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(54) GUIDE FOR FACILITATING MANUAL INSERTION OF A FLEXIBLE STRIP INTO A TRAVEL PATH

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America of 343 State Street, Rochester, New York 14650, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a guide for facilitating manual insertion of a flexible strip into a travel path, more particularly, but not exclusively, for use in a motion picture projector.

The threading of flexible strips into strip transporting apparatus has always presented particular problems. This is due to the fact that, in general, the nature of the strip requires that it be touched as little as possible to prevent surface damage. While this could most readily be prevented by utilizing controllable manual threading techniques, a typical operator may not have the necessary mechanical dexterity to accomplish such techniques. An example of such a problem area is that concerned with motion picture projection film threading which must be accomplished by even the most uncoordinated. In order to simplify threading of motion picture film, automated threading devices have been developed which closely approximate desired manual threading techniques.

Threading problems are further complicated if it is necessary to impart a twist to the strip being threaded. The twist usually must take place in one direction only so that a particular orientation of the strip may be maintained. The twist problem in flexible strip transportation was considered in the German Auslegeschrift No. 2,024,646 in the name of Agfa-Gevaert AG, and in British Patent No. 1,206,043 in the name of the Rank Organisation Limited. In each of the identified

publications a guide channel is used to impart a desired twist to a flexible filmstrip. The twist must be accomplished in a specific direction to keep the film perforations and emulsion surface in a particular orientation relative to their respective film gate. These guide channels provided in the noted publications, while accomplishing desired twisting, have considerable surface contact with respective filmstrips. The amount of contact with the surface of the filmstrip presents problems with regard to drag on the strip and possible scratching of the film surfaces. These problems are accentuated due to the fact that the filmstrip is fed endwise into the cited channels which results in contact with the film while the film is moving longitudinally in the channels.

In accordance with the present invention there is provided a guide for facilitating manual insertion of a flexible strip into a travel path having a desired angle of twist, said guide comprising a hollow body having a pair of openings for the travel of the flexible strip therethrough and lying along said travel path, a slot extending generally in the direction of said travel path and dimensioned to receive a flexible strip only when an edge of said strip is presented thereto, the slot communicating with the interior of the body and with one opening, and a deflecting surface which communicates with the slot and the other opening and is configured so that upon edgewise insertion of the flexible strip through the slot and into the openings, the desired twist angle is imparted to the flexible strip.

In the accompanying drawing:—

Figure 1 is a perspective view of the flexible strip guide according to this invention, the guide being shown as associated with a motion picture projector having a horizontally orientated film reel;

Figure 2 is a plan of the flexible strip guide of Figure 1;

Figure 3 is a side elevation of the flexible strip guide of Figure 1 showing the first opening thereof; and

Figure 4 is a front elevation of the flexible strip guide of Figure 1 showing the second opening thereof.

Referring now to the drawings, Figure 1 shows a flexible strip guide 10 mounted, for example, on a horizontal format motion picture projector 12, the projector 12 being shown and described only to the extent necessary for a complete understanding of this invention. The projector 12 has mounted thereon a reel 14 having a flexible strip of film 16 of well known type used in amateur motion picture apparatus wound thereon, the film 16 having a series of perforations 18 along one edge thereof. The reel 14 is mounted for rotation on a spindle 20. The guide 10 is located on the projector 12 adjacent the reel 14 so as to permit the film 16 to be properly threaded to pass over a guide roller 24 to be directed in a proper orientation into the film gate 22. After proper threading, the film 16 may be withdrawn from the reel 14 and directed through the film gate 22 by a drive mechanism (not shown) not forming part of this invention.

The guide 10 is formed by a hollow housing having a base 26, a top member 28 and upstanding side walls 30, 32, 34 and 36 interconnecting the base 26 and the top 28. As shown in Figure 3 the side wall 34 has a first opening 38 located therein which provides for passage of the filmstrip 16 without interfering with the movement of the strip therethrough. Immediately adjacent the opening 38 within the housing of the guide 10 there is located a guide roller 40 over which the filmstrip 16 is entrained so as to be redirected towards a second opening 42 located in the side wall 32 (see Figure 4). The roller 40 may be a snubber roller to compensate for changes in tension in the filmstrip 16, and further may serve as a trip for an automatic rewind system for the projector 12.

The second opening 42 has major dimensional margins 44 and 46 and minor dimensional margins 48 and 50 and generally conforms to the cross-sectional area of the filmstrip 16 being guided. The dimensions of the opening 42, however, are relatively largely increased so as not to interfere with the movement of the filmstrip through the opening. The major dimensional margins 44 and 46 of the second opening are oriented with respect to the roller 40 at an angle equal to the desired twist to be imparted to the filmstrip 16 and at a vertical height such that filmstrip 16

passing over rollers 40 and 24 will not normally touch the side margins. In the instant embodiment, the desired twist is 90° and therefore the major dimensional margins are rotated relatively through an angle of 90°.

A slot 52 is formed in the top member 28 and intersects the first opening 38 to provide communication therewith through the top 28. The slot 52 continues to the side wall 32 wherein a slot 54 is formed which connects with the minor dimensional margin 48 of the second opening 42. The slot 52 is configured so as to permit passage of the filmstrip 16 only when it is in an edgewise orientation. The slot 54 is configured so as to form a deflection surface for the edge of the film entering the slot 52 to twist the film strip through a desired angle.

With the slots 52 and 54 thus formed, as shown in Figure 4, when a strip of film 16 is inserted in the slot 52 at one end it may be entrained over the guide roller 40 so as to extend through the first opening 38 into the hollow interior of the guide 10. Because of the curvature of the slot 54, as the edge of the filmstrip 16 (not having the perforations 18) enters the slot 54, the film will be twisted until it reaches the desired degree of twist as it enters the opening 42. Due to the particular described configuration of the slots 52 and 54, the twist of the film 16 being threaded can only be accomplished in one desired direction and is no way dependent upon the mechanical skill of the threader. In this manner the perforations 18 will necessarily be maintained on the desired edge of the film 16 for proper feeding into the film gate 22. When the film 16 is properly threaded with the aid of the guide 10 so that the film extends over rollers 40 and 24, the configuration of the guide 10 and its opening 42 is such that the film will not contact the opening during normal operation.

From the foregoing, it is readily apparent that there is herein provided a guide of simple construction for ensuring the proper threading of a flexible strip. The guide has a slot for receiving the strip in edgewise orientation only and a deflecting surface communicating with the slot for deflecting the first edge of the strip to enter the slot through a desired twist angle so that the mere insertion of the flexible strip into the guide through the slot will impart the desired twist to the strip only in a desired direction. Because of the configuration and location of elements of the guide, the flexible strip will normally have no contact with the guide so as to substantially eliminate the possibility of damage to the strip.

WHAT WE CLAIM IS:—

1. A guide for facilitating manual
insertion of a flexible strip into a travel path
having a desired angle of twist, said guide
comprising a hollow body having a pair of
openings for the travel of the flexible strip
therethrough and lying along said travel
path, a slot extending generally in the
direction of said travel path and
dimensioned to receive a flexible strip only
when an edge of said strip is presented
thereto, the slot communicating with the
interior of the body and with one opening,
and a deflecting surface which
communicates with the slot and the other
opening and is configured so that upon
edgewise insertion of the flexible strip
through the slot and into the openings, the
desired twist angle is imparted to the
flexible strip.

2. A guide according to claim 1 for
guiding a flexible strip into a travel path
having a desired angle of twist, substantially
as hereinbefore described with reference
to, and as shown in, the accompanying
drawings.

3. A motion picture projector having a
pair of guide rollers defining a film travel
path therebetween, the guide rollers being
orientated at an angle with respect to one
another so that the travel path has a desired
angle of twist, and a guide according to
claim 1 or 2 for guiding a film into said
travel path.

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