

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO CAMERAS

(71) We, FRANKE & HEIDECHE G.m.b.H., a German Body Corporate, trading as Rollei-Werke Franke & Heidecke, of 196 Salzdahlumerstrasse, 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:—

10 The present invention relates to a bayonet-type connection for securing an accessory to a photographic camera.

Detachable connections between camera accessories and camera housings etc. are generally used in the form of positively or frictionally connected bayonet-type connections with wedge-shaped or screw-type ends. Bayonet connections of this kind, with multi-part bayonet lugs and a wedge-shaped end, for example, necessitate narrow manufacturing tolerances, both in the inserted and in the receiving part, rendering such products more expensive, particularly when produced by precision engineering methods. Furthermore, bayonet connections have to be carefully inserted and locked by hand, so that they will not tilt or rattle or even fall out of the socket provided for them on the apparatus. With the continuing miniaturization of cameras and their accessories, furthermore, it is becoming increasingly difficult to accommodate bayonet connections with multi-part bayonet lugs in the space available in the small housings.

35 The present invention may provide, without the known drawbacks, a detachable connection between the camera and its accessory, enabling the latter to be rapidly inserted and reliably secured, with a very simple manufacturing method necessitating no narrow tolerances and providing a compact construction.

45 The present invention provides the bayonet-type connection with a bayonet-type lock rotatably mounted on the camera or accessory and which is rotated to effect locking by means of a prestressed spring which is releasably lockable in the stressed position. A suitable version of the invention for enabling the prestressed spring to be left in this position for a certain time before it acts

on the bayonet-type connection has a handle for prestressing the spring and a roller-type lock serving to lock it in position the roller-type lock being unlocked by the attachment of the accessory to the camera. 55

To enable a camera housing and an accessory to be rapidly connected to each other without problems, a further embodiment of the invention offers the particular advantage that the roller-type lock is provided with a release knob which extends towards the outside and which is pressed in when the walls of the housing encounter each other, thus releasing the prestressed force of the spring. 60

Finally, an almost automatic locking system of this kind is advantageously based, in a further embodiment of the invention, on the fact that the handle by which the spring is stressed is provided with a rack connected with the bayonet-type lock via a pinion. This ensures that any pressure exerted on the handle will always prepare the accessory to be reliably connected to the camera without any problem by means of a simple manual operation. 65

A constructional embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawing, wherein:— 70

Figure 1 shows a lateral section through the housing of the accessory, with the main functional components; 75

Figure 2 shows a section through the housing of the camera, with the receiving parts of the locking system; 80

Figure 3 shows an opened-up view of the functional parts shown in Figure 1, turned through an angle of 90°; 85

Figure 4 shows a plan view of the bayonet-type lock, in the connected position; 90

Figure 5 shows a plan view of the bayonet-type lock in the locked position and at a different angle; and

Figure 6 shows the locking position of the two housing parts shown in Figures 1 and 2. 95

As may be seen from Figure 1, a screw threaded bushing 20 is provided in the wall 18 of the housing of the accessory 1, the said wall being shown opened up and the internal threading 3 of the said bushing containing 100

the bayonet-type lock 2 with its threaded pin 19 as a rotatable central part. A toggle 5 is rotatably mounted on the end of the threaded pin 19, outside the wall of the housing 18, while on the opposite end of the threaded pin 19 a pinion 4 is either cut in or, in the event of a comparatively great pitch diameter, likewise rigidly mounted thereon. A rack 6 is longitudinally guided in projections of the wall of the housing and perpendicularly to the bayonet type lock 2. The row of teeth 9 on the rack engage the teeth 21 of the pinion 4, and a roller-type lock 10 prevent the rack 6 from moving back as soon as it has been prestressed towards the spring 8. In this process the locking disc 22 of the roller-type lock 10 drops as a result of the load placed on it by the spring 11 and is pressed against the projection 23 of the rack 6, thus entering on the key-shaped handle 17 belonging to the rack 6 and situated on the outside of the housing 1, the projection 23 belonging to the said rack and pressed towards the left by the spring 8 will run up onto the locking disc 22 and prevent the said rack 6 from moving back. Figure 3 shows the rack 6, after it has been pressed and locked, with the prestressed spring 8. Figures 4 and 5 each show a plan view of the toggle 5. In Figure 4 the toggle 5, with the bayonet-type lock 2 in the prestressed position, is situated inside the guide contours 25 of the lock mounting 15 in the wall 16 of the camera housing 12 (see also Figure 2).

As soon as an accessory is mounted on the camera housing 12 the toggle 5, which is held by the prestressing of the spring 8 in its position inside the contours 25 of the lock mounting 15 will be placed on the lock 13. The said lock 13, which fits flush against the wall 16 of the housing and which closes the lock mounting 15 on the form-closed principle when not in use will be deflected into the inside of the housing of the camera 12 as soon as the pressure of the accessory 1 against the spring 14 commences. At the moment when the toggle 5 has passed the wall of the housing 16 the two walls 16 and 18 of the housing will make firm impact with each other. The result is that the release knob 7 of the roller-type lock 10 has been pressed the whole of the way into the wall 18 of the housing, so that the locking disc 22 slides out of the zone of the projection 23. As soon as the rack 6 is released the spring 8 will press it out of the housing, towards the left. In this process the toothed bar 9 which meshes with the pinion 4 will rotate the said pinion in such a way that the screw threaded guide of the bayonet-type lock 2 will at the same time pivot the toggle present in the camera housing 9 (according to Figure 5) and draw it against the inside of the wall 16 of the

housing. The toggle 5, thus tightened on the form-locked and force-locked principle by the action of the spring 8 will connect the camera housing 1 and the accessory housing 12 tightly together. As no locking stops are provided, any movements (wobbling) of the housing, occurring at the beginning of the operation, e.g. as a result of manufacturing tolerances, will be continuously counterbalanced by further tightening of the toggle 5.

Figure 6 shows the camera 12 and the accessory 1 after they have been completely locked together. The housing walls 16 and 18, held tightly together, have pressed the release knob 7 into the accessory housing so that it fits tightly therein. It can be seen that the locking disc 22 of the non-return lock 10 has released the projection 23 by which the rack 6 has been held in the stressed position. The accumulated force of the pressure spring 8 has thus been released and maintains the housing locking action with an adequate reserve of spring tension.

Before the accessory 1 can be removed from the housing of the camera 12, the handle 17 must be pressed once again. The unlocking operation now takes place in the reverse order to the locking of the housings 1, 12. As the spring 8 is stressed, the pinion 4 and thus the toggle 5 are at the same time moved to the left, away from the inside of the wall 16 of the housing, and returned to the position inside the contours 25 of the lock mounting 15.

As soon as the rack 6 has been once again locked, the spring 14, with the lock 13, will also press the toggle 5 out of the camera housing 12. The accessory 1 is once again released. In the meantime the roller-type lock 10 has taken over the function of locking the rack 6, as the locking disc 22 has dropped into the zone of the projection 23 of the handle 17 under the effect of the spring 11. The apparatus has thus been restored to its original state, for further use.

The bayonet-type connection according to the invention, and explained by reference to an example, and serving to secure camera accessories, is not confined to the example described. For instance, a bayonet-type lock 2 according to the invention, with the driving parts described, can also be accommodated in the camera housing 12 itself, while a corresponding locking mounting 15 is accommodated in the accessory 1. Neither need the handle 17 consist of a straight rack 6 operating in the longitudinal direction. An alternative construction of the stressing and driving spring 8 can be provided in the form of a toothed segment capable of being rotated and locked by means of a rotary knob fitted to the outside of the accessory 1.

WHAT WE CLAIM IS:—

1. Bayonet-type connection for securing 130

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As soon as an accessory is mounted on the camera housing 12 the toggle 5, which is held by the prestressing of the spring 8 in its position inside the contours 25 of the lock mounting 15 will be placed on the lock 13. The said lock 13, which fits flush against the wall 16 of the housing and which closes the lock mounting 15 on the form-closed principle when not in use will be deflected into the inside of the housing of the camera 12 as soon as the pressure of the accessory 1 against the spring 14 commences. At the moment when the toggle 5 has passed the wall of the housing 16 the two walls 16 and 18 of the housing will make firm impact with each other. The result is that the release knob 7 of the roller-type lock 10 has been pressed the whole of the way into the wall 18 of the housing, so that the locking disc 22 slides out of the zone of the projection 23. As soon as the rack 6 is released the spring 8 will press it out of the housing, towards the left. In this process the toothed bar 9 which meshes with the pinion 4 will rotate the said pinion in such a way that the screw threaded guide of the bayonet-type lock 2 will at the same time pivot the toggle present in the camera housing 9 (according to Figure 5) and draw it against the inside of the wall 16 of the

housing. The toggle 5, thus tightened on the form-locked and force-locked principle by the action of the spring 8 will connect the camera housing 1 and the accessory housing 12 tightly together. As no locking stops are provided, any movements (wobbling) of the housing, occurring at the beginning of the operation, e.g. as a result of manufacturing tolerances, will be continuously counterbalanced by further tightening of the toggle 5.

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WHAT WE CLAIM IS:—

1. Bayonet-type connection for securing 130



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an accessory to a photographic camera, having rotatably mounted on the camera or accessory a bayonet-type lock which is rotated to effect locking by means of a prestressed spring which is releasably lockable in the stressed position.

2. Bayonet-type connection in accordance with Claim 1, wherein a handle for prestressing the spring and a roller-type lock serving to lock it in position are provided, the roller-type lock being unlocked by the attachment of the accessory to the camera.

3. Bayonet-type connection in accordance with Claim 1 or 2, wherein the roller-type lock is provided with a release knob which extends towards the outside and which is pressed in when the walls of the housing encounter each other, thus releasing the prestressed force of the spring.

4. Bayonet-type connection in accordance with any one of Claims 1 to 3, wherein

the handle by which the spring is stressed is provided with a rack connected with the bayonet-type lock via a pinion.

5. Bayonet-type connection as claimed in any preceding claim wherein the bayonet-type lock can be screwed in a threaded bushing penetrating through the wall of the accessory, so that the bayonet-type lock is unscrewed from the threaded bushing when the spring is stressed and is screwed into the threaded bushing when the spring is relaxed.

6. A bayonet-type connection device, substantially as described herein with reference to and as illustrated by the accompanying drawing.

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