDT ET AL	1
A	US, A 3,667,361 PUBLISHED 6 JUNE 1972 MEGGS ET AL	1
A	US, A 4,167,318 PUBLISHED 11 SEPTEMBER 1979 WAREHAM	1
A	US, A 4,212,527 PUBLISHED 15 JULY 1980 FISCHER	1
A	US, A 4,272,178 PUBLISHED 9 JUNE 1981 BENDONI ET AL	1
A	US, A 4,307,955 PUBLISHED 29 DECEMBER 1981 COCCO ET AL	1-6
A	US, A 4,309,100 PUBLISHED 5 JANUARY 1982 BENDONI ET AL	1-6
A	US, A 4,313,667 PUBLISHED 2 FEBRUARY 1982 GOLD	1-6
A, P	US, A 4,325,624 PUBLISHED 20 APRIL 1982 PEDROLI	1-6
<p>* Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²	Date of Mailing of this International Search Report ²	
6 JUNE 1983	15 JUN 1983	
International Searching Authority ¹	Signature of Authorized Officer ²⁰	
ISA/US	<i>Alan Mathews</i> ALAN MATHEWS	

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A,E	US,A 4,375,324	PUBLISHED	1 MARCH 1983	HOLMES	1-6