

PATENT SPECIFICATION

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(54) PHOTOGRAPHIC CAMERA

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America of 343 State Street, Rochester, New York 14650, United States of America 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:—

This invention relates to photographic cameras, and more particularly to apparatus operatively associated with a photographic shutter for preventing a film exposure during preparation for a picture-taking operation.

In photographic cameras which features a single apertured shutter blade, measures may have to be taken to cover the exposure aperture during return movement of the shutter blade, when such movement is necessary in order to cock the shutter to prepare for a subsequent exposure.

An object of the present invention is the provision of a camera having an improved light shielding mechanism for shielding the film from light during camera preparation for a picture-taking operation.

In accordance with the present invention, there is provided a camera having an exposure aperture, a shutter movable along a path relative to the exposure aperture for permitting light to pass through the exposure aperture to a film exposure plane, a diaphragm movable for setting the effective size of the exposure aperture, and a reset member actuable for effecting return movement of the shutter, the reset member including means associated with the diaphragm for positioning at least part of the diaphragm in an exposure aperture light blocking position during the return movement of the shutter.

The invention will be described further, by way of example, with reference to the accompanying drawing, in which:

Fig. 1 is a diagrammatic cross-section of a

camera having a pair of movable diaphragm control blades, a shutter blade (shown in its released position), and a camera reset member;

Fig. 2 is a view, similar to Fig. 1, showing relative positions of the reset member, the diaphragm control blades, and shutter on commencement of a shutter cocking operation; and

Fig. 3 is a top view, part broken away, of the camera illustrating a film cartridge loaded in the camera and positioned relative to the diaphragm blades and the shutter.

As photographic cameras are well known, the present description will be directed in particular to elements forming part of, or cooperating more directly with, apparatus in accordance with the present invention. It is to be understood that camera elements not specifically shown or described may take various forms well known to those having skill in the art.

There is shown, in the drawing, a camera 10 having an exposure aperture 11 and a housing 12 in which is included a shutter blade 14 having an aperture or opening 16 cut therefrom. As viewed in Fig. 3, shutter blade 14 is disposed between a mounting plate 18 and a received film cartridge 20 and is mounted for slidable movement between spaced guides 22, 24, which are fixedly mounted on the mounting plate, between a shutter released position shown in Figs. 1 and 2 and a shutter cocked position shown by the partial dashed lines 14a in Fig. 2.

Shutter blade 14 is biased in the direction of arrow A by a tension spring 26, one end of which is hooked to the mounting plate 18 and the other end of which is hooked to the left edge of the shutter blade as viewed in Figs. 1 and 2 by suitable means such as a post or stud 28 secured thereto. Shutter blade 14 is releasably retained in its cocked position against the bias of spring 26 by a releasable engaging means 30 which is biased in the counterclockwise direction as viewed in Figs. 1 and 2 by means of a tensioned torsion spring 32 wound around a post 33. In its

cocked position, a catch member 34 which is integral with one end of a L-shaped lever 36 engages a tab 38 formed from the top right hand edge of shutter 14 so as to extend perpendicularly therefrom as is most clearly seen in Fig. 3. Mounted on the opposite end of lever 36 externally of housing 12 so as to be accessible to a camera operator is a shutter release member 40, actuation of which under operator finger pressure causes lever 36 to pivot in a clockwise direction about post 33 disengaging catch member 34 from tab 38. When this condition occurs, shutter blade 14 moves under the influence of tension spring 26 from its cocked position to its released position wherein a projection or a finger member 42 which depends from the lower edge of the blade in the plane thereof engages guide 22. By virtue of its location relative to exposure aperture 11, shutter blade aperture 16 crosses the exposure aperture as the shutter blade runs down in the direction of arrow A to expose film F which is located at a film exposure plane 43, between a film supply chamber 44 and a film take-up chamber 46 of cartridge 20.

A pair of opaque diaphragm blades 46, 48 are positioned on the front side of mounting plate 18 as viewed in the drawing for slidable movement relative to each other. Diaphragm blades 46, 48 are respectively provided with diamond-shaped apertures 46a, 46b and 48a, 48b which cooperatively form a lens diaphragm aperture 50 in registry with exposure aperture 11 and a photocell aperture 52 in alignment with photocell 54. Since the amount to which the diaphragm blades can overlap each other is variable, the lens diaphragm aperture and the photocell aperture are variable, both apertures being photoelectrically controlled by suitable means such as a linkage mechanism (not shown) coupling the diaphragm blades to each other and responsive to the light intensity level as monitored by the output of photocell 54. Mechanisms of this type are well known in the art and for that reason descriptive details are not included herein.

Diaphragm blades 46, 48 are both mounted for horizontal movement as viewed in Figs. 1 and 2, diaphragm blade 48, like shutter 14, being mounted for movement between spaced guides 22, 24 which project on each side of the plate 18, and diaphragm blade 46 being resiliently urged into contact with a pair of spaced bearings 55, 56 by bias means such as a light-force spring 57 shown diagrammatically in Figs. 1 and 2. For a reason made apparent hereinafter this latter arrangement permits diaphragm 46 to be pivoted in its own plane with the bearing 56 serving as a pivoting point or fulcrum.

A triangular-shaped projection or cam follower 58 depends from the lower left front edge of diaphragm blade 46 in the plane thereof. Diaphragm blades 46, 48 are moved horizontally over a sufficiently restricted range so that follower 58 does not engage either of bearing 55, 56 so as to interfere or obstruct such movement.

A shutter reset member 59 is mounted for slidable movement along an operational path in the direction of arrow B for rendering camera 10 ready for a picture-taking operation by cocking shutter blade 14. Reset member 59 is disposed beneath and in the plane of both shutter blade 14 and diaphragm blade 46 and includes a knurled button portion 60 at one end thereof located at the exterior of housing 12 so as to be accessible to the camera operator and an elongated finger portion 61 at the other end located so as to engage the left edge of finger member 42 to effect shutter cocking movement. The central portion of reset member 59 includes a raised cam portion 62 having inclined end portions or cam surfaces 63, 64, the cam portion being located so that cam surface 64 abuttingly engages follower 58 at the commencement of shutter cocking movement.

The camera shutter is cocked for a picture-taking operation as follows: Starting from an initial position shown in Fig. 1 shutter reset member 59 is actuated under operator control in the direction of arrow B (Fig. 2). As this occurs, cam follower 58 rides up cam surface 64, thereby pivoting diaphragm blade 46 in the counterclockwise direction such that aperture 46a is caused to no longer overlap exposure aperture 11. In this position, shown in Fig. 2, blade 46 completely overlaps exposure aperture 11 and the latter is sealed or shielded from light. Once exposure aperture 11 is shielded from light, further movement of reset member 59 in the direction of arrow B causes finger member 61 to engage projection 42, and thereby to urge shutter blade 14 toward its cocked position. During this cocking movement, shutter blade aperture 16 crosses exposure aperture 11, without however being able to give rise to any film exposure as diaphragm blade 46 due to the influence of cam portion 62 shields the exposure aperture from light. On completion of the shutter cocking movement, catch member 34 snaps into engagement with detent 38 and shutter 14 is releasably retained in its cocked position, wherein the blade is tensioned for return movement by means of spring 26.

Once shutter blade 14 is cocked, reset member 59 is returned to its initial position in the direction of arrow A. As this occurs, diaphragm blade 46 is returned in the clockwise direction under the influence of spring

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57 to its light regulating position one cam 62 clears follower 58. When this happens, camera 10 is set for a film exposure operation.

- 5 Owing to the advantageous use of diaphragm blade 46 as a light shield during shutter cocking movement, the apparatus constituting the present invention is rendered economical in respect to cost and
10 internal camera space.

The invention has been described in detail with particular reference to a preferred embodiment thereof but it will be understood that variations and modifications
15 can be effected within the scope of the invention as defined in the appended claims.

WHAT WE CLAIM IS:—

1. A camera having an exposure aperture, a shutter movable along a path relative to the exposure aperture for permitting light to pass through the exposure aperture to film exposure plane, a diaphragm movable for setting the effective size of the exposure aperture, and a reset member actuable for effecting return movement of the shutter, the reset member including means associated with the diaphragm for positioning at least part of the diaphragm in an exposure aperture light blocking position during the return movement of the shutter.
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2. A camera as claimed in Claim 1 further including means responsive to light for determining scene light intensity, and means for adjusting the diaphragm to select the effective exposure aperture size in accordance with the scene light intensity.
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3. A camera as claimed in Claim 1 or 2 wherein the path of the shutter extends between a cocked position and a released position and the shutter is returnable by the reset member to the cocked position.
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4. A camera as claimed in Claim 1, 2 or 3 wherein the diaphragm comprises a plurality of blade members cooperatively coupled for setting the effective size of the exposure aperture.
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5. A camera as claimed in Claim 4

wherein the reset member includes means coupling it to at least one of the blade members to position the at least one blade member in an exposure aperture capping position during the return movement of the shutter.
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6. A camera as claimed in Claim 5 wherein the at least one blade member is mounted for movement along a first path adjustably to vary the effective exposure aperture size and for movement along a second path transverse to the first path to cap the exposure aperture.
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7. A camera as claimed in Claim 5 or 6 wherein the at least one blade member includes means located within an operational path of movement of the reset member for urging the at least one blade member transverse to the operational path into a position overlapping the exposure aperture whereby the exposure aperture is shielded from light during movement of the reset member to effect return of the shutter.
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8. A camera as claimed in Claim 7 wherein the reset member includes means defining a cam member, and the at least one blade member urging means includes a cam follower responsive to the cam member defining means for urging the at least one blade member into the exposure aperture overlapping position.
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9. A camera as claimed in Claim 8 wherein the reset member further includes a projection member adapted to engage the shutter, the projection member and the cam member defining means being located and arranged relative to each other such that the at least one blade member is moved into the exposure aperture capping position prior to commencement of return movement of the shutter.
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10. A camera substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.
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20 exposure aperture for permitting light to pass through the exposure aperture to film exposure plane, a diaphragm movable for setting the effective size of the exposure aperture, and a reset member actuable for
25 effecting return movement of the shutter, the reset member including means associated with the diaphragm for positioning at least part of the diaphragm in an exposure aperture light blocking position during the return movement of the shutter.
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2. A camera as claimed in Claim 1 further including means responsive to light for determining scene light intensity, and means for adjusting the diaphragm to select the
35 effective exposure aperture size in accordance with the scene light intensity.

3. A camera as claimed in Claim 1 or 2 wherein the path of the shutter extends between a cocked position and a released
40 position and the shutter is returnable by the reset member to the cocked position.

4. A camera as claimed in Claim 1, 2 or 3 wherein the diaphragm comprises a plurality of blade members cooperatively coupled for
45 setting the effective size of the exposure aperture.

5. A camera as claimed in Claim 4

wherein the reset member includes means coupling it to at least one of the blade members to position the at least one blade member in an exposure aperture capping
50 position during the return movement of the shutter.

6. A camera as claimed in Claim 5 wherein the at least one blade member is mounted for movement along a first path
55 adjustably to vary the effective exposure aperture size and for movement along a second path transverse to the first path to cap the exposure aperture.

7. A camera as claimed in Claim 5 or 6 wherein the at least one blade member includes means located within an
60 operational path of movement of the reset member for urging the at least one blade member transverse to the operational path into a position overlapping the exposure aperture whereby the exposure aperture is shielded from light during movement of the
65 reset member to effect return of the shutter.

8. A camera as claimed in Claim 7 wherein the reset member includes means defining a cam member, and the at least one
70 blade member urging means includes a cam follower responsive to the cam member defining means for urging the at least one blade member into the exposure aperture overlapping position.

9. A camera as claimed in Claim 8 wherein the reset member further includes a
80 projection member adapted to engage the shutter, the projection member and the cam member defining means being located and arranged relative to each other such that the at least one blade member is moved into the exposure aperture capping position prior to
85 commencement of return movement of the shutter.

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90 illustrated in the accompanying drawing.

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