

PATENT SPECIFICATION

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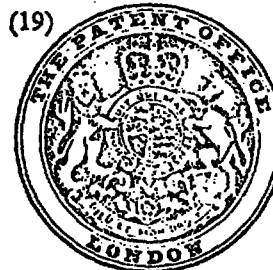
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(72) Inventor HELMUT ETTISCHER

(19)



(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 a light shielding member operatively associated with a photographic shutter for preventing the exposure aperture from being uncovered during preparation for a picture-taking operation.

In photographic cameras which feature an 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 photographic camera having an improved light shielding mechanism for shielding light from film during preparation of the camera for a picture-taking operation.

In accordance with the present invention, there is provided a photographic camera having an exposure aperture and including a release member and a shutter movable, in response to actuation of the release member, along a path operatively associated with the exposure aperture between an initial cocked position and a final released position to allow scene light to pass through the exposure aperture toward a film exposure plane, actuable means movable for preparing the camera for a picture-taking operation, means coupling the actuable means to the shutter in response to movement of the actuable means, the coupling means including means for cocking the shutter whilst shielding the exposure aperture from light during movement of the

shutter from its released position to its cocked position, and means for automatically decoupling the coupling means from the actuable means upon the shutter reaching the cocked position.

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 and a shutter reset member (shown in the lower left-hand corner);

Fig. 2 is a view similar to Fig. 1 taken along a plane spaced from that of Fig. 1, showing a shutter in its released position and its cocked position, as represented by the dashed lines, and a light shielding member in its light unblocking position;

Fig. 3 shows a top view part broken away of the camera and illustrating a film cartridge positioned relative to the diaphragm blades and the shutter;

Fig. 4 is a view, similar to Fig. 2, showing the shutter reset member, light shielding member and shutter on commencement of a shutter cocking movement; and

Fig. 5 is a view, similar to Figs. 2 and 4, showing the relative positions of the shutter reset member, light shielding member and shutter at the completion of the shutter cocking operation.

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.

As is shown in Fig. 1 of the drawing, a camera 10 having an exposure aperture 11 includes a housing 12 in which is located a pair of apertured diaphragm blades 14 and 16 mounted on the far side of a mounting plate 17 for slidable movement relative to each other between spaced guides 18 and 20 under the control of a diaphragm setting

member 22. Diaphragm blades 14 and 16 are respectively provided with apertures 14a, 14b and 16a, 16b which cooperatively form a variable size lens diaphragm aperture 23 and a photocell aperture 24 as the amount to which the diaphragm blade apertures overlap is variable. The magnitude of lens diaphragm aperture 23 is proportional to the magnitude of photocell aperture 24, both apertures being selected by the setting member 22, for example, in dependence upon the amount of light impinging on a photocell 25 positioned in alignment with the photocell aperture and which is coupled to means (not shown) such as a movable meter or the like for indicating light intensity level. The movement of the setting member 22 is transmitted to diaphragm blades 14, 16 by means of a linkage mechanism 26 comprising a lever 28 pivotally mounted on a stud 29 and having a slot 30 adapted loosely to receive a pin 32 mounted on setting member 22 and having pins 34 which locate in slots 30a and 30b in diaphragm blades 14 and 16 respectively. An apertured shutter blade 36 is positioned on the front side of mounting plate 17 as viewed in Figs. 2, 4 and 5 and, like the diaphragm blades, is mounted for slidable movement between guides 18 and 20, which project on both sides of the plate 17, between a shutter released position shown in Figs. 2, 3 and 4 and a shutter cocked position shown in Fig. 5 and in Fig. 2 by the dashed lines 36a. Shutter blade 36 is retained in its cocked position against the bias of a tension spring 38, one end of which is hooked to the interior of housing 12 and the other end of which is hooked to the shutter blade by means of an opening 39 cut therefrom, by releasable engaging means 40 comprising a pivotally mounted lever 41 which is biased in the counterclockwise direction as viewed in Fig. 2 by means of a tensioned torsion spring 42. In this position, hook portion 43, which is integral with lever 41, engages suitable means such as a detent 44 formed from the top of the shutter blade as is most clearly shown in Fig. 3. Mounted on lever 41 on the exterior of camera 10 so as to be accessible to a camera operator is a shutter release member 45, actuation of which under operator finger pressure effects movement of shutter blade 36 under the influence of tension spring 38 from its cocked position to its released position adjacent stop member 46. By virtue of its shape or configuration, shutter blade aperture 47 crosses exposure aperture 11 as the shutter blade runs down in the direction of arrow A to expose film F to scene light. As is shown in Fig. 3, film F is loaded into camera 10 and positioned at a film exposure plane by means of the well known film cartridge identified with the numeral 48. It shall be

understood that the invention is not restricted to cameras of the type known as cartridge-loading cameras or the like but that other cameras such as the type adapted to receive separate film supply and take-up spools are included within the scope of the invention.

A shutter reset member 50 is mounted for slidable movement along an operation path in the direction of arrow B and serves for rendering camera 10 ready for a picture taking operation by cocking the shutter and advancing the film. In order to carry out the shutter cocking operation, the operational path length of which remains constant, and simultaneously to advancing the film, the operational path length of which decreases as the diameter of the take-up film roll increases, with one and the same shutter reset member, measures must be taken to separate the shutter reset member 50 from the camera shutter blade 36 when the cocked position of the shutter has been reached. According to the present invention, this is done by means of an opaque member 51 located and arranged to engage shutter reset member 50 during shutter cocking movement to cock the shutter but which member 51 is disengaged from the reset member during film advance movement. Furthermore, member 51 by virtue of its configuration overlaps shutter blade aperture 47 during shutter cocking movement and by virtue of its opacity shields exposure aperture 11 from light so that film exposure does not occur during the shutter cocking operation.

In accordance with a preferred embodiment of the present invention, opaque member 51 includes a detent portion 52 projecting perpendicularly therefrom as is shown most clearly in Fig. 3 so as to extend into the plane of shutter blade 36. Depending from the bottom of member 51 is an elongate finger member 53 which is adapted to be releasably received in a socket 56, shown in Fig. 5, formed between a bevelled section 58a and an upstanding member 58b, both of which are integral with reset member 50.

Camera 10 is prepared for a picture-taking operation as follows: Starting from an initial position shown in Figs. 2 (full lines) and 4 shutter reset member 50 is actuated under operator control in the direction of arrow B (Fig. 2). Light shield 51 is moved therewith under the influence of section 58a acting on finger member 53 whereupon, first, detent portion 52 abuttingly engages the left edge of shutter blade 56 as shown in Fig. 4. In this position, light shield 51 overlaps both shutter blade aperture 47 and lens aperture 11. Further movement of reset member 50 in the direction of arrow B urges shutter blade 36 under the influence of light shield 51

towards its cocked position. During this cocking movement, which is of a fixed length, shutter blade aperture 47 crosses exposure aperture 11, without however being able to give rise to any exposure since light shield 51 overlaps the aperture 47 and shields exposure aperture 11 from light. As shutter blade 36 approaches its cocked position, incline or cam surface 60 of light shield 51 abuttingly engages fixed projection or post 61 and rides along the top thereof. When this interaction initially occurs, the top, right portion of light shield 51 engages detent 62, which is attached to shutter blade 36, so that, as further shutter cocking movement occurs, light shield 51 is pivoted in the clockwise direction and finger portion 53 thereof is removed from socket 56 and rests against the top of section 58a as viewed in Fig. 5. In this position, light shield 52 is retained between projection 61 and detent 62. On completion of shutter cocking movement light shield 51 is effectively completely disconnected for reset member 50 and shutter release member 41 snaps into engagement with shutter blade 36 by means of hook portion 43 as is also shown in Fig. 5. When in its cocked position the shutter blade is tensioned for return movement by means of spring 38.

Once the shutter is cocked, reset member 50 is free to move along the final portion of its operational path, which portion is of a length relates to the diameter of the unexposed film roll, and to engage a film advance mechanism (not shown) responsive to the film diameter, thereby to advance the film. A film advance mechanism of this kind is well known in the art, does not constitute part of the invention, and for that reason a description thereof is not included.

When shutter blade 36 has been cocked and the film advanced, reset member 50 returns to its initial position in the direction of arrow A. This may be done automatically by means of a tension spring or the like or manually under operator control. In so doing, the top horizontal portion of sector 58a clears finger member 53. The up-standing member 58b engages the member 53 moving it to the left (as seen in the drawings) thereby enabling the finger member 53 to drop, under gravity, into socket 56 under the direction of the bevelled edge of the sector. When this happens, light shield 51 is returned under the influence of reset member 50 to its initial position shown in Fig. 2 wherein the light shield no longer overlaps exposure aperture 11. Shutter blade 36 is now set for a picture-taking operation.

Owing to the advantageous use of the light shield 51 as a light and shutter control member and a coupling member between the shutter reset member and the shutter

blade, the apparatus constituting the present invention is rendered economical in respect of cost and 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 can be effected within the scope of the invention as defined in the appended claims.

WHAT WE CLAIM IS:—

1. A photographic camera having an exposure aperture and including a release member and a shutter movable, in response to actuation of the release member, along a path operatively associated with the exposure aperture between an initial cocked position and a final released position to allow scene light to pass through the exposure aperture toward a film exposure plane, actuable means movable for preparing the camera for a picture-taking operation, means coupling the actuable means to the shutter in response to movement of the actuable means, the coupling means including means for cocking the shutter whilst shielding the exposure aperture from light during movement of the shutter from its released position to its cocked position, and means for automatically decoupling the coupling means from the actuable means upon the shutter reaching the cocked position.

2. A camera as claimed in Claim 1 wherein the coupling means include an opaque body member, first and second means on the body member arranged releasably to engage the actuable means and the shutter respectively, the first and second means being located and arranged on the body member such that the actuable means and the first means cooperatively bring the body member into registry with the exposure aperture before the second means engages the shutter.

3. A camera as claimed in Claim 1 or 2 wherein the coupling means includes means for urging the shutter from the released position into the cocked position, and cooperatively engages a projection defining means during movement of the shutter toward the cocked position automatically to decouple the coupling means from the actuable means when the shutter reaches its cocked position whereby the actuable means is cleared to effect film advancement free of the coupling means.

4. A camera as claimed in Claim 3 wherein the projection defining means effects movement of the coupling means relative to the actuable means.

5. A camera as claimed in Claim 2 or Claims 2 and 3 or Claims 2, 3 and 4 wherein the actuable means includes means arranged to receive the first means during



(2)

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towards its cocked position. During this
cocking movement, which is of a fixed
length, shutter blade aperture 47 crosses
exposure aperture 11, without however
5 being able to give rise to any exposure since
light shield 51 overlaps the aperture 47 and
shields exposure aperture 11 from light. As
shutter blade 36 approaches its cocked
position, incline or cam surface 60 of light
10 shield 51 abuttingly engages fixed projection
or post 61 and rides along the top thereof.
When this interaction initially occurs, the
top, right portion of light shield 51 engages
detent 62, which is attached to shutter blade
15 36, so that, as further shutter cocking
movement occurs, light shield 51 is pivoted
in the clockwise direction and finger portion
53 thereof is removed from socket 56 and
rests against the top of section 58a as viewed
20 in Fig. 5. In this position, light shield 52 is
retained between projection 61 and detent
62. On completion of shutter cocking
movement light shield 51 is effectively
completely disconnected for reset member
25 50 and shutter release member 41 snaps into
engagement with shutter blade 36 by means
of hook portion 43 as is also shown in Fig. 5.
When in its cocked position the shutter blade
is tensioned for return movement by means
30 of spring 38.

Once the shutter is cocked, reset member
50 is free to move along the final portion of
its operational path, which portion is of
a length relates to the diameter of the
35 unexposed film roll, and to engage a film
advance mechanism (not shown) responsive
to the film diameter, thereby to advance the
film. A film advance mechanism of this kind
is well known in the art, does not constitute
40 part of the invention, and for that reason a
description thereof is not included.

When shutter blade 36 has been cocked
and the film advanced, reset member 50
returns to its initial position in the direction
45 of arrow A. This may be done automatically
by means of a tension spring or the like or
manually under operator control. In so
doing, the top horizontal portion of sector
58a clears finger member 53. The up-
50 standing member 58b engages the member
53 moving it to the left (as seen in the
drawings) thereby enabling the finger
member 53 to drop, under gravity, into
socket 56 under the direction of the bevelled
55 edge of the sector. When this happens, light
shield 51 is returned under the influence of
reset member 50 to its initial position shown
in Fig. 2 wherein the light shield no longer
overlaps exposure aperture 11. Shutter
60 blade 36 is now set for a picture-taking
operation.

Owing to the advantageous use of the
light shield 51 as a light and shutter control
65 member and a coupling member between
the shutter reset member and the shutter

blade, the apparatus constituting the present
invention is rendered economical in respect
of cost and internal camera space.

The invention has been described in detail
with particular reference to a preferred 70
embodiment thereof but it will be un-
derstood that variations and modifications
can be effected within the scope of the
invention as defined in the appended claims.

WHAT WE CLAIM IS:—

1. A photographic camera having an 75
exposure aperture and including a release
member and a shutter movable, in response
to actuation of the release member, along a
path operatively associated with the ex- 80
posure aperture between an initial cocked
position and a final released position to
allow scene light to pass through the ex-
posure aperture toward a film exposure
plane, actuable means movable for 85
preparing the camera for a picture-taking
operation, means coupling the actuable
means to the shutter in response to
movement of the actuable means, the
coupling means including means for cocking 90
the shutter whilst shielding the exposure
aperture from light during movement of the
shutter from its released position to its
cocked position, and means for
automatically decoupling the coupling 95
means from the actuable means upon the
shutter reaching the cocked position.

2. A camera as claimed in Claim 1
wherein the coupling means include an 100
opaque body member, first and second
means on the body member arranged
releasably to engage the actuable means and
the shutter respectively, the first and second
means being located and arranged on the 105
body member such that the actuable means
and the first means cooperatively bring the
body member into registry with the exposure
aperture before the second means engages
the shutter.

3. A camera as claimed in Claim 1 or 2 110
wherein the coupling means includes means
for urging the shutter from the released
position into the cocked position, and
cooperatively engages a projection defining
means during movement of the shutter 115
toward the cocked position automatically to
decouple the coupling means from the
actuable means when the shutter reaches its
cocked position whereby the actuable
means is cleared to effect film advancement 120
free of the coupling means.

4. A camera as claimed in Claim 3
wherein the projection defining means 125
effects movement of the coupling means
relative to the actuable means.

5. A camera as claimed in Claim 2 or
Claims 2 and 3 or Claims 2, 3 and 4 wherein
the actuable means includes means
arranged to receive the first means during

return movement of the actuable means to
 5 return the coupling means to an aperture
 unblocking position.

6. A camera as claimed in any preceding
 5 claim wherein the actuable means com-
 prises a reset member mounted for
 movement along an operational path to
 prepare the camera for a film exposure
 operation, the operational path having a
 10 first portion constituting shutter cocking

movement and a second portion con-
 stituting film advance movement.

7. A photographic camera substantially as
 hereinbefore described with reference to
 and as illustrated in the accompanying
 15 drawing.

L.A. TRANGMAR, B.Sc., C.P.A.,
 Agent for the Applicants.

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10 of post or advance
 When the
 15 20 25 30
 movement of the
 in the clockwise
 35 40 45 50
 reset against the
 in Fig. 5. In this
 55 60 65
 On completion of
 movement, the
 70 75 80
 50 and shutter
 engagement with
 of the piston
 When in the
 is tensioned for a
 30 of spring 38.

Once the shutter
 35 40 45 50
 is free to move
 its operation will
 a length of film
 55 60 65
 unexposed film
 advance the supply
 to the film chamber
 film. A film
 is well known in the
 40 part of the device
 described, thereby

When the shutter
 and the film advance
 returns to its
 45 of throw. At this
 by means of a
 manually
 doing so, the
 50 55 60
 standing member
 53 moving to
 drawings, there
 member 53
 such that the
 55 edge of the
 shield 51 is
 reset member
 in Fig. 2 with
 overlap, exposure
 60 blade 50 is
 operation.

Owing to the
 light shield 51
 member and a
 65 the shutter