March 29, 1938. E. PLESS 2,112,606

FILM DEVELOPMENT SPOOL

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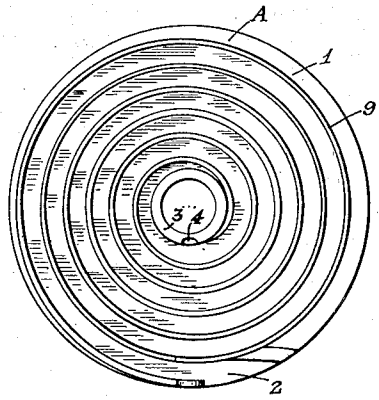


Fig: 1

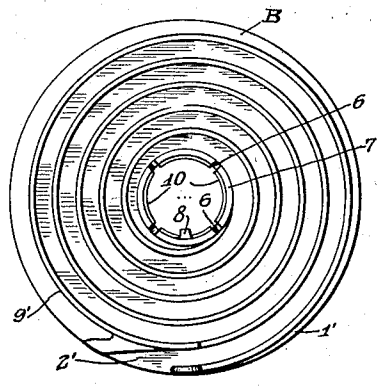


Fig: 2

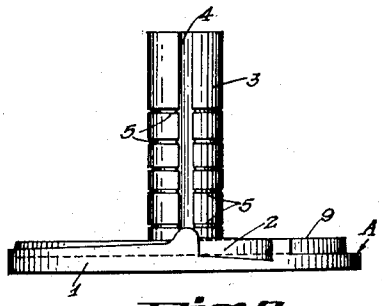


Fig: 3

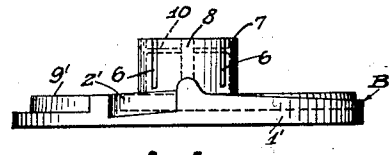


Fig: 4

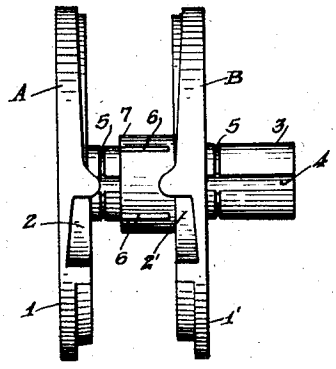


Fig: 5

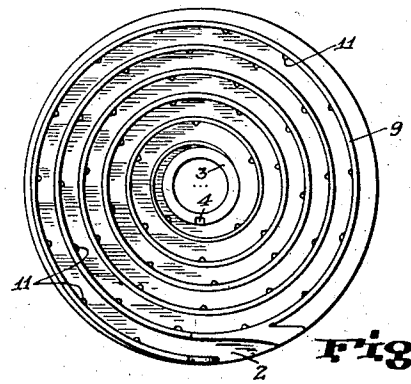


Fig: 6

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FILM DEVELOPMENT SPOOL

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2 Claims. (Cl. 242—104)

This invention relates to devices for developing photographic films commonly known as developing tanks. In the use of such devices, the film after exposure in a camera is spirally wound upon a support such as a spool with the adjacent spiral windings properly spaced from each other. The spool is then placed in a receptacle or tank and the developing solution poured into the tank. The developing process may be carried out in a dark room or daylight. In the latter case, the tank is closed by a light tight cover. After a specified developing time dependent on the developer used, the temperature, etc., the solution is poured out and the film fixed and rinsed in the commonly known manner.

The present invention is specifically concerned with a spool for holding the film to be developed and has for one of its objects to provide a developing spool adapted to accommodate different sizes of films available on the market to avoid the necessity of using a different developing device for each particular film size. Another object is to facilitate the insertion and winding of the film into a developing spool and to prevent jamming and other drawbacks experienced with similar devices known in the art. Another object is to provide a means to insure free access of the developer to all portions of the sensitive surface especially to the edges of the film to secure uniformly developed negative.

With the above objects in view, the film holding device or developing spool described by this invention comprises substantially two disc shaped parts or flanges mounted upon and spaced by a central member. The discs are formed with spiral guides parallel to each other for guiding the film during the winding operation and maintaining adjacent windings properly spaced during the developing process. In order to accommodate different film sizes, the distance between the discs is made adjustable to conform to the standard widths of film available on the market. Another feature consists in the construction of the ingress opening from the periphery of the discs to the spiral guide to enable an easy insertion and winding of the film even in full darkness without clogging or jamming.

These and further objects of the invention will become more apparent by the following detailed description taken with reference to the accompanying drawing in which

Figures 1 and 3 are a top and side view, respectively, of one part of the developing spool.

Figures 2 and 4 are a top and side view, respectively, of the other part of the developing spool.

Figure 5 shows the two parts mounted ready for insertion and winding of the film.

Figure 6 illustrates a modification of a spool according to the invention.

Similar reference numerals identify similar elements in the different views of the drawing.

Referring to Figures 1 and 3, these illustrate the lower part A of the spool comprising a disc or flange 1 having a spiral guide 9 preferably formed integral therewith by a thin spiral shaped wall at right angles to the disc surface for insertion and guiding of the film through the ingress opening 2. The disc 1 has a central tubular extension 3 provided with a longitudinal guide groove 4, the purpose of which will be described later. The tube 3 is provided with a plurality of circular grooves 5 suitably spaced from each other conforming to different widths of standard film sizes.

The upper part B of the spool as shown in Figures 2 and 4 comprises a disc 1' provided with a spiral guide 9' and an ingress opening 2' substantially similar as in the case of part A. The disc 1' has a central extension or sleeve 7 having an inner diameter adapted to fit snugly over the central tube 3 of part A as shown in Figure 5. The sleeve 7 is provided with a plurality of longitudinal slots 6 to secure a certain degree of resiliency and ensure frictional engagement with the tube 3 of part A. In order to secure the proper alignment of the spiral guides 9 and 9' of parts A and B and prevent relative rotation thereof, the sleeve 7 is further provided with a longitudinal guide 8 projecting from its inner surface and adapted to engage the groove 4 of the center tube 3 of part A.

In order to facilitate the insertion of the edge of the film into the spiral guide, the ingress openings 2 and 2' to the film guides are formed with edges tapering gradually from the outer surface of the discs towards the inner surface thereof and terminating in the spiral guides as shown in the drawing. In this manner, the film may be inserted into the spiral guide even in complete darkness by merely pushing it into the openings 2 and 2' until it has been completely wound inside the spool.

In order to lock part B or upper disc in the different positions corresponding to the particular widths of film used, the inner surface of sleeve 7 is furthermore formed with a circular projection or collar 10 (see Figure 2) adapted to snap into and out of the grooves 5 of tube 3 when part B or lower disc is moved along the center tube 3 as shown in Figure 5.

In some cases it has been found disadvantageous if the entire edge of the film is in direct contact with the walls of the spiral guides 9 and 9' whereby the developing solution is prevented from having proper access to these parts of the sensitive surface. In order to obviate this drawback, I have shown an improved construction according to Figure 6, comprising elevations or protuberances 11 projecting from the walls of the spiral guides 9 or 9' serving to keep the edge of the film spaced from the guide walls and allow free access of the developer. In order to allow the developing solution to pass freely into the space between the spiral windings of the film, the discs 1 and 1' are suitably provided with openings or slots in a manner well known.

It is evident that the invention is not limited to the specific construction described and shown for illustration, and that variations and modifications thereof are possible coming within the broader scope and spirit of the invention as defined in the appended claims.

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

1. A developing spool comprising a pair of end members having spiral passageways disposed opposite and parallel to each other and adapted to hold a film wound therein, a central cylindrical member extending from one of said end members, a sleeve connected to the other member, said sleeve being adapted to slide over said cylindrical member and slotted longitudinally to frictionally engage said cylindrical member, said cylindrical member being provided with a plurality of circular grooves spaced at predetermined distances, and a collar on the inner surface of said sleeve adapted to engage said grooves and lock said end members in predetermined relative positions.

2. A developing spool comprising a pair of end members formed with spiral passageways adapted to hold a film wound therein, one of said end members having an axial cylindrical sleeve, a longitudinally slotted sleeve extending from the other end member and adapted to slidably and frictionally engage said first sleeve, whereby said sleeves form a hub for said spool, one of said sleeves being formed with a plurality of circular grooves spaced apart by predetermined distances, and a collar on the engaging surface of the other sleeve being adapted to engage said grooves and lock said end members at predetermined axial distances, and a further longitudinal key and groove arrangement between said sleeves to prevent relative rotary movement thereof.

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