

PATENT SPECIFICATION

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- (21) Application No. 25762/73 (22) Filed 30 May 1973
(31) Convention Application No. 2 226 204 (32) Filed 30 May 1972 in
(33) Germany (DT)
(44) Complete Specification published 28 April 1976
(51) INT. CL.² G03B 1/06
(52) Index at acceptance
G2E A6A3
(72) Inventors HEINZ PESCHEL
MANFRED RADTKE



(54) CINEMATOGRAPHIC APPARATUS HAVING NOVEL TAKE-UP DRIVE

(71) We, EASTMAN KODAK COMPAN, 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:—

The invention relates to cinematographic apparatus, such as motion picture cameras, and more particularly to a novel mechanism for winding a portion of a film strip into a roll or coil at the same time as another portion of the film strip is being advanced through the cinematographic apparatus.

It is known in the motion picture camera art to wind exposed film into a film coil in the take-up chamber of a camera or cartridge by using a variety of drive mechanisms. These mechanisms generally have complicated delicate gear portions dependent on the drive motor for driving the film reel. These have many individual parts, are inefficient and subject to friction and abrasion besides being extremely complicated in their mounting and adjustment. In order to avoid parts which are expensive or particularly disadvantageous with respect to energy, like worm drives as disclosed in German Patent Specification No. 1,244,569, for example, and friction parts whose operation is not always reliable when open to the influence of varying temperatures and humidity, constructions described in German Patent Specification No. 1,297,464 and the corresponding United States Patent Specification No. 3,570,783 have been devised. In the latter patent specifications, two gears are alternatively driven in opposite directions of rotation in response to the reciprocating

movement of a film claw via two pawls which are mounted on one end of a lever controlled by the claw by means of a leg spring. These gears are connected to each other and also to the film take-up reel to cause the take-up reel to be driven by the gears in the take-up direction whenever the gears are driven by the pawls. Such a film reel drive mechanism requires many parts to assemble and is therefore expensive to manufacture.

According to the present invention there is provided cinematographic apparatus having film engaging means arranged to advance a received film strip intermittently, film take up means including an indexing wheel, and a pivotally mounted leg spring member having a first leg coupled to the film engaging means and a second leg co-operating with the indexing wheel to serve as a shifting pawl therefor, so that operation of the film engaging means serves to drive the indexing wheel via the spring member to take up the film strip.

By such apparatus, functioning of the film drive simply and reliably effects movement of the film take-up through the elasticity of the leg spring.

In the accompanying drawing, the single figure is a schematic representation of a preferred embodiment of the present invention.

Because photographic apparatus are well known, the present description will be directed in particular to elements forming part of, or cooperating more directly with, the present invention, apparatus not specifically shown or described being understood to be selectable from those known in the art.

Referring now to the drawing, a portion of a motion picture camera is shown which includes a housing 10, a film path 12, a motor 14 having a drive shaft 16 secured to an eccentric 18, and a film claw 20

which is reciprocally driven in the direction of the arrow 22 by the eccentric 18. A film drive wheel 30 for a cartridge take-up or a take-up reel is rotatably mounted on a shaft 34 which is secured to the camera housing 10. The drive wheel 30, which also serves as an indexing wheel, includes a toothed rim portion 32 and an eccentric 30a which cooperates with a cartridge take-up (not shown) or film take-up reel (not shown) to wind the film in a known manner.

A leg spring 24 serves as a positive connection between the claw 20 and the drive wheel 30 as shown in the drawing. The leg spring 24 is firmly connected to a sleeve 26 which is rotatable about a holding pin 28 secured to the housing 10. The sleeve 26 may be affixed to the leg spring 24 as by soldering or, as in the embodiment illustrated, may be wound tightly around the sleeve 26 so as to exert pressure thereon. The direction of winding of the spring 24 is selected to tend to pull tight when operating power is transmitted from the motor 14 or the claw 20 to the drive wheel 30.

A lug 20a on the claw 20 has an insertion slot 20b for the driven end 24a of the leg spring 24 and the lug carries the end 24a along on the strokes of the claw 20. The design of the other spring leg 24b is such that its end 24c, which is bent at right angles to the leg 24b, resiliently engages the teeth on the rim 32 of the drive wheel 30 as shown in the drawing. The leg 24b preferably is geometrically shaped and positioned with respect to drive wheel 30 such that the end 24c is moved substantially tangentially to the drive wheel 30. The resulting driving relation between the end 24c and the teeth 32 on the drive wheel 30 is effective to result in more positive movement of the drive wheel 30 as will be described in greater detail.

When the film claw 20 is driven downward by the eccentric 18 from the solid-line position toward the broken line position, the spring leg 24a is urged toward the position indicated in broken lines and the other spring leg 24b is urged to pivot into the position indicated in broken lines. The resulting movement of the end 24c urges the drive wheel 30 in the counterclockwise direction as indicated by the arrow 36. A locking spring 40 cooperates with the toothed rim 32 to prevent the drive wheel 30 from turning backwards in a direction opposed to the arrow 36. As the film claw

20 is returned to the upward position, both legs 24a and 24b of the leg spring 24 are returned to the initial position shown in solid lines and the cycle can then be repeated indefinitely. However, on the down stroke of the film claw 20 there may be increased forces resisting further rotation of the drive wheel 30 as a result of the received film strip being wound tightly upon the reel. When the energy stored in the spring 24 by the movement of the leg 24a is not sufficient to overcome the forces resisting rotation of the drive wheel 30, the spring leg 24a can assume a variety of positions between that shown in solid line and that shown in broken lines, as for example the position indicated in dash and dot lines. By assuming such a position, energy is stored in the spring leg 24a during the downward stroke of the film claw 20 and is released therefrom during the upward stroke of the film claw 20.

WHAT WE CLAIM IS:

1. Cinematographic apparatus having film engaging means arranged to advance a received film strip intermittently, film take-up means including an indexing wheel, and a pivotally mounted leg spring member having a first leg coupled to the film engaging means and a second leg co-operating with the indexing wheel to serve as a shifting pawl therefor, so that operation of the film engaging means serves to drive the indexing wheel via the spring member to take up the film strip.

2. Cinematographic apparatus as claimed in Claim 1 wherein the pivotal mounting of the spring member comprises a fixed pin having a sleeve rotatably mounted thereon, a central portion of the spring member being fixedly connected to the sleeve.

3. Cinematographic apparatus as claimed in Claim 1 wherein the pivotal mounting of the spring member comprises a fixed pin having a sleeve rotatably mounted thereon, a central portion of the spring member being closely wound on the sleeve such that the spring member tends to grip the sleeve when driving the indexing wheel.

4. Cinematographic apparatus constructed substantially as described herein with reference to and as shown in the accompanying drawing.

L. A. TRANGMAR, B.Sc., C.P.A.,
Agent for the Applicants.



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