

PATENT SPECIFICATION

(11) 1 385 293

1 385 293

- (21) Application No. 23384/73 (22) Filed 16 May 1973
- (31) Convention Application No. 2 230 199
- (32) Filed 21 June 1972
- (31) Convention Application No. 7 300 295
- (32) Filed 5 Jan. 1973 in
- (33) Germany (DT)
- (44) Complete Specification published 26 Feb. 1975
- (51) INT CL² G03B 7/20
- (52) Index at acceptance G2A 401 403 591 688 CG



(54) LENS ADAPTER

(71) We, **FRANKE & HEIDECHE** G.M.B.H., a German Body Corporate, trading as **Rollei-Werke Franke & Heidecke**, of 196 Salzdhumerstrasse, Braunschweig, Germany, 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 a lens adaptor ring for interchangeable lenses with bayonet and/or screw sockets and with coupling devices to enable the push rod for the lens diaphragm and/or the central shutter to be actuated by the drive situated inside the camera housing.

Adapter rings of this kind enable lenses to be used of which the lens mount differs from that of the camera housing and also make it possible for the connection between the central shutter and the release device and/or the operation of the diaphragm to be effected from the camera housing, when the coupling of the camera housing is of a different type from that of the replacement lens, by designing transmission parts of the adapter rings on suitable lines.

Embodiments of the present invention construct the transmission parts in the adapter ring in such a way that they automatically compensate a difference between the travel of a camera push rod and that of lens push rod and also ensure a driving connection for the operating mechanism when the push rods are differently positioned over the periphery of the lens and of the camera mount.

According to the present invention there is provided lens adapter ring with bayonet and/or screw sockets and with a coupling device to enable a push rod for the lens diaphragm and/or the central shutter to be actuated by a drive situated inside the camera housing, wherein the coupling device used comprises a pair of rings which are situated inside the adapter ring and

which, at one point of their periphery, are pivotally mounted and which at a further point on their periphery are normally spaced apart but are capable of being pressed together against a spring bias on the application of a force in excess of that required to operate the diaphragm and/or shutter.

The pair of rings performs the function of an intermediate elements between the two push rods and thus compensates the displacement caused in the peripheral direction between the push rod of the lens and that of the camera when the lens has been screwed in sufficiently into the adapter ring.

The spring action serves as a safeguard against an attempt to operate the diaphragm from inside the camera housing for the purpose of selecting a very small aperture for which no provision is made in the lens, and also as a means of compensating excess travel of a push rod of the camera housing.

In a preferred embodiment of the invention the rings are independently pivotally mounted on a pivot in the adapter ring, and an excess stroke spring is provided between them, preferably in the zone of application of the lens push rod and camera push rod.

In a particularly suitable version of the invention the rings each consist of two superimposed spring rings which are integrally pivotally affixed on a common pivot in the adapter ring while they are resiliently bent away from each other in the zone of application of the lens push rod and camera push rod but may be brought together on the application of sufficient force.

Constructional embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:—

Fig. 1 shows a sectional diagram of the adapter ring to which the invention relates; and

Figs. 2a and 2b show sectional diagrams of a further example of the adapter ring, in which

Fig. 2a shows the ring before the camera push rod has been operated, and

Fig. 2b shows the ring after the operation of the push rod, with an excess stroke of the camera push rod.

The adapter ring 1 is fitted on the outer periphery with a bayonet socket 2 and on the inner periphery with a screw socket 3, to which any desired interchangeable lenses can be attached by their external threading (shown in dot-and-dash lines). These interchangeable lenses are provided on the camera housing side with push rods 21 for the adjustment of the diaphragm or operation of the central shutter, of different length and with different engagement depths. A push rod 21 interacts with a corresponding push rod 22 in the camera housing, thus enabling the system to be operated from the camera housing side. The connection between the push rods 21 and 22 is provided in Fig. 1 by two rings 12 and 13 pivotally mounted on a pivot 11 in the adapter ring 1, independently of each other. On the side situated opposite to the pivot 11, in the zone of application of the lens push rod 21 and camera push rod 22, the rings are held apart by an excess stroke spring 14 designed in such a way that it cannot be compressed until a force of about 20 p over the diaphragm closing force or shutter release force is reached. The excess stroke spring thus acts as a fixed connecting device when the push rod 22 is actuated, and the movement of the said push rod 22 is transmitted direct to the push rod 21. Only when the push rod 21 cannot be displaced any farther will the further operation of the push rod 22 cause the compression of the excess stroke spring, thus compensating for any differences in length of travel between the push rods 21 and 22. The extend to which the two rings 12 and 13 can pivot about the pivot 11 is limited on the camera housing side by the securing cap 15.

In Fig. 2 the connection between the push rods 21 and 22 is provided by a coupling element consisting of two spring rings 4 and 5, rigidly interconnected at one end at which they are mounted on a pivotable member 6 in the interior of the adapter ring 1. In the zone of application of the two push rods 21 and 22 the two spring rings are bent apart from each other. The force required to press the bent parts of the ring together is slightly greater, as in the case of the excess stroke spring 14 of Fig. 1, than the impacting force required for the displacement of the diaphragm or release of the shutter drive.

The method of operation of the adapter ring of the invention will be described below

by reference to the embodiment illustrated in Fig. 2:

The adapter ring 1, with the interchangeable lens screwed onto it (the screw threading of the interchangeable lens, not shown in the drawing, is indicated by dot-and-dash lines); is mounted on the camera, not shown in the drawing, via the bayonet socket 2. After the mounting of the adapter ring the push rods 21 and 22 are not yet mechanically interconnected and the coupling element consisting of the spring rings 4 and 5 is still able to pivot about member 6. Not until the push rod 22, by being operated on the camera housing side, has overcome the clearance of the coupling element between said push rods 21 and 22 will the said push rods 21 and 22 be mechanically interconnected and the operating force of the push rod 22 be transmitted to the push rod 21, without the bent parts of the rings being pressed together.

Fig. 2b shows how, with the push rod 21 completely inserted an excess stroke emanating from the camera push rod 22 is compensated for by pressing together the two bent parts of the rings 4 and 5. If the distances travelled by the push rods are not completely coordinated, therefore, the spring action between the two bent parts of the spring rings 4 and 5 will prevent the destruction of any driving parts in the camera housing and/or lens which might be caused by the further forcing of the push rod 22 from the camera housing side.

The adapter ring 1 with a coupling element 4, 5, 6 (Figure 2), or 11, 12, 13, 14 (Figure 1), either enables the lens push rod and the camera push rod to be mechanically interconnected for the diaphragm adjustment or enables the release device and the central shutter to be mechanically interconnected. If both actions are to be possible at the same time, the adapter may contain a further coupling element, constructed in the same manner.

The adapter ring to which the invention relates, by means of its annular coupling element, can also provide, as shown in Figs. 1 and 2, the driving connection between the lens push rod 21 and the camera push rod 22 when they are not aligned with each other, i.e. when they are angularly offset.

Needless to say, there are still further ways in which the lens adapter ring covered by the invention can be used for the transmission of the movements of the lens push rod and the camera push rod. For example, the movement can be transmitted from the lens to the camera housing as when a diaphragm value to which the lens has been set is to be simulated in the camera housing by means of a push-rod transmission elements, for example.

WHAT WE CLAIM IS:—

1. Lens adapter ring with bayonet and/or screw sockets and with a coupling device to enable a push rod for the lens diaphragm and/or the central shutter to be actuated by a drive situated inside the camera housing, wherein the coupling device used comprises a pair of rings which are situated inside the adapter ring and which, at one point of their periphery are pivotally mounted and which at a further point on their periphery are normally spaced apart but are capable of being pressed together against a spring bias on the application of a force in excess of that required to operate the diaphragm and/or shutter.

2. Lens adapter ring in accordance with claim 1, wherein the rings are independently pivotally mounted on a pivot in the adapter ring and an excess stroke is provided between them.

3. Lens adapter ring in accordance with

claim 1, wherein the excess stroke spring is provided between the rings in the zone of application of the lens push rod and camera push rod. 25

4. Lens adapter ring in accordance with claim 1, wherein the rings comprises two superimposed spring rings which are integrally pivotally mounted on a common pivot in the adapter ring while they are resiliently bent apart from each other in the zone of application of the lens push rod and camera push rod but may be brought together on the application of sufficient force. 30 35

5. A lens adapter substantially as described herein with reference to and as illustrated by the accompanying drawings.

For the Applicants:

MATTHEWS, HADDAN & CO.,
Chartered Patent Agents,
33 Elmfield Road,
Bromley, Kent. BR1 1SU.



1,385,293

WHAT WE CLAIM IS:—

1. Lens adapter ring with bayonet and/or screw sockets and with a coupling device to enable a push rod for the lens diaphragm and/or the central shutter to be actuated by a drive situated inside the camera housing, wherein the coupling device used comprises a pair of rings which are situated inside the adapter ring and which, at one point of their periphery are pivotally mounted and which at a further point on their periphery are normally spaced apart but are capable of being pressed together against a spring bias on the application of a force in excess of that required to operate the diaphragm and/or shutter.

2. Lens adapter ring in accordance with claim 1, wherein the rings are independently pivotally mounted on a pivot in the adapter ring and an excess stroke is provided between them.

3. Lens adapter ring in accordance with

claim 1, wherein the excess stroke spring is provided between the rings in the zone of application of the lens push rod and camera push rod.

4. Lens adapter ring in accordance with claim 1, wherein the rings comprises two superimposed spring rings which are integrally pivotally mounted on a common pivot in the adapter ring while they are resiliently bent apart from each other in the zone of application of the lens push rod and camera push rod but may be brought together on the application of sufficient force.

5. A lens adapter substantially as described herein with reference to and as illustrated by the accompanying drawings.

For the Applicants:

MATTHEWS, HADDAN & CO.,
Chartered Patent Agents,
33 Elmfield Road,
Bromley, Kent. BR1 1SU.