July 14, 1964 R. L. MILLER 3,140,647

FILM WASHER

Filed July 3, 1961

Fig. 1

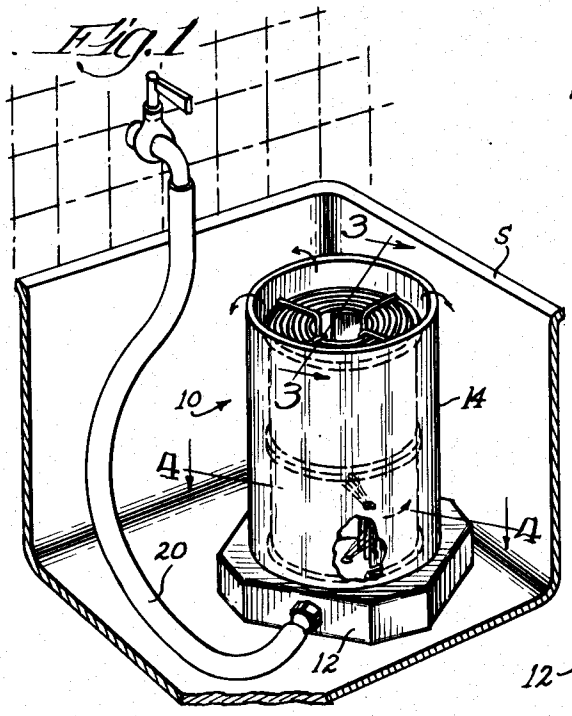


Fig. 2

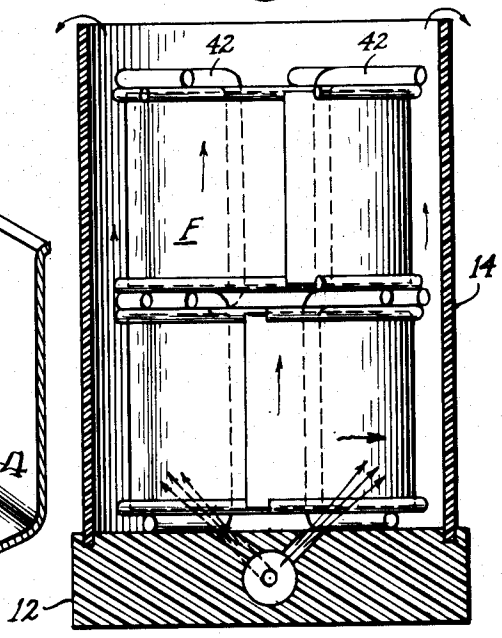


Fig. 3

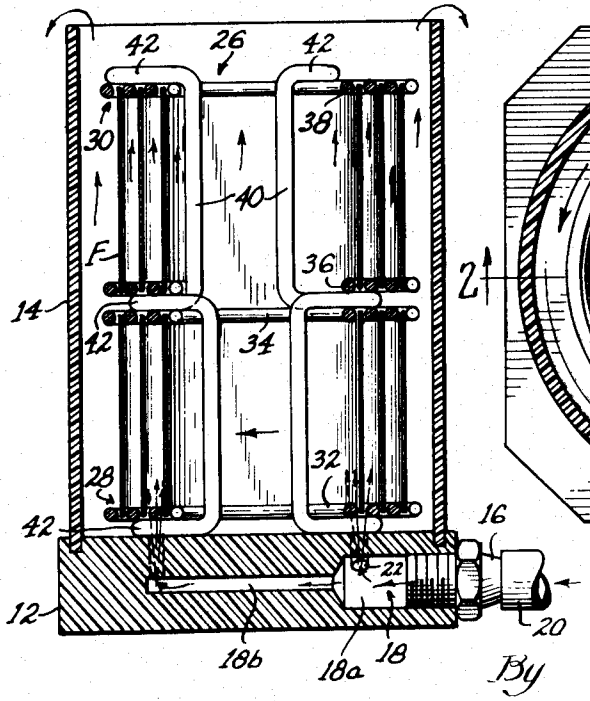
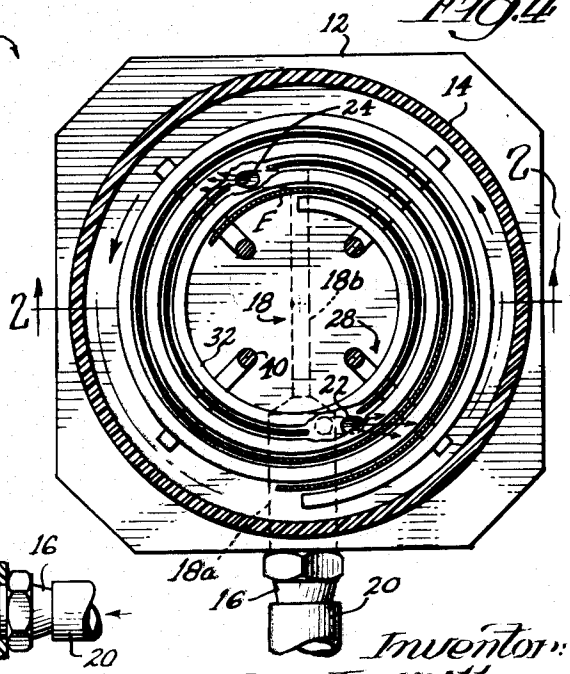


Fig. 4



Inventor:
Roy L. Miller
By Dan Lawrence Atty

United States Patent Office 3,140,647 Patented July 14, 1964

3,140,647

FILM WASHER

Roy L. Miller, 9337 S. Ada St., Chicago 20, Ill.

Filed July 3, 1961, Ser. No. 121,640
2 Claims. (Cl. 95—93)

This invention relates to a washer for photographic film and more particularly to a washer especially suited for washing roll film.

It is well known in the photographic processing art that after film has been developed it must be washed thoroughly in order to remove all traces of the chemicals used in the hypo or fixer.

Accordingly, it is an object of this invention to provide an improved washer for photographic film.

It is another object of this invention to provide an improved washer for photographic film which is particularly suitable for use with roll type film.

It is still another object of the invention to provide a washer for photographic film which has an improved washing action as compared to film washing devices of the prior art due to the use of a new and different water flow system in the film washer.

In achievement of these objectives, there is provided in accordance with this invention a washer for roll film comprising a cylindrical tank secured to a base member, the continuously flowing wash water being directed upwardly through the base and into the lower end of the tank through inlet passages which communicate with an inlet duct in the base. The film to be washed is mounted within the tank on a reel assembly formed of steel rod or the like which radially spaces successive convolutions of the roll film from each other.

In accordance with an important feature of the construction, the inlet passages which direct wash water into the interior of the wash tank are located adjacent opposite ends of the inlet duct in the base and are inclined upwardly in opposite directions from the inlet duct to the right and to the left, respectively, of the axis of the inlet duct. The upwardly inclined inlet passages are so located in the base that the water impinges against the film on the reel on opposite sides of the vertical axis of rotation of the reel to produce a torque or turning moment on the reel which causes the reel to rotate, the film rotating with the reel, thereby producing an improved washing action compared to film washers of the prior art.

Further objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawing, in which:

FIGURE 1 is a perspective view showing the film washer of the invention connected for operation in a sink or the like;

FIGURE 2 is a view in vertical section of the film washer of FIGURE 1;

FIGURE 3 is a view in vertical section taken along line 3—3 of FIGURE 1; and

FIGURE 4 is a view in horizontal section taken along line 4—4 of FIGURE 1.

Referring now to the drawing, there is shown a film washer generally indicated at **10** comprising a base member **12** which is adapted to rest on the bottom of a sink or the like, such as the sink S shown in FIGURE 1. Washer **10** includes a tank **14** which is preferably in the form of a vertically positioned cylinder whose lower end is secured in a circular groove in the upper surface of base **12**. The base **12** and cylinder **14** of washer **10** are preferably made of a suitable plastic material which is not corroded by the chemicals used in the hypo or fixing soltuion which is to be removed by the washer.

Wash water is admitted to the interior of wash tank **14** through an inlet fitting **16** connected to an inlet duct generally indicated at **18**. Inlet duct **18** includes a large

diameter portion **18***a* adjacent the inlet fitting **16**, and a small diameter portion **18***b*. The duct portions **18***a* and **18***b* are in fluid communication with each other and lie along a horizontal axis which substantially coincides with a diameter of cylindrical tank **14**. A hose **20** is attached to the inlet fitting **16** for conducting water into the interior of wash tank **14**, the opposite end of hose **20** being connected to a faucet above sink S.

In accordance with an important feature of the invention, the water flow from the inlet duct **18** is conducted into the interior of wash tank **14** by means of an inlet passage **22** which extends upwardly at an inclination from inlet duct portion **18***a* and in a direction to the right of the longitudinal axis of duct **18**, with respect to the view shown in FIGURE 4, and by means of a similar inclined inlet passage **24** which extends from the inner end of duct portion **18***b* upwardly through the base, the inlet passage **24** extending to the left of the axis of duct **18** with respect to the view shown in FIGURE 4 of the drawing. In the embodiment shown, passages **22** and **24** are inclined at an angle of substantially 45 degrees with respect to the horizontal and vertical planes.

By positioning inlet passages **22** and **24** respectively adjacent opposite ends of the axis of duct **18** and respectively directed to the right and to the left of the axis of the duct **18**, the water flowing through the inlet passages **22** and **24** into the interior of tank **14** impinges against the film on opposite sides of the vertical axis of rotation of reel assembly **26**, causing rotation of the reel assembly **26** and of the film thereon, as will be described more fully hereinafter.

The film F being washed is supported within tank **14** by a reel assembly generally indicated at **26** preferably formed of small diameter stainless steel rod, but which could be formed of other suitable material. The reel assembly **26** is coaxial with cylinder **14** but is of somewhat smaller diameter. Since inlet duct **18** in base **12** lies along a diameter of cylinder **14**, it also lies along a diameter of reel assembly **26**, and inlet passages **22** and **24** extend to the right and to the left of the diameter of reel assembly **26** on opposite sides of the vertical axis of rotation of the reel assembly, the water discharging from inlet passages **22** and **24** adjacent or between several of the inner turns of the film roll on lower reel **28**.

In the illustrated embodiment, a "double-decker" reel assembly is provided which can support two rolls of film for simultaneous washing. Thus, reel assembly **26** includes a lower reel **28** and an upper reel **30**. Lower reel **28** includes a lower end **32** and an upper end **34**, each respectively formed of a plurality of radially-spaced spirally-wound turns of steel rod. Similarly, upper reel **30** includes a lower end **36** and an upper end **38**, also each formed of a plurality of radially-spaced spirally-wound turns of steel rod. The lower end upper reels **28** and **30** are secured to each other in a unitary assembly by vertical metal rods **40** which are secured by welding or the like to the upper and lower ends of both of the reels. Each of the rods **40** is bent at substantially 90 degrees at each of its opposite ends to provide horizontal upper and lower end portions **42** which respectively lie beneath the lower end **32** of lower reel **28**, between the upper end **34** of lower reel **28** and the lower end **36** of upper reel **30**, and above the upper end **38** of upper reel **30**. The horizontal end portions **42** of rods **40** are suitably attached as by welding to the ends of the reels.

The radial spacing between the successive spiral turns of the metal rod forming each of the reel ends **32, 34, 36, 38** provide a plurality of spirally-extending channels at the upper and lower end of each reel into which the successive spirally-wound turns of a roll of film may be received. The horizontal end portions **42** of the rods **40** which lie below the lower end of each reel and above the

upper end of each reel serve as stops which retain the film on the respective reels, and prevent the film from slipping through the space between successive spiral turns of the metal rod forming the respective ends of the reels.

In using the film washer of the invention, the reel assembly **26** with roll film F positioned on one or both of the reels **28** and **30**, is removed from the developing tank (not shown) and is inserted into the cylinder **14**. Water is then admitted to the base **12** through inlet fitting **16**, the water passing through inlet duct **18**, and being discharged into the lower end of cylinder **14** through inclined inlet passages **22** and **24**.

The upwardly and radially outward direction of inclination of the inlet passages **22** and **24** and the location of passages **24** adjacent opposite ends of inlet duct **18** and on opposite sides of the axis of duct **18**, namely, to the right and left of the axis of duct **18** and on opposite sides of the vertical axis of rotation of reel assembly **26**, causes the water from passages **22** and **24** to impinge against the film F on reel assembly **26** in such manner as to produce a torque or turning moment on the reel which causes the reel assembly to rotate, the film rolls moving with the rotating reel assembly.

The water from passages **22** and **24** passes upwardly through the cylinder **14**, passing through the space between successive spiral turns of the film and in the spaces radially inwardly and radially outwardly of the film roll or rolls. After reaching the upper end of the water tank, the water overflows the top of the tank and passes down into the drain of the sink. In passing through the tank, the wash water comes into intimate contact with all surfaces of the film and thoroughly washes the film, removing all traces of the chemicals used in the prior development step. The rotation of the reel and the film due to the inclination and location of the inlet passages **22** and **24** contributes substantially to the washing action.

It can be seen from the foregoing that there is provided in accordance with this invention an improved film washer which has advantages not obtainable with film washers of the prior art, and which utilizes a different type of water flow system than that used in prior art film washers.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein and, therefore, it is aimed to cover

all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as my invention is:

1. A washer for photographic roll film comprising a tank, a reel for supporting roll film in said tank with the convolutions of said film radially spaced from each other with respect to the vertical axis of said reel, first and second water inlet passages inclined upwardly and radially outwardly for admitting wash water to the lower end of said tank, said first and second water inlet passages being respectively located on opposite sides of the vertical axis of said reel and being directed in opposite directions away from the diameter of said reel, whereby water entering said tank through said passages is directed against said film and the spiral convolutions thereof and therefore produces a turning moment on said reel to cause said reel and the film carried thereby to revolve about the vertical axis of said reel.

2. A washer for photographic roll film, comprising a base member, a tank mounted on said base member, a rotatable reel for supporting roll film in said tank with the convolutions of said film radially spaced from each other with respect to the vertical axis of said reel, an inlet duct lying in said base, means connecting said inlet duct to a source of water supply, first and second water inlet passages connected between said inlet duct and the lower end of said tank, said inlet passages being inclined upwardly and radially outwardly from said inlet duct to the lower end of said tank, said first and second water inlet passages being so positioned as to lie on opposite sides of the vertical axis of rotation of said reel and being directed in opposite directions away from the diameter of said reel, whereby two streams of water entering said tank through said passages are directed against said film and therefore producing a turning moment on said reel to cause said reel and the film carried thereby to revolve about the vertical axis of rotation of said reel.

References Cited in the file of this patent

UNITED STATES PATENTS

607,677	Bierwirth	July 19, 1898
2,308,519	Lane	Jan. 19, 1943
2,315,572	Wilson	Apr. 6, 1943
2,641,170	Hutchins	June 9, 1953