

PATENT SPECIFICATION

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(54) CAMERA FOR USE WITH DETACHABLE FLASH APPARATUS

(71) We, AGFA-GEVAERT AKTIENGESellschaft, a body corporate recognised under German Law, 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 a camera for use with a detachable flash apparatus which can be ignited by means of an impact

It has previously been proposed in a camera of this type, to drive a lever by way of a drive member acting on an oblique surface provided on the lever, towards the ignition device of a flash apparatus which is fitted onto the camera, against the force of a spring. A disadvantage of this camera is that the operating member of the lever remains projecting out of the camera housing after the drive member has run down and further means are necessary to return the lever to the initial position.

It is an object of the invention to create a camera of the type outlined above which will be simply and reliably constructed, avoiding the above-mentioned disadvantages.

The invention provides a camera for use with detachable flash apparatus that includes an impact member and an ignition device so arranged that the flash is operated when the impact member strikes the ignition device, which camera includes a release member arranged to move from an initial position to a release position in which it is arranged, when a flash apparatus is attached, to release the impact member to produce ignition, resilient means tending to urge the release member away from the release position, a drive member arranged to drive the release member from the initial position to the release position to release the impact member and a control member arranged to free the release member from

the action of the drive member after the release member has reached the release position so that the release member is returned to the initial position under the action of the resilient means.

This has the advantage that the release member only protrudes briefly from the camera and is then immediately returned to the initial position.

Advantageously, the release member is pivotally mounted and the control member is pivotally mounted on the release member, the drive member being arranged so to engage the control member and the control member being so coupled to the release member that the drive member drives the release member towards the release position and after the release member has reached the release position the control member is so pivoted that the drive member is disengaged. In this way the movement of the release lever is controlled in a particularly simple manner.

Advantageously, there is provided a stop on the release member so arranged that when the release member has reached the release position the control member is brought into engagement with the stop so that the control member is pivoted out of engagement with the drive member. Preferably, the spindle about which the release member is arranged to pivot is arranged to act as the stop for the control member.

Advantageously, there is provided further resilient means tending so to urge the control member that the control member is held in engagement with the drive member until the control member is brought into engagement with the stop. Preferably, the further resilient means is arranged so to couple the release member and the control member that the control member is urged towards the stop. Advantageously, also, the further resilient means is arranged, during the return of the release member to the

initial position, to urge the control member towards the drive member so that when all the members are returned to their initial positions the control member re-engages the drive member.

According to another advantageous development, there is provided a member fixed in the camera and so shaped that when, during pivoting of the release member, the control member is brought into contact with the fixed member the control member is pivoted out of engagement with the drive member.

Advantageously, there is provided locking means for the control member so arranged that, when the flash apparatus is detached, the control member is held out of engagement with the drive member and when the flash apparatus is attached the control member is brought into engagement with the drive member so that the release member can be driven to release the impact member.

In an advantageous manner there is provided a further member arranged, when a flash apparatus is attached, to determine the position of the impact member and to operate means for indicating whether the impact member has been released previously. In this way an indication is given to the camera user that the flash bulb is the ready-for-use position is burnt out and a new bulb should be made ready for use.

Preferably, there is provided a member for positioning the further member and third resilient means tending to pivot the further member to engage the impact member to determine the position of the impact member, the arrangement being such that when the flash apparatus is detached the positioning member holds the further member in an inoperative position and when the flash apparatus is attached the positioning member releases the further member to determine the position of the impact member.

Advantageously, there is provided releasable locking means for the drive member so arranged that when the drive member is returned to its initial position it is retained by the locking means until released to initiate a release operation.

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

Figure 1 is a view of a part of a first form of camera,

Figures 2 to 4 are views of one part of a modified form of the first form of camera shown in Fig. 1 showing different operative positions, and

Figure 5 is a view of part of a second form of camera.

For clarity, in the camera shown in

Figures 1 to 4 components having the same function are given the same reference numerals. In a camera housing 1 a release lever 3 is pivotably arranged about a pin 2 fixed to the camera and a spring 4 engages the lever 3. One arm 5 of the release lever 3 is arranged to operate an impact member 6 of a flash-bulb 7 of a flash-cube 8 which is in the flash-ready position. A retaining pin for the impact member 6 is indicated by 9. Each of the flash-bulbs 7 in the flash-cube 8 has such an impact member. A control lever 12 is pivotably arranged about a pin 11 arranged near the end of the other arm 10 of the release lever 3. The control lever 12 has an angled arm 13 for which the spindle 2 of the release lever 3 acts as a stop. The release lever 3 and the control lever 12 are non-positively interconnected with one another by means of a hairpin spring 14. The reference 15 indicates a locking lever which is pivotable about a spindle 16. The locking lever 15 is linked to an actuating member 17 which is movably arranged in the direction of attachment of the flash-cube 8 in the socket for the flash-cube. A spring which acts on the actuating member 17 is indicated by 18.

Near the free end of the control lever 12 is a lever 19 which is in the form of a drive member and is pivotable about a spindle 20 arranged normally to the pivoting axis of the release lever 2. The reference 21 indicates an extension of the drive lever 19 which co-operates with a corresponding recess in the control lever 12.

The drive lever 19 is held in its initial position by means of a lever 22 which is subject to the action of a spring 23. In a manner which is not shown, a spring engages with the drive lever 19. The lever 22 can be pivoted by an actuating handle 24.

Against the side of the extension 21 furthest from the control lever 12 there rests the extension 25 of a shutter opening blade 26. The shutter opening blade covers a shutter aperture 27. The reference 28 indicates a spring which engages with the opening blade 26 and presses the opening blade against the extension 21 of the drive lever 19. A closing blade which is subject to the action of a spring 30 is indicated by 29. A retarding mechanism 31 is connected with the closing blade 29.

The method of operation is as follows:

Referring to Figure 1, a flash-cube 8 is fitted onto the camera. The actuating member 17 has been pressed downwards and therefore the locking lever 15 with its extension 32 has been pivoted out of contact with the control lever 12. The control lever 12 rests with its free end against the extension of the drive lever 19. If the actuating handle 24 is now pressed in the direction of the arrow A, the lever 22 is pivoted and the

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drive lever 19 released to run down. The extension 21 of the drive lever 19 carries the control lever 12 along with it in the direction of the arrow B. At the same time, the release lever 3 is pivoted in the direction of the arrow C against the force of the spring 4. During the movement of the control lever 12 in the direction of the arrow B and during the pivoting of the release lever 3 in the direction of the arrow C, the arm 13 of the control lever 12 moves towards the spindle 2. This stop is adjustable so that the drive path of the release lever 3 can be adjusted.

During the pivoting of the drive lever 19, the shutter opening blade 26 follows the movement of the extension 21 under the influence of its spring 28.

Referring to Fig. 2, the control lever 12 has been moved so far from the position corresponding to that shown in Fig. 1, in the direction of the arrow B, and the release lever 3 has been pivoted so far in the direction of the arrow C, that the arm 13 has almost come into contact with the spindle 2.

If the extension 21 of the drive lever 19 is now moved further in the direction of the arrow B, as shown Fig. 3, the control lever 12 engages the spindle 2 and so is pivoted together with the release lever 3 in the direction of the arrow C about the spindle 2. The arm 5 of the release lever 3 lifts the impact member 6 above the retaining pin 9. The impact member 6 therefore strikes the ignition device of the flash-lamp 7. The extension 21 of the drive lever 19 is situated in the liberating position for the control lever 12.

After the control lever 12 has been released by the extension 21 of the drive lever 19, the release lever 3 returns into its initial position in the opposite direction to the arrow C under the action of its spring 4. The control lever 12 is thereby carried along with the release lever 3 in the opposite direction of the arrow B. The spring 14 has the effect that the control lever 12 is pressed against the extension 21 of the drive lever 19 from below.

After a predetermined delay time, the closing blade 29 is released to run down. If the drive lever 19, after completion of an exposure, is now moved in a manner which is not shown in the opposite direction to the arrow B, it carries the shutter opening blade 26 along with it into its initial position, and in addition the extension 21 engages in the recess of the control lever 12. In its initial position, the drive lever 19 is held by means of the lever 22.

If no flash-cube has been fitted onto the camera 1, the extension 32 of the locking lever 15 is pivoted downwards to such an extent that the control lever 12 is disengaged from the extension 21 of the drive lever 19.

Referring to the second form of camera as

shown in Fig. 5, in a camera housing 50 a release lever 51 is pivotably arranged about the spindle 52. A Spring 53 engages with the release lever 51. Pivotably arranged about a spindle 54 on the release lever 51 is a control lever 55, one arm of which is indicated by 56. Both the release lever 51 and the control lever 55 are subject to the action of a hairpin spring 57. An extension of a drive lever 59 is indicated by 58. The drive lever 59 is held in its initial position by means of a pawl 60. The reference 61 indicates a spring which engages with the pawl 60. A locking lever 62, which is pivotable about a spindle 63, is subject to the action of a spring 64. On one of the ends of the locking lever 62 an extension 65 is provided which holds the control lever 55 in the position shown, so that the drive lever 59 is not in engagement with the control lever 55. The other end of the locking lever 62 is in contact with a positioning lever 66 which is subject to the action of a spring 67. The positioning lever 66 is connected to an actuating member 67 which is arranged in the socket for a flash-cube 68. A spring 69 engages with the actuating member 67. The free end of the positioning lever 66 rests against an extension of a feeler lever 70 which is pivotable about a pin 71 fixed to the camera. A spring which engages with the feeler lever 70 is indicated by 72. The free end of the feeler lever 70 passes through an opening in the camera housing 50.

An impact member for a flash-bulb 73 is indicated by 77. A retaining pin 74 holds the striker member 77 in its initial position.

The method of operation is as follows:

If no flash-cube has been inserted into the socket of the camera 4, the individual levers assume the positions shown in Fig. 5. After the release of the drive lever 59 there is no effect on the levers 55 to 70.

If a flash-cube 68 is now inserted into the camera socket, the positioning lever 66 is pivoted in the direction of the arrow D. The feeler lever 70 can thus rotate in the direction of the arrow E under the influence of the spring 72, and determine the position of the impact member 77 of the flash-bulb 73 which is situated in the flash-ready position, then with its arm 75 move the lever 76 in order to pivot a signal tab into the viewfinder. The movement of the feeler lever 70 is greater if the latter does not come into contact with the impact member 77 in the event that the flash-lamp is burnt out.

In addition, the positioning lever 66 causes the locking lever 62 to pivot in the direction of the arrow F. The control lever 55 consequently rotates in the direction of the arrow G and thus comes within reach of the extension 58 of the drive lever 59.

If the lever 60 is now moved in the direction of the arrow G', the drive lever 59,

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after its release, carries the control lever 55 along with it as it runs down. The remaining operations occur as described for the first form of camera shown in Figs. 1 to 4. After a given amount of rotation of the release lever 51, the release lever comes into contact with the feeler lever 70, which is carried along with the release lever whilst rotating further in the direction of movement E to release the impact member 77. The ignition of the 'lash-bulb 73 then takes place.

WHAT WE CLAIM IS:—

1. A camera for use with detachable flash apparatus that includes an impact member and an ignition device so arranged that the flash is operated when the impact member strikes the ignition device, which camera includes a release member arranged to move from an initial position to a release position in which it is arranged, when a flash apparatus is attached, to release the impact member to produce ignition, resilient means tending to urge the release member away from the release position, a drive member arranged to drive the release member from the initial position to the release position to release the impact member and a control member arranged to free the release member from the action of the drive member after the release member has reached the release position so that the release member is returned to the initial position under the action of the resilient means.

2. A camera as claimed in claim 1, wherein the release member is pivotably mounted and the control member is pivotally mounted on the release member, the drive member being arranged so to engage the control member and the control member being so coupled to the release member that the drive member drives the release member towards the release position and after the release member has reached the release position the control member is so pivoted that the drive member is disengaged.

3. A camera as claimed in claim 2, wherein there is provided a stop on the release member so arranged that when the release member has reached the release position the control member is brought into engagement with the stop so that the control member is pivoted out of engagement with the drive member.

4. A camera as claimed in claim 3, wherein there is provided further resilient means tending so to urge the control member that the control member is held in engagement with the drive member until the control member is brought into engagement with the stop.

5. A camera as claimed in claim 4, wherein the further resilient means is arranged so to couple the release member

and the control member that the control member is urged towards the stop.

6. A camera as claimed in any one of claims 3 to 5, wherein the spindle about which the release member is arranged to pivot is arranged to act as the stop for the control member.

7. A camera as claimed in any one of claims 4 to 6, wherein the further resilient means is arranged, during the return of the release member to the initial position, to urge the control member towards the drive member so that when all the members are returned to their initial positions the control member re-engages the drive member.

8. A camera as claimed in claim 2, wherein there is provided a member fixed in the camera and so shaped that when, during pivoting of the release member, the control member is brought into contact with the fixed member the control member is pivoted out of engagement with the drive member.

9. A camera as claimed in anyone of claims 1 to 8, wherein the drive member is pivotable about an axis normal to the direction of the axis of rotation of the release member.

10. A camera as claimed in any one of claims 1 to 9, wherein there is provided locking means for the control member so arranged that, when the flash apparatus is detached, the control member is held out of engagement with the drive member and when the flash apparatus is attached the control member is brought into engagement with the drive member so that the release member can be driven to the release position to release the impact member.

11. A camera as claimed in anyone of claims 1 to 10, wherein there is provided a further member arranged, when a flash apparatus is attached, to determine the position of the impact member and to operate means for indicating whether the impact member has been released previously.

12. A camera as claimed in claim 11, wherein there is provided a member for positioning the further member and third resilient means tending to pivot the further member to engage the impact member to determine the position of the impact member, the arrangement being such that when the flash apparatus is detached the positioning member holds the further member in an inoperative position and when the flash apparatus is attached the positioning member releases the further member to determine the position of the impact member.

13. A camera as claimed in claim 11 or claim 12, wherein the release member is arranged to drive the further member to release the impact member.

14. A camera as claimed in anyone of

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after its release, carries the control lever 55 along with it as it runs down. The remaining operations occur as described for the first form of camera shown in Figs. 1 to 4. After a given amount of rotation of the release lever 51, the release lever comes into contact with the feeler lever 70, which is carried along with the release lever whilst rotating further in the direction of movement E to release the impact member 77. The ignition of the flash-bulb 73 then takes place.

WHAT WE CLAIM IS:—

1. A camera for use with detachable flash apparatus that includes an impact member and an ignition device so arranged that the flash is operated when the impact member strikes the ignition device, which camera includes a release member arranged to move from an initial position to a release position in which it is arranged, when a flash apparatus is attached, to release the impact member to produce ignition, resilient means tending to urge the release member away from the release position, a drive member arranged to drive the release member from the initial position to the release position to release the impact member and a control member arranged to free the release member from the action of the drive member after the release member has reached the release position so that the release member is returned to the initial position under the action of the resilient means.

2. A camera as claimed in claim 1, wherein the release member is pivotally mounted and the control member is pivotally mounted on the release member, the drive member being arranged so to engage the control member and the control member being so coupled to the release member that the drive member drives the release member towards the release position and after the release member has reached the release position the control member is so pivoted that the drive member is disengaged.

3. A camera as claimed in claim 2, wherein there is provided a stop on the release member so arranged that when the release member has reached the release position the control member is brought into engagement with the stop so that the control member is pivoted out of engagement with the drive member.

4. A camera as claimed in claim 3, wherein there is provided further resilient means tending so to urge the control member that the control member is held in engagement with the drive member until the control member is brought into engagement with the stop.

5. A camera as claimed in claim 4, wherein the further resilient means is arranged so to couple the release member

and the control member that the control member is urged towards the stop.

6. A camera as claimed in any one of claims 3 to 5, wherein the spindle about which the release member is arranged to pivot is arranged to act as the stop for the control member.

7. A camera as claimed in any one of claims 4 to 6, wherein the further resilient means is arranged, during the return of the release member to the initial position, to urge the control member towards the drive member so that when all the members are returned to their initial positions the control member re-engages the drive member.

8. A camera as claimed in claim 2, wherein there is provided a member fixed in the camera and so shaped that when, during pivoting of the release member, the control member is brought into contact with the fixed member the control member is pivoted out of engagement with the drive member.

9. A camera as claimed in anyone of claims 1 to 8, wherein the drive member is pivotable about an axis normal to the direction of the axis of rotation of the release member.

10. A camera as claimed in any one of claims 1 to 9, wherein there is provided locking means for the control member so arranged that, when the flash apparatus is detached, the control member is held out of engagement with the drive member and when the flash apparatus is attached the control member is brought into engagement with the drive member so that the release member can be driven to the release position to release the impact member.

11. A camera as claimed in anyone of claims 1 to 10, wherein there is provided a further member arranged, when a flash apparatus is attached, to determine the position of the impact member and to operate means for indicating whether the impact member has been released previously.

12. A camera as claimed in claim 11, wherein there is provided a member for positioning the further member and third resilient means tending to pivot the further member to engage the impact member to determine the position of the impact member, the arrangement being such that when the flash apparatus is detached the positioning member holds the further member in an inoperative position and when the flash apparatus is attached the positioning member releases the further member to determine the position of the impact member.

13. A camera as claimed in claim 11 or claim 12, wherein the release member is arranged to drive the further member to release the impact member.

14. A camera as claimed in anyone of



claims 1 to 13, wherein there is provided releaseable locking means for the drive member so arranged that when the drive member is returned to its initial position it is retained by the locking means until released to initiate a release operation.

15. A camera as claimed in any one of claims 1 to 14, wherein during a release operation the drive member is arranged to operate shutter-release means to initiate exposure.

16. A camera substantially as hereinbefore described with reference to, and as shown in, Figs. 1 to 4 of the accompanying drawings.

17. A camera substantially as herein-

before described with reference to, and as shown in, Fig. 5 of the accompanying drawings.

18. A camera as claimed in any one of claims 1 to 17, wherein a detachable flash apparatus, that includes an impact member and an ignition device so arranged that the flash is operated when the impact member strikes the ignition device, is attached to the camera.

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