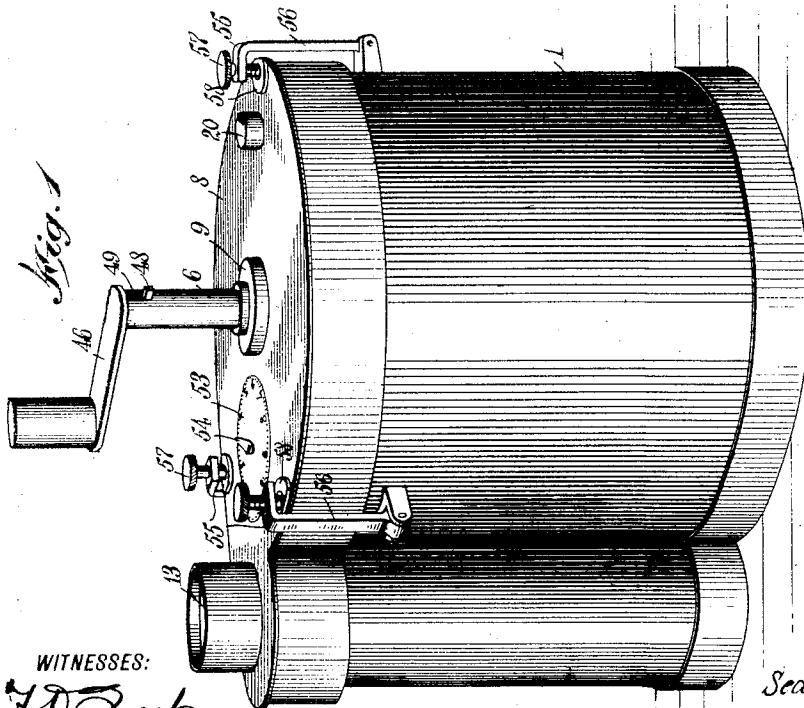
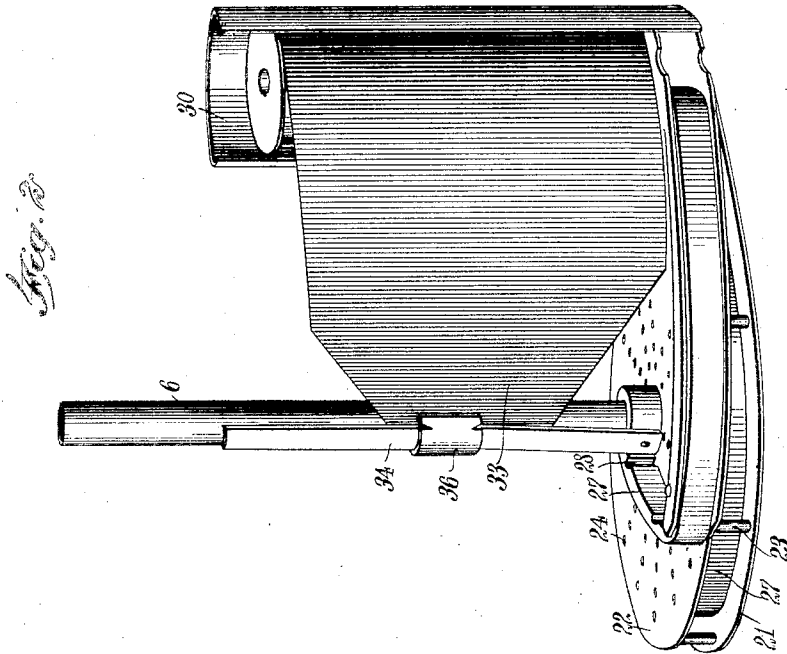


S. PRATT.
DEVELOPING APPARATUS.
APPLICATION FILED JAN. 5, 1911.

1,039,190.

Patented Sept. 24, 1912.

2 SHEETS—SHEET 1.



WITNESSES:
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2 SHEETS—SHEET 2.

Fig. 3

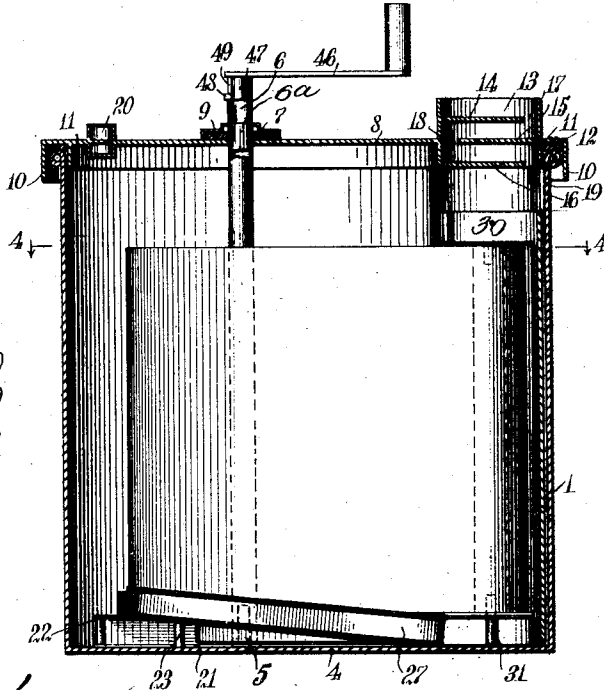


Fig. 9

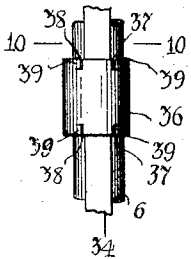


Fig. 10

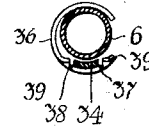


Fig. 4

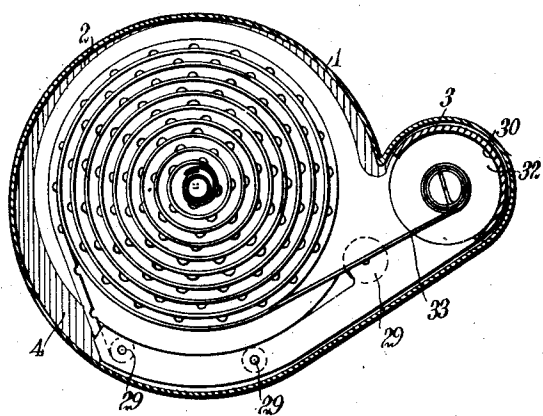


Fig. 5

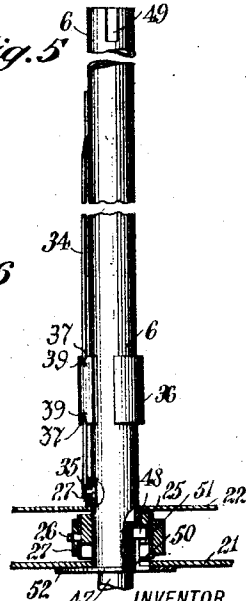


Fig. 6

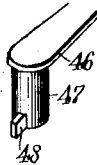


Fig. 8

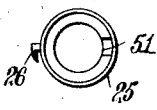
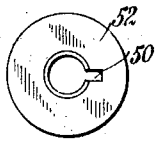


Fig. 7



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UNITED STATES PATENT OFFICE.

SEDGWICK PRATT, OF PIEDMONT, CALIFORNIA.

DEVELOPING APPARATUS.

1,039,190.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed January 5, 1911. Serial No. 600,913.

To all whom it may concern:

Be it known that I, SEDGWICK PRATT, a citizen of the United States, and a resident of Piedmont, in the county of Alameda and State of California, have invented a new and Improved Developing Apparatus, of which the following is a full, clear, and exact description.

This invention relates to a new and improved apparatus for developing and washing sensitized films in such a manner that they will at no time be exposed to the light.

An object of this invention is to provide a device which will be simple in construction, inexpensive to manufacture, compact in form, strong, durable, easily manipulated, and quick and thorough in its operation.

Another object of this invention is to supply the developing apparatus with adjustments whereby it may be adapted to accommodate films of different sizes.

A further object of this invention is to provide a developing apparatus with means for permitting the supplying of solutions thereto, at the same time preventing the intrusion of rays of light therein.

A still further object of this invention is to provide means for unreeling the roll of film and spacing apart the successive coils thereof, so as to permit a circulation of the developing fluids therebetween.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a perspective view; Fig. 2 is a perspective view showing the internal mechanism removed from the casing; Fig. 3 is a vertical section; Fig. 4 is a horizontal section on the line 4—4 of Fig. 3; Fig. 5 is a view in elevation, partly in section, of the shaft; Fig. 6 is a fragmentary perspective view of the crank for operating the shaft; Fig. 7 is a detail bottom plan view of the shaft; Fig. 8 is a detail bottom plan view of the spacer collar on the shaft; Fig. 9 is a fragmentary view in elevation, showing the means for preventing the rotation of the

locking collar; and Fig. 10 is a transverse section on the line 10—10 of Fig. 9.

Referring more particularly to the separate parts of the device, 1 indicates a casing, which may be of any suitable material, and is preferably provided with a large compartment 2 and a small compartment 3, connected together. The former may be termed the "bath compartment" and the latter may be termed the "reel compartment". The compartments 2 and 3 have a common bottom 4, which forms the bottom of the casing 1. Projecting upward from the upper surface of the bottom in the compartment 2, there is provided a stud 5, which forms a pivot support for a hollow tubular shaft 6. The hollow tubular shaft 6 extends upward through an opening 7 in the cover 8 for the casing 1, and projects above the top of the cover 8. The opening 7 is surrounded by a resilient washer 9, of any suitable material, such as rubber, which forms a light-tight fit with the shaft 6, so as to prevent the intrusion of light into the casing. A rubber plug 6^a is inserted in the shaft 6, just below the slot 49, to prevent access of light to the interior of the casing through the hollow shaft 6. The cover 8 is provided with an outer flange 10 and an inner flange 11, spaced apart from the flange 10, so as to form a channel therebetween, in which is adapted to extend the upper edge of the body of the casing 1. This channel between the flanges 10 and 11 is preferably provided with a resilient cushion 12 of any suitable material, such as rubber, so as to insure the darkness of the interior of the casing and to prevent the leakage of the developing liquids from the casing.

For the purpose of feeding the washing solutions to the interior of the casing, the cover 8 is provided with a spout 13, which, while shown as being above the compartment 3, may be located in any other suitable position. This spout 13 is formed so as to obstruct the passage of rays of light into the interior of the casing and yet at the same time permit the flow of fluid thereinto. For this purpose, it is provided with three compartments, formed by partitions 14, 15 and 16, parts of which are broken away to form openings 17, 18 and 19. It will be noted that the openings 17, 18 and 19 are

staggered relative to each other, so that the fluid is forced to travel in a zig-zag path in order to get into the casing. For the purpose of admitting air to the interior of the casing to take the place of the fluid which is poured out through the spout 13, there is provided a smaller spout 20, which, similar to the spout 13, is provided with a plurality of partitions having openings therein arranged in staggered relation with respect to each other, so as to permit the passage of air and obstruct the passage of light.

Mounted on the shaft 6, there is provided a base plate 21, which is connected to, and held in spaced relation from, a superposed auxiliary base plate 22, by any suitable means, such as pins 23, disposed in spaced relation around the peripheries of the two plates. These plates extend into both compartments, and are preferably provided with a plurality of openings 24, to permit the circulation of the developing and washing solutions therethrough.

Loosely mounted on the shaft 6, intermediate the plates 21 and 22, there is provided a collar 25, the particular structure of which will be more clearly seen by reference to Figs. 5 and 8. This collar is provided on its outer surface with a hook 26, which is adapted to be engaged by an opening in a spacer 27, which may be of any suitable form, such as a strip of leather, provided with a plurality of cut-out portions or notches 28, for the purpose of permitting the transmission of the developing and washing solutions therethrough. The plates 21 and 22 are bent upwardly slightly at a portion thereof, to form a guide for the spacer 27, and for this purpose are provided with a plurality of anti-friction rollers 29, over which the spacer 27 is adapted to run.

Connected to the plates 21 and 22 in any suitable manner, there is provided a reel-holder 30, which is adapted to extend into the compartment 3, and which is open at the side facing the compartment 2.

Centrally located in the compartment 3, on the plates 21 and 22, there is provided a stub shaft 31, which is adapted to form a pivot support for a film reel 32, which carries a film 33, to be developed. For the purpose of securing the free end of the film 33 to the shaft 6, there is provided on the shaft 6 a clamping member 34, which is preferably of a springy nature and secured at its upper end on the shaft 6 and free at its lower end. This clamp 34 is also provided with a pin 35 at its lower end, which is adapted to engage in an opening in the spacer 27, whereby the free end of the spacer 27 is also locked to the shaft 6 and carried therewith.

For the purpose of securely holding the clamp 34 against the shaft 6, and thus locking the end of the film 33 and the end of the

spacer 27 thereto, there is provided a locking collar 36, which is slidably mounted on the shaft 6, and is open at one side, so as to permit it to slide by the film 33. In order that this locking collar 36 may not rotate, it is provided with slots 37 and 38, located on each side of the clamp 34, as more clearly illustrated in Figs. 9 and 10. The metal of the collar 36, at the location of these slots, is forced inwardly to form tongues 39, which engage the side edges of the clamp 34, and thus permit the sliding engagement of the collar 36, and yet prevent its rotation.

For the purpose of rotating the shaft 6, and thereby winding thereon the film 33 together with the spacer 27 which separates the successive coils of the film, there is provided a crank 46, which has thereon a lug 47, the latter being adapted to be inserted in the upper end of the shaft 6. In order to form a positive connection between the crank 46 and the shaft 6, there is provided on the lug 47 a pin 48, which engages a slot 49 in the top of the shaft 6. In order to rotate the shaft 6 in the opposite direction and wind the spacer on the collar 25, which forms a reel therefor, there is provided in the bottom of the shaft 6, a slot 50, which is adapted to be engaged by pin 48 on the crank 46, and there is also provided a corresponding slot 51 in the collar 25, which is adapted to be brought into alinement with the slot 50, and is also adapted to receive the pin 48 on the crank 46. The plates 21 and 22, together with the reel-holder, may be removed bodily from the receptacle 1, and for this purpose, the shaft 6 is provided with a flange 52 on the bottom thereof.

In order to provide a convenient means for indicating the period during which it is desired to submit the film to the particular solution, there is inscribed on the cover 8 a graduated scale 53, preferably in the form of a circular scale, and a movable pointer 54, preferably a pivoted member, which is adapted to be moved relative to the scale and left in any predetermined position.

For the purpose of securing the cover 8 to the body of the receptacle, there is provided a plurality of locks 55, which may be of any suitable structure, but are shown in the form of angle bars 56 pivoted to the side of the receptacle and extending up over the cover 8, where they are provided with adjustable set screws 57, which are adapted to engage in bearing pieces 58 on the top of the cover. This structure forms a neat and secure lock which positively holds the cover to the body, without danger of the solution leaking out or the light creeping in.

The operation of the device will be readily understood when taken in connection with the above description.

The film reel 32 containing the film 33 to

be developed, is inserted in the holder 30, and the end of the film 33 attached to the shaft 6 by being inserted beneath the clamp 34. The end of the spacer 27 is also secured to the shaft 6 by being inserted beneath the clamp 34, with the pin 35 passing through the aperture therein. The clamp 34 is then locked securely to the shaft 6, so as to grip the spacer and the film tightly by means of the collar 36, which is slid down into the position indicated in Fig. 2. All the members, being thus prepared, are put into the casing. The developing solution is then poured into the casing, to a level considerably higher than the top edge of the film will reach. The cover is then placed and locked in position, and the film unwound from the reel 32 and wound on the shaft 6 in such a manner that each successive coil is spaced apart from the next adjacent coil in a spiral manner, by means of the spacer 27, so that there will be plenty of room between the successive coils of the film to permit the developing and washing solutions to circulate. The object is to unreel the film into the developing solution below the surface thereof, so as to prevent the formation of air bubbles on the surface of the film. The shaft 6 is then gently moved up and down, so that the solution will pass through the various openings in the plates and the spacer, between the coils of the film, completely developing the latter to the degree desired. The upward motion of the shaft 6 and the part carrying the film connected therewith is limited by the top of the clamp 34 coming in contact with the under side of the cover, so that the film at no time comes above the surface of the solution. This method keeps up a constant circulation. The desired period of developing may be indicated by the pointer 54 on the cover 8. When the period of developing has elapsed, the solution is poured out through the spout or conduit 13, the auxiliary spout or conduit 20 permitting the air to pass into the interior of the developer to take the place of the solution poured out. The film is then washed one or more times by pouring in a washing solution, such as water, through the spout 13. The cover can then be removed, and the film laid out flat on the table and treated in any desired manner with a fixing solution. In order to reset the developing device, the hand crank 46 is removed from engagement with the top end of the shaft 6 and adjusted to the bottom end of the shaft by inserting it through the slots 50 and 51, when it will be in a position to simultaneously rotate the shaft 6 and the collar 25. The spacer can then be rewound on the collar 25 between the plates 20 and 22.

While I have shown one embodiment of my invention, I do not wish to be limited to

the specific details thereof, but desire to be protected in various changes, modifications and alterations which may come within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. The combination with a casing, of a holder in said casing adapted to hold a reel with a film thereon, means mounted in said casing for coiling said film from said reel in such a manner that the transmission of a fluid is permitted between the successive layers, and plates in said casing for supporting said reel and said means, and having perforations therein adapted to permit the transmission of a fluid therethrough.

2. The combination with a casing, of a shaft adapted to coil up a strip of material to be treated in said casing, a spacer for separating the successive layers of said strip of material, a collar loosely mounted on said shaft adapted to form a drum for said spacer, and means for operatively connecting said collar to said shaft.

3. The combination with a casing, of a shaft rotatably supported in said casing and adapted to wind a strip of material, to be treated, thereon, a spacer for separating the successive coils of said strip of material, a collar for winding said spacer, and a crank adapted to rotate said shaft alone, and said collar together with said shaft.

4. The combination with a casing, of a shaft rotatably mounted in said casing, a plurality of perforated plates mounted on said shaft, said shaft being adapted to wind up a strip of material to be treated, and a spacer for separating the successive coils of said strip of material said plates forming guides for said spacer.

5. The combination with a casing, of means located in said casing for coiling up a strip of material to be treated; a cover for said casing, said cover having a pair of flanges extending in spaced relation on opposite sides of the rim of the body of said casing, a strip of flexible material interposed between said flanges, and exterior clamps for securing said cover in place whereby a light-tight joint is made between the body of said casing and said cover.

6. The combination with a casing, of a shaft movably mounted in said casing and adapted to have a film wound thereon, and members secured to said shaft and movable therewith, so that said film can be manipulated up and down in said casing when filled with treating solution.

7. The combination with a casing, of a shaft rotatably mounted in said casing and capable of vertical movement relative thereto and adapted to receive a film thereon, and members secured to said shaft and adapted to move vertically therewith relative to said

casing, said members being adapted to support said film, spacing means for holding the various portions of said film in spaced relation, whereby said film may be manipulated up and down in developing solutions so as to treat each portion thereof without the formation of bubbles.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SEDGWICK PRATT.

Witnesses:

CHARLES R. HOLTON,
JOHN DONNELLAN.