April 23, 1968 R. R. JOSEPH 3,379,114

FILM WASHING DEVICE

Filed July 29, 1965

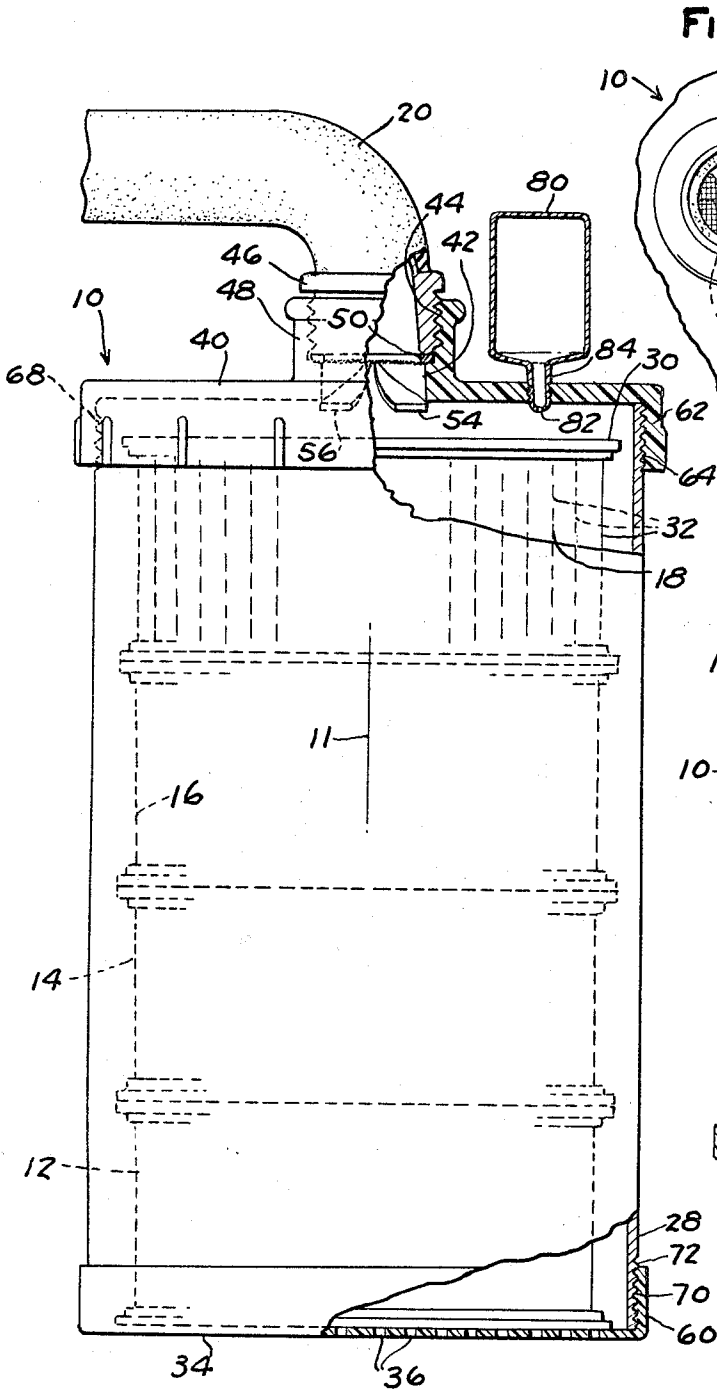


FIG. 1

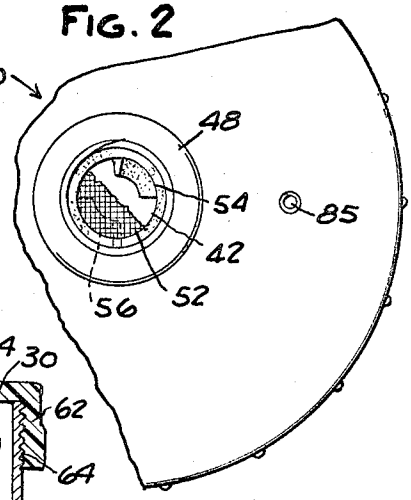


FIG. 2

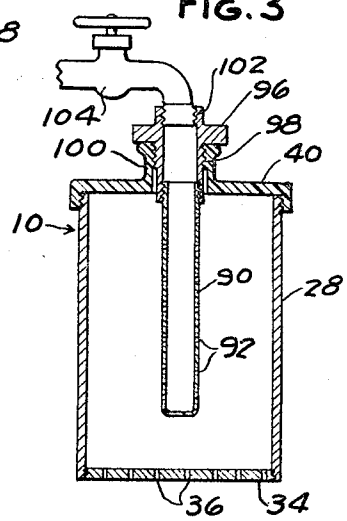


FIG. 3

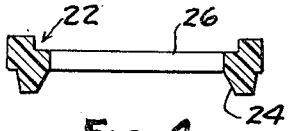


FIG. 4

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United States Patent Office 3,379,114 Patented Apr. 23, 1968

3,379,114

FILM WASHING DEVICE

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Filed July 29, 1965, Ser. No. 475,655
5 Claims. (Cl. 95—97)

ABSTRACT OF THE DISCLOSURE

A film washing tank having a cylindrical side wall with top and bottom walls threaded thereto, the top wall having a rigid inlet fitting thereon adapted for connection with a source of water under pressure such as a faucet or hose. The inlet fitting provides a rigid connection for the hose or faucet attached thereto so that the tank may be suspended in a generally vertical position from said hose or faucet when filled. The bottom wall has a plurality of small outlets therein of such a size as to cause the tank to become filled with water when water under pressure is admitted thereto through the inlet fitting.

This invention relates to film washing devices.

An object of this invention is to provide a device for washing roll film with water which enters at the top and drains from the bottom of the device so that any chemicals washed from the film which are heavier than water do not become concentrated at the bottom of the device.

Another object of the invention is to provide a portable film washing device which may be coupled to a faucet or hose by a connection at the top of the device.

Still another object of the invention is to make it easy to place roll film in and remove roll film from the device, and yet keep the device closed on all sides when washing film.

A further object of the invention is to combine a swirling motion of the water with the downward flow of water through the device.

A further object of the invention is to assure that water entering the washing device is relatively free of foreign matter.

Another object of the invention is to make provisions in a film washing device for introducing a chemical into the water directed through the device.

In the drawings:

FIG. 1 is an elevational view, partly in section, of a film washing device which constitutes one embodiment of the invention.

FIG. 2 is a fragmentary plan view of the top of the film washing device of FIG. 1.

FIG. 3 is a sectional view of a modification of the device of FIG. 1.

FIG. 4 is a sectional view of a stand on which the device may be placed.

The film washing device of this invention has a tubular body dimensioned to receive and retain a vertical stack of film rolls to be washed, a closure at the top end of the tubular body having a water inlet opening through it, and another closure at the bottom end of the tube having one or more water outlet openings through it to allow water to drain from the bottom of the device. There is a fitting at the top of the device for coupling the device to a faucet or a hose. In washing film, the device is positioned with the axis of the tubular body extending vertically. Thus, water entering the device at its top washes film rolls within the device and drains from its bottom end in such a manner that there is little or no opportunity for chemicals washed from the film to accumulate within the device. Vanes may be provided at the inlet opening to impart a swirling motion to the water as it flows downward through

the device. The device may also have a filter at the inlet opening for removing foreign matter from incoming water. A dispenser may be integrated with the device for introducing into the water in the device a chemical which speeds up the washing action.

Referring to the drawings, the washing device **10** shown in FIG. 1 has four film rolls **12, 14, 16** and **18** stacked vertically within it. Device **10** is connected at its top end to a hose **20**, and the axis **11** of the device extends vertically in the washing position of the device. The body of device **10** is a tube **28**, preferably made of a transparent plastic material, although metal or a combination of materials could be used. The inside diameter of tube **28** is slightly larger than the diameter of the reels **30** on which the film rolls **12, 14, 16** and **18** are wound. The individual convolutions of film roll **18** are shown by broken lines **32** in FIG. 1, and the reel has spiral shaped elements which separate the film convolutions from each other. The spiral elements of the reel are not visible in the drawing and have no relation to the invention.

A closure **34** at the bottom end of tube **28** has a plurality of openings **36** extending through it providing outlets for allowing water to drain from the bottom of device **10**. It is possible to provide only one water outlet opening through the bottom closure **34**, but a plurality of openings are preferred. The size and number of the water outlet openings **36** is selected such that for a normal rate of incoming flow of water the tube **28** will become substantially filled with water, thus assuring that all surfaces of the film are washed. To assure that tube **28** initially becomes filled with water, the bottom closure may be allowed to sit on the bottom of a sink. Openings **36** are then closed sufficiently by the sink's bottom that the tube fills with water. Once the device is filled, a stand **22** having legs **24** and an opening **26** (FIG. 4) may be placed under closure **22** to allow freer flow of water through the outlet openings **36**. However it is not necessary to use a stand with the device because the pressure of conventional tap water is sufficient to insure discharge through outlet openings **36** even when the device is resting on the bottom of a sink.

Another closure **40** at the top end of tube **28** has a water inlet opening **42** extending through it. Closure **40** has threads **44** which are screwed onto threaded member **46** on hose **20**, thereby coupling device **10** to the hose. There are alternative ways of coupling device **10** to a source of water at the top end of the device, for example by means of a nipple and hose or by attaching the device directly to a faucet, as in FIG. 3. In the embodiment illustrated in FIG. 1, threads **44** are provided in a fitting **48** in the form of a neck which is an integral part of closure **40**, but a separate fitting may be used if desired.

Fitting **48** has an internal shoulder **50** on which a filter **52** is seated and secured. Filter **52** acts to remove particles of foreign matter from the incoming water. Vanes **54** and **56** are attached to the bottom side of filter **52** and are slanted so as to impart a swirling motion to water flowing through tube **28** to improve its washing action on the film. Vanes **54** and **56** swirl the water in a clockwise direction as viewed in FIG. 2.

At least one of the closures **34** and **40** is removable from tube **28**. Tube **28** of the embodiment of FIG. 1 is threaded at both ends and closures **34** and **40** have threaded rims **60** and **62**, respectively, which are screwed to the threads on tube **28**. Rim **62** is an annular flange which has a thread **64** on its internal surface matching the thread **68** on the outer surface at the top end of tube **28**. Rim **60** of closure **34** has a thread **70** which matches thread **72** on the inner surface at the bottom end of tube **28**. It will be understood that either external or internal threading may be used at the top and bottom ends of tube **28**, the closures being either a simple disc-like closure or

a flanged closure, as illustrated, to accommodate either internal or external tube threads. Thus, both closures are removable from tube **28** in the device of FIG. 1, but it is only necessary to have one removable closure as mentioned previously. Closures **34** and **40** may be made of plastic or metal, plastic being indicated in FIG. 1.

Affixed to the closure **40** in FIG. 1 is a container **80** of the type commonly known as a "squeeze-bottle." Container **80** is inverted and has a threaded tip **84** screwed into a tapped opening **85** in closure **40**. By squeezing container **80**, a liquid chemical substance may be forced through an opening **82** in tip **84** into the interior of device **10**. In this way, a chemical for speeding up the washing action may be introduced from container **80** into water in device **10**. The chemical may be mildly alkaline. Device **10** is filled with water and the chemical is then introduced from container **80**. As previously mentioned, the bottom closure **34** may rest on the bottom of a sink while the device is being filled, thus reducing the rate of drainage. Container **80** may be removed and hole **85** may be closed by screwing a closure plug into it.

An alternative structure for introducing a wash-accelerating chemical into water in the device is incorporated in the modification shown in FIG. 3. Like parts in FIGS. 1 and 3 have the same reference numerals. A tubular container **90** having openings **92** through its side wall is located within device **10**. The mouth of container **90** is secured by threads **94** to a fitting **96** which in turn is attached by threads **98** to neck **100** of top closure **40**. Fitting **96** is secured by threads **102** to a faucet **104**. A solid water-soluble chemical substance, preferably in the form of crystals, may be provided in container **90**. Water entering the inlet of the device passes through container **90** and dissolves some of the chemical substance enroute. The treated water flows through openings **92** into device **10**, washes film in the device, and drains from the bottom end of the device.

The invention provides an improved portable film washing device so constructed as to rapidly wash rolls of reel support film with water under pressure which enters the top and drains from the bottom of the device. The device is so constructed as to be connected either with a hose or directly to a water faucet. By combining a chemical dispenser with the device it is possible to treat water within the device in order to speed up the washing action. This greatly reduces the time required to wash film.

I claim:

1. A film washer comprising, a receptacle having a cylindrical side wall and top and bottom walls, said top and bottom walls being generally co-extensive in area with the cross-section of the receptacle, means detachably connecting the top wall with the upper end of the receptacle so that when removed, the receptacle is adapted to receive a film reel which occupies substantially the entire cross-section of the receptacle, said top wall having a vertically extending inlet fitting integrally connected thereto, said inlet fitting being connected with the central portion of said top wall and including means for solidly connecting the inlet fitting to a generally vertically downwardly extending faucet or hose so that the receptacle may be suspended by said inlet fitting in a generally vertical position from such hose or faucet when filled, said detachable connection means being of a type adapted to support the receptacle from the cover when filled, said bottom wall having outlet openings therein sized to cause the receptacle to become filled with water when water under pressure is admitted thereto through said inlet fitting.

2. A film washer as called for in claim **1** including a chemical dispenser mounted on said top wall exteriorly of the receptacle and having a passageway therein extending through said top wall for dispensing a chemical in said receptacle.

3. The combination called for in claim **1** including an elongate tubular chemical dispenser disposed within said receptacle and connected with said inlet fitting so that water introduced through said inlet fitting is caused to discharge into said dispenser before discharging into said receptacle, said dispenser having openings therein for permitting the water to flow from the dispenser into the receptacle.

4. A portable film washer comprising an imperforate tube consisting of plastic material having first and second open ends and having threads at said first and second ends, a first disc having a threaded rim and having at least one water outlet opening through the same, said first disc being screwed to the threads at said first end of said tube and closing that end except for said water outlet opening but being removable from said tube by unscrewing the same to allow reel supported film to be placed in and removed from said tube, a second disc having a threaded rim and having a water inlet opening through the same, said second disc being screwed to the threads at said second end of said tube and closing that end except for said water inlet opening, means at said water inlet opening for coupling said washer to a faucet or hose with the axis of said tube positioned vertically and said water inlet and water outlet openings at the top and bottom respectively of said tube for allowing water entering said inlet opening to flow downward through said outlet opening at the bottom of said tube.

5. The portable film washer of claim **4** further including means at said water inlet opening for imparting a swirling motion to water entering said inlet opening and flowing through said tube.

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