

PATENT SPECIFICATION

(11)

1 475 150

- (21) Application No. 23998/74 (22) Filed 30 May 1974
(31) Convention Application No. 2 328 226 (32) Filed 2 June 1973 in
(33) Fed. Rep. of Germany (DT)
(44) Complete Specification published 1 June 1977
(51) INT. CL.² G03B 17/04
(52) Index at acceptance
G2A 401 403 443 449 451 458 459 476 647 DA
(72) Inventors WOLFGANG ORT
GERHARD BRÄUNING

(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:—

in its fully unfolded, picture-taking configuration;

Fig. 2 is a cross-sectional, side-elevational view of the camera of Fig. 1, showing the camera in its fully folded, storing-and-carrying configuration; and

Fig. 3 is a perspective front view of the camera of Fig. 1, showing the camera in its fully folded, storing-and-carrying configuration.

Because certain parts of photographic and related apparatus are well known, the following description is directed in particular to those elements forming, cooperating directly with, or relating to, the present invention, elements that are not specifically shown or described wherein being understood to be selectable from those known in the art.

A camera constructed in accordance with a preferred embodiment of the present invention is illustrated in Figs. 1-3. Referring now to Figs. 1-3, a camera 100 has a housing 102 which includes a central portion 104 adapted to support a photosensitive element 105 in an exposure position, a front wall portion 106, a rear wall portion 108, a first end portion 110, a second end portion 112, a first side portion 114, and a second side portion 116. A first cover member 118 is hingedly mounted, as at 120, on the first end portion 110 of the housing. When in its fully open position, the member 118 projects angularly forwardly from the housing, as shown in Fig. 1. The first cover member 118 includes a free end portion 122 which supports a lens 124, a photocell 126, a flash-lamp-receiving socket 128, and a shutter 130. Light-sealing means such as a foldable bellows 132 extends, in light-sealing relation, from the first cover member 118 to the housing, to provide a light-tight exposure chamber between the lens 124 and the central portion 104. The first cover member 118 includes a

The present invention relates to photography, and more particularly to a foldable large-format camera.

Accordingly, an object of the present invention is the provision of a large-format foldable camera of improved construction.

According to the present invention, there is provided a foldable photographic camera comprising a body arranged to support a photosensitive element in a position for exposure, a first rigid cover member pivotally connected by one end to the body and having a lens at its free end, sealing means arranged to define a light-tight compartment between the lens and the body, a second rigid cover member pivotally connected by one end to the free end of the first member and arranged, in an operating condition of the camera, with the body and the first member, to form a rigid triangular support for the lens, and wherein the body is arranged so that, on folding, the second cover member passes therethrough so as to lie, in the folded condition of the camera, parallel to the first cover member and on the opposite side of the body thereto.

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

Fig. 1 is a perspective front view of a large-format foldable camera constructed in accordance with a preferred embodiment of the present invention showing the camera

skirt portion 134 at each side partially to protect the bellows 132 when the member 118 is in its open position.

A second cover member 136 is hingedly mounted, as at 138, on the free end portion 122 of the first cover member 118. When in its fully erect position, the member 136 projects angularly forwardly from the second end portion 112 of the housing to its hinge mount 138, as shown in Fig. 1. The second cover member 136 includes a skirt portion 140 at each side partially to protect the bellows 132 when the member 136 is in its erect position. It will thus be seen that the first and second cover members, when in their respective open and erect positions, form with the camera housing a substantially triangular structure which rigidly maintains the lens 124 in a stable relation relative to the central portion 104.

Camera 100 is designed to receive in its central portion 104 a cartridge 142 containing one or more of the photosensitive elements 105, so that when the cartridge is fully inserted, the foremost photosensitive element 105 is in the exposure position. In the first side portion 114 of the camera housing, there is provided an exit slot 144 through which the foremost photosensitive element 105 can be removed from the camera after it has been exposed.

Extending endwise from the first side portion 114 beyond the second end portion 112 of the housing is an L-shaped extension 146 comprising a first leg 148 housing a viewfinder 150 and a second leg 152 extending perpendicularly to the first leg 148 in a direction generally parallel with the second end portion 112. The leg 152 houses a battery compartment 154. It will be seen that legs 148 and 152 of the extension 146 form two sides, while the end portion 112 of the housing 102 forms the third side, of a three-sided space 155 into which a rear end portion 136a of the second cover member 136, extends when the member 136 is in its erect position shown in Fig. 1.

The skirt portion 140 of the second cover member 136 includes, on its inner surface, a guide groove 156 which cooperates with a mating pin or other guide means 158 on the housing to guide the member 136 during at least a portion of its movement from its erect position shown in Fig. 1 to its folded position shown in Fig. 2, wherein the member 136 lies substantially flat against the rear wall portion 108 of the housing. Also cooperating with the pin 158 is a pawl 160 adapted releasably to latch the second cover member 136 in its erect position. The pawl 160 is releasable to unlatch the member 136 by depressing a pawl release button 162 which

is coupled to a front end portion of the pawl. The camera is also provided with means such as spring 163 for biasing the two cover members toward each other automatically to urge the second cover member 136 into its folded position after the first cover member 118 has reached its closed position. The movements of the cover members to and from their picture-taking positions is effected by the second cover member 136 passing through the space 155 defined by the extension 146 and the end portion 112 during movement thereof from its erect position toward its folded position. With this arrangement, the free end portion 122 of the first cover member 118 moves into the space 155 as the second cover member 136 reaches its folded position shown in Fig. 2. With the free end portion 122 of the first cover 155, the lens 124 is, to a large extent, protected by the extension 146 from damage.

The extension 146 also provides a handle by which the camera can be held. Holding the camera by means of the leg 152 of the extension helps keep batteries contained in the compartment 154 warmer than they otherwise might be, thereby enhancing their operating efficiency. Another advantage of the extension 146 is that the leg 148 thereof affords a convenient location for the viewfinder 150 without its interfering with movement of a photosensitive element 105 from the exposure position through the slot 144.

At the opposite end of the camera housing is a second extension 164 extending generally endwise from the housing beyond first end portion 110 thereof. The second extension 164 supports a shutter release button 166 for effecting release of the shutter 130 to expose a photosensitive element 105 in the exposure position. The extension 164 also houses a film transport mechanism 168 by which an exposed photosensitive element 105 can be moved from its exposure position through the slot 144. The extension 164 also provides a convenient means of gripping that end of the camera when in use.

In the fully unfolded, picture-taking configuration shown in Fig. 1, the camera is rendered convenient and comfortable to hold and operate by means of the extensions 146 and 164 and the camera components included therein. In that configuration, the lens 124 is maintained in stable relation to a photosensitive element 105 in the exposure position by virtue of the substantially triangular structure provided by the cover members 118 and 136 and the housing 102. Also in that configuration, the bellows 132 is at least partially protected from damage. The cover 130

members are conveniently unlatched by means of the button 162 and then simply pushed in a counterclockwise direction, as viewed in Figs. 1-3, from their respective open and erect positions shown in Fig. 1 to their respective closed and folded positions shown in Fig. 2. In the latter positions of the cover members, the camera is thin and compact for convenient storing and carrying, and the lens 124 is safely protected from damage by its location in the space 155.

Modifications of the preferred embodiment are, of course, possible. For example, the legs 148 and 152 of the extension 146 need not be perpendicular to each other, inasmuch as an angle other than 90° therebetween could be used. Also, the extension 146, instead of comprising only two legs as shown, could comprise a third leg interconnecting the free end of the leg 152 and the second side portion 116 of the housing, thereby defining, with the second end portion 112, a four-sided space into which the free end portion 122 of the first cover member 118 could move. Moreover, the extension 146 need not be made up of a plurality of straight legs as shown, but could comprise a single "leg" of straight, slanted, or curved configuration, which might provide a handle that is more comfortable to grip and more pleasing to behold without detracting from its function of defining a space for the protection of the objective lens.

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

WHAT WE CLAIM IS:—

1. A foldable photographic camera comprising a body arranged to support a photosensitive element in a position for exposure, a first rigid cover member pivotally connected by one end to the body and having a lens at its free end, sealing means arranged to define a light-tight compartment between the lens and the body, a second rigid cover member pivotally connected by one end to the free end of the first member and arranged in an operative condition of the camera, with the body and the first member, to form a rigid triangular support for the lens, and wherein the body is arranged so that, on folding, the second cover member passes therethrough so as to lie, in the folded condition of the camera, parallel to the first cover member and on the opposite side of the body thereto.

2. A camera as claimed in Claim 1

wherein in the folded condition, the first and second cover members are arranged to lie flat on opposite sides of the body.

3. A camera as claimed in Claim 1 or 2 wherein, in the folded condition, the lens is located between said opposite sides.

4. A camera as claimed in Claim 1, 2 or 3 wherein guide means are provided on the second cover member arranged to cooperate with complementary guide means on the body on movement of the second cover member through the body between operative and folded conditions of the camera.

5. A camera as claimed in any of Claims 1 to 4 wherein the body has an L-shaped extension defining with the body, a three sided recess, wherethrough the second cover member is movable.

6. A camera as claimed in Claim 5 wherein the extension comprises a first leg including a viewfinder.

7. A camera as claimed in Claim 5 or 6 wherein the extension comprises a second leg including a battery compartment.

8. A camera as claimed in Claim 5, 6 or 7 wherein the extension serves as a handgrip for holding the camera in the operative condition thereof.

9. A camera as claimed in any preceding Claim further including biasing means for biasing the second cover member to one of its end positions.

10. A camera as claimed in Claim 9 wherein the biasing means biases the second cover member towards its end position in which it lies parallel to the first cover member.

11. A camera as claimed in any preceding Claim further including latch means for latching the first and second cover members in the operative condition of the camera.

12. A camera as claimed in any preceding Claim wherein the light sealing is, in part, defined by the first cover member, and, in part, by a flexible, foldable, light tight material.

13. A camera as claimed in any preceding Claim including a shutter mounted with the lens at the free end of the first cover member.

14. A camera as claimed in Claim 13 including manually operable means for releasing the shutter, the manually operable means being provided on the camera body.

15. A camera as claimed in any preceding Claim wherein the body includes means for receiving a cartridge containing at least one photosensitive element, and an exit slot through which a photosensitive element, after exposure, is removable from the camera.

16. A camera as claimed in any preceding Claim further including means, in

members are conveniently unlatched by means of the button 162 and then simply pushed in a counterclockwise direction, as viewed in Figs. 1-3, from their respective open and erect positions shown in Fig. 1 to their respective closed and folded positions shown in Fig. 2. In the latter positions of the cover members, the camera is thin and compact for convenient storing and carrying, and the lens 124 is safely protected from damage by its location in the space 155.

Modifications of the preferred embodiment are, of course, possible. For example, the legs 148 and 152 of the extension 146 need not be perpendicular to each other, inasmuch as an angle other than 90° therebetween could be used. Also, the extension 146, instead of comprising only two legs as shown, could comprise a third leg interconnecting the free end of the leg 152 and the second side portion 116 of the housing, thereby defining, with the second end portion 112, a four-sided space into which the free end portion 122 of the first cover member 118 could move. Moreover, the extension 146 need not be made up of a plurality of straight legs as shown, but could comprise a single "leg" of straight, slanted, or curved configuration, which might provide a handle that is more comfortable to grip and more pleasing to behold without detracting from its function of defining a space for the protection of the objective lens.

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

45 WHAT WE CLAIM IS:—

1. A foldable photographic camera comprising a body arranged to support a photosensitive element in a position for exposure, a first rigid cover member pivotally connected by one end to the body and having a lens at its free end, sealing means arranged to define a light-tight compartment between the lens and the body, a second rigid cover member pivotally connected by one end to the free end of the first member and arranged in an operative condition of the camera, with the body and the first member, to form a rigid triangular support for the lens, and wherein the body is arranged so that, on folding, the second cover member passes therethrough so as to lie, in the folded condition of the camera, parallel to the first cover member and on the opposite side of the body thereto.

2. A camera as claimed in Claim 1

wherein in the folded condition, the first and second cover members are arranged to lie flat on opposite sides of the body.

3. A camera as claimed in Claim 1 or 2 wherein, in the folded condition, the lens is located between said opposite sides.

4. A camera as claimed in Claim 1, 2 or 3 wherein guide means are provided on the second cover member arranged to cooperate with complementary guide means on the body on movement of the second cover member through the body between operative and folded conditions of the camera.

5. A camera as claimed in any of Claims 1 to 4 wherein the body has an L-shaped extension defining with the body, a three sided recess, wherethrough the second cover member is movable.

6. A camera as claimed in Claim 5 wherein the extension comprises a first leg including a viewfinder.

7. A camera as claimed in Claim 5 or 6 wherein the extension comprises a second leg including a battery compartment.

8. A camera as claimed in Claim 5, 6 or 7 wherein the extension serves as a handgrip for holding the camera in the operative condition thereof.

9. A camera as claimed in any preceding Claim further including biasing means for biasing the second cover member to one of its end positions.

10. A camera as claimed in Claim 9 wherein the biasing means biases the second cover member towards its end position in which it lies parallel to the first cover member.

11. A camera as claimed in any preceding Claim further including latch means for latching the first and second cover members in the operative condition of the camera.

12. A camera as claimed in any preceding Claim wherein the light sealing is, in part, defined by the first cover member, and, in part, by a flexible, foldable, light tight material.

13. A camera as claimed in any preceding Claim including a shutter mounted with the lens at the free end of the first cover member.

14. A camera as claimed in Claim 13 including manually operable means for releasing the shutter, the manually operable means being provided on the camera body.

15. A camera as claimed in any preceding Claim wherein the body includes means for receiving a cartridge containing at least one photosensitive element, and an exit slot through which a photosensitive element, after exposure, is removable from the camera.

16. A camera as claimed in any preceding Claim further including means, in 13



the body, for moving a photosensitive reference to and as illustrated in the accompanying drawings.

17. A foldable photographic camera
5 substantially as hereinbefore described with

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

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1977.
Published at the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies
may be obtained.

