Feb. 4, 1941. F. BUSSE 2,230,584

DAYLIGHT PHOTOGRAPHIC DEVELOPING TANK

Filed May 10, 1939

Fig. 1

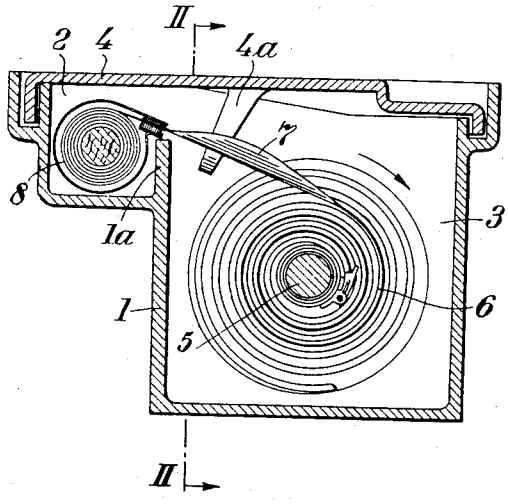


Fig. 3

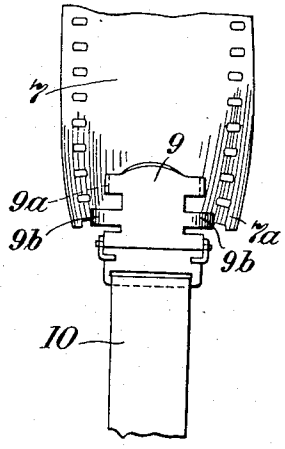


Fig. 2

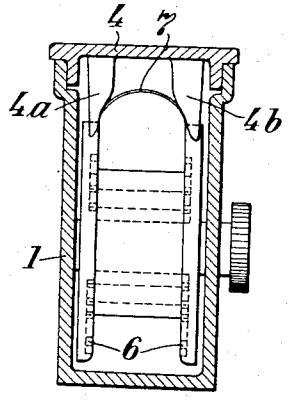
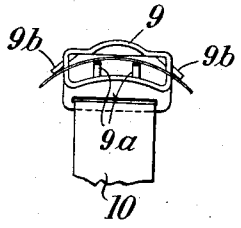


Fig. 4



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UNITED STATES PATENT OFFICE

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DAYLIGHT PHOTOGRAPHIC DEVELOPING TANK

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Application May 10, 1939, Serial No. 272,754
In Germany May 11, 1938

4 Claims. (Cl. 95—90.5)

My present invention relates to daylight photographic developing tanks.

Daylight developing tanks generally consist of a chamber for the film spool and an adjacent developing chamber. Both chambers are covered by a common lid. In order that the film may be subjected to the developer, the film is generally held in the developing chamber in spiral form. This may be done by leading the film into spiral grooves on the inner faces of two parallel discs mounted on the same axle, the whole constituting the developing spool. The distance between the inside faces of the discs is less than the width of the film. With such a device it is necessary before winding the film on the developing spool to bend the film so that as it travels to the innermost turn of the spiral it can slide over the ribs which form the spiral grooves. It has already been proposed for this purpose to incline the film before it arrives at the spiral grooves, but this has the drawback that, owing to its inclination, the film often enters a groove other than that required. It has further been proposed to provide guiding pieces or grooves before or between the spirally grooved discs. The manufacture of such guides is, however, relatively costly and their use involves the presence in the developing tank of a movable part in addition to the band furnished with a clip which is necessary for winding the film in the developing tank. Moreover, the use of such guides has the disadvantage that if the developing spool is rotated in error after the film is completely wound, the latter is damaged by the guide.

It is one object of my present invention to avoid these drawbacks by affording an essentially simpler method of winding the film in the spiral grooves.

Another object of my invention is to provide a method in which the film is arched by a clip connected with the axle of the developing spool by a band, and the arched form is maintained while the film is wound by a device fixed to the lid of the developing tank. The device for maintaining the arched form of the film may be a fork fixed to the lid of the developing tank so that it is in a position between the spool chamber and the developing spool, the distance between the prongs of the fork being less than the width of the film to be wound.

Further objects of my invention will appear more in detail from the description following hereinafter.

Reference is made to the accompanying drawing in which:

Fig. 1 is a longitudinal section through a daylight developing tank;

Fig. 2 is a section on the line II—II of Fig. 1;

Fig. 3 shows attached to the film the clip for drawing the film into the developing spool, and

Fig. 4 is an end view of the clip.

In the figures, 1 is the housing of the daylight developing tank. The housing is divided by the partition 1*a* into the spool chamber 2 and the developing chamber 3, and is closed by a lid 4. The spirally grooved discs 6 in the developing chamber 3 are mounted on the axle 5. To wind the film 7 from the film cassette 8 on to the developing spool 6 the free end 7*a* (Fig. 3) of the film is attached to a clip 9. As shown in Fig. 4, the clip 9 has a number of teeth 9*a* of which those in the middle project further than those at the sides, so that in conjunction with the lateral extensions 9*b* they arch the film 7. The clip 9 is attached to the axle 5 of the developing spool by a band 10. The use of a clip such as 9 has the advantage that as it is wound in the developing spool, the arched film assumes a width corresponding with the distance between the inside faces of the discs 6, so that the film readily enters the innermost turns of the spiral grooves. To maintain the arched form of the film 7 while it is being wound there is fixed to the lid 4 a fork against the prongs of which 4*a*, 4*b* the film bears as the developing spool is turned, so that the prongs exert on the adjacent edges of the film 7, a frictional force having a direction opposite to the desired arching of the film. The prongs 4*a* and 4*b* thus prevent any appreciable alteration of the arching of the film 7 caused by the clip 9. The fork 4*a*, 4*b* can be made in one piece with the lid so that if the latter is hinged they will move clear of the tank when the lid is opened.

What I claim is:

1. In a daylight film developing tank, a housing having a developing chamber and a spool chamber for the film cassette communicating with said developing chamber, a cover for closing said housing, a spool axle arranged in said developing chamber and having two spirally grooved film holding discs mounted thereon, a clip connected with said axle by a band and provided with means for gripping the end of the film and arching said film, and means carried by the underside of said cover and in the closed position of said cover engaging the edges of the film and maintaining the arched form thereof during winding of the film in said spiral grooves.

2. In a daylight film developing tank, a hous-

ing having a developing chamber and a spool chamber for the film cassette communicating with said developing chamber, a cover for closing said housing, a spool axle arranged in said developing chamber and having two spirally grooved film holding discs mounted thereon, a clip connected with said axle by a band and provided with a number of teeth for gripping the end of the film, those of said teeth in the middle projecting farther than those at the sides for arching said film, and means carried by the underside of said cover and in the closed position of said cover engaging the edges of the film and maintaining the arched form thereof during winding of the film in said spiral grooves.

3. In a daylight film developing tank, a housing having a developing chamber and a spool chamber for the film cassette communicating with said developing chamber, a cover for closing said housing, a spool axle arranged in said developing chamber and having two spirally grooved film holding discs mounted thereon, a clip connected with said axle by a band and provided with a number of teeth for gripping the end of the film, those of said teeth in the middle projecting farther than those at the sides for arching said film, and a fork carried by the underside of said cover and provided with prongs engaging the edges of the film in the closed position of said cover for maintaining the arched form of the film during winding of the film in said spiral grooves.

4. In a daylight film developing tank, a housing having a developing chamber and a spool chamber for the film cassette communicating with said developing chamber, a cover for closing said housing, a spool axle arranged in said developing chamber and having two spirally grooved film holding discs mounted thereon, a clip connected with said axle by a band and provided with a number of teeth for gripping the end of the film, those of said teeth in the middle projecting further than those at the sides for arching said film, and a fork carried by the underside of said cover and provided with prongs engaging the edges of the film in the closed position of said cover for maintaining the arched form of the film during winding of the film in said spiral grooves, the distance between said prongs being less than the width of the film.

FERDINAND BUSSE.