

Description

The invention relates generally to the field of photography, and more particularly to an automatic exposure control apparatus for a disposable single-use camera to be used for daylight and underwater photography.

Recently, a disposable single-use 35mm camera referred to as the "Quick Snap" was introduced by Fuji Photo Film Co. Ltd. and another disposable single-use 35mm camera referred to as the "Fling 35" was introduced by Eastman Kodak Co. Generally, each disposable camera is a point-and-shoot type and comprises (1) a plastic inner camera shell including a taking lens, a film metering mechanism, and a simple shutter and (2) a paper-cardboard outer sealed pack which contains the inner camera shell and has respective openings for the taking lens and for a shutter release button, a frame counter window, and a film advance thumbwheel on the camera shell. The inner camera shell has front and rear viewfinder windows located at opposite ends of a see-through viewfinder tunnel, and the outer sealed pack has front and rear openings for the respective viewfinder windows. At the manufacturer, the inner camera shell is loaded with a conventional 24-exposure 35mm film cartridge, and substantially the entire length of the unexposed filmstrip is factory prewound from the cartridge into a supply chamber of the camera shell. After the customer takes a picture, the thumbwheel is manually rotated to rewind the exposed frame into the cartridge. The rewinding movement of the filmstrip the equivalent of one frame rotates a metering sprocket to decrement a frame counter to its next lower numbered setting. When substantially the entire length of the filmstrip is exposed and rewound into the cartridge, the single-use camera is sent to a photofinisher who first removes the inner camera shell from the outer sealed pack and then removes the filmstrip from the camera shell. The filmstrip is processed, and the camera shell and the opened pack may be recycled.

While neither of these disposable cameras is adapted for underwater use, their modification for such purpose would be of interest to the consumer. US-A-4,882,800 discloses an underwater camera comprises a standard camera enclosed in some form of waterproof housing, with the manual controls operating through water-tight seals such as "O" rings or continuous flat rubber gaskets. The camera's viewfinder is aligned with glass windows in the waterproof housing, or alternatively a gun-sight viewfinder is mounted atop the waterproof housing. An exposure meter or other light sensitive device, built into the camera or hand-held, is used in the usual manner to adjust the camera's exposure control apparatus in accordance with the available ambient light.

SU-A-1 430 932 discloses an underwater cine

camera having a depth sensor with five hermetic electrodes, two facing each other at open end of capillary. With increasing depth of water the electrodes close in sequence, which connects different automation circuits and their energisation. When attaining a certain depth, the electrodes connected with a display unit are closed by the water pressure resulting in displaying a depth marker making easier to assess photographing conditions.

US-A-4,634,253 discloses a camera of waterproof construction comprising operation means having a depth sensor for adjusting the focal point of a lens to a predetermined position suited for underwater photography. The depth sensor consists of a flexible disk-like member and a single switch which is closed by the water pressure.

According to the invention, a camera capable of underwater photography is provided as defined in Claim 1. Essentially, the camera comprises an inner shell, an outer water pressure-resistant casing,

pressure sensitive means exposed through an opening in the outer casing for actuation responsive to water pressure; and

adjustable exposure control means located within the inner casing; characterized by

coupling means for connecting the pressure sensitive means and the exposure control means to adjust the exposure control means in accordance with actuation of the pressure sensitive means responsive to water pressure.

Preferably, the camera includes a taking lens, the exposure control means includes diaphragm means adjustable to vary the size of an aperture optically aligned with the taking lens, and the coupling means includes linkage means connecting the pressure sensitive means and the diaphragm means for adjusting the diaphragm means to increase the size of the aperture in accordance with actuation of the pressure sensitive means responsive to water pressure. Moreover, the exposure control means includes biasing means for adjusting the diaphragm means normally to minimize the size of the aperture for daylight photography.

FIG. 1 is a front exploded perspective view of an underwater disposable single-use 35mm camera according to a preferred embodiment of the invention, showing the disposable camera and a waterproof casing;

FIG. 2 is a front perspective view only of the disposable camera, showing a plastic inner camera shell and a paper outer sealed pack;

FIG. 3 is a sectional view of the respective front walls of the waterproof casing, the outer sealed pack, and the inner camera shell, particularly with respect to a tunnel-like viewfinder;

FIG. 4 is a sectional view similar to FIG. 3, but at the respective rear walls of the waterproof casing, the outer sealed pack, and the inner camera

shell;

FIG. 5 is front perspective view of an automatic exposure control apparatus for the disposable camera; and

FIG. 6 is a front elevation view similar to FIG. 5.

The invention is disclosed in connection with a 35mm camera. Because such a camera is widely known, this description is directed in particular to photographic elements forming part of or cooperating directly with the invention. It is to be understood, however, that other elements not specifically shown or described may take various forms known to persons of ordinary skill in the art.

Referring now to the drawings, FIGS. 1-4 depict a disposable single-use 35mm camera 1. The disposable camera 1 is a point-and-shoot type and comprises (a) an inner camera shell 3 having a front viewfinder opening 5 arranged in a front wall 7 of the inner shell and a rear viewfinder opening 9 arranged in a rear wall 11 of the inner shell for viewing a subject to be photographed through the two viewfinder openings and (b) an outer sealed pack 13 which tightly contains the inner shell and has a front opening 15 arranged in a front wall 17 of the outer pack and a rear opening 19 arranged in a rear wall 21 of the outer pack to be substantially aligned with the respective viewfinder openings in the inner shell. The inner camera shell 3 houses a taking lens 23, a single blade shutter (not shown), a film advance and metering mechanism (not shown), a frame counter (not shown), and a multi-blade diaphragm 24 shown in FIGS. 5 and 6. A top wall 25 of the inner camera shell 3 has a top opening 27 for a manually depressible shutter release button 29 and a top window 31 for the frame counter. A top wall 33 of the outer sealed pack 13 has respective top openings 35 and 37 for the release button 29 and the top window 31 for the frame counter. The front wall 17 of the outer sealed pack 13 has a front opening 39 for the taking lens 23. A manually rotatable thumbwheel 41 is coupled to the film advance and metering mechanism via a stem 43 which extends through respective bottom openings 45 and 47 in the outer sealed pack 13 and the inner camera shell 3.

At the manufacturer, the inner camera shell 3 is loaded with a conventional 24-exposure 35mm film cartridge and substantially the entire length of the unexposed filmstrip is factory prewound from the cartridge onto a take-up spool (not shown) in the camera shell. After the customer takes a picture by depressing the release button 29, the thumbwheel 41 is manually rotated to rewinding the exposed frame into the cartridge. The rewinding movement of the filmstrip the equivalent of one frame rotates a metering sprocket (not shown) to decrement the frame counter to its next lower numbered setting. When substantially the entire length of the filmstrip is exposed and rewound into the cartridge, the single-use camera 1 is sent to a photofinisher who first removes the inner camera

shell 3 from the outer sealed pack 13 and then removes the filmstrip from the camera shell. The filmstrip is processed, and the camera shell 3 and the opened pack 13 are thrown away.

A plastic transparent waterproof casing 49 tightly encloses the outer sealed pack 13 and the inner camera shell 3. See FIG. 1. The waterproof casing 49 includes a front plastic viewfinder lens 51 integrally formed on a front wall 53 of the casing to be optically aligned with the front opening 15 in the outer pack 13 and the front viewfinder opening 5 in the inner shell 3 as shown in FIG. 3, and it includes a rear plastic viewfinder lens 55 integrally formed on a rear wall 57 of the casing to be optically aligned with the rear opening 19 in the outer pack and the rear viewfinder opening 9 in the inner shell as shown in FIG. 4. The front viewfinder lens element 51 extends through the front opening 15 in the outer pack 13 and slightly into the front viewfinder opening 5 in the inner shell 3. See FIG. 3. A pair of spacers 58 are integrally formed on the front wall 53 of the waterproof casing 49 to abut the front wall 17 of the outer pack 13, to limit the extent to which the front viewfinder lens element 51 extends into the front viewfinder opening 5 of the inner shell 3. The rear wall 57 of the waterproof casing 49 is outwardly bowed as shown in FIG. 4 to urge the rear viewfinder lens element 55 firmly against the rear wall 21 of the outer pack 13, to position the rear viewfinder lens element to cover the rear opening 19 in the outer pack.

The waterproof casing 49 may be injection molded in two pieces as shown in FIG. 2. The two pieces would then be sealed together in a watertight relation with the disposable camera 1 enclosed between them. Since the front and rear viewfinder lens elements 51 and 55 may be made of the same material as the waterproof casing, it is a simple matter to injection mold the lens elements with the casing. A bottom opening 59 is provided in the waterproof casing 49 to admit the stem 43 of the thumbwheel 41 into the respective bottom openings 45 and 47 in the outer sealed pack 13 and the inner camera shell 3. See FIG. 1. A flat rubber gasket 61 is sandwiched between the bottom opening 59 and the bottom opening 45 to prevent water from entering the casing 49 along the stem 43 of the thumbwheel 41.

The multi-blade diaphragm 24 comprises a pair of diaphragm blades 63 and 65 supported for movement towards and away one another at a pivot pin 67 to continuously increase or decrease the size of an aperture (lens opening) 69. The aperture 69 is optically aligned with the taking lens 23. See FIG. 5. According to custom, the size of the aperture 69 determines an "f-number", which is a relatively high number when the aperture is small and is a relatively low number when the aperture is enlarged. As the size of the aperture 69 is reduced, i.e. the f-number is made higher, the angle of the cone of light rays passing through the

aperture from the taking lens 23 becomes narrower. Thus, when the aperture 69 is small, the depth of field covered sharply is increased.

Pressure sensitive means in the form of a resiliently flexible rubber disk 71 is supported within an opening 73 in the waterproof casing 49. See FIGS. 5 and 6. The rubber disk 71 is adapted to be collapsed or bowed increasingly inward of the opening 73 due to increases in water pressure. That is, as the waterproof casing 49 is submerged further underwater, the rubber disk 71 will be bowed further inward of the opening 73.

A linking rod 75 has one end 77 connected to the two diaphragm blades 63 and 65 by means of a cam pin 79 projecting from that end into respective cam follower slots 81 in the blades, and it has an opposite end 83 extending through respective openings 85 and 87 in the inner shell 3 and the outer pack 13 substantially into abutment against the inside face of the rubber disk 71. The rod 75 is supported for movement about a pivot pin 89 and is urged by a very light spring 91 clockwise in FIGS. 5 and 6 against a stop 93. The spring 91 is grounded to the pin 89 or the shell 3.

When the camera 1 is submerged underwater, the rubber disk 71 is bowed inward of the opening 73, causing the rod 75 to be pivoted counter-clockwise in FIGS. 5 and 6 away from the stop 93 to, in turn, pivot the two blades 63 and 65 away from one another to increase the size of the aperture 69 and thereby lower the f-number. When the camera 1 is removed from the water, the rubber disk 73 returns to its original normal position, allowing the light spring 91 to pivot the rod 75 clockwise in FIGS. 5 and 6 against the stop 93 to, in turn, pivot the blades 63 and 65 towards one another to decrease the size of the aperture 69 and thereby raise the f-number. A typical f-number for the aperture 69 when the camera 1 is out of the water is f/22. Conversely, typical f-numbers for the aperture 69 are f/16, when the camera 1 is in one foot of water (1 foot = 0.3048 m), and f/8, when the camera is in ten feet of water. Of course, as the camera 1 is submerged underwater from one foot to ten feet, the rubber disk 71 will be progressively bowed inward, gradually increasing the size of the aperture 69 and correspondingly lowering the f-number.

The invention has been described with reference to a preferred embodiment. However, it will be appreciated that variations and modifications can be effected within the ordinary skill in the art without departing from the scope of the invention.

Claims

1. A camera (1) capable of underwater photography comprising:
 - an inner shell (3) for housing camera devices (23,24),

an outer water pressure-resistant casing (49) enclosing said inner shell (3),

adjustable exposure control means (24) located within said inner shell for providing film exposure, and

pressure actuatable sensitive means (71) exposed through an opening (73) in said outer casing (49) adapted to be actuated by the water pressure when the camera is submerged underwater,

characterized by

coupling means (75) for coupling said pressure actuatable sensitive means (71) and said exposure control means in order (24) to adjust the exposure provided by said exposure control means in accordance with the actuation of said pressure actuatable sensitive means due to water pressure.

2. A camera (1) as recited in claim 1, wherein said camera includes a taking lens (23), said exposure control means (24) includes diaphragm means (24) adjustable to vary the size of an aperture (69) optically aligned with said taking lens (23), and said coupling means (75) includes linkage means (75) connecting said pressure sensitive means (71) and said diaphragm means (24) for adjusting the diaphragm means to increase the size of said aperture in accordance with the increasing of the actuation of the pressure actuating sensitive means due to water pressure.
3. A camera (1) as recited in claim 2, wherein said exposure control means (24) includes biasing means (91) for adjusting said diaphragm means (24) normally to minimize the size of said aperture (69) for daylight photography.
4. A camera (1) as recited in claim 1, wherein said exposure control means (24) includes f-number control means (63, 65) adapted to adjust the diaphragm means (24) from an f-number value for picture-taking to a relatively low f-number for underwater photography, and said coupling means (75) includes linkage means (75) connecting said pressure sensitive means (71) and said f-number control means (63, 65) for adjusting the f-number value to at least one relatively low f-number for underwater photography in accordance with actuation of the pressure actuatable sensitive means due to water pressure.
5. A camera (1) as recited in claim 4, wherein said exposure control means (24) includes biasing means (91) for adjusting said f-number control means (63, 65) normally to adjust the diaphragm means to a relatively high f-number for daylight photography.

aperture from the taking lens 23 becomes narrower. Thus, when the aperture 69 is small, the depth of field covered sharply is increased.

Pressure sensitive means in the form of a resiliently flexible rubber disk 71 is supported within an opening 73 in the waterproof casing 49. See FIGS. 5 and 6. The rubber disk 71 is adapted to be collapsed or bowed increasingly inward of the opening 73 due to increases in water pressure. That is, as the waterproof casing 49 is submerged further underwater, the rubber disk 71 will be bowed further inward of the opening 73.

A linking rod 75 has one end 77 connected to the two diaphragm blades 63 and 65 by means of a cam pin 79 projecting from that end into respective cam follower slots 81 in the blades, and it has an opposite end 83 extending through respective openings 85 and 87 in the inner shell 3 and the outer pack 13 substantially into abutment against the inside face of the rubber disk 71. The rod 75 is supported for movement about a pivot pin 89 and is urged by a very light spring 91 clockwise in FIGS. 5 and 6 against a stop 93. The spring 91 is grounded to the pin 89 or the shell 3.

When the camera 1 is submerged underwater, the rubber disk 71 is bowed inward of the opening 73, causing the rod 75 to be pivoted counter-clockwise in FIGS. 5 and 6 away from the stop 93 to, in turn, pivot the two blades 63 and 65 away from one another to increase the size of the aperture 69 and thereby lower the f-number. When the camera 1 is removed from the water, the rubber disk 73 returns to its original normal position, allowing the light spring 91 to pivot the rod 75 clockwise in FIGS. 5 and 6 against the stop 93 to, in turn, pivot the blades 63 and 65 towards one another to decrease the size of the aperture 69 and thereby raise the f-number. A typical f-number for the aperture 69 when the camera 1 is out of the water is f/22. Conversely, typical f-numbers for the aperture 69 are f/16, when the camera 1 is in one foot of water (1 foot = 0.3048 m), and f/8, when the camera is in ten feet of water. Of course, as the camera 1 is submerged underwater from one foot to ten feet, the rubber disk 71 will be progressively bowed inward, gradually increasing the size of the aperture 69 and correspondingly lowering the f-number.

The invention has been described with reference to a preferred embodiment. However, it will be appreciated that variations and modifications can be effected within the ordinary skill in the art without departing from the scope of the invention.

Claims

1. A camera (1) capable of underwater photography comprising:
 - an inner shell (3) for housing camera devices (23,24),

an outer water pressure-resistant casing (49) enclosing said inner shell (3),

adjustable exposure control means (24) located within said inner shell for providing film exposure, and

pressure actuatable sensitive means (71) exposed through an opening (73) in said outer casing (49) adapted to be actuated by the water pressure when the camera is submerged underwater,

characterized by

coupling means (75) for coupling said pressure actuatable sensitive means (71) and said exposure control means in order (24) to adjust the exposure provided by said exposure control means in accordance with the actuation of said pressure actuatable sensitive means due to water pressure.

2. A camera (1) as recited in claim 1, wherein said camera includes a taking lens (23), said exposure control means (24) includes diaphragm means (24) adjustable to vary the size of an aperture (69) optically aligned with said taking lens (23), and said coupling means (75) includes linkage means (75) connecting said pressure sensitive means (71) and said diaphragm means (24) for adjusting the diaphragm means to increase the size of said aperture in accordance with the increasing of the actuation of the pressure actuating sensitive means due to water pressure.
3. A camera (1) as recited in claim 2, wherein said exposure control means (24) includes biasing means (91) for adjusting said diaphragm means (24) normally to minimize the size of said aperture (69) for daylight photography.
4. A camera (1) as recited in claim 1, wherein said exposure control means (24) includes f-number control means (63, 65) adapted to adjust the diaphragm means (24) from an f-number value for picture-taking to a relatively low f-number for underwater photography, and said coupling means (75) includes linkage means (75) connecting said pressure sensitive means (71) and said f-number control means (63, 65) for adjusting the f-number value to at least one relatively low f-number for underwater photography in accordance with actuation of the pressure actuatable sensitive means due to water pressure.
5. A camera (1) as recited in claim 4, wherein said exposure control means (24) includes biasing means (91) for adjusting said f-number control means (63, 65) normally to adjust the diaphragm means to a relatively high f-number for daylight photography.



6. A camera (1) as recited in claim 1, 2 or 4, wherein said pressure actuatable sensitive means (71) includes a resiliently flexible disk-like member (71) adapted to be increasingly bowed responsive to the increasing of the water pressure.
7. A camera (1) as recited in claim 1, wherein said exposure control means (24) includes a plurality of blades (63, 65) supported for movement with respect to one another to continuously vary the size of an aperture (69) formed by said blades, said pressure actuatable sensitive means (71) includes a pressure actuatable sensitive member (71) adapted to be increasingly actuated due to the increasing in water pressure, and said coupling means (75) includes linkage means (75) connecting said blades (63, 65) and said pressure actuatable sensitive member (71) for moving the blades to continuously increase the size of said aperture (69) in accordance with the increasing actuation of the pressure sensitive member due to the increasing of water pressure.

Patentansprüche

1. Fotografische Kamera (1) für Unterwasseraufnahmen, mit
 - einem Inneren Gehäuse (3), in dem Elemente (23, 24) der Kamera untergebracht sind,
 - einer das innere Gehäuse (3) umschließenden, wasserdruckresistenten äußeren Umhüllung (49),
 - einer im Inneren Gehäuse angeordneten einstellbaren Belichtungssteuervorrichtung (24) zum Belichten des Films, und
 - einem druckempfindlichen Element (71), das in einer Öffnung (73) in der äußeren Umhüllung (49) angeordnet ist und durch Wasserdruck betätigbar ist, wenn die Kamera sich unter Wasser befindet,
 - gekennzeichnet durch
 - ein Verbindungselement (75), das das druckempfindliche Element (71) mit der Belichtungssteuervorrichtung (24) verbindet, um die durch die Belichtungssteuervorrichtung gesteuerte Belichtung entsprechend der durch Wasserdruck erfolgenden Betätigung des druckempfindlichen Elements einzustellen.
2. Fotografische Kamera (1) nach Anspruch 1, dadurch gekennzeichnet, daß die Kamera ein Objektiv (23) aufweist, daß die Belichtungssteuervorrichtung (24) eine Blende (24) umfaßt, die derart verstellbar ist, daß dadurch die Größe einer mit dem Objektiv (23) optisch ausgerichteten Blendenöffnung (69) veränderbar ist, und daß das Verbindungselement (75) ein Kupplungsge-
- stänge (75) aufweist, das das druckempfindliche Element (71) zum Einstellen der Blende (24) mit dieser verbindet, damit sich die Blendenöffnung entsprechend der durch Wasserdruck erfolgenden verstärkten Betätigung des druckempfindlichen Elements vergrößert.
3. Fotografische Kamera (1) nach Anspruch 2, dadurch gekennzeichnet, daß die Belichtungssteuervorrichtung (24) ein Vorspannelement (91) aufweist, um die Blende (24) derart einzustellen, daß sich die Blendenöffnung (69) für Tageslichtaufnahmen minimiert.
4. Fotografische Kamera (1) nach Anspruch 1, dadurch gekennzeichnet, daß die Belichtungssteuervorrichtung (24) Blendensteuermittel (63, 65) aufweist, die die Blende (24) von einem Blendenwert für Tageslichtaufnahmen auf einen relativ geringen Blendenwert für Unterwasseraufnahmen umstellen, und daß das Verbindungselement (75) ein Kupplungsge- stänge (75) umfaßt, das das druckempfindliche Element (71) und die Blendensteuermittel (63, 65) miteinander verbindet, um die Blende entsprechend der durch Wasserdruck erfolgenden Betätigung des druckempfindlichen Elements auf mindestens einen niedrigen Blendenwert für Unterwasseraufnahmen einzustellen.
5. Fotografische Kamera (1) nach Anspruch 4, dadurch gekennzeichnet, daß die Belichtungssteuervorrichtung (24) ein Vorspannelement (91) aufweist, um die Blendensteuermittel (63, 65) so einzustellen, daß die Blende auf einen relativ hohen Blendenwert für Tageslichtaufnahmen eingestellt wird.
6. Fotografische Kamera (1) nach Anspruch 1, 2 oder 4, dadurch gekennzeichnet, daß das druckempfindliche Element (71) ein federnd nachgiebiges, scheibenförmiges Teil (71) aufweist, das sich mit steigendem Wasserdruck zunehmend durchbiegt.
7. Fotografische Kamera (1) nach Anspruch 1, dadurch gekennzeichnet, daß die Belichtungssteuervorrichtung (24) eine Vielzahl von Lamellen (63, 65) aufweist, die beweglich zueinander gelagert sind, um die durch sie definierte Größe einer Blendenöffnung (69) kontinuierlich zu verändern, daß das druckempfindliche Element (71) ein druckempfindliches Teil (71) aufweist, das mit steigendem Wasserdruck zunehmend betätigt wird, und daß das Verbindungselement (75) ein Kupplungsge- stänge (75) umfaßt, das die Lamellen (63, 65) derart mit dem druckempfindlichen Element (71) verbindet, daß die Lamellen beweg-



bar sind, um die Blendenöffnung (69) entsprechend der durch steigenden Wasserdruck zunehmenden Betätigung des druckempfindlichen Elements kontinuierlich zu vergrößern.

Revendications

1. Appareil photographique (1) permettant la photographie sous l'eau, comprenant :
 - une enveloppe interne (3) destinée à loger les dispositifs (23, 24) de l'appareil photographique,
 - un carter externe (49) résistant à la pression de l'eau et entourant l'enveloppe interne (3),
 - un dispositif réglable (24) de réglage d'exposition placé à l'intérieur de l'enveloppe interne et destiné à assurer l'exposition d'une pellicule, et
 - un dispositif sensible (71) sous l'action d'une pression, exposé par une ouverture (73) du carter externe (49) et destiné à être actionné par la pression de l'eau lorsque l'appareil photographique est immergé sous l'eau, caractérisé par :
 - un dispositif (75) d'accouplement du dispositif sensible (71) à l'action de la pression et du dispositif de réglage d'exposition (24) afin que l'exposition donnée par le dispositif de réglage d'exposition soit ajustée en fonction de la commande du dispositif sensible à l'action de la pression par la pression de l'eau.
2. Appareil photographique (1) selon la revendication 1, dans lequel l'appareil photographique comporte un objectif (23) de prise de vues, le dispositif (24) de réglage d'exposition comporte un dispositif (24) à diaphragme réglable afin qu'il fasse varier la dimension d'une ouverture (69) qui est alignée optiquement sur l'objectif (23), et le dispositif d'accouplement (75) comporte un dispositif de liaison (75) raccordant le dispositif (71) sensible à la pression et le dispositif (24) à diaphragme pour l'ajustement du dispositif à diaphragme afin qu'il augmente la dimension de l'ouverture en fonction de l'augmentation de la commande du dispositif sensible à l'action de la pression due à la pression de l'eau.
3. Appareil photographique (1) selon la revendication 2, dans lequel le dispositif (24) de réglage d'exposition comporte un dispositif (91) de rappel destiné à ajuster le dispositif (24) à diaphragme normalement afin qu'il réduise au minimum la dimension de l'ouverture (69) pour la photographie à la lumière du jour.
4. Appareil photographique (1) selon la revendication 1, dans lequel le dispositif (24) de réglage

d'exposition comprend un dispositif (63, 65) de réglage d'ouverture relative destiné à ajuster le dispositif à diaphragme (24) d'une valeur de nombre d'ouverture relative de prise de vues à une valeur de nombre d'ouverture relative relativement faible pour la photographie sous l'eau, et le dispositif d'accouplement (75) comprend un dispositif (75) de liaison raccordant le dispositif (71) sensible à la pression et le dispositif (63, 65) de réglage de l'ouverture relative afin qu'il ajuste la valeur du nombre de l'ouverture relative à au moins une valeur de nombre d'ouverture relative relativement faible pour la photographie sous l'eau en fonction de la manœuvre du dispositif sensible à l'action d'une pression due à la pression de l'eau.

5. Appareil photographique (1) selon la revendication 4, dans lequel le dispositif (24) de réglage d'exposition comporte un dispositif (91) de rappel destiné à ajuster le dispositif (63, 65) de réglage de l'ouverture relative normalement pour l'ajustement du dispositif à diaphragme à une valeur de nombre d'ouverture relative relativement élevée pour la photographie à la lumière du jour.
6. Appareil photographique (1) selon la revendication 1, 2 ou 4, dans lequel le dispositif (71) sensible à l'action d'une pression comporte un organe en forme de disque (71) élastiquement flexible destiné à être bombé de façon croissante lors de l'augmentation de la pression de l'eau.
7. Appareil photographique (1) selon la revendication 1, dans lequel le dispositif (24) de réglage d'exposition comporte plusieurs lamelles (63, 65) supportées afin qu'elles se déplacent les unes par rapport aux autres et fassent varier de façon continue la dimension d'une ouverture (69) formée par les lamelles, le dispositif (71) sensible à l'action d'une pression comporte un organe (71) sensible à l'action d'une pression et destiné à être commandé de plus en plus par l'augmentation de la pression de l'eau, et le dispositif d'accouplement (75) comprend un dispositif de liaison (75) raccordant les lamelles (63, 65) à l'organe (71) sensible à l'action d'une pression afin qu'il déplace les lamelles et augmente de façon continue la dimension de l'ouverture (69) sous l'action d'une action croissante de l'organe sensible à une pression due à l'augmentation de la pression de l'eau.

