

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 Germany, of Leverkusen, 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:

10 The present invention relates to a camera for use with roll film and including film transport drive means, a differential mechanism for transmitting force from the film transport drive means to two outputs, one of which comprises film spool drive means, means for metering the amount by which a film has been advanced and a locking member for the other output, the arrangement being such that during film transport the locking member is arranged in engagement with the other output and, when the film has been advanced by a predetermined amount, the film metering means is arranged to cause the locking member to disengage from the other output to lock the one output, as described and claimed in United Kingdom Patent Application No. 57076/72 (Serial No. 1.408.645).

30 It is an object of the invention to provide, in a camera of the type described above, double exposure prevention means that is of particularly simple construction.

35 The invention provides a camera, of the type described above, in which the locking member is so arranged that when it is engaged with the other output it lies within the range of movement of shutter release member to prevent operation of the shutter release member, and when urged out of engagement with the other output the locking member is moved out of the range of movement of the shutter release member to permit shutter release. In this way the camera is provided with double exposure

45 [Price 33p]

means without requiring any additional mechanism.

Advantageously, the locking means is arranged to change the said other output during film transport and is urged out of engagement with the other output by the film measuring means, the locking means being arranged in its engaged position to lie within the range of movement of the shutter release member, and in its disengaged position to lie outside the said range of movement. Preferably, the said other output comprises a gearwheel and the locking means comprises a pawl arranged to engage the teeth of the gearwheel, the path of movement of the shutter release member being at right angles to the plane of the gearwheel and the pawl.

The input, preferably, comprises a further gearwheel mounted co-axially with the first mentioned gearwheel and movable to and from a rest position adopted before and after operation, the further gearwheel having an excision so arranged that when the further gearwheel is in its rest position the excision lies on the path of movement of the shutter release member. Thus the shutter release member cannot be operated until the input has been returned to its rest position. That is to say, until a film transport handle, which drives the input, has been released to return to its initial position.

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 plan view of part of a camera in a position during film transport,

Fig. 2 is a view of the camera shown in Fig. 1, after film transport, and

Fig. 3 is a section on the line (III)-(III) of Fig. 1 showing a third position of operation

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Referring to the accompanying drawings, the housing of a camera which is shown diagrammatically is indicated by 100. A film transport wheel 110 carries a spindle 5 118 on which a sun gear 119 is supported. A non-return pawl is arranged to engage a locking toothed section 110a. The transport wheel 110 can be arranged to engage with a transport slider 125 or may project from 10 a corner of the camera housing 100 as a handle. The gearwheel 119 engages both a gearwheel 116a of a disc arrangement 116, 117, with a locking toothed section 117a of which a locking member 211, which is 15 mounted on an axis 212, can engage, and with an internal toothed section 122a of a gearwheel 122 which co-operates with a spool drive member 126. The locking member 211 is in turn so arranged that it 20 locks the disc 117 when a feeler 209b co-operating with film perforations 202a has not engaged a perforation 202a. When the feeler 209b has engaged a perforation 202a, the locking member 211 releases the disc 25 117. The locking member 211 is thus controlled by means of a known feeler 209, and for each exposure on a film 202 a perforation 202a is provided which the feeler 209b is arranged to engage to control the 30 locking member 211 and from which it is disengaged during or after exposure. The film transport is thus terminated not by locking of the film transport handle 110/125, but by the fact that the gearwheel 35 116/117 is released and that the gearwheel 122 comes to rest under the action of friction and the pull of the film. A protective backing paper is indicated by the numeral 203.

40 The gearwheels 116 and 117, are not of one-piece construction but are separated into two parts having a friction member provided between them. As shown in Fig. 3, the spindle stub of the gearwheel 116 is 45 in the form of a square 116c on which a bearing 127 with flanges 127a and 127b is non-rotatably supported. The gearwheel 117 and a friction spring 128 are arranged between the flanges 127a and 127b. If both 50 outputs 122 and 117 are locked because the locking member 221 is still engaged with the gearwheel 117 and the film is held at its end by a locking device, the drive force of the wheel 110 becomes greater 55 than the force of the friction member 128. The gearwheel 116, together with the bearing 127, now simply slides relative to the gearwheel 117 so that neither the film nor the mechanism can be damaged. The force 60 of the friction member must, therefore, be less than the force at which the film would tear or the mechanism would be damaged.

The feeler 209 is subject to the action of two springs 208a and 208b, which pull it 65 on the one hand in the opposite direction

to the film transport direction and on the other hand towards the film 202. The feeler 209 engages with a slot 209a round a pin 201a fixed to the camera. The springs 208a and 208b pull the end 209b of the 70 feeler 209 in an anticlockwise direction and in the opposite direction to the film transport direction.

The feeler 209 is subject to the action of a lever 216 which is rotatable about a 75 spindle 217 fixed to the camera housing 100 and is pulled in an anticlockwise direction by a spring 218. The lever 216 has two substantially adjacent notches 216b and 216c of different depths. During the 80 film transport, a lug 209c on the feeler 209 locks in the shallower notch 216b, on the right hand side as shown in Figure 1. The feeler 209 thus rests against the film 202 under the action of the springs 208b and 85 218, and on meeting a perforation 202a drops into it. When the film is further advanced, since the member 211 is still engaged with the toothed section 117a of the gearwheel 117, the end of the feeler 209b 90 rests against the right-hand end of the perforation as shown in Fig. 2, and is carried along by the moving film 202. The protective backing paper 203 is thus tensioned and at the same time prevents the feeler 95 209/209b from dropping further into the perforation 202a.

Due to the rotary movement of the feeler 209 brought about by being carried 100 along by the film 202, the feeler alters its position with respect to the lever 216. The lug 209c slides out of the notch 216b and the notch 216c drops over the lug 209c. The lever 216, therefore, alters its position 105 in an anticlockwise direction and drives the member 211 in a clockwise direction so that it releases the gearwheel 117a and film transport is ended.

During shutter release the feeler 209 is 110 pulled out of the perforation 202a in the usual manner, and the lever 216 is raised and moved by means of the spring 208a in the opposite direction to film transport. The lug 209c thus slides into the notch 216b again and raises the lever 216 in a 115 clockwise direction. The lever 216 thus releases the member 211 and the latter moves under the action of the spring 213 into the film transport position shown in Figure 1. 120

The subject of the present invention is now a further development of this already proposed arrangement in the sense of creating a simple double exposure preventing means therefor. For this purpose, 125 the release member 225 is arranged normally to the plane of the locking member 211 in such a way that the locking member 211 lies with its locking tooth 211a beneath the release member 225 for as 130

long as a film transport operation is not completed and the tooth 211a is engaged with the toothed section 117a. The locking tooth 211a thus prevents actuation of the release member 225 for as long as it is in the locking position. When the film transport operation is completed the locking member 211 pivots the locking tooth 211a away from the tooth section 117a, and also out of the path of movement of the release member 225. An excision 110a is provided at the point on the wheel 110 which lies under the locking tooth 211a in the rest position. If a film transport operation has just ended as shown in Fig. 2, the locking tooth 211a does in fact leave the path for the release member 225. The excision 110a, however, is still in the position shown in Figure 2, shutter release is not, therefore, yet possible. Only when the handle 125 has been released and has returned to its initial position under the action of a return spring 127, is the gearwheel 110 rotated back into the position shown in Figure 1. Due to the fact that, as a result of the completion of film transport, the tooth 211a at the same time assumes the position shown in Figure 2, the release member 225 can now be actuated. (see Figure 3). After the actuation of the release member 225, the locking member 211 returns to the position shown in Figure 1, in a manner which is described but not shown, so that it is only possible to actuate the release member 225 again after a further film transport operation.

It is of course possible to improve other known arrangements, in which, when the feeler engages a perforation the locking member engages a gearwheel of the film transport means and locks it, by constructing the double exposure preventing means in such a manner that the locking member lies in the path of movement of the release member when it is not in engagement with the gearwheel, and clears the release member when it locks the gearwheel.

WHAT WE CLAIM IS:—

1. A camera for use with roll film and including film transport drive means, a differential mechanism for transmitting force from the film transport drive means to two outputs, one of which comprises film spool drive means, means for metering the amount by which a film has been advanced and a locking member for the other output, the arrangement being that during film transport the locking member is arranged in engagement with the other output and, when the film has been advanced by a predetermined amount, the film metering means is arranged to cause the

locking member to disengage from the other output to lock the one output, the locking member being so arranged that when it is engaged with the other output it lies within the range of movement of a shutter release member to prevent operation of the shutter release member, and when urged out of engagement with the other output the locking member is moved out of the range of movement of the shutter release member to permit shutter release.

2. A camera as claimed in claim 1, wherein the film metering means comprises a feeler member arranged to engage a perforation in the film, the feeler member and the locking member being so interconnected that when the feeler member engages a perforation the locking member is disengaged from the other output and when the feeler member is disengaged from the perforations the locking member is engaged with the other output.

3. A camera as claimed in claim 1 or claim 2, wherein the locking means is arranged to engage the said other output during film transport and is urged out of engagement with the other output by the film metering means, the locking means being arranged in its engaged position to lie within the range of movement of the shutter release member, and in its disengaged position to lie outside the said range of movement.

4. A camera as claimed in claim 3, wherein the said other output comprises a gearwheel and the locking means comprises a pawl arranged to engage the teeth of the gearwheel, the path of movement of the shutter release member being at right angles to the plane of the gearwheel and the pawl.

5. A camera as claimed in claim 4, wherein the input comprises a further gearwheel mounted co-axially with the first mentioned gearwheel and movable to and from a rest position adopted before and after operation, the further gearwheel having an excision so arranged that when the further gearwheel is in its rest position the excision lies on the path of movement of the shutter release member.

6. A camera having transport means substantially as hereinbefore described, with reference to, and as shown in, the accompanying drawings.

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locking member to disengage from the other output to lock the one output, the locking member being so arranged that when it is engaged with the other output it lies within the range of movement of a shutter release member to prevent operation of the shutter release member, and when urged out of engagement with the other output the locking member is moved out of the range of movement of the shutter release member to permit shutter release.

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