June 23, 1942. L. MANDEL 2,287,742

PHOTOGRAPHIC APPARATUS

Filed July 25, 1940 2 Sheets-Sheet 1

Fig. 1

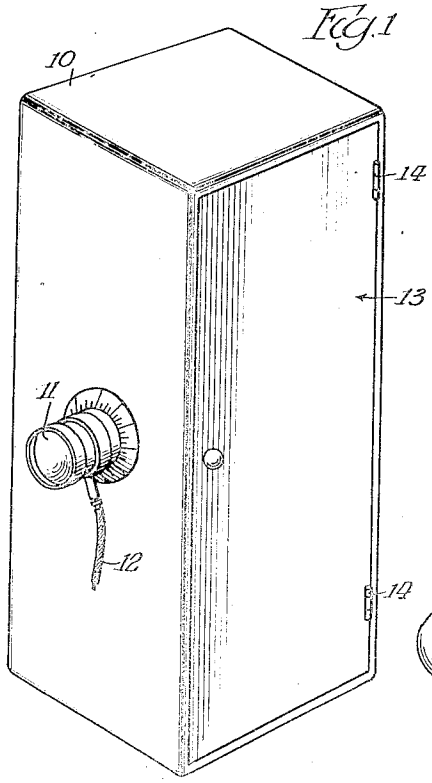


Fig. 2

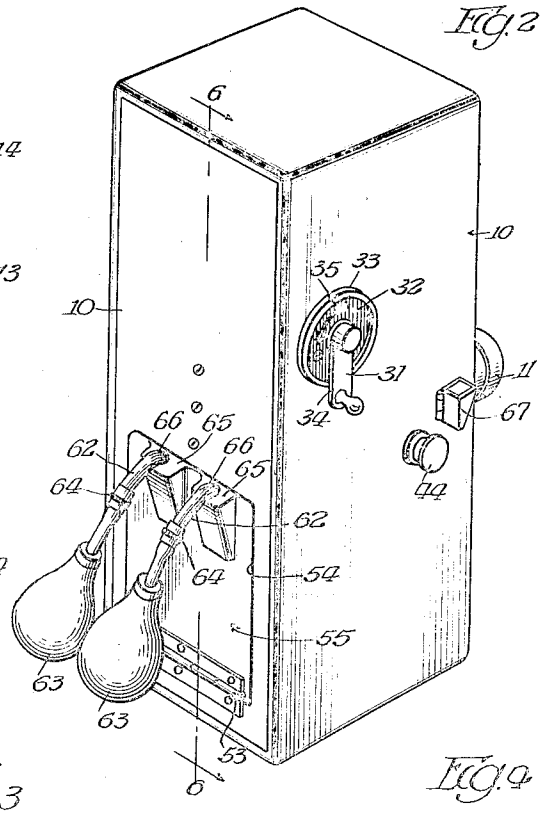


Fig. 3

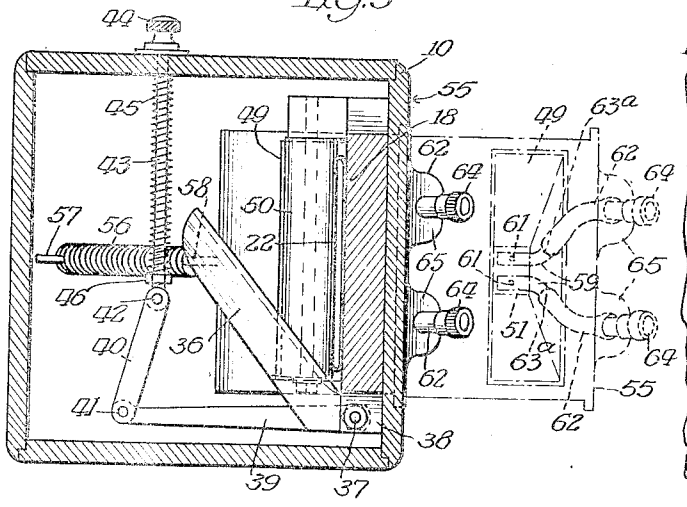
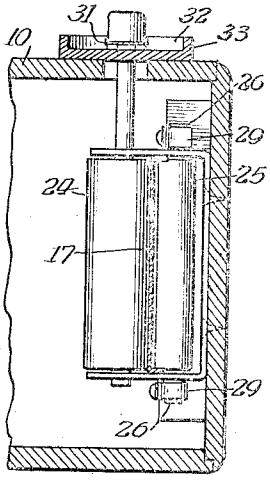


Fig. 4



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Filed July 25, 1940 2 Sheets-Sheet 2

Fig. 5

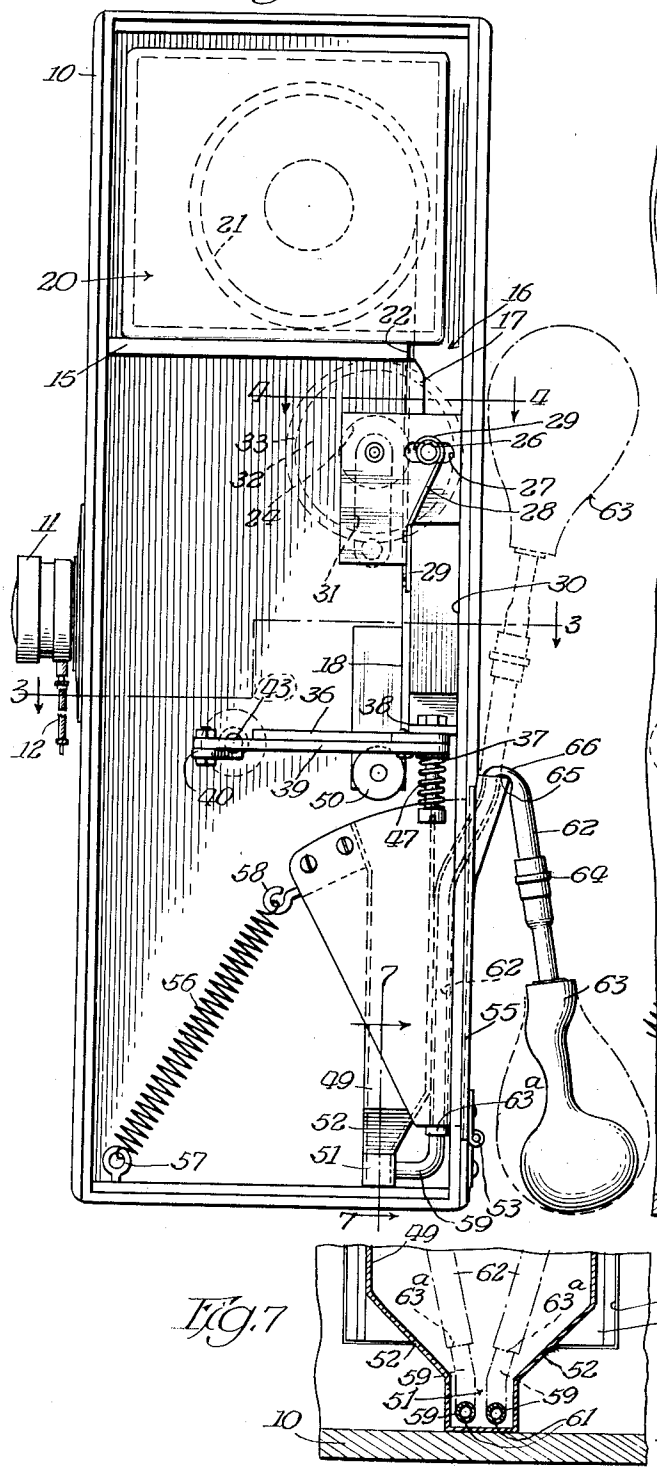


Fig. 6

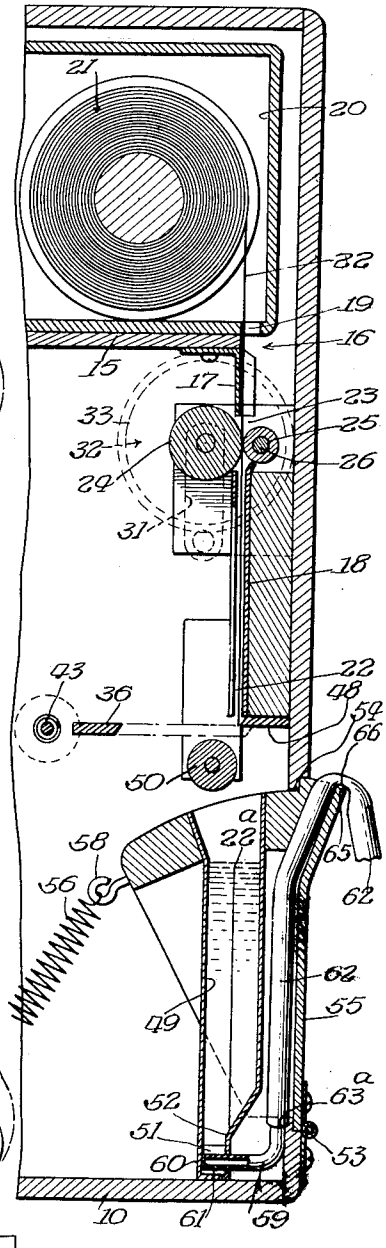


Fig. 7

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2,287,742

PHOTOGRAPHIC APPARATUS

Louis Mandel, Chicago, Ill.

Application July 25, 1940, Serial No. 347,505

7 Claims. (Cl. 95—90)

This invention relates to improvements in photographic apparatus and one of the objects of the same is to provide improved apparatus of this character in which the photographs which are taken by the camera, that forms a part of the apparatus, are developed and rinsed inside the machine, rendering it possible to further the development of photographs in daylight and thereby dispensing with the necessity of the usual dark room.

A further object is to provide an improved means for feeding the sensitized medium in a straight line from the supply into a position to receive the exposure, and then severing the exposed portion of the supply and delivering the severed portion into a developing and rinsing container.

A still further object is to provide in an apparatus of this character an improved container in which the photographs are both developed and rinsed and improved means for alternately supplying the developing solution and the rinse liquid to and removing them from the container.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a perspective view of an apparatus of this character constructed in accordance with the principles of this invention, and taken from the front of the apparatus.

Figure 2 is a perspective view, similar to Figure 1, taken from the rear of the apparatus.

Figure 3 is a detail horizontal sectional view taken on line 3—3 Figure 5.

Figure 4 is a horizontal sectional view taken on line 4—4 Figure 5.

Figure 5 is a side elevation, on an enlarged scale, showing the interior of the casing, and with the closure removed.

Figure 6 is a vertical sectional view taken on line 6—6 Figure 2.

Figure 7 is a detail vertical sectional view taken on line 7—7 Figure 5.

The apparatus consists essentially of a casing 10 which may be of any desired size and configuration and is provided with the usual photographic lens 11 having a shutter (not shown) which is adapted to be actuated by the actuating mechanism 12, a portion of which latter is shown and which operating mechanism may be of any approved type.

The casing is provided with a closure 13 which, if desired, may be hinged, as at 14, and may be secured in its closing position in any suitable manner.

Within the casing 10 is arranged a horizontal partition or shelf 15 adjacent the upper portion thereof which extends across the interior of the casing and terminates short of one of the walls of the casing to provide an opening 16 beneath which is arranged a guide 17.

Below the guide 17 in alinement therewith and preferably spaced therefrom is another guide 18, and these guides 17—18 are arranged in alinement with an opening 19 in a carton or package 20 which holds the roll 21 of the sensitized media 22. When the sensitized media is unrolled from the roll 21 it will pass in a straight line through the opening 19 in the carton 20, thence into the guide 17 and then into the guide 18, the latter being arranged in alinement with the lens 11 and in a position to receive the exposure through the lens 11.

Arranged in proximity to the space 23 intermediate the guides 17—18 is a feed roller 24 preferably of rubber or any other suitable friction creating material and this roller is suitably mounted.

A similar roller 25 of any suitable diameter is arranged adjacent the roller 24 and the shaft 26 of the roller 25 extends beyond the ends of the roller and is mounted in suitable bearings 27, the latter being preferably in the form of slots, and springs 28 are provided which are mounted by one end, as at 29, upon suitable supports 30. These springs 28 contact at their free ends the extremities of the shaft 26 and tend normally to move the roller 25 toward the roller 24 to cause the rollers to grip the sensitized media 22 and feed the same through the guide 18 and into a position in alinement with the lens 11. The roller 24 may be operated in any suitable manner preferably by means of a handle 31 arranged on the outside of the casing 10. Encompassing the shaft of the roller 24 and on the outside of the casing 10 is a disc 32 having an upstanding flange 33, a portion of the flange being cut away, as at 34, to provide a notch or recess into which the handle 31 is adapted to spring, the handle being preferably formed of suitable resilient material.

An indicator 35 preferably in the form of an arrow may be provided to indicate the direction

in which the handle 31 should be moved so as to rotate the roller 24.

At any desired or suitable position within the casing 10 there is provided a knife or cutter 36 which is pivotally mounted, as at 37, upon a suitable support 38. Connected to the cutter is an arm 39 and a link 40 is pivotally connected, as at 41, to the free end of the arm 39, and as at 42, to a bar or rod 43, which latter passes through a wall of and to the outside of the casing and is provided with an operating handle or knob 44. A spring 45 encompasses the rod 43 and preferably has a bearing at one end against the casing wall and at its other end is connected to an adjustable nut or collar 46 whereby the tension of the spring 45 may be varied. If desired, a spring 47 may be provided which encompasses a rod or bolt 37 that forms the pivot for the knife or cutter 36, and this spring 47 assists in holding the parts in proper relation.

The cutter 36 co-operates with a member 48 past which latter the sensitized medium 22 is fed by the rollers 24—25 so that when the knob or handle 44 is drawn outwardly the sensitized media will be severed and the severed portion 22*a* thereof will drop into the container 49.

If desired, an additional roller 50 may be provided along the path of movement of the sensitized media so as to direct it into the container 49.

The container 49 may be of any desired or suitable construction but is preferably provided with a reduced portion or well 51 at the base thereof and the walls of the container adjacent the well may be inclined as at 52 so as to direct all of the liquid contents of the container 49 into the well.

The container is mounted for swinging movement preferably by means of a hinge 53 so that the container will swing through an opening 54 in the wall of the casing. The wall 55 of the container forms a closure for the opening.

A spring 56 is anchored at one end, as at 57, and is connected at its other end, as at 58, to the container 49 and tends normally to move the container into the position shown in Figure 6.

The liquid is supplied to the container through the well 51 and to that end there may be provided a pair of tubular members 59 each of which is provided with a closed end 60. The closed ends extend into the well 51 through a wall thereof and in each of the tubes 59 there is provided an opening 61 in the bottom of the tube. These tubes 59 may extend upwardly through the wall of the container if desired or flexible members 62 may be housed within the wall of the container, one of each is connected, as at 63*a*, with each of the tubes 59. The free ends of the tubes 63 project beyond the top of the wall of the container as shown more clearly in Figures 5 and 6. A hollow bulb 63 is connected by means of a suitable coupling 64 with each of the tubes 62 so that each of the bulbs will have communication with the well 51 in the container 49 through the medium of the respective tubes 62.

The tube 62 projects for a substantial distance beyond the edge or shoulder 65 of the top of the container so that there will be formed a clearly defined edge over which the flexible tube 62 is adapted to be bent so as to distort the tube and thereby form a closure to shut off communication between the well 51 and the respective bulbs 63. One of the bulbs 63 is adapted to be filled with a developing solution and the other of the bulbs 63 is adapted to be with a washing water or any other suitable liquid. In use these two bulbs are first filled with the respective liquids and then attached by means of the couplings 64 to the respective tubes 62. The weight of the bulbs 63 normally and when no liquid is therein is such as to cause the tube 62 to be collapsed or "kinked" as at 66, to close communication between the bulb and the well 51 of the container 49.

When these two bulbs have been filled and are in the position shown in Figures 1 and 5, and the sensitized medium 22 has been drawn from the carton and fed downwardly by the rollers 24—25 into a position in alinement with the lens 11, the apparatus is ready for use. The proper position of the apparatus is ascertained by means of a suitable sight finder 67 arranged in a suitable position on the outside of the casing 10. After the exposure has been made, the handle or knob 44 is drawn outwardly against the stress of the spring 45 causing the knife or cutter 36 to be swung about its pivot 37 to sever the sensitized medium. The severed portion will then drop downwardly and into the container 49 as shown in Figure 6. The extent of rotation of the roller 24 to feed the proper amount of the sensitized medium will be controlled by the handle 31 springing into the recess 34 of the flange 33 so that when one portion of the medium has been severed another portion will then be in position in front of the lens 11.

After the portion 22*a* has dropped into the container 49 the bulb 63 which contains the developing solution is raised and then collapsed by compressing the same which will expell or force out of the bulb the developing solution causing it to flow out of the opening 61 in the tube 59 into the container 49. While the bulb is thus collapsed and held collapsed it is allowed to hang downwardly into the position shown in full lines in Figure 5 so that the bulb will remain collapsed and communication between the bulb and the container will be cut off.

After the photograph has been allowed to remain in the developing solution the necessary or required time the bulb 63 is raised from the full line position in Figure 5 to the elevated position shown in dotted lines in Figure 5, so as to remove the "kink" 66 from the tube 62 whereupon the bulb itself will start to expand or dilate and such dilation will create a suction which will draw out of the container 49 the developing solution and this solution will run back into the bulb 63. After all of the developing solution has been thus removed, the bulb 63 is allowed to hang downwardly again to recreate the "kink" 66 in the tube 62 so as to shut off communication between this bulb and the container thereby preventing any of the developing solution from entering the container.

After this part of the developing operation has been performed, it is then necessary to wash the print or photograph. This is accomplished by raising the other bulb 63 in the same manner forcing the wash water or solution therefrom into the container 49, allowing the water to remain in the container for the desired length of time, or if desired a circulation of the water may be created by compressing and then allowing the bulb with the wash water to again expand, repeating this operation as often as desired. After the print has been thoroughly washed, the bulb 63 from which the wash water has been expelled

may then be allowed to expand and this will create a suction causing the wash water to be withdrawn from the container back into the respective bulb **63**.

While the bulbs are thus hanging downwardly and while the developing solution and the washing liquid are in their respective bulbs **63**, the container **49** may be swung outwardly or to the outside of the casing moving about the hinge **53** so as to permit the developed and washed print or photograph to be removed from the container **49**.

It will therefore be manifest that with the present invention photographs will be taken, developed and washed within the same apparatus thereby rendering it possible to develop the print or photograph in daylight and the necessity of the use of a dark room will be obviated.

Furthermore it will be manifest that the same container **49** is employed as both a developing and a washing container for the exposed print.

It will also be manifest that there will be provided a compact and complete photographic apparatus all arranged and disposed within a single casing and by the use thereof photographs may be taken and developed in daylight without fogging the sensitized medium.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangements of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. A developing container of the character described, means for supplying a developing solution to and for removing it from said container, the said means embodying a hollow compressible element, and a flexible tubular member forming communication between said element and said container whereby upon compression of said element said solution will be ejected therefrom through said tubular member and into the said container, and upon expansion thereof the said solution will be withdrawn from the container into said element, the point of connection of said tubular member with the container being such that when the said hollow element is allowed to hang by said tubular member, the latter will be distorted to close the communication between said hollow element and said container.

2. A developing container of the character described, means for supplying a developing solution to and for removing it from said container, the said means embodying a hollow compressible element, and a flexible tubular member forming communication between said element and said container whereby upon compression of said element said solution will be ejected therefrom through said tubular member and into the said container, and upon expansion thereof the said solution will be withdrawn from the container into said element, the point of connection of said tubular member with the container being such that when the said hollow element is allowed to hang by said tubular member, the latter will be distorted to close the communication between said hollow element and said container, the said tubular member having communication with the said container at the bottom of the container.

3. A developing container of the character described, means for supplying a developing solution to and for removing it from said container, the said means embodying a hollow compressible element, and a flexible tubular member forming communication between said element and said container whereby upon compression of said element said solution will be ejected therefrom through said tubular member and into the said container, and upon expansion thereof the said solution will be withdrawn from the container into said element, the point of connection of said tubular member with the container being such that when the said hollow element is allowed to hang by said tubular member, the latter will be distorted to close the communication between said hollow element and said container, the said tubular member being closed at its free end, said free end extending into the container in close proximity to the bottom of the container, there being one or more openings in the lower side of the said end of the said tubular member in close proximity to the bottom of the container.

4. An upright developing container of the character described supported to swing about a horizontal pivot, a tubular member communicating with the container adjacent the bottom thereof, a flexible tubular element connected with said member, a guide of substantial length spaced from the point of connection with said tubular member and through which guide a portion of said flexible element passes, and a hollow compressible element connected with the free end of the tube, the edge of said guide operating to distort said flexible tubular member to close the latter when said hollow element is allowed to hang by said tubular element.

5. A developing container of the character described, means for supplying a liquid to and for removing it from the said container, the said means embodying a hollow compressible element, a flexible tubular member to which one end of said element is connected, a substantially rigid pipe communicating at one end with the container adjacent its bottom, the other end of the pipe being outside of the container and disposed at an angle to the remaining portion of the pipe, one end of said flexible member having a telescoping connection with the last said end of the pipe, a guide for the flexible member spaced from said connection, and a shoulder on said guide by means of which shoulder a portion of the flexible tubular member will be distorted to close the latter when said hollow compressible element is allowed to hang by said flexible tubular member.

6. A developing container of the character described, means for supplying a liquid to and for removing it from the said container, the said means embodying a hollow compressible element, a flexible tubular member to which one end of said element is connected, a substantially rigid pipe communicating at one end with the container adjacent its bottom, the other end of the pipe being outside of the container and disposed at an angle to the remaining portion of the pipe, one end of said flexible member having a telescoping connection with the last said end of the pipe, a guide for the flexible member spaced from said connection, and a shoulder on said guide by means of which shoulder a portion of the flexible tubular member will be distorted to close the latter when said hollow compressible element is allowed to hang by said flexible tubular member, the said end of the pipe that extends into the container being closed and disposed in a well at the bottom of the container, there being one or more openings in the bottom of said pipe.

7. A developing container of the character described, a deflatable member, a flexible tube one end of which is connected with said member, the other end of said tube being connected with said container at a point remote from the base of, and having communication with the container, and a shoulder supported by the container and disposed intermeditae the ends of said tube, the combined length of said deflatable member and said tube between the base of the container and to a point beyond said shoulder being such that when the said deflatable member is allowed to hang by the tube, the weight of the said member will cause said tube to engage and be distorted by said shoulder to close communication between said member and the container.

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