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(54) IMPROVEMENTS IN AND RELATING TO CAMERAS

(71) We, AGFA-GEVAERT AKTIEN-GESELLSCHAFT, a body corporate organised according to the Laws of the 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 invention relates to a camera having a slidable control for film transport and/or shutter tensioning.

The invention provides a still camera having a film transport control which is slidable between a first, picture-taking, position, and a second position, film transport being effected in response to movement of the control between the two positions, a shutter release, and an electrical switch which closes in response to actuation of the shutter release when the control is in the first position but which is so acted upon in response to movement of the control to the second position that in that position of the control the switch cannot be closed if the user attempts to actuate the shutter release. The switch can be, for example, for the actuation of an electronically controlled shutter, and the invention serves to prevent the switch from being actuated by accidental actuation of the camera shutter release when the camera is not ready for use.

Advantageously, a part of the switch is pivotally displaced in response to movement of the control from the first to the second position in order to prevent it being closed in the second position. Preferably, the release includes a displaceable member for acting on the switch to close it in the first position: the displaceable member may be restrained from movement in the second position of the control (to prevent switch closure), or it may be movable, the pivotal movement of the said part of the switch being such that the switch cannot be closed in the range of movement of the displaceable member in the second position of the control. The said part of the switch may be spring-biased in the opposite sense to that of the said pivotal movement.

Advantageously, the switch is acted upon, in response to movement of the control to the second position, via a shutter tensioning member which is driven against the action of spring-biasing by the control as it moves to the second position. The switch may be acted upon by a lever mechanism controlled by the shutter tensioning member. Preferably, the shutter tensioning member is arranged to tension the shutter fully over a first part of a stroke of the control, the control and the shutter tensioning member being capable of further movement beyond this part of the the stroke without further tensioning the shutter. Preferably, a shutter member is arranged to be displaced over the said first part of the stroke and held by an arcuate cam during the remainder of the stroke. The control advantageously acts on the switch during the remainder of the stroke of the control. Less space will thus be required than if separate mechanisms were provided for acting on the switch and for driving the shutter tensioning member.

Advantageously, the film transport control covers one or more camera components in the second position, but uncovers them in the first position. Preferably, the control is extended beyond the camera body in the first position and retracted in the second.

Advantageously, the control also effects shutter tensioning in response to movement between the first and second positions. Preferably, the shutter is tensioned on the stroke of the control from the first position to the second.

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 schematic view of the camera in a ready for use position,

Fig. 2 shows the camera shown in Fig. 1 during exposure and,

Fig. 3 shows the camera shown in Fig. 1 when not in use.

The reference numeral 1 indicates diagrammatically a camera housing, and the reference numeral 1a indicates a shutter aperture. The camera includes in a known manner (which is not therefore shown in

detail) a slider member which acts as a protective cover for the camera; for example, it may cover the lens and viewfinder when it is in one position (closed) on the camera, and uncover them for picture-taking when it is in another position (pulled out from the camera). In a manner which is also known, the slider forms a film transport control and/or shutter tensioning control, with the film transport and the shutter tensioning operation taking place on the stroke in which the slider is moved into the closed position. The slider is rigidly connected to a further slider member 2 of which only part is shown in the drawings and which when moved in the direction of the arrow 14, tensions the shutter, but which returns to the position shown in Figure 1 when the first slider is moved into the open position in which the camera is ready for use.

In this tensioned, ready-for-use position of the camera, the shutter aperture 1a is covered by an opening blade 5d of the shutter. A drive member 5a for the blade 5d, which is subject to the action of a tensioned spring, is held by a release lever 3 (forming part of the camera shutter release) acting through a tensioning member 4. The member 4 is pivotable about a spindle 15 and is subject to the action of a spring 16. The release lever 3 is connected to a release member 10 (also forming part of the shutter release), which is urged against a stop 11 by a return spring 12. Any other known construction of shutter release may, however, be used. The tensioning member 4 carries on it a tensioning cam 4b which is arranged to co-operate with a cam 5b provided on the drive member 5a. The tensioning member 4 also carries an arc-shaped cam edge 4c, and a cam 4a against which the spring 16 acts.

When the shutter release is actuated, a switch comprising switch contacts 8a and 8b and a switch member 7 is closed, to control an electronically-controlled second shutter blade 5c, by pivotal movement of the part 7 of the switch 8a, 8b, 7. The switch member 7 is mounted on a spindle around which a contact spring 9 is arranged. The contact spring 9 rests in continuous engagement with the switch contact 8b, whilst a part of the release member 10 lies between two stops 7a and 7c on the switch member 7. A coupling member 6 is pivotally connected to the part 7 at 17 and is linked to a lever 18 by means of a pin-slot connection 6b and 18a.

If the release member 10 is actuated when the camera is in the ready-for-use position as shown in Figure 1, then as shown in Figure 2 the shutter opening blade 5d is released by the release lever 3 and the tensioning member 4 to uncover the aperture 1a. The switch member 7, either before

the blade 5d is released or simultaneously with the release of the blade 5d follows the release member 10 under the action of the spring 9 so that the spring 9 makes contact with the second switch contact 8a and the switch contacts 8a and 8b are, therefore, closed. The second shutter blade 5c, or, when using a different type of shutter, the shutter speed, is controlled by means of a known circuit which is not, therefore, shown.

When the slider (not shown) is moved in the tensioning direction, and thus also into the closed position, the further slider member 2 is moved in the direction of the arrow 14 (as shown in Figure 3). The member 2 first rotates the tensioning member 4 in a clockwise direction until the shutter 5a to 5d is tensioned. The drive member 5a then rests against the arc 4c so that the shutter is no longer affected by further movement of the tensioning member 4 in a clockwise direction. The magnitude of the movement of the slider member 2 is such that the cam 4b meets the edge 6a and pivots the coupling member 6 to such an extent that the switch member 7 is pivoted to the position of Figure 3 where it holds the release member 10 and prevents actuation thereof when the slider and the slider member 2 have reached their end position, that is to say when the slider reaches the closed position on the camera. If, therefore, the user tries to actuate the camera release now that the camera is not ready for use, neither the switch 8a and 8b nor the shutter can be actuated.

If the slider and slider member 2 are moved into the open position in which the camera is ready for use, as shown in Figure 1, out of the position shown in Figure 3 and in the opposite direction to the arrow 14, the slider member 2 releases the tensioning member 4 so that the latter returns until it is engaged and held by the release lever 3. The switch member 7 is thereby rotated again under the action of the spring 9 into a position in which it can close the contacts 8a and 8b when the release member 10 is actuated. The operation already described can, therefore, begin again.

The invention is not of course, restricted to the form of camera shown in the accompanying drawings. It would also be possible to associate with the slider member 2 an extended arm which, when the slider and slider member 2 are moved, acts directly on the switch member 7 and rotates it into the ineffective position when the slider is moved into the closed position on the camera. It would thus be unnecessary for the parts tensioning and releasing the shutter to act directly on the switch member 7. Such an arrangement would be of particular value if instead of a tensioned shutter an automatic shutter were to be used, so that the film

transport control 2 would not have to be responsible for shutter tensioning. In addition it would be possible to pivot not the switch member 7 but the contact 8a directly or indirectly by means of the slider member 2 to such an extent that the contact lies outside the range of movement of the switch member 7 when the release member 10 is actuated.

WHAT WE CLAIM IS:—

1. A still camera having a film transport control which is slidable between a first, picture-taking position, and a second position, film transport being effected in response to movement of the control between the two positions, a shutter release, and an electrical switch which closes in response to actuation of the shutter release when the control is in the first position but which is so acted upon in response to movement of the control to the second position that in that position of the control the switch cannot be closed if the user attempts to actuate the shutter release.

2. A camera as claimed in claim 1, wherein a part of the switch is pivotally displaced in response to movement of the control from the first to the second position in order to prevent it being closed in the second position.

3. A camera as claimed in claim 2, wherein the release includes a displaceable member for acting on the switch to close it in the first position of the control, the displaceable member being restrained from movement in the second position of the control.

4. A camera as claimed in claim 2, wherein the release includes a displaceable member for acting on the switch to close it in the first position of the control, the pivotal movement of the part of the switch being such that the switch cannot be closed in the range of movement of the displaceable member in the second position of the control.

5. A camera as claimed in any one of claims 2 to 4, wherein the said part of the switch is spring-biased in the opposite sense to that of the said pivotal displacement.

6. A camera as claimed in any one of

claims 1 to 5, wherein the switch is acted upon, in response to movement of the control to the second position, via a shutter tensioning member which is driven against the action of spring-biasing by the control as it moves to the second position.

7. A camera as claimed in claim 6, wherein the switch is acted on by a lever mechanism controlled by the shutter tensioning member.

8. A camera as claimed in claim 6 or claim 7, wherein the shutter tensioning member is arranged to tension the shutter fully over a first part of a stroke of the control, the control and the shutter tensioning member being capable of further movement beyond this part of the stroke without further tensioning the shutter.

9. A camera as claimed in claim 8, wherein a shutter member is arranged to be displaced over the said first part of the stroke and held by an arcuate cam during the remainder of the stroke.

10. A camera as claimed in any one of claims 1 to 9, wherein the film transport control covers one or more camera components in the second position, but uncovers them in the first position.

11. A camera as claimed in claim 10, wherein the control is extended beyond the camera body in the first position and retracted in the second.

12. A camera as claimed in any one of claims 1 to 11, wherein the control also effects shutter tensioning in response to movement between the first and second positions.

13. A camera as claimed in claim 12, wherein the shutter is tensioned on the stroke of the control from the first position to the second.

14. A camera as claimed in any one of claims 1 to 13, wherein the electrical switch lies in a circuit for electronically controlling the shutter.

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

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2. A camera as claimed in claim 1, wherein a part of the switch is pivotally displaced in response to movement of the control from the first to the second position in order to prevent it being closed in the second position.

3. A camera as claimed in claim 2, wherein the release includes a displaceable member for acting on the switch to close it in the first position of the control, the displaceable member being restrained from movement in the second position of the control.

4. A camera as claimed in claim 2, wherein the release includes a displaceable member for acting on the switch to close it in the first position of the control, the pivotal movement of the part of the switch being such that the switch cannot be closed in the range of movement of the displaceable member in the second position of the control.

5. A camera as claimed in any one of claims 2 to 4, wherein the said part of the switch is spring-biased in the opposite sense to that of the said pivotal displacement.

6. A camera as claimed in any one of

claims 1 to 5, wherein the switch is acted upon, in response to movement of the control to the second position, via a shutter tensioning member which is driven against the action of spring-biasing by the control as it moves to the second position.

7. A camera as claimed in claim 6, wherein the switch is acted on by a lever mechanism controlled by the shutter tensioning member.

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9. A camera as claimed in claim 8, wherein a shutter member is arranged to be displaced over the said first part of the stroke and held by an arcuate cam during the remainder of the stroke.

10. A camera as claimed in any one of claims 1 to 9, wherein the film transport control covers one or more camera components in the second position, but uncovers them in the first position.

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