July 18, 1939. C. S. BASSIN 2,166,387

FILM HOLDING DEVICE

Filed April 22, 1938

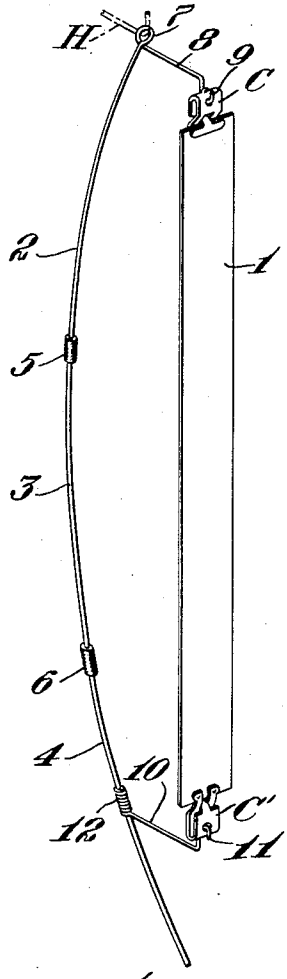


Fig. 1

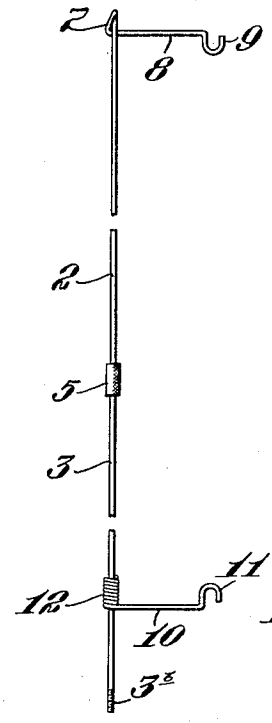


Fig. 2

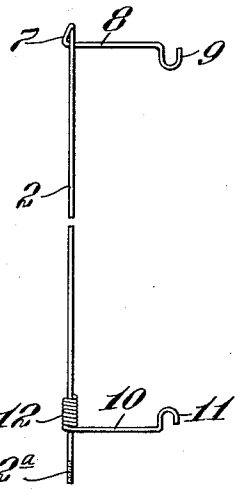


Fig. 3

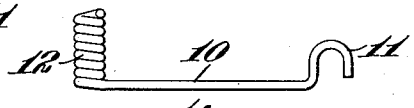


Fig. 10

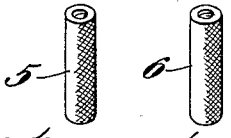


Fig. 8 Fig. 9

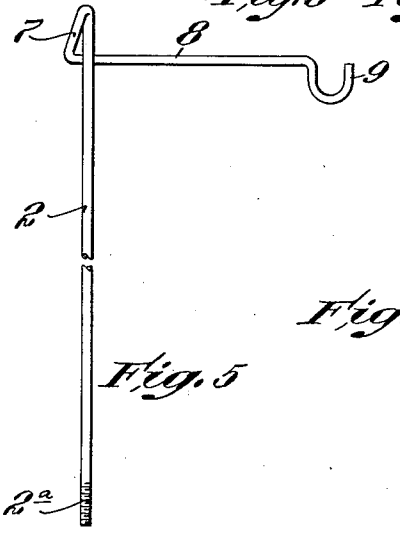


Fig. 5

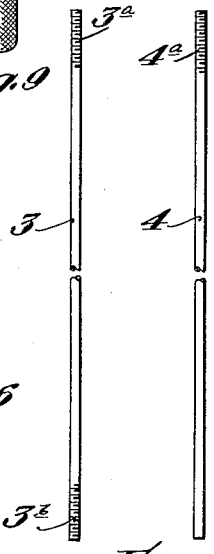


Fig. 6 Fig. 7

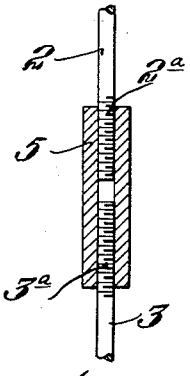


Fig. 4

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FILM HOLDING DEVICE

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Application April 22, 1938, Serial No. 203,710

13 Claims. (Cl. 95—100)

This invention pertains to photography and relates more especially to a support for holding roll film strips in unrolled stretched condition during certain stages of the developing process, for example, while drying the film after washing.

In order to prevent rolling or curling of the film and to hold it as nearly flat as possible, thereby to insure uniformity of treatment, it is requisite to place the film under considerable longitudinal tension, but to support it by its ends alone so that at intermediate points it will be free from contact with any part of the supporting structure. When, heretofore, attempts have been made to provide the requisite longitudinal tension, the resultant support has usually been of complicated and expensive construction. On the other hand, simpler types of support, previously devised, have failed to provide adequate tension and have usually necessitated the disposal of the film in loops, whereas for most effective treatment of the film and to avoid injury during treatment it is desirable to hold the film extended in a single length.

The principal object of the present invention is to provide a film support of simple and inexpensive type but capable of holding a rolled film stretched to its full length without doubling or folding and by gripping it at its ends only, and under sufficient tension to keep it substantially flat while undergoing the treatment to which it is to be subjected. Further objects are to provide a film support so devised as to permit the tension imposed upon the film to be varied at will and by the smallest increments and by a very simple and ready manipulation of the parts, as well as to provide for supporting films which differ greatly in length.

Prior film supports, designed to hold the film fully extended in a single length, have been cumbersome and unhandy to ship or store, and a further object of the invention is to provide a film support capable, when assembled, of holding the film fully extended in a single length but which may be decreased in effective length when not in use to facilitate storage or transportation.

Other objects and advantages of the invention will be made manifest in the following more detailed description and by reference to the accompanying drawing in which

Fig. 1 is a perspective view, to small scale, showing a preferred embodiment of the invention as it appears in use, with a film held in properly tensioned condition by the support;

Fig. 2 is a fragmentary view showing a film support substantially like that of Fig. 1, but arranged for use with a shorter film, certain of the parts being broken away and the support being shown in its normal position, that is to say, untensioned by a film;

Fig. 3 is a view similar to Fig. 2 but showing the support arranged for use with a still shorter film;

Fig. 4 is a fragmentary section, to large scale, illustrating one way of uniting sections of the strut or spring portion of the support; and

Figs. 5 to 10 inclusive are detail views illustrating the several elements comprising the support shown in Fig. 1.

Referring to the drawing, the numeral 1 designates a length of roll film such as is used in the ordinary hand camera. The opposite ends of this film are shown as gripped by clamping devices C and C^1, respectively, it being understood that these clamping devices are illustrative of any suitable connecting element designed to grip or otherwise to engage the end portion of the film and to connect the film to other parts of the supporting device.

As illustrated in Fig. 1, the supporting device comprises an elongate strut or spring member made in three independent sections 2, 3 and 4, respectively, (although a greater number of sections may be provided) which, in use, are rigidly united in an end-to-end relation but which may be separated from each other for convenience in storage or transportation. Each of these sections 2, 3 and 4 is of some suitable stiffly resilient, transversely bendable material which tends, when bent transversely, to resume its normally straight condition when the bending forces are released. While other materials may be employed and while the sections 2, 3 and 4 may be of a different transverse shape from that shown herein and may be tubular as well as solid, it is preferred to make these sections from lengths of resilient steel wire. Thus, as shown in Fig. 5, the section 2 comprises a substantially straight length of wire, screw threaded at 2^a at its lower end for engagement with sleeve 5 and having an integral loop portion 7 at the other end of its straight portion, such loop 7 being designed for engagement by a hook H or other fixed support by means of which the entire device may be suspended in use. Integral with the loop portion 7 is a laterally extending bracket 8 terminating in a hook 9 which is designed to engage an opening, loop, or the like in or carried by the upper film connecting element C. The section 3 of the support (Fig. 6) is normally substantially

straight from end to end and is screw threaded at its opposite ends, as shown at 3a and 3b, while the section 4 (Fig. 7) is normally straight from end to end and is screw threaded at its upper end 4a for engagement with the sleeve 6. If desired, the sleeves 5 and 6 may each be screw threaded with a right and left pitch respectively, at their opposite ends, and the ends of the sections which engage these sleeves may be correspondingly threaded, although the same pitch threading may be used throughout the length of each sleeve if preferred.

A second bracket 10 (Fig. 10) provided at one end with a hook portion 11 for engagement with the lower connecting member C', is furnished at its other end with an elongated sleeve portion 12, conveniently formed by coiling a portion of the material of the bracket 10 (this material preferably being stiff steel wire though it need not be as heavy as that forming sections 2, 3 and 4) the sleeve member 12 being of such internal diameter that it may slide with a fairly close fit upon the straight portion of either of the sections 2, 3 or 4 with which it may be engaged.

Assuming that a film 1 of substantial length is to be treated and that the strut or spring portion of the support comprises the three sections 2, 3 and 4 properly united by the sleeves 5 and 6, the operator secures the ends of the film to the attaching members C and C' respectively, and, after attaching the connecting member C to the hook 9, slides the sleeve 12 down along the section 4 of the strut to such a distance from the bracket 8 that it is not possible to attach the member C' to the hook 11 except by transversely bending or bowing the strut member comprising the united sections 2, 3 and 4, thus to bring the hook end of the bracket 10 near enough to the hook 9 to permit the member C' to be secured to the hook 11. Such bending or bowing of the strut or spring member of the supporting device places the film under substantial longitudinal tension due to the effort of the strut to resume its normal straight condition. At the same time, since the attachment of the connecting member C' to the bracket 10 is spaced laterally a substantial distance from the axis of the section 4 of the support, the tensioning of the film tends to rock the bracket about its sleeved end and thus causes the sleeve to bind or cramp on the section 4 so that it can not slide along the latter. Thus the bracket 10 is held securely in adjusted position so that it can not slip and release the tension. However, by intentional bowing of the support to a greater degree, the sleeve 12, may, if desired, be moved further downwardly along the section 4, and when the parts are then released the sleeve will again grip the section 4 and will hold the strut in this more deeply bowed condition thereby imposing a greater tension on the film. It is thus evident that the tension imposed on the film may be varied very readily and by any desired increment but without requiring the use of pawl and ratchet mechanism, set screws, or other adjunctive devices such as have commonly been employed for holding the parts of a film supporting and stretching device in adjusted position. When it is desired to release the film from the support it is merely necessary for the operator to exert pressure to bow the support a little more deeply, whereupon the connections C and C' may readily be disconnected from the hooks 9 and 11, the strut thereupon resuming its normal straight condition.

If it be desired to use the support with films of a substantially shorter length such that the proper tension can not be attained by sliding the bracket 10 to the upper end of the section 4 of the strut, this section 4 and sleeve 6 may be removed, leaving the support as shown in Fig. 2, the bracket 10 then being mounted on the section 3, whereupon the parts may be used in the same way as above described for holding a film under tension. Likewise if a still shorter film is to be treated the section 3 with the sleeve 5 may be removed and the bracket 10 may then be mounted directly on the section 2.

Normally, when the film is not in place, the bracket arms 8 and 10 are substantially parallel and are disposed in substantially the same plane, but when the film is properly in place and under tension the bracket arms 8 and 10 converge toward their hooked extremities and the force exerted by the spring strut tends to swing these arms back into parallel relation thereby imposing the desired tension on the film.

With the parts shown as illustrated in Fig. 1, the supporting device may be suspended from the hook H, for example for drying the film after washing, but on the other hand, if desired, the strut or spring portion of the support comprising the sections 2, 3 and 4 (or a lesser number of sections, if fewer be used) may be employed as a handle whereby the device with the tensioned film may be manipulated, for example for immersing the film in a developing or fixing bath or in a tank of wash water.

While a preferred embodiment of the invention is herein disclosed by way of example it is to be understood that the invention is regarded as inclusive of all equivalent constructions and materials such as fall within the terms of the appended claims.

I claim:

1. A film-supporting device comprising an elongate resilient strut provided with longitudinally spaced elements for connection to the respective ends of the film, said elements, when the device is not in use, being spaced apart a distance greater than the length of the selected film which it is desired to support so that in securing the ends of the film to the respective elements the strut must first be bent so as to cause said elements to approach, whereby the tendency of the bent resilient strut to straighten imposes longitudinal tension upon the film whose ends are secured to said elements.

2. A film-supporting device comprising an elongate stiffly resilient transversely bendable member having a bracket projecting laterally from one end, a second bracket spaced from the first, said second bracket comprising a guide sleeve normally slidable with a snug sliding fit longitudinally of the spring member, the brackets comprising parts designed to hold a tensioned film extended between them, the spring member, in use, being transversely bowed thereby to hold the film under tension, the guide sleeve of the adjustable bracket being of such length that when the spring member is bent, the sleeve is cramped, and thereby held in adjusted position in opposition to the tension of the film.

3. A film-supporting device designed to hold a film extended at full length and comprising an elongate strut and spaced brackets carried by the strut, the brackets having provision for attachment of the opposite ends, respectively, of the film thereto, said strut comprising a plurality of independent elongate parts and connecting means operative rigidly, but separably to unite said parts in end-to-end relation.

4. A film-supporting device designed to hold a film extended at full length and under tension, said device comprising an elongate strut having a bracket projecting laterally therefrom, the strut comprising a plurality of independent sections, and means rigidly but separably uniting said sections, and a second bracket comprising a guide member cooperable at will with any selected section of the strut to hold the last-named bracket in adjusted position on the strut, the brackets having provision for attaching to them the opposite ends respectively of the film.

5. A film-supporting device of variable length designed to accommodate films of a wide range of lengths and to hold a film extended to full length, said device comprising an elongate strut including a plurality of independent elongate sections disposed in end-to-end relation, and a pair of spaced laterally extended brackets carried by the strut, each bracket having an element designed to be connected to one end respectively of a film, and means operative rigidly but separably to unit the several sections forming the strut.

6. A film-supporting device of variable length designed to accommodate films of a wide range of lengths and to hold a film extended at full length and under tension, the strut comprising a plurality of independent elongate sections disposed in end-to-end relation and each transversely bendable, a bracket fixed to the strut adjacent to one end of the latter, a second bracket comprising a guide portion engageable at will with any of the sections of the strut, each bracket being provided with means for connecting one end respectively of a film thereto so that the film will be longitudinally extended between the brackets, and means normally holding the several sections rigidly in end-to-end relation, the brackets being so spaced that when the ends of the film are connected to the brackets the strut is held in transversely bowed condition.

7. A film-supporting device comprising a strut consisting of a length of stiffly resilient transversely bendable wire having an integral offset portion adjacent to one end constituting a bracket for attachment to one end of a film, a second bracket comprising a tubular guide portion normally slidable along the wire, the second bracket being designed for attachment to the other end of the film, the brackets being so spaced apart when the device is in use the strut is held in transversely bowed condition by reason of the resistance of the film to elongation.

8. A film-supporting device comprising a strut consisting of a length of stiffly resilient transversely bendable wire having an integral offset portion adjacent to one end constituting a bracket for attachment to one end of a film, a second bracket comprising a tubular guide portion normally slidable along the wire, the second bracket being designed for attachment to the other end of the film, the brackets being so spaced apart when the device is in use that the strut is held in transversely bowed condition by reason of the resistance of the film to elongation, the tubular guide portion of the second bracket being so designed as to cramp when the strut is bent, thereby preventing slippage of the second bracket longitudinally of the strut.

9. A film-supporting device comprising a strut consisting of a normally straight length of stiffly resilient wire having an integral lateral offset adjacent to one end of a film, a second bracket spaced from the first adjustable longitudinally of the normally straight part of the wire, said second bracket having provision for attaching the other end of the film thereto, and means whereby the second bracket may be held in adjusted position, said normally straight portion of the wire being laterally bowed when the device is in use and by its tendency to straighten imposing tension on the film.

10. A film-supporting device including an elongate strut comprising a normally straight length of stiffly resilient wire having a lateral offset constituting a bracket to which one end of the film may be attached, a second bracket to which the other end of the film may be attached, said second bracket comprising means for attaching it to the normally straight portion of the wire, the brackets being so spaced that said normally straight portion of the wire is bowed when the device is in use and by its tendency to straighten imposes tension on the film.

11. A film-supporting device including an elongate strut comprising a normally straight length of stiffly resilient wire having a loop portion to facilitate suspension of the device from a fixed position, the device also comprising a pair of laterally offset bracket members, each having means adjacent to its outer end for attaching one end of the film thereto, one of said brackets, at least, comprising means for so attaching it to the strut so as to be adjustable longitudinally thereof, the brackets being so spaced that the straight portion of the wire is bowed when the device is in use and by its tendency to straighten imposes tension on the film.

12. A film-supporting and tensioning device including an elongate strut comprising a plurality of normally straight sections of stiff resilient wire disposed in end-to-end relation, adjacent ends of said sections being screw threaded, and a screw-threaded sleeve member normally uniting the adjacent ends of said sections, one of said sections having a laterally projecting bracket to which one end of the film may be attached, said second bracket comprising means whereby it is attached to another section of the strut, the brackets being so spaced that when the device is in use the strut is bowed transversely and by its tendency to straighten imposes tension upon the film.

13. A film-supporting device comprising a pair of film-gripping clamps, a pair of bracket arms disposed in substantially the same plane and each having means adjacent to one end far attachment to one of the respective clamps, and an elongate strut connecting the opposite ends of the respective brackets, the strut being transversely bendable so that the clamps may be caused to approach by bowing the strut and whereby, when so bowed, the effort of the strut to straighten tends to move the clamps apart.

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