

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN CINE-CAMERAS

(71) We, KARL VOCKENHUBER, of 118 Pötzleinsdorferstrasse, Vienna 18, Austria, and RAIMUND HAUSER, of 2 Goldeggasse, Vienna 4, Austria, both Austrian citizens, 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 cine-camera.

According to the present invention, there is provided a cine-camera comprising a casing; sound-recording means comprising guide means for the film including a capstan for driving the film having an operative and an inoperative condition and at least one sound-head, and pressure means for pressing the film at least against the capstan of the guide means, the pressure means and the capstan having at least two relative positions, of which in the first position they are spaced one from another for enabling insertion of the film therebetween, in the second position at least one of them is displaced towards the other in comparison with the first position; release means manually controllable for rendering the capstan operative in an operative position and for rendering the capstan inoperative in an inoperative position; operating means manually actuatable independently from the release means, the operating means having an actuated and a deactuated condition; activating means for the sound-recording means controlled by the operating means for enabling relative displacement of the pressure means and the capstan from the first into the second position thereof, in the deactuated condition of the operating means the pressure means and the capstan remaining in the first position thereof, in the actuated condition of the operating means the pressure means and the capstan being enabled, one with respect to the other, to assume the second position thereof.

The invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a side view of a cine-camera containing a cassette reception chamber and having basic internal parts shown in broken outline and showing handle controls,

Figure 2 shows in sketches A to C a mechanism inside the camera of Figure 1 and which controls the approach movement of a pinch roller to a sound spindle in accordance with the movement of the handle controls,

Figure 3 is an electrical circuit associated with the camera of Figure 1,

Figure 4 shows a side view of a cine-camera, partially broken away, to show controls enabling a pinch roller to be moved towards a sound spindle in accordance with the way the external controls are operated,

Figure 5 shows a modification of Figure 4 in which movement of a forehead rest associated with a camera eyepiece is used to control the approach movement of a pinch roller, and

Figure 6 is a modification of Figure 4 which corresponds to Figure 5 but in which movement of the eyepiece itself is used to provide the controlling motion.

Control of the pinch roller in dependence on gripping a handle portion of the camera casing is illustrated in Figures 1 and 2.

A lens of a camera 101 is provided with a diaphragm blade 103 which is adjustable by a galvanometer 105 in accordance with the light conditions of the scene that is to be photographed. The galvanometer 105 is controlled by a photo-resistor or a photo-semiconductor. A camera drive motor 106 transports a film F in a cassette 2 by a claw drive 107 diagrammatically indicated.

The camera drive motor 106 and the galvanometer 105 are powered by batteries 170 disposed in the handle of the camera. The rear of the handle is provided with a pivotable bar 171 which controls a switch

183 (Figures 2, 3) in the circuit of the batteries 170 and isolates them when the camera is not in use. On being operated the camera release 120 closes a switch 172 (Figure 3) in the circuit of the camera motor 106 and simultaneously releases a mechanical lock for the drive 107. Conversely, when the camera release 120 is released the drive 107 is blocked so that the camera shutter covers the image window and the motor circuit is simultaneously interrupted.

Referring to Figure 2, the release 120 is disposed on a slide 173 which carries a prod 174. In the position illustrated in Figure 2A it is disposed opposite to a control face 175 of a cam 177 rotatable about a shaft 176. The cam is biased by a return spring 178 against an extension 179 of the bar 171. The extension 179 is provided with a slot 180 in which locates a stationary pin 181. The cam 177 is connected to an actuator 182 that co-operates with the switch 183. The switch 183 connects the exposure regulator as well as the camera drive motor to the batteries 170.

The cam 177 has one end of a slide 185 pivoted to it at 184. A block 186 is slidable along the slide 185 and is urged by a spring 187 against a stop abutment 188 on the end of the slide 185. The block 186 also functions as bearing system for a pinch roller 109.

In the position illustrated in Figure 2A the cam 177 assumes a position such that the pinch roller 109 is spaced from a capstan 108 which forms a portion of a guide means associated with a sound recording means having a sound-head, not shown. This position corresponds to the threading-up position in which the cassette 2 is placed in the reception chamber.

If an attempt is made to depress the release 120 from the position illustrated in Figure 2A the prod 174 simply abuts the control surface 175 and prevents any further motion. The camera drive thus remains locked. If the camera is held by the camera handle in the conventional manner the hand which surrounds the handle also depresses the bar 171 (see also Figure 2B). The extension 179 of the bar 171 turns the cam 177 about the pivot 176 in the anti-clockwise direction so that the control face 175 moves out of the zone of the prod 174 and the main switch 183 is simultaneously closed by the actuator 182.

Operation of the main switch connects the galvanometer 105 to the voltage supply and exposure metering commences. If desired the camera motor 106 for driving the capstan 108 may have already been started but in this case the drive for the claw gear 107 must be interrupted by a

clutch which is engageable by the release 120.

Rotation of the cam 177 in the anti-clockwise direction raises the position of the slide 185 and causes the pinch roller 109 to be moved into a standby position close to the capstan 108 as shown in Figure 2B. The camera release can be operated as soon as the bar 171 assumes the position illustrated in Figure 2B. If the user releases the bar 171 while the release 120 is depressed it will nevertheless not be possible for the cam 177 and therefore for the actuator 182 to return into the starting position. Although return spring 178 tends to pivot the cam in the clockwise direction this only causes the cam 177 to abut the prod 174 of the release so that any further pivoting motion is prevented. The circuits of the exposure regulator and of the camera drive motor therefore remain closed for as long as the release 120 is operated.

Since the prod 174, as it advances, causes further pivoting of the cam 177 the pinch roller 109 engages with the driven capstan 108 in the position illustrated in Figure 2C and establishes a driving nip to drive the film F. The block 186 separates from the stop abutment 188 after the roller 109 bears on the capstan 108 so as to provide a lost motion connection and the spring 187 provides a constant force on the pinch roller.

A ratchet 189 is provided in order to define the individual control positions of the cam and thus the pinch roller. After the release is freed the cam 177 returns into its starting position under the action of the spring 178 and opens the switch 183. A self release connected to the cam 177 can be used in place of the control obtained by the release 120.

In the embodiment illustrated in Figure 4 the bottom of the camera 190 is provided with a lever 191 which is operated when the camera is gripped and is in the form of a bar 191. The bar 191 is pivotable about an axis 192 and is shown in the Figure in the position at which it retains the pinch roller 109 in the threading-up position. The connection between the bar 191 and the pinch roller 109 is provided by a linkage 193, the shaft 195 of the pinch roller 109 being guided in a slit 196 in a lever 194 of the linkage. A spring 197 maintains the roller 109 in the illustrated position.

If the bar 191 is pressed against the camera the lever 194 pivots in the anticlockwise direction, the shaft 195 being moved into a bifurcated opening 198 in one arm of a cranked two-armed lever 199 to the position shown in broken outline. The two-armed lever is pivoted at 200 to an armature 201 of a solenoid 202. The other arm of the lever 199 is hinged to a fixed

shaft 203. In the position which is shown in broken outline the pinch roller 109 will be in its standby position.

If the release 204 is operated, switching-
5 on of the camera motor or of the film claw drive is accompanied by the solenoid 202 being connected *via* a switch 205 to the voltage supply and to be energised so that the armature 102 is pulled in. This causes
10 the lever 199 to pivot anticlockwise about the shaft 203. The shaft 195 slides in the fork 198 along the slit 196 into the operating position at which the pinch roller 109 is thrust against the driven capstan 108, as
15 shown in dash dot outline. After the release 204 is freed the solenoid is de-energised and the pinch roller returns into the initial position under the action of the spring 197.

Figures 5 and 6 show that controlling the
20 position of the pinch roller need not necessarily be performed by a lever which is manually operated but can also be performed by a forehead support 206 which is disposed in the region of a view finder
25 207. When the camera operator looks through the view finder his forehead presses the support 206 against the spring 208 to depress the support towards the camera wall. Either the cam 177 of Figure 2
30 or the lever 194 of Figure 4 is connected *via* a linkage 209 to the support 206 so as to be operated thereby.

This also applies to the device illustrated in Figure 6 where the view finder eyepiece
35 207a itself is displaced and the pinch roller 109 is controlled *via* the linkage partially shown at 209a.

WHAT WE CLAIM IS:—

1. A cine-camera comprising a casing;
40 sound-recording means comprising guide means for the film including a capstan for driving the film having an operative and an inoperative condition and at least one sound-head, and pressure means for
45 pressing the film at least against the capstan of the guide means, the pressure means and the capstan having at least two relative positions, of which in the first position they are spaced one from another for enabling
50 insertion of the film therebetween, in the second position at least one of them is displaced towards the other in comparison with the first position; release means manually controllable for rendering the
55 capstan operative in an operative position and for rendering the capstan inoperative in an inoperative position; operating means manually actuable independently from the release means, the operating means having

an actuated and a deactuated condition; activating means for the sound-recording means controlled by the operating means for enabling relative displacement of the pressure means and the capstan from the first into the second position thereof, in the
60 deactuated condition of the operating means thereat, in the actuated condition of the operating means the pressure means and the capstan being enabled, one with respect to the other, to assume the second
65 position thereof.

2. A camera as claimed in Claim 1 wherein the generating means are arranged in an area of the casing which, in use of the camera, is gripped by a user and the
70 operating means are forcibly actuable when holding and using the camera.

3. A camera as claimed in Claim 1 or Claim 2, further comprising retaining means connected to the release means for
75 retaining in their operative position the pressure means and the capstan in engagement after the operating means have been actuated to bring them into the second position.

4. A camera as claimed in Claim 1 or 2 or 3, further comprising buffer spring means interposed between the retaining means and the movable sound-recording means.

5. A camera as claimed in Claim 1, 2, 3 or 4, further comprising locking means having a locking and an unlocking position and being operatively connected to the
80 operating means, in deactuated condition of the operating means the locking means being in locking position for preventing the release means to be depressed into the operative position when the sound
85 recording means are in the first position.

6. A camera as claimed in any preceding claim, further comprising an exposure control circuit including switch means having an off-position and an on-position, the switch means being also controlled by
90 the operating means together with the sound-recording means so that in actuated condition of the operating means the switch means are in on-position.

6. A cine-camera substantially as hereinbefore particularly described with reference to and as illustrated in the
95 accompanying drawings.

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3 shaft 203. In the position which is shown in broken outline the pinch roller 109 will be in its standby position.

5 If the release 204 is operated, switching-on of the camera motor or of the film claw drive is accompanied by the solenoid 202 being connected *via* a switch 205 to the voltage supply and to be energised so that the armature 102 is pulled in. This causes the lever 199 to pivot anticlockwise about the shaft 203. The shaft 195 slides in the fork 198 along the slit 196 into the operating position at which the pinch roller 109 is thrust against the driven capstan 108, as shown in dash dot outline. After the release 204 is freed the solenoid is de-energised and the pinch roller returns into the initial position under the action of the spring 197.

20 Figures 5 and 6 show that controlling the position of the pinch roller need not necessarily be performed by a lever which is manually operated but can also be performed by a forehead support 206 which is disposed in the region of a view finder 207. When the camera operator looks through the view finder his forehead presses the support 206 against the spring 208 to depress the support towards the camera wall. Either the cam 177 of Figure 2 or the lever 194 of Figure 4 is connected *via* a linkage 209 to the support 206 so as to be operated thereby.

35 This also applies to the device illustrated in Figure 6 where the view finder eyepiece 207a itself is displaced and the pinch roller 109 is controlled *via* the linkage partially shown at 209a.

WHAT WE CLAIM IS:—

40 1. A cine-camera comprising a casing; sound-recording means comprising guide means for the film including a capstan for driving the film having an operative and an inoperative condition and at least one sound-head, and pressure means for pressing the film at least against the capstan of the guide means, the pressure means and the capstan having at least two relative positions, of which in the first position they are spaced one from another for enabling insertion of the film therebetween, in the second position at least one of them is displaced towards the other in comparison with the first position; release means manually controllable for rendering the capstan operative in an operative position and for rendering the capstan inoperative in an inoperative position; operating means manually actuatable independently from the release means, the operating means having

an actuated and a deactuated condition; activating means for the sound-recording means controlled by the operating means for enabling relative displacement of the pressure means and the capstan from the first into the second position thereof, in the deactuated condition of the operating means thereat, in the actuated condition of the operating means the pressure means and the capstan being enabled, one with respect to the other, to assume the second position thereof.

2. A camera as claimed in Claim 1 wherein the generating means are arranged in an area of the casing which, in use of the camera, is gripped by a user and the operating means are forcibly actuatable when holding and using the camera.

3. A camera as claimed in Claim 1 or Claim 2, further comprising retaining means connected to the release means for retaining in their operative position the pressure means and the capstan in engagement after the operating means have been actuated to bring them into the second position.

4. A camera as claimed in Claim 1 or 2 or 3, further comprising buffer spring means interposed between the retaining means and the movable sound-recording means.

5. A camera as claimed in Claim 1, 2, 3 or 4, further comprising locking means having a locking and an unlocking position and being operatively connected to the operating means, in deactuated condition of the operating means the locking means being in locking position for preventing the release means to be depressed into the operative position when the sound recording means are in the first position.

6. A camera as claimed in any preceding claim, further comprising an exposure control circuit including switch means having an off-position and an on-position, the switch means being also controlled by the operating means together with the sound-recording means so that in actuated condition of the operating means the switch means are in on-position.

6. A cine-camera substantially as hereinbefore particularly described with reference to and as illustrated in the accompanying drawings.

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