

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN AND RELATING TO CAMERAS

(71) We, AGFA-GEVAERT AKTIENGESellschaft, a body corporate organised according to the Laws of Federal Rep. of Germany, of Leverkusen, Federal Rep. of Germany, 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 present invention relates to a camera for use with film having one perforation associated with each frame and including a feeler member arranged to engage the perforations to control film transport.

The invention provides a camera for use with film having one perforation associated with each frame, which camera comprises film transport means, a blocking member movable from a first position to a second position to thereby cause film transport to be arrested, an operating member movable from a first position to a second position to thereby move the blocking member to its second position, means for biasing the operating member to its second position, a retaining member arranged to releasably hold the operating member clear of its second position, a feeler member for engaging perforations in the film, and means for biasing the feeler member against the film, the arrangement being such that, in use, during film transport the feeler member enters a perforation under the action of its biasing means, and further movement of the film drives the feeler member into engagement with the retaining member to release the operating member so that the operating member can move to its second position to cause film transport to be terminated.

Thus the feeler member need only be subject to the action of a relatively weak biasing means when it enters a perforation,

while relatively strong biasing means can be used for the operating member to provide positive release without affecting the force with which the feeler member enters a perforation. Thus, the strain on the edges of the perforation can be reduced while allowing accurate and quick termination of film transport to take place.

The biasing means may each comprise one or more springs.

Advantageously, there is provided means (for example, a part moving during the shutter operation) for returning the operating member to its first position in response to operation of the camera shutter.

Preferably, the retaining member is biased into its position where it releasably holds the operating member, and there is provided means for withdrawing the feeler member from a perforation and for so moving it as to permit the retaining member to move to a position where it holds the operating member.

One form of camera constructed in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 is a diagrammatic representation of part of the camera during film transport, and

Fig. 2 shows the part of the camera shown in Fig. 1 at the end of film transport.

Referring to the accompanying drawings, a housing 100 for a camera is shown diagrammatically. A film transport wheel 110 forms a support-piece on which are mounted planetary pinions. A release member 225 may be arranged over a recess in a locking member 110a in a known manner. The transport wheel 110 may engage a transport member 125 or may be accessible from outside the camera housing as a knob protruding from a corner of the housing

100. The planetary pinions engage both with an internal toothed edge of an annulus 117 which also has teeth 117a with which a blocking pawl 211 co-operates, and with a sun gear (not shown), which co-operates with a film spool drive dog. The blocking pawl 211 is arranged so that (in a first position) it locks the annulus 117 when a feeler member 209, which co-operates with perforations 202a in a film 202, is not in engagement with a perforation 202a, but so that, if the feeler member 209 engages a perforation 202a, the blocking pawl 211 (in a second position) releases the annulus 117. The pawl 211 is thus controlled by the feeler member 209, one perforation 202a being provided per frame on the film 202, into which the feeler member 209 falls during film transport, and from which it is lifted again during or after the exposure. The blocking of the film advance is not effected by locking the film transport mechanism 110, 125, but by the annulus 117 being released and the sun gear, co-operating with the film spool, coming to rest under the action of frictional forces due to the film, in the transport mechanism, or both. Film backing paper is indicated by 203.

The feeler member 209 is subject to the action of two springs 208a and 208b, which urge it in the opposite direction to the direction of film transport and against the film 202. A slot 209a in the feeler member 209 contains a pin 101a fixed in the camera and the springs 208a and 208b urge an end 209b, which makes contact with the film 202, in an anti-clockwise direction. The feeler 209 also includes a flange 209c.

An operating lever 216, which is rotatable about an axis 217 fixed in the housing 100 is movable between a first position (Fig. 1) and a second position (Fig. 2) and is urged in an anti-clockwise direction by a spring 218. The lever 216 has two notches 216b and 216c which are of different depth and are adjacent to one another. During film transport (Fig. 1) the flange 209c lies freely under the shallower notch 216c which is on the right as shown in the drawings, so that the spring 218 does not act on the feeler member 209 and thus on the film 202. The feeler 209, therefore, rests against the film 202 under the action of the spring 208a and 208b only and when it meets a perforation 202a, is urged into it by these springs only. When the film is moved further, the member 211 being still engaged with the toothed wheel 117a, the end 209b of the feeler 209 lies against the right-hand end of the perforation, and is carried along by the moving film 202. The backing paper 203 is tensioned here and at the same time keeps

the feeler 209 from falling further into the perforation.

During this film transport, one end 216a of the lever 216 rests on an end 221a of a lever 221 which is pivotable about an axis 220, and thus prevents the lever 216 from engaging the flange 209c of the feeler 209. The lever 221 is urged against a stop 223 by a spring 222.

During further movement of the film 202, the feeler member 209 is pivoted in a clock-wise direction so that the flange 209d engages the lever 221, and swivels it anti-clockwise against the action of the spring 222. The end 221a of the lever 221 is slid away from the lever end 216a. Simultaneously, the flange 209c is moved into a position in which it lies under the deeper notch 216c in the lever 216 so that now the lever 216 engages the flange 209c with its notch 216c. The spring 218 is arranged to exert a greater force on the lever 216 than the force that the springs 208a and 208b in combination exert on the feeler 209. The end 216a of the lever 216 strikes against the member 211 and moves it counter to the action of the spring 213 out of contact with the toothed portion 117a, of the annulus 117. As a result film transport is blocked, even though the transport mechanism 110, 125 can be moved even further.

In a known manner, the feeler member 209 is lifted out of the perforation 202a during the shutter operation or at the beginning of the next film transport operation. During the shutter operation the member 211 and the lever 216 are moved so that the member 211 re-engages the toothed portion 117a, and renders possible a further film transport operation. The feeler member 209 is moved in the opposite direction to that of the film transport, under the action of the spring 208a; the flange 209c is again brought to the position in which it lies below the notch 216b, and the flange 209d releases the lever 221 so that it returns to the position shown in Figure 1, and retains the lever 216 when it is released by the member 211 returned it during the shutter operation.

Obviously other embodiments, not shown for the purpose of simplicity, are possible in accordance with the invention. Thus, instead of a differential between operating member 125 and film spool there could be a direct gear transmission. The member 211 would then be held out of contact with a gear wheel of the gear transmission by a spring during the film transport, and at the end of the film advance would be brought by the lever 216 into engagement with this toothed wheel. Also, the return movement of the lever 216 could be effected by a shutter member during operation, for ex-

ample, by means of a pin 224 joined to such a shutter member, for example, a shutter drive member which is movable to and fro in the direction of transport, the shutter member and pin 224 being moved in the direction of the arrow 225' during the shutter operation, could engage the lever 216 to return it to the position shown in Figure 1. The pin 224 could then be moved in the opposite direction during shutter cocking after the lever 221 has returned to the position shown in Figure 1, or the pin 224 could return it to its initial position in preparation for a further shutter operation by means of the return movement of the feeler member after it has disengaged the member 221.

WHAT WE CLAIM IS:

1. A camera for use with film having one perforation associated with each frame, which camera comprises film transport means, a blocking member movable from a first position to a second position to thereby cause film transport to be arrested, an operating member movable from a first position to a second position to thereby move the blocking member to its second position, means for biasing the operating member to its second position, a retaining member arranged to releasably hold the operating member clear of its second position, a feeler member for engaging perforations in the film and means for biasing the feeler member against the film, the arrangement being such that, in use, during film transport the feeler member enters a

perforation under the action of its biasing means, and further movement of the film drives the feeler member into engagement with the retaining member to release the operating member so that the operating member can move to its second position to cause film transport to be terminated.

2. A camera as claimed in claim 1, wherein there is provided means for returning the operating member to its first position in response to operation of the camera shutter.

3. A camera as claimed in claim 2, wherein the retaining member is biased into its position where it releasably holds the operating member, and there is provided means for withdrawing the feeler member from a perforation and for so moving it as to permit the retaining member to move to a position where it holds the operating member.

4. A camera as claimed in claim 3, wherein during the return of the feeler member to its initial position it is arranged to cause the returning means to return to the position it occupied immediately before the shutter operation.

5. A camera substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

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