

PATENT SPECIFICATION (11)

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(54) CAMERA SUPPORT

(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 a camera support, which is more particularly for use with photographic and cinematographic cameras and is an improvement in or modification of the camera support described and claimed in our copending Application No. 29817/71 (Serial No. 1,351,833).

In our copending Application No. 29817/71 (Serial No. 1,351,833) there is described and claimed a camera support comprising a body portion and an elongate connecting member, one end of which is provided with means for mounting a camera, the connecting member being pivotally mounted, by means of a ball head secured to the other end thereof, within a recess in the body portion and being retractable into the body portion.

With the popularization of electronic shutters, the least sophisticated of photographers can now make an accurate time exposure with a simple and inexpensive mechanism. The only new problem faced by the operator is camera movement. However, many cameras equipped with electronic shutters provide signals responsive to low scene light conditions which suggest to the photographer the use of a camera support and a cable release to make a time exposure, and such cameras now include sockets for receiving both types of accessories.

In accordance with the present invention there is provided an improvement in or modification of the camera support claimed in claim 1 of Patent Application No. 29817/71 (Serial No. 1,351,833) wherein the

body portion has a generally hollow interior containing a plurality of interior walls which cooperate with a cover means to form a recess within the body portion into which a cable release may be at least partially inserted for storage.

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

Figure 1 shows a perspective view of one form of camera support according to the present invention, with the connecting member in its extended position;

Figure 2 is a bottom view of the camera support of Figure 1, with the cover spring partially cut away to reveal the inner portions of the body;

Figure 3 is a section through the camera support shown in Figure 1, taken on the line 3—3;

Figure 4 is an exploded view of the camera support of Figures 1—3;

Figure 5 is a bottom view of a camera support according to the present invention, which is provided with one form of anti-rotation mechanism associated with the ball head of the connecting member;

Figure 6 is a section through the camera support shown in Figure 5, taken on the line 6—6;

Figure 7 is an isolated view of the ball head shown in Figures 5 and 6, showing the slots formed in the ball head;

Figure 8 is a section through part of a camera support of the present invention which is provided with a second form of anti-rotation mechanism; and

Figure 9 is an enlarged view of the release button of the camera support of Figure 8.

Because photographic apparatus is well known, the present description will be directed in particular to apparatus forming part of, or cooperating more directly with, a camera support in accordance with the present invention. It is to be understood that elements of photographic apparatus not

specifically shown or described may take various forms well known to those skilled in the art.

Referring first to Figures 1—4, a camera support indicated generally by the numeral 10 includes a support body 12 and a connecting member 14. The connecting member 14 consists of a ball head 16 at one end thereof, a shaft 18 extending from ball head 16, a flange 20 at the opposite end of shaft 18 from ball head 16, and a screw end 22 extending from flange 20. The screw end 22 is threaded so as to mate with a suitable receptacle in a camera (not shown) which is to be mounted on the camera support 10. The end 22 could, however, be replaced by any means which is suitable for mating with an accessory receptacle in a camera.

The body 12 includes a generally flat upper wall 30 and four downwardly depending sidewalls 32a, 32b, 32c and 32d which cooperate with the upper wall 30 such that the body 12 is generally box-shaped. The interior of the body 12 is substantially hollow and includes a first pair of walls 34 which depend from the upper wall 30 and which extend inwardly from the sidewall 32a into the interior of the body 12. The walls 34 terminate at a generally cylindrical wall 36, which extends downwardly from a bearing 38 in the upper wall 30. A second pair of walls 40, also depending from the upper wall 30, extend generally from the opposite side of wall 36 from walls 34, further into the interior of body 12 and terminate in a cross-wall 42 which depends from wall 30 and which intersects both walls 40.

The bearing 38 includes an aperture 52, which communicates with an aperture 52 in the upper wall 30. Bearing 38 is preferably spherical and of such a radius as to mate with the ball head 16 of the connecting member 14 when the ball head 16 is inserted within cylindrical wall 36 and the shaft 18 passes through the aperture 50. A cover spring 60 is mounted on the lower surface of wall 36 by means of screws 62. The cover spring 60 has a central portion 64, a flat transverse portion 65 and a flat, longitudinal portion 66. Central portion 64 is spherical and of such a radius as to mate with the ball head 16 of connecting member 14 so as to produce a frictional force upon the ball head 16 under the urging of screws 62. Transverse portion 65 extends across the entire width of body 12 and fits into a lip 68 which extends across the lower portion of the sidewall 32a and partially along each of sidewalls 32b and 32d. Longitudinal portion 66 of the cover spring 60 is generally rectangular and extends longitudinally with the body 12 so as to cover the recess defined by walls 40 and cross-wall 42. The cover spring 60, in cooperation with sidewalls 32a, 32b and 32d, walls 34,

cylindrical wall 36 and walls 40, thus defines a pair of opposed recesses 70 between the cover spring 60 and the upper wall 30, which are partially enclosed by the cover spring 60.

The upper wall 30 is cut out to form a generally rectangular recess 72 which extends from the aperture 52 towards the sidewall 32a. As may best be seen in Figure 4, the recess 72 extends between the walls 34 and through the sidewall 32a. The recess 72 is of sufficient width to receive the shaft 18 of the connecting member 14 when the connecting member is in its retracted position.

When the camera support 10 is not in use, the connecting member 14 may be stored within the body 12 by rotating the ball head 16 within the bearing 38 until the shaft 18 rests within the recess 72. A cable release 74, with a pair of opposed ends 76 and a central portion 78, may be stored partially within the recesses 70 between the upper wall 30 and the cover spring 60 by inserting the ends 76 into the recesses 70, with the central portion 78 resting against the sidewall 32c. The cable release 74 will be held within the recesses 70 by a combination of the cover spring 60 and the frictional force between the central portion 78 and the sidewall 32c. The cable release 74 may be easily removed when desired by grasping the central portion 78 and extracting it, thereby drawing the ends 76 out of the recesses 70. The camera support 10 then has a compact configuration, with a stored connecting member 14 and a stored cable release 74, and with only the screw end 22 extending outwardly of the body 12 for ease in coupling the connecting member 14 to a camera.

In the camera support shown in Figures 5—7, an anti-rotation pin is provided for assisting the operator in assembling or disassembling the camera support to a camera (not shown). Components similar to those in the camera support shown in Figures 1—4 are designated by the same numerals which have been primed. The connecting member 14¹ is identical to that illustrated in Figures 1—4 with the exception of ball head 100 in which a number of slots 102 are formed. As may best be seen in Figure 7, the slots 102 extend along the circumference and through a point on ball head 100 which is opposite shaft 18¹ of the connecting members 14¹. A plunger 110 is mounted on cross-wall 42¹ of support body 12¹, and extends through an aperture 111 in wall 36¹. The plunger 110 includes an anti-rotation pin 112 adapted for insertion into a slot 102 in ball head 100. The plunger 110 is spring biased by a spring 114, held between the cylindrical wall 36¹ and a flange 116 on the plunger 110, so that the pin 112 is held out

of the slot 102. When the operator desires to assemble the camera support 10¹ to a camera, the plunger 110 is pressed inwardly so that the pin 112 enters a slot 102 in the ball head 100, thereby holding the connecting member 14¹ against rotation as the camera is screwed on to screw end 22¹ of connecting member 14¹. Disassembly of the camera from the support 10¹ may also be aided by pressing inwardly on the plunger 110 and thereby preventing the ball head 100 from rotating as the camera is unscrewed.

Figures 8 and 9 show part of a camera support provided with a second form of anti-rotation pin. A connecting member 200 consists of a shaft 202 and a ball head 204 in which is formed an anti-rotation slot 206. One or more similar slots 206 may be formed around the circumference of the ball head 204, so that a slight axial rotation of the connecting member 200 will bring one of the slots 206 to the desired position for locking against rotation. An aperture 208 formed in a cover spring 209 communicates with one of the slots 206.

A support body 210 includes an upper wall 212 and an access door 214 which is rotatably mounted on a pin 216 fixedly mounted to the top wall 212. The door 214 is made of a resilient material and terminates in a latch end 218 which includes a latch 220, a release button 221 and a cam surface 222. The latch 220 fits within an aperture 224 located in a bottom wall 226 of the body 210 and may be freed from the aperture 224 by pressing upward on the button 221 to open the access door 214.

A lever arm 228 is pivotally mounted on a pin 230 which is fixedly attached to the bottom wall 226. One end 232 of the lever 228 rests upon the cam surface 222 of the latch end 218. The other end 234 of the lever arm 228 rests against a flange 236 on an anti-rotation pin 238 which is axially aligned with a slot 206 in the ball head 204. The pin 238 is biased by a spring 240 into the slot 206, the spring 240 being compressively held between the flange 236 and the bottom wall 226.

The camera support of Figure 8 is shown with the connecting member 200 in its stored position and with the pin 238 held within slot 206 of the ball head 204. A screw end (not shown) on the connecting member 200 may now be inserted into the camera (not shown) which is to be supported by the camera support and ball head 204 will not rotate. Ball head 204 is then released for

movement of connecting member 200 to its extended position by pressing inwardly on button 221. Pressing button 221 forces cam surface 222 against end 232 of the lever 228, causing lever 228 to rotate in an anticlockwise direction about the pin 230. The pin 238 is moved out of the slot 206, thereby freeing the ball head 204 and permitting the connecting member 200 to be pivoted out of its storage position in body 210. The access door 214 may also be opened at this time to gain access to the interior of body 210 for removal of the cable release 74 which may be stored as described hereinbefore.

The lever 228 will be held in its anticlockwise position by engagement of pin 238 with ball head 204 until the connecting member 200 is returned to its stored position. The pin 238 will then be moved under the bias of spring 240 so that it re-enters slot 206 in the ball head 204 to prevent rotation of ball head 204 as the support is removed from the camera. The access door 214 may be closed at any time, with connecting member 200 in either its stored or extended position. If connecting member 200 is in its extended position, the lever 228 is held in its anticlockwise position by the pin 238 and the door 214 may be rotated about the pin 216 until the latch 220 engages the aperture 224. If connecting member 200 is in its stored position, as illustrated, the cam surface 222 will rotate the lever 228 in an anticlockwise direction, thereby permitting the latch 220 to engage the aperture 224.

WHAT WE CLAIM IS:—

1. An improvement in or modification of the camera support claimed in Claim 1 of Patent Application No. 29817/71 (Serial No. 1,351,833) wherein the body portion has a generally hollow interior containing a plurality of interior walls which cooperate with a cover means to form a recess within the body portion into which a cable release may be at least partially inserted for storage.

2. A camera support according to Claim 1 wherein the cover means includes a resilient portion positioned in engagement with the ball head and a wall portion in engagement with the interior walls.

3. A camera support according to Claim 1 constructed substantially as hereinbefore described with reference to, and as shown in, Figures 1—4, or Figures 5—7, of Figures 8 and 9 of the accompanying drawings.

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Figures 8 and 9 show part of a camera support provided with a second form of anti-rotation pin. A connecting member 200 consists of a shaft 202 and a ball head 204 in which is formed an anti-rotation slot 206. One or more similar slots 206 may be formed around the circumference of the ball head 204, so that a slight axial rotation of the connecting member 200 will bring one of the slots 206 to the desired position for locking against rotation. An aperture 208 formed in a cover spring 209 communicates with one of the slots 206.

A support body 210 includes an upper wall 212 and an access door 214 which is rotatably mounted on a pin 216 fixedly mounted to the top wall 212. The door 214 is made of a resilient material and terminates in a latch end 218 which includes a latch 220, a release button 221 and a cam surface 222. The latch 220 fits within an aperture 224 located in a bottom wall 226 of the body 210 and may be freed from the aperture 224 by pressing upward on the button 221 to open the access door 214.

A lever arm 228 is pivotally mounted on a pin 230 which is fixedly attached to the bottom wall 226. One end 232 of the lever 228 rests upon the cam surface 222 of the latch end 218. The other end 234 of the lever arm 228 rests against a flange 236 on an anti-rotation pin 238 which is axially aligned with a slot 206 in the ball head 204. The pin 238 is biased by a spring 240 into the slot 206, the spring 240 being compressively held between the flange 236 and the bottom wall 226.

The camera support of Figure 8 is shown with the connecting member 200 in its stored position and with the pin 238 held within slot 206 of the ball head 204. A screw end (not shown) on the connecting member 200 may now be inserted into the camera (not shown) which is to be supported by the camera support and ball head 204 will not rotate. Ball head 204 is then released for

movement of connecting member 200 to its extended position by pressing inwardly on button 221. Pressing button 221 forces cam surface 222 against end 232 of the lever 228, causing lever 228 to rotate in an anticlockwise direction about the pin 230. The pin 238 is moved out of the slot 206, thereby freeing the ball head 204 and permitting the connecting member 200 to be pivoted out of its storage position in body 210. The access door 214 may also be opened at this time to gain access to the interior of body 210 for removal of the cable release 74 which may be stored as described hereinbefore.

The lever 228 will be held in its anticlockwise position by engagement of pin 238 with ball head 204 until the connecting member 200 is returned to its stored position. The pin 238 will then be moved under the bias of spring 240 so that it re-enters slot 206 in the ball head 204 to prevent rotation of ball head 204 as the support is removed from the camera. The access door 214 may be closed at any time, with connecting member 200 in either its stored or extended position. If connecting member 200 is in its extended position, the lever 228 is held in its anticlockwise position by the pin 238 and the door 214 may be rotated about the pin 216 until the latch 220 engages the aperture 224. If connecting member 200 is in its stored position, as illustrated, the cam surface 222 will rotate the lever 228 in an anticlockwise direction, thereby permitting the latch 220 to engage the aperture 224.

WHAT WE CLAIM IS:—

1. An improvement in or modification of the camera support claimed in Claim 1 of Patent Application No. 29817/71 (Serial No. 1,351,833) wherein the body portion has a generally hollow interior containing a plurality of interior walls which cooperate with a cover means to form a recess within the body portion into which a cable release may be at least partially inserted for storage.

2. A camera support according to Claim 1 wherein the cover means includes a resilient portion positioned in engagement with the ball head and a wall portion in engagement with the interior walls.

3. A camera support according to Claim 1 constructed substantially as hereinbefore described with reference to, and as shown in, Figures 1—4, or Figures 5—7, of Figures 8 and 9 of the accompanying drawings.

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