

PATENT SPECIFICATION

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(54) PHOTOGRAPHIC CAMERA



(7i) 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:—

The invention relates to a photographic camera with a plurality of objective lenses which can be selectively brought into operative positions, and with an aperture defining means the aperture of which can be preselected.

An object of the present invention is the provision of an improved camera which may be of small dimensions, having a plurality of objective lenses.

According to the present invention there is provided a photographic camera having a plurality of lenses selectively positionable on an optical axis of the camera, an exposure aperture defining means, aperture selector means for selecting the desired exposure aperture, and control means for controlling the exposure aperture formed by the defining means in accordance with the setting of the aperture selector means and in accordance with the focal length of the lens selected.

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

Fig. 1 is a diagrammatic front view, partially sectioned, of a camera according to the present invention; and

Fig. 2 is a diagrammatic view, partially sectioned, of the camera shown in Fig. 1.

A camera 17 shown in Figs. 1 and 2 comprises a diaphragm shutter, having two shutter blades 2 and 3 slidably mounted by slots 2b, 3b and 2c, 3c cooperating with a pin 21 and a shaft 13 respectively. Apertures 2a and 3a in the blades 2, 3

respectively, define the diaphragm aperture. The shutter blade 2 is held in its cocked position by a release 1. A pivoting lever 4 is rotatably mounted about the shaft 13 and engages the shutter blades 2, 3 by pins 2d, 3d in slots 4g, 4b respectively. The pivoting lever 4 is biased in the direction of the arrow "E" by a spring (not shown) and drives the shutter blades 2, 3 in opposite directions "B" and "C" respectively.

A lug 4c on the pivoting lever 4 is engageable with teeth 6a of a slider 6. The slider 6 is slidable and pivotable about a pin 22 on the body of the camera 17 and is biased in a direction opposite to the direction of the arrow "D", by a spring 15. A slot 6b on the slider 6, engages a pin 23 on a diaphragm preselector 5 controlling the pivoting of the slider 6 about the pin 22. The diaphragm preselector 5 provides an indication of its setting on a diaphragm scale 14. A lug 6c projecting from the slider 6 co-operates with an arm 7a of a shutter resetting member 7 which is rotatably mounted about the shaft 13 and is biased in a clockwise direction by a spring (not shown). An abutment 7b on the resetting member 7 engages the pivoting lever 4 to drive the pivoting lever 4 in a direction opposite to the direction shown by arrow "E".

As may be seen from Fig. 2, the camera 17 has two lens mounts 8 and 10 arranged for sliding movement parallel to the film plane 20 of a film cartridge 19 which is positioned in contact with, and behind the camera exposure opening 12. The first lens mount 8 holds a standard focal length lens 9, the second lens mount 10 holds a telephoto lens 11 in a plane nearer the front of the camera. When the first lens mount 8 is displaced from its operative position in the direction "G", the second lens mount 10 is moved by coupling means (not shown) and the telephoto lens 11 is moved into alignment with the exposure opening 12. The shutter blades 2, 3 are mounted between the planes of the lenses 9 and 11.

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An arm 10a on the second lens mount 10 serves as an abutment extending into the path of sliding movement of the slider 6. A further abutment 16 is provided on the base 18 of the camera 17.

Consider the operation of the camera with the shutter cocked and using the standard lens 9. Prior to an exposure, the aperture value is set by use of the diaphragm preselector 5, either as a function of the illumination or, in the case of a flash exposure, as a function of the distance to the subject. The diaphragm scale 14 may be provided either with aperture values and/or with symbols. When an aperture value is set, the slider 6 is pivoted about the pin 22 so that a predetermined one of the teeth 6a comes within the range of movement of the lug 4c of the pivoting lever 4.

When the release 1 is depressed in the direction of the arrow "A", the shutter blades 2, 3 are released for movement in opposite directions "B" and "C" respectively. The pivoting lever 4 moves the shutter blades 2, 3 until the lug 4c makes contact with the predetermined tooth 6a of the slider 6. It would then assume a position as partly shown in dash-dot lines (Fig. 1). The slider 6 is moved by the lug 4c in the direction of the arrow "D" against the bias of the spring 15 until it contacts the arm 10a of the second lens mount 10 which provides an abutment. The aperture is then set in accordance with the preselected aperture value.

When the slider 6 is displaced in the direction of the arrow "D", the arm 7a of the resetting member 7 which was held by the lug 6c is released, the resetting member now runs down in the direction of the arrow "F". After a short preliminary travel, the abutment 7b engages with the pivoting lever 4 in a direction opposite to the direction of the arrow "E" moving the shutter blades 2, 3 towards their closing positions. The slider 6 after disengagement of the lug 4c being again lifted off the abutment 10a by means of the spring 15 and the shutter blade 2 again being engaged by the release 1. The resetting member 7 can be rotated in a direction opposite to the direction of the arrow "F" by means of a shutter cocking slider (not shown) and the camera re-cocked.

If the standard lens 9 is to be replaced by the telephoto lens 11 movement of the first lens mount 8 in the direction of the arrow "G", also moves the second lens mount 10 by the coupling means, and the telephoto lens 11 is brought into the operative position in alignment with the exposure opening 12, the arm 10a being out of the sliding path of the slider 6. When the release 7 is actuated in this situation, the

slider 6 is again displaced in the direction of the arrow "D" in the manner already described, the range of movement being increased by an amount "X" (Fig. 1), the slider 6 making contact with the abutment 16 on the bottom 18 of the camera 17. As a result, with the same diaphragm setting as was used in the preceding exposure with the standard lens 9, the travel path of the shutter blades 2, 3 is slightly increased when using the telephoto lens, and a larger shutter opening to correspond to the telephoto lens is automatically provided.

The principle described above can of course be extended to cater for a camera having more than two interchangeable lenses, by simply providing appropriately dimensioned arms similar to the arm 10a, or by stepping arm 10a, to provide the appropriate abutments for the slider 6.

It will be appreciated that a camera having an exposure aperture defining means, such as is described above, may be provided with a separate shutter, for example a single-bladed shutter, the shutter being arranged to open to expose a film located behind the exposure aperture as the aperture defining means reaches, or subsequent to the aperture defining means reaching, the desired exposure aperture.

The principle is equally applicable to a pivoted blade diaphragm shutter.

The diaphragm preselector 5 may be automatically controlled in response to the scene illumination incident upon a photocell.

WHAT WE CLAIM IS:—

1. A photographic camera having a plurality of lenses selectively positionable on an optical axis of the camera, an exposure aperture defining means, aperture selector means for selecting the desired exposure aperture, and control means for controlling the exposure aperture formed by the defining means in accordance with the setting of the aperture selector means and in accordance with the focal length of the lens selected.

2. A photographic camera as claimed in Claim 1, wherein the exposure aperture defining means comprise a pair of oppositely movable apertured blades defining the exposure aperture, the blades being movable as determined by the control means to define the exposure aperture.

3. A photographic camera as claimed in Claim 2, wherein the movable blades of the exposure aperture defining means are constituted by a diaphragm shutter.

4. A photographic camera as claimed in Claim 1 or 2, wherein the lenses are mounted on slidably movable lens holders.

5. A photographic camera as claimed in

An arm 10a on the second lens mount 10 serves as an abutment extending into the path of sliding movement of the slider 6. A further abutment 16 is provided on the base 18 of the camera 17.

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When the release 1 is depressed in the direction of the arrow "A", the shutter blades 2, 3 are released for movement in opposite directions "B" and "C" respectively. The pivoting lever 4 moves the shutter blades 2, 3 until the lug 4c makes contact with the predetermined tooth 6a of the slider 6. It would then assume a position as partly shown in dash-dot lines (Fig. 1). The slider 6 is moved by the lug 4c in the direction of the arrow "D" against the bias of the spring 15 until it contacts the arm 10a of the second lens mount 10 which provides an abutment. The aperture is then set in accordance with the preselected aperture value.

When the slider 6 is displaced in the direction of the arrow "D", the arm 7a of the resetting member 7 which was held by the lug 6c is released, the resetting member now runs down in the direction of the arrow "F". After a short preliminary travel, the abutment 7b engages with the pivoting lever 4 in a direction opposite to the direction of the arrow "E" moving the shutter blades 2, 3 towards their closing positions. The slider 6 after disengagement of the lug 4c being again lifted off the abutment 10a by means of the spring 15 and the shutter blade 2 again being engaged by the release 1. The resetting member 7 can be rotated in a direction opposite to the direction of the arrow "F" by means of a shutter cocking slider (not shown) and the camera re-cocked.

If the standard lens 9 is to be replaced by the telephoto lens 11 movement of the first lens mount 8 in the direction of the arrow "G", also moves the second lens mount 10 by the coupling means, and the telephoto lens 11 is brought into the operative position in alignment with the exposure opening 12, the arm 10a being out of the sliding path of the slider 6. When the release 7 is actuated in this situation, the

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1. A photographic camera having a plurality of lenses selectively positionable on an optical axis of the camera, an exposure aperture defining means, aperture selector means for selecting the desired exposure aperture, and control means for controlling the exposure aperture formed by the defining means in accordance with the setting of the aperture selector means and in accordance with the focal length of the lens selected.

2. A photographic camera as claimed in Claim 1, wherein the exposure aperture defining means comprise a pair of oppositely movable apertured blades defining the exposure aperture, the blades being movable as determined by the control means to define the exposure aperture.

3. A photographic camera as claimed in Claim 2, wherein the movable blades of the exposure aperture defining means are constituted by a diaphragm shutter.

4. A photographic camera as claimed in Claim 1 or 2, wherein the lenses are mounted on slidably movable lens holders.

5. A photographic camera as claimed in



any preceding Claim wherein the aperture selector means is manually operable.

5 6. A photographic camera as claimed in any preceding Claim, wherein the control means comprises a slidably and pivotally mounted control member, the pivotal movement of the control member being controllable by the aperture selector means and the sliding movement of the control member during operation of the camera being limited by engagement with an abutment corresponding to the selected lens.

10 7. A photographic camera as claimed in any preceding Claim, wherein the lenses

comprise a standard lens and a telephoto lens.

8. A photographic camera as claimed in Claims 4 and 6 or Claims 4, 6 and 7, wherein the abutment corresponding to at least one lens is provided by the lens holder of another of the lenses. 20

9. A photographic camera substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawing. 25

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