May 27, 1941. F. BUSSE 2,243,453

SUPPORTING SPOOL FOR SPIRALLY COILED FILM IN FILM DEVELOPING DEVICES

Filed Oct. 6, 1939

Fig. 1

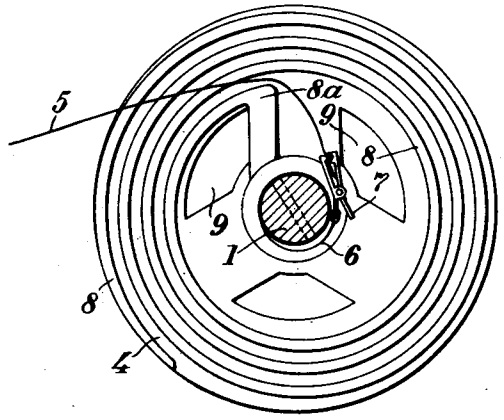
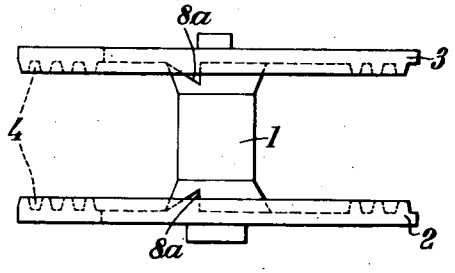


Fig. 2



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2,243,453

SUPPORTING SPOOL FOR SPIRALLY COILED FILM IN FILM DEVELOPING DEVICES

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4 Claims. (Cl. 242—77)

This invention relates to daylight developing reels.

The known developing reels which consist of two flanges united together by a core have spiral ribs forming grooves for the purpose of receiving the edges of the band in the faces of these flanges. These developing reels are intended for insertion in the daylight developing tank charged with developer, fixing salt or water. The film is either pushed from without inwards into the spiral grooves or drawn thereinto from within outwards by means of a draw-band.

It is an object of the invention to provide an improved developing reel, which is simple in construction and reliable in operation.

Further objects will become apparent from the detailed specifications following hereinafter.

Reference is made to the accompanying drawing in which

Fig. 1 is a section through the developing reel at right angles to the axis of the core of the reel, while

Fig. 2 is a top plan view of the reel.

In the figures corresponding reference numerals indicate corresponding parts.

The developing reel consists of the core 1 and the end flanges 2, 3. Each of the latter is provided with a guide groove 4 formed by the continuous spiral rib 8 and into this groove the film 5 is drawn from within outwards by means of the draw-band 6 attached by a clamp 7 so that the film enters the groove.

Since the drawing band is narrower than the film, the drawing band is wound onto the core 1 while the film 5 is engaged by the raised ends 8a upon being drawn into the reel. Upon further rotation of the reel, the film is guided into the spiral grooves 4.

The guide grooves 4 each begin with the innermost raised rib 8a which is a certain distance from the core of the reel, namely a distance of about the length of the diameter of the core. This allows provision for comparatively large openings 9 in the flange and ensures a separation of the first portion of the film from the core of the reel; owing to these provisions the treating bath has free access to the first portion of the film. The innermost turn 8a of the rib need be raised only along a small portion of its periphery. For example the innermost portion of the rib on each flange may be formed as or carry a tooth or pin.

As pointed out the invention relates to a developing apparatus in which the film is drawn by means of a draw-band from within outwards into the spiral grooves of the reel. In the reels hitherto known of this kind the spiral guiding grooves lead up to the core of the spool. They have the disadvantage that the end part of the film rests for a more or less considerable length on the core of the spool and thus the developer or the fixing solution as the case may be does not have free access to the end portion of the film. In order to avoid this disadvantage and to allow unhindered and sufficient access to the inner part of the spool of the treatment bath, the construction of the invention is such that the distance between the innermost end of one spiral rib from the innermost end of the spiral rib on the opposite flange is less than the distance from each other of the remaining portions of the two ribs. Furthermore the innermost spiral turn on each flange is arranged at a certain distance from the core of the reel so that the openings in the flanges may be of considerable size. The distance of the innermost spiral turn from the core of the reel should be at least equal to the diameter of the core.

By raising the height of the innermost portions of the ribs it is ensured that the first part of the film does not come to rest against the core but is at a certain distance therefrom so that the treating bath has free access to the film. Moreover by raising the height of the innermost portions of the guide ribs the insertion of the first portion of the film in the innermost spiral groove is ensured. By drawing the film into the groove by means of the draw-band the first portion of the film in consequence of the smaller distance apart of the two inner guiding ribs from each other engage these higher parts and can easily be introduced into the further portion thereof.

Guiding means for introducing the film into the reel and to wind it from within outwards into the spiral grooves are for instance disclosed in U. S. Patent No. 2,082,962 to Lesjak et al.

I claim:

1. A developing reel for daylight developing tanks comprising in combination a core, two flanges affixed to said core, each having spiral ribs on the inner side thereof, the distance between the ribs of one flange and the ribs of the other flange being smaller than the breadth of the film, raised end pieces being arranged at the innermost end of said ribs to render the distance between the endpiece of the rib of one flange and the endpiece of the ribs of the other

flange smaller than the distance between said ribs.

2. A developing reel for daylight developing tanks comprising in combination a core, two flanges affixed to said core, each having spiral ribs on the inner side thereof, the distance between the ribs of one flange and the ribs of the other flange being smaller than the breadth of the film, raised end pieces being arranged at the innermost end of said ribs to render the distance between the endpiece of the rib of one flange and the endpiece of the rib of the other flange smaller than the distance between said ribs, said innermost end pieces being arranged at a distance from the core of the reel corresponding substantially with the length of the diameter of said core.

3. A developing reel for daylight developing tanks comprising in combination a core, two flanges affixed to said core, each having spiral ribs on the inner side thereof, the distance between the ribs of one flange and the ribs of the other flange being smaller than the breadth of the film, raised end pieces being arranged at the innermost end of said ribs to render the distance between the endpiece of the rib of one flange and the endpiece of the rib of the other flange smaller than the distance between said ribs, said innermost end pieces being arranged at a distance from the core of the reel corresponding substantially with the length of the diameter of said core, openings being arranged in the flange walls in the space between said core and the innermost turn of said spiral rib.

4. A developing reel for daylight developing tanks comprising in combination a core having a substantially continuous cylindrical surface, two flanges affixed to said core, each having spiral ribs on the inner side thereof, the distance between the ribs of one flange and the ribs of the other flange being smaller than the breadth of the film, raised end pieces being arranged at the innermost ends of said ribs to render the distance between the end piece of the rib of one flange and the end piece of the rib of the other flange smaller than the distance between said ribs, said innermost ends and raised end pieces being spaced a substantial distance from the surface of said core.

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