

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:—

The present invention relates to cameras having a plurality of interchangeable lenses which can be selectively brought into the taking position.

Accordingly, it is an object of the present invention to provide an improved camera of the type having interchangeable lenses of different focal lengths.

According to the present invention there is provided a camera comprising a first fixed focus lens movable into and out of axial alignment with an exposure aperture of the camera, a focussable second lens movable into and out of axial alignment with the exposure aperture, a selector member operatively connected with the lenses for selectively moving one of the lens into or out of axial alignment with the exposure aperture while moving the other of the lens respectively out of or into axial alignment with exposure aperture, and focus means for focussing the second lens.

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

Figure 1 is a diagrammatic front view, partially in section, showing a camera in accordance with the present invention; and

Figure 2 is a plan view, partially in section, of the camera shown in Figure 1.

As 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 skilled in the art.

Referring to the drawings, a camera 10 has a pair of lens carriers 12 and 14 slidably mounted in guides 16 and 18, respectively, for movement parallel to the film plane. Lens carrier 12 has a mount 20 which holds a lens 22, and carrier 14, which lies toward the front of the camera, carries a mount 24 with a lens 26. Lenses 22 and 26 may, of course be formed of more than one element.

A focussing pin 28 is attached to mount 24 and projects through a slot 30 in a lens tube 32. In the illustrated embodiment, lens 22 is a standard taking lens and lens 26 is a telephoto lens. However, lenses 22 and 26 may be of any power, and it is contemplated only that lens 22 be of shorter focal length than lens 26.

While lens 26 is free to move axially in tube 32, the axial position of lens 22 is set during manufacture and lens 22 is thus of fixed-focus.

Between lens carriers 12 and 14, a shutter plate 34 carries a shutter blade 36 and has an exposure aperture 38. The shutter plate is not shown in Figure 1 for purposes of clarity. Shutter blade 36 is biased about a pin 40 into abutment with a stop 44 by tension spring 42. A shutter release lever 46 is movable to the right as viewed in Figure 1 to momentarily open the shutter in a manner well known in the art when a shutter release button 48 is depressed.

Lens carrier 14 carries a blocking lug 50 and has a recess 51 into which an arm 52 extends from lens carrier 12. A sliding plate 54 has a bent-over portion 56 which engages a groove in lens carrier 14. Sliding plate 54 has a pair of legs 58 and 59, leg 58 being connected to an overcentre snap spring 60 above a viewfinder cavity 62. The viewfinder cavity houses front and rear elements 64 and 66 and an adjustable element 68. Element 68 is connected to leg 59 of sliding plate 54 by a pin 70. A leg 72 projects downwardly from sliding plate 54

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to serve as a warning signal in the viewfinder as will be later described.

A selector member 74 is connected to sliding plate 54. This member is L-shaped and projects through an opening 76 in the camera housing.

A focus member 78 projects through an opening 80 in the camera housing and has an indicator nose 82 selectively alignable with a focussing scale on the camera housing. Focussing member 78 has an angular slot 84 which opens downwardly and is adapted to receive pin 28 when the telephoto lens is moved into the camera's optical axis.

Each of lens carriers 12 and 14 has an adjusting screw 86 and 88, respectively, by means of which the plane of the lens carrier can be adjusted parallel to the film plane. Further, adjustable stops 90 and 92 are provided for limiting the displacement path of the lens carriers so that the respective lenses are aligned with the camera's optical axis when in their taking positions.

In Figures 1 and 2, the camera is shown in its "standard" state. Short focal length lens 22 is in axial alignment with exposure aperture 38 while long focal length lens 26 is in a stored position. The word "standard" printed on the camera housing is visible to the operator while the abbreviation "tele" is covered by a projection 94 on selector member 74.

In order to change the focal length of the camera, actuating member 74 is manually moved to the right as viewed in the drawings. The abbreviation "tele", focussing member 78 and the distance scale are thereupon revealed while the word "standard" is covered by projections 94. Bent portion 56 of sliding plate 54 draws lens carrier 14 to the right while lens carrier 12 remains stationary until lens carrier 14 has moved a distance X and tab 52 is contacted by the edge of recess 51, whereupon lens carrier 12 moves with lens carrier 14. During this displacement, overcentre spring 60 snaps over to carry sliding plate 54 and lens carrier 14 to a position aligning long focal length lens 26 with exposure aperture 38 and to hold lens carrier 14 against stop 90.

As sliding plate 54 moves to the right, pin 70 on viewfinder lens element 68 follows slot 96 to change the field of the view finder to correspond with the image at the film plane.

As telephoto lens 26 is brought into the optical axis, focussing pin 28 enters angular slot 84 of focussing slider 78. Now, displacement of the focussing slider along the scale provided causes telephoto lens 26 to be displaced axially by pin 28 riding along slot 84.

When either lens 22 or lens 26 is in axial

alignment with the exposure aperture, blocking lug 50 is out of the path of travel of shutter release lever 48 and warning leg 72 on sliding plate 54 is not in viewfinder cavity 62. If the sliding member 54 is in an intermediate position, blocking lug 50 will prevent depression of the shutter release lever and warning leg 72 will appear in the viewfinder.

To change from telephoto lens to standard lens, selector member 74 is moved to the left, immediately moving lens carrier 14 with it. After lens carrier 14 has moved a distance X, the trailing edge of recess 51 contacts arm 52 and brings along lens carrier 12. Overcentre snap spring 60 now acts upon sliding plate 54 to urge the sliding plate to the left and to hold lens carrier 12 against stop 92.

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.

Application No. 52623/76 (Serial No. 1481214) was divided out of this application.

WHAT WE CLAIM IS:—

1. A camera comprising a first fixed focus lens movable into and out of axial alignment with an exposure aperture of the camera, a focussable second lens movable into and out of axial alignment with the exposure aperture, a selector member operatively connected with the lenses for selectively moving one of the lenses into or out of axial alignment with the exposure aperture while moving the other of the lens respectively out of or into axial alignment with the exposure aperture, and focus means for focussing the second lens.

2. A camera as claimed in Claim 1 wherein the selector member includes means for covering the focus means when the first lens is in axial alignment with the exposure aperture, whereby the focus means is inaccessible.

3. A camera as claimed in Claim 1 or 2 wherein the focus means includes a manually movable focus member, means operatively connecting the focus member and the second lens when the second lens is in axial alignment with the exposure aperture to adjust the axial position of the second lens as the focus member is moved, the focus member being disconnected from the second lens when the first lens is in axial alignment with the exposure aperture.

4. A camera as claimed in Claims 2 and 3 wherein the selector member includes means for covering the focus member when



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to serve as a warning signal in the viewfinder as will be later described.

A selector member 74 is connected to sliding plate 54. This member is L-shaped and projects through an opening 76 in the camera housing.

A focus member 78 projects through an opening 80 in the camera housing and has an indicator nose 82 selectively alignable with a focussing scale on the camera housing. Focussing member 78 has an angular slot 84 which opens downwardly and is adapted to receive pin 28 when the telephoto lens is moved into the camera's optical axis.

Each of lens carriers 12 and 14 has an adjusting screw 86 and 88, respectively, by means of which the plane of the lens carrier can be adjusted parallel to the film plane. Further, adjustable stops 90 and 92 are provided for limiting the displacement path of the lens carriers so that the respective lenses are aligned with the camera's optical axis when in their taking positions.

In Figures 1 and 2, the camera is shown in its "standard" state. Short focal length lens 22 is in axial alignment with exposure aperture 38 while long focal length lens 26 is in a stored position. The word "standard" printed on the camera housing is visible to the operator while the abbreviation "tele" is covered by a projection 94 on selector member 74.

In order to change the focal length of the camera, actuating member 74 is manually moved to the right as viewed in the drawings. The abbreviation "tele", focussing member 78 and the distance scale are thereupon revealed while the word "standard" is covered by projections 94. Bent portion 56 of sliding plate 54 draws lens carrier 14 to the right while lens carrier 12 remains stationary until lens carrier 14 has moved a distance X and tab 52 is contacted by the edge of recess 51, whereupon lens carrier 12 moves with lens carrier 14. During this displacement, overcentre spring 60 snaps over to carry sliding plate 54 and lens carrier 14 to a position aligning long focal length lens 26 with exposure aperture 38 and to hold lens carrier 14 against stop 90.

As sliding plate 54 moves to the right, pin 70 on viewfinder lens element 68 follows slot 96 to change the field of the view finder to correspond with the image at the film plane.

As telephoto lens 26 is brought into the optical axis, focussing pin 28 enters angular slot 84 of focussing slider 78. Now, displacement of the focussing slider along the scale provided causes telephoto lens 26 to be displaced axially by pin 28 riding along slot 84.

When either lens 22 or lens 26 is in axial

alignment with the exposure aperture, blocking lug 50 is out of the path of travel of shutter release lever 48 and warning leg 72 on sliding plate 54 is not in viewfinder cavity 62. If the sliding member 54 is in an intermediate position, blocking lug 50 will prevent depression of the shutter release lever and warning leg 72 will appear in the viewfinder.

To change from telephoto lens to standard lens, selector member 74 is moved to the left, immediately moving lens carrier 14 with it. After lens carrier 14 has moved a distance X, the trailing edge of recess 51 contacts arm 52 and brings along lens carrier 12. Overcentre snap spring 60 now acts upon sliding plate 54 to urge the sliding plate to the left and to hold lens carrier 12 against stop 92.

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.

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1. A camera comprising a first fixed focus lens movable into and out of axial alignment with an exposure aperture of the camera, a focussable second lens movable into and out of axial alignment with the exposure aperture, a selector member operatively connected with the lenses for selectively moving one of the lenses into or out of axial alignment with the exposure aperture while moving the other of the lens respectively out of or into axial alignment with the exposure aperture, and focus means for focussing the second lens.

2. A camera as claimed in Claim 1 wherein the selector member includes means for covering the focus means when the first lens is in axial alignment with the exposure aperture, whereby the focus means is inaccessible.

3. A camera as claimed in Claim 1 or 2 wherein the focus means includes a manually movable focus member, means operatively connecting the focus member and the second lens when the second lens is in axial alignment with the exposure aperture to adjust the axial position of the second lens as the focus member is moved, the focus member being disconnected from the second lens when the first lens is in axial alignment with the exposure aperture.

4. A camera as claimed in Claims 2 and 3 wherein the selector member includes means for covering the focus member when

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the first lens is in axial alignment with the exposure aperture.

5. A camera as claimed in any of Claims 1 to 4 wherein the second lens is of longer focal length than the first lens.

6. A camera as claimed in any preceding claim having a shutter mechanism and comprising means for disabling the shutter mechanism if one of the lenses is not positioned in axial alignment with the exposure aperture.

7. A camera as claimed in any preceding

claim having a viewfinder comprising means for indicating to an operator that one of the lenses is not positioned in axial alignment with the exposure aperture.

8. A camera having first and second lenses and substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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