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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:—

The present invention relates to cameras having a control member arranged during movement between open and closed positions to carry out film transport and/or tensioning of the shutter and which is arranged in the closed position to cover certain components of the camera.

Cameras of the above type have previously been proposed particularly for films with a small picture format. In the previously proposed cameras, however, the control member must be pushed over the camera at each film transport operation and pulled back over it again by hand. The camera must usually be taken away from the eye for tensioning, which is a disadvantage when making exposures in quick succession. Furthermore, to-and-fro movement of the control member must always be carried out by hand.

It is an object of the invention to simplify and improve further the operation of cameras of this type and especially to avoid having to remove the camera from the taking position during film transport.

The invention provides a camera which comprises a camera housing and a control member which is slidably mounted on the housing and movable between a closed position, in which it covers certain components of the camera, and an open position in which the said components are uncovered, the control member being arranged during movement between the said positions to carry out film transport and/or tensioning of the camera shutter, and there is provided resilient means tending to urge the control member into the open position.

The result achieved by means of a spring tensioned between the control member and the camera housing is that, without having to remove the camera from the eye, film transport can be effected by push-button actuation of the control member, so that the control member returns to its open position immediately after being released. This push-button-type operation of the control member offers the further advantage that it need not be firmly grasped in any particular manner, but it is sufficient to press on it with the flat of the hand.

Advantageously, there is provided locking means arranged, in a first position, to retain the control member in the closed position and in a second position to permit movement of the control member between the open and closed positions and there is provided means for moving the locking means between the said first and second positions. The locking means may comprise a resilient member having a first projection arranged in the first position of the locking means to engage a projection on the control member, and a second projection arranged, on distortion of the resilient member, to be brought into or out of engagement with a projection on the camera to bring the first projection into or out of the range of movement of the projection on the control member. Preferably, when the resilient member is in a relaxed position, the second projection is not engaged with the projection on the housing and the first projection lies within the range of movement of the projection on the control member, and distortion of the resilient member is arranged to bring the second projection into engagement with the projection on the housing and to move the first projection out of the range of movement of the projection on the control member. There is, preferably, provided a push-button for moving the resilient member between relaxed and distorted positions. The push-button may be arranged in a recess in the camera housing

so that there is no projection beyond the surface of the housing.

Alternatively, the locking means may comprise a pivotally mounted resilient member, and there is provided an operating member carrying a control pin for pivoting the pivotally mounted member into and out of the range of movement of a locking projection on the control member. Advantageously, the pivotally mounted member includes an angled surface arranged so to co-operate with the control pin that movement of the control pin over the angled surface in one direction urges the pivotally mounted member out of the range of movement of the locking extension and there is provided on the pivotally mounted member a notch arranged so to engage the control pin that the pivotally mounted member is held out of the range of movement of the locking extension. The pivotally mounted member, preferably, includes a further angled surface and resilient means tending so to urge it into the range of movement of the locking extension that when the control pin is moved out of engagement with the notch in the said one direction the resilient means urges the further angled surface over the control pin to release the pivotally mounted member and there is provided further resilient means arranged to urge the control pin into its rest position. Thus the control pin performs the functions of both releasing the control member and maintaining it unlocked, and of operating the locking means to hold the control member.

The control member, advantageously, conforms in shape to the camera housing and is arranged to supplement the housing in the open position. Thus, while in the closed position the camera is small and convenient for carrying, when in the open position it is of a convenient size for gripping and so helps to eliminate camera shake.

Two forms of camera constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a diagrammatic view partially in section of a first form of camera.

Figure 2 is a partial section through the first form of camera along the line II-II of Figure 1, and

Figure 3 is a view of second form of camera.

Throughout the accompanying drawings, the housing of a still camera is indicated by 1, its viewfinder lenses by 2 and 3, and its objective by 4. The camera includes a movable housing section 5 which is connected to the housing 1 and is arranged to act as a protective covering for viewfinder 3, objective 4 and/or further components of the camera when in a position in which it is pushed over the housing 1. With the

movable housing section 5 pulled out into the position shown in Figures 1 and 3, the camera 1 is ready for operation, with the viewfinder 3, objective 4 and/or further operating parts of the camera free for operation. The movable housing section 5 acts as a tensioning slider which, when pushed in the direction of the arrow 6, by means of, for example, a rack, transports the film and/or tensions the shutter. A spring 7 is held in tension between the camera housing 1 and the section 5 and tends to urge the section 5 into the extended position, so that it is ready for a film transport operation. If the film is now to be transported, the section 5 is moved in the direction of the arrow 6 as far as its end position and is then released again. It then moves back under the action of the spring 7 into the extended position, in which a further film transport is possible after the camera release has been operated.

An advantage of this arrangement is that while the camera is otherwise very small and can easily be placed in the pocket it is, during operation, of a convenient size and easy to handle and it automatically returns to this size after a film transport operation, without the user having to effect any further manipulations first.

It is, of course, necessary to provide on the camera housing 1 suitable locking means which when the camera is not being used allows the section 5 to be locked in the closed position, but during normal tensioning operations carried out in quick succession avoids locking so that the spring 7 can take effect.

Figures 1 and 2 of the accompanying drawings show a first form of locking means of this type. In this case an elongate aperture 8 is provided in the housing 1 in which is guided a movable push-button 9. The push-button 9 is connected to a leaf spring 11. The leaf spring 11 is guided with one end in a pocket 10 in the camera housing 1. The other end 11a of the leaf spring 11 is arranged to co-operate with a projection 1a on the camera housing 1. A third, angled, arm 11b of the leaf spring 11 has an oblique surface 11c which projects within the range of movement of a locking spring 12 having a locking hook 12b with an oblique surface 12a and being mounted on the section 5.

In the state shown in Figures 1 and 2, the spring end 11a lies against the projection 1a. The spring 11 is, therefore, bent downwards to such an extent that the oblique surface 11c does not lie within the range of movement of the locking hook 12b on the section 5. The section 5 can thus be moved in the direction of the arrow 6 for film transport, without being locked. After being released by the camera-user, the

section 5 is urged back into its extended position by the spring 7, as described above.

If the section 5 is to be locked in the closed position in which it protects the camera, however, the push-button 9 is pushed in the direction of the arrow 13 so that the spring end 11a locks behind the projection 1a. The spring arm 11b, therefore, moves upwards so that the oblique surface 11c comes within the range of the locking hook 11b. If the section 5 is now pushed in the direction of the arrow 6 into the position in which it closes the camera, the oblique surface 12a slides resiliently over the oblique surface 11c so that the locking hook 12b engages the oblique surface 11c and locks the section 5 in the closed position. To open the camera 1, the push-button 9 is pressed downwards and in the opposite direction to the arrow 13 into the position shown in the Figures 1 and 2, so that the spring end 11a comes to rest in engagement with the projection 1a in the position already described.

A second form of locking means is shown in Figure 3 of the accompanying drawings. In this case there is a push-button 15 supported in the housing 1, subject to the action of a spring 16 and carrying a control pin 17. In addition, a leaf spring 18 is so supported that it is resilient in different planes. The leaf spring 18 includes, a locking lug 18a which is arranged to co-operate with a locking hook 19 provided on the section 5, an oblique surface 18b defining a notch 18c and a lug 18d which has an under surface which slopes upward towards its free end, and is arranged near the notch 18c. In the position shown, the control pin 17 of the push-button 15 is engaged in the notch 18c. The locking lug 18a is, therefore, pivoted out of the range of movement of the locking hook 19. The section 5 can, therefore, be actuated freely in the manner already described. In order to lock the slider 5 in the closed position the push-button 15 is actuated in the direction of the arrow 20. The pin 17 is, therefore, moved beyond the free end of the lug 18d and the spring 18 is pivoted by the spring 21 until the end of the lug 18d lies in line with the pin 17. When the button 15 is released, the pin 17 slides under the surface of the lug 18d urging the spring 18 upwards, so disengaging the pin 17 and permitting it to return to its initial position under the action of the spring 16 in the opposite direction to the arrow 20. The spring 18 is, therefore, released and urged in an anti-clockwise direction by the spring 21 so that the locking lug 18a comes within the range of the locking hook 19 on the section 5. If the section 5 is now moved in the direction of the arrow 6, it is locked in the closed position by the locking hook 19 and the locking lug 18a. To open the

camera 1, the button 15 is actuated again in the direction of the arrow 20. The pin 17 slides over the oblique surface 18b and forces the spring clockwise (as shown in Figure 3) out of the path of the locking hook 19 and finally re-engages the notch 18c. The position shown in Figure 3 is thus reached again.

Other forms of camera which, for the sake of simplicity, are not shown in the drawings are also possible. Thus, in particular, suitable known locking means can be used for the section 5. The section 5 may have excisions which in the open position uncover the view-finder objective 2 and/or indicating means provided elsewhere, for example. It could also co-operate with a locking means for a camera release member and be of a different, suitable, shape.

It is of particular significance that the slider 5 should form an extension of the camera housing 1 in the position in which the housing is uncovered, so that the camera which is otherwise very small and can easily be placed in the pocket fits conveniently into the hand during exposure, thus reducing the risk of camera shake inherent in small cameras.

WHAT WE CLAIM IS:—

1. A camera which comprises a camera housing and a control member which is slidably mounted on the housing and moveable between a closed position, in which it covers certain components of the camera, and an open position in which the said components are uncovered, the control member being arranged during movement between the said positions to carry out film transport and/or tensioning of the camera shutter, and there is provided resilient means tending to urge the control member into the open position.

2. A camera as claimed in claim 1, wherein the control member is arranged, in the closed position, to cover the objective lens and the camera viewfinder.

3. A camera as claimed in claim 1 or claim 2, wherein there is provided locking means arranged, in a first position to retain the control member in the closed position and in a second position to permit movement of the control member between the open and closed positions and there is provided means for moving the locking means between the said first and second positions.

4. A camera as claimed in claim 3, wherein the locking means comprises a resilient member having a first projection arranged in the first position of the locking means to engage a projection on the control member and a second projection arranged, on distortion of the resilient member, to be brought into or out of engagement with a projection on the camera to bring the first



section 5 is urged back into its extended position by the spring 7, as described above.

If the section 5 is to be locked in the closed position in which it protects the camera, however, the push-button 9 is pushed in the direction of the arrow 13 so that the spring end 11a locks behind the projection 1a. The spring arm 11b, therefore, moves upwards so that the oblique surface 11c comes within the range of the locking hook 11b. If the section 5 is now pushed in the direction of the arrow 6 into the position in which it closes the camera, the oblique surface 12a slides resiliently over the oblique surface 11c so that the locking hook 12b engages the oblique surface 11c and locks the section 5 in the closed position. To open the camera 1, the push-button 9 is pressed downwards and in the opposite direction to the arrow 13 into the position shown in the Figures 1 and 2, so that the spring end 11a comes to rest in engagement with the projection 1a in the position already described.

A second form of locking means is shown in Figure 3 of the accompanying drawings. In this case there is a push-button 15 supported in the housing 1, subject to the action of a spring 16 and carrying a control pin 17. In addition, a leaf spring 18 is so supported that it is resilient in different planes. The leaf spring 18 includes, a locking lug 18a which is arranged to co-operate with a locking hook 19 provided on the section 5, an oblique surface 18b defining a notch 18c and a lug 18d which has an under surface which slopes upward towards its free end, and is arranged near the notch 18c. In the position shown, the control pin 17 of the push-button 15 is engaged in the notch 18c. The locking lug 18a is, therefore, pivoted out of the range of movement of the locking hook 19. The section 5 can, therefore, be actuated freely in the manner already described. In order to lock the slider 5 in the closed position the push-button 15 is actuated in the direction of the arrow 20. The pin 17 is, therefore, moved beyond the free end of the lug 18d and the spring 18 is pivoted by the spring 21 until the end of the lug 18d lies in line with the pin 17. When the button 15 is released, the pin 17 slides under the surface of the lug 18d urging the spring 18 upwards, so disengaging the pin 17 and permitting it to return to its initial position under the action of the spring 16 in the opposite direction to the arrow 20. The spring 18 is, therefore, released and urged in an anti-clockwise direction by the spring 21 so that the locking lug 18a comes within the range of the locking hook 19 on the section 5. If the section 5 is now moved in the direction of the arrow 6, it is locked in the closed position by the locking hook 19 and the locking lug 18a. To open the

camera 1, the button 15 is actuated again in the direction of the arrow 20. The pin 17 slides over the oblique surface 18b and forces the spring clockwise (as shown in Figure 3) out of the path of the locking hook 19 and finally re-engages the notch 18c. The position shown in Figure 3 is thus reached again.

Other forms of camera which, for the sake of simplicity, are not shown in the drawings are also possible. Thus, in particular, suitable known locking means can be used for the section 5. The section 5 may have excisions which in the open position uncover the view-finder objective 2 and/or indicating means provided elsewhere, for example. It could also co-operate with a locking means for a camera release member and be of a different, suitable, shape.

It is of particular significance that the slider 5 should form an extension of the camera housing 1 in the position in which the housing is uncovered, so that the camera which is otherwise very small and can easily be placed in the pocket fits conveniently into the hand during exposure, thus reducing the risk of camera shake inherent in small cameras.

WHAT WE CLAIM IS:—

1. A camera which comprises a camera housing and a control member which is slidably mounted on the housing and moveable between a closed position, in which it covers certain components of the camera, and an open position in which the said components are uncovered, the control member being arranged during movement between the said positions to carry out film transport and/or tensioning of the camera shutter, and there is provided resilient means tending to urge the control member into the open position.

2. A camera as claimed in claim 1, wherein the control member is arranged, in the closed position, to cover the objective lens and the camera viewfinder.

3. A camera as claimed in claim 1 or claim 2, wherein there is provided locking means arranged, in a first position to retain the control member in the closed position and in a second position to permit movement of the control member between the open and closed positions and there is provided means for moving the locking means between the said first and second positions.

4. A camera as claimed in claim 3, wherein the locking means comprises a resilient member having a first projection arranged in the first position of the locking means to engage a projection on the control member and a second projection arranged, on distortion of the resilient member, to be brought into or out of engagement with a projection on the camera to bring the first

projection into or out of the range of movement of the projection on the control member.

5 5. A camera as claimed in claim 4, wherein, when the resilient member is in a relaxed position, the second projection is not engaged with the projection on the housing and the first projection lies within the range of movement of the projection on the control member and distortion of the resilient member is arranged to bring the second projection into engagement with the projection on the housing and to move the first projection out of the range of movement of the projection on the control member.

15 6. A camera as claimed in claim 4 or claim 5, wherein there is provided a push-button for moving the resilient member between relaxed and distorted positions.

20 7. A camera as claimed in claim 3, wherein the locking means comprises a pivotally mounted resilient member, and there is provided an operating member carrying a control pin for pivoting the pivotally mounted member into and out of the range of movement of a locking projection on the control member.

25 8. A camera as claimed in claim 7, wherein the pivotally mounted member includes an angled surface arranged so to co-operate with the control pin that movement of the control pin over the angled surface in one direction urges the pivotally

mounted member out of the range of movement of the locking extension and there is provided on the pivotally mounted member, a notch arranged so to engage the control pin that the pivotally mounted member is held out of the range of movement of the locking extension. 35

40 9. A camera as claimed in claim 8, wherein the pivotally mounted member includes a further angled surface and resilient means tending so to urge it into the range of movement of the locking extension that when the control pin is moved out of engagement with the notch in the said one direction the resilient means urges the further angled surface over the control pin to release the pivotally mounted member and there is provided further resilient means arranged to urge the control pin into its rest position. 45

50 10. A camera as claimed in any one of claims 1 to 9, wherein the control member conforms in shape to the camera housing and is arranged to supplement the housing in the open position. 55

60 11. A camera substantially as herein-before described with reference to, and as shown in, Figures 1 and 2 or Figure 3 of the accompanying drawings.

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