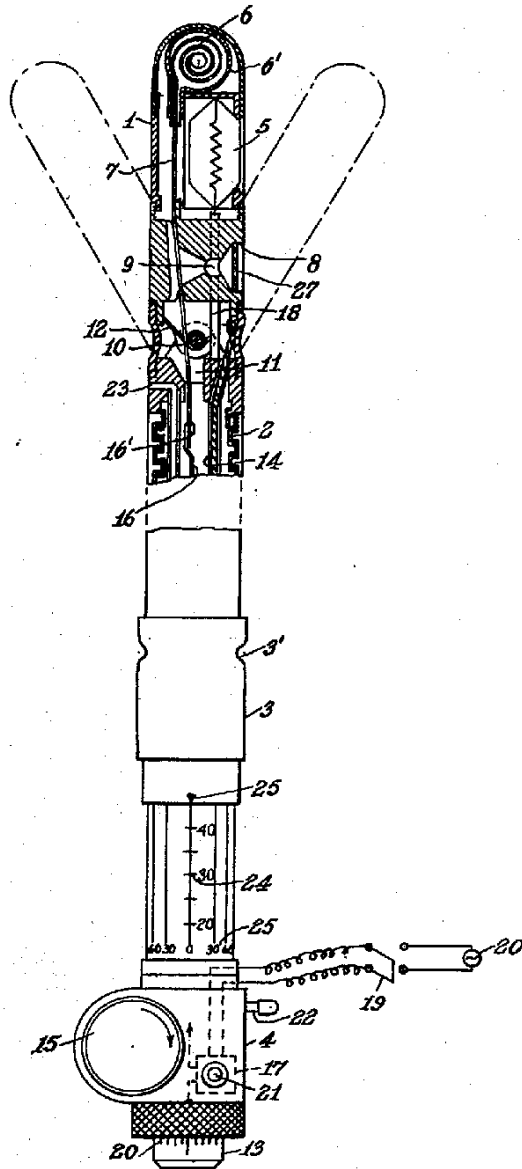


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CAMERA FOR TAKING PHOTOGRAPHS OF INNER WALL
OF CAVITY OF HUMAN OR ANIMAL BODIES
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CAMERA FOR TAKING PHOTOGRAPHS OF INNER WALL OF CAVITY OF HUMAN OR ANIMAL BODIES

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1 Claim. (Cl. 95-11)

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This invention relates to a camera adapted to be inserted into the cavity of a human or animal body such, for example, as the cavity of internal organs such as the stomach, intestines, womb etc. to take photographs of the inner wall thereof. The camera embodying this invention is characterized in that a number of photographs of various parts of the inner wall of the cavity of a human or animal body are successively taken from any desired direction without regard to the position of the inner wall to be photographed by remotely controlling an electric lamp at definite intervals.

The drawing illustrates a camera embodying this invention in enlarged scale showing a part in section.

In the drawing, 1 designates a short metallic tubular bulb which constitutes a camera part. The bulb 1 is pivotally mounted at 10 on a piece 11 secured in the top end of a flexible tube 2 and normally biased by a spring 12 to a counterclockwise direction. The flexible tube 2 is made, for example, of a rubber covered flexible tube. The tube 2 extends through a holding sleeve 3 having a necked portion 3' and is provided at its rear end with an end sleeve 4 secured thereto. The bulb 1 encloses in its top end a roll film 6 contained in a magazine 6', the free end of which is connected at 16' to one end of a guide wire 16 extended through the flexible tube 2 and wound on the end sleeve 4. An electric lamp 5 is fitted in one side wall of the bulb 1 and an opening 8 facing opposite to passage of the film 7 is formed on the same side wall as the lamp 5. Located opposite to the opening 8 is a lens 9. Threaded in the end of the end sleeve 4 is a knob 13, the inner end of which being connected to the base of the bulb 1 by means of a flexible wire 14 extended through the tube 2 so as to oppose the action of spring 12. The knob 13 is so adjusted that the wire 14 normally opposes the action of the spring 12 so as to keep the bulb 1 in its upright position shown in the drawing. Enclosed in the sleeve 4 is a time switch 17 which at a certain time interval, such as $\frac{1}{25}$ second to $\frac{1}{15}$ second, closes and opens an energizing circuit of the electric lamp 5. This energizing circuit emanates from an electric source 20 through a switch 19, lead wires 18, one leading through the metallic portion of the tube 2 and the other directly to the electric lamp 5. 21 shows a push button for operating the time switch 17.

The operation of the camera embodying this invention is as follows. The bulb 1 together with

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the flexible tube 2 is inserted into a cavity of a human or animal body until the necked portion 3' of the holding sleeve 3 is in line with the inlet periphery of the body. Next, the switch 19 is closed and the push button 21 of the time switch 17 is pressed down. Then, the time switch 17 is operated to close an energizing circuit of the electric lamp 5 which follows from the electric source 20 through switch 19, time switch 17, lead wires 18, and one through the metallic portion of the tube 2 and the other through a wire 16 directly to the electric lamp 5. Thus, the electric lamp 5 is lighted up. At the end of the definite time interval set by the time switch 17, the circuit is opened to extinguish the electric lamp 5. Hence, one photograph of the inner wall of the cavity opposite to the lens 9 is taken on the film 7. Next, the reel 15 is turned in the direction shown by an arrow to bring a fresh section of the film in position opposite to the lens 9. Then, the above operation can be repeated to take another photograph of the inner wall of the cavity. If the knob 13 is turned, it will be threaded in or out with respect to the end sleeve 4 to loosen or tighten the flexible wire 14 whereby to move the bulb 1 in a counterclockwise or clockwise direction bringing it into a position shown by the chain lines. Hence, photographs of other parts of the inner wall of the cavity will be taken by repeating the above operation. If the holding sleeve 3 is grasped by one hand and the end sleeve 4 is rotated around its axis by the other hand, the flexible tube 2 with the tubular bulb 1 will also be rotated around its own axis. Similarly, if holding the sleeve 3 by one hand and the end sleeve 4 is axially moved toward or away from the sleeve 3 as desired by the other hand, then the flexible tube 2 with the tubular bulb 1 may also be moved axially. Thus, a number of photographs, such as 30, of various parts of inner wall of the cavity of a human or animal body will be taken as desired within about 5 minutes from different angles without regard to the position of the inner wall to be photographed. 22 and 23 designate an inlet and outlet for water or air fed into the cavity to expand the volume thereof whereby to make it easy to photograph the inner wall. 24 shows a scale for indicating the axial position of the tubular bulb 1 in the cavity. 25 shows a scale for indicating the rotating angle of the tubular bulb 1. 25' is its pointer. 26 is a scale for indicating an angular displacement of the tubular bulb 1 around its axis 10. 27 shows a cover glass.

As above mentioned, in accordance with the

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camera embodying this invention, the lens is always full open without a shutter and a number of photographs of the inner wall of the cavity of a human or animal body can be taken successively at certain definite time interval by remotely controlling an electric lamp. Also, a number of photographs of angularly displaced various parts of the inner wall of the cavity without regard to their positions in the cavity can successively be taken by three dimensional motion of the tubular bulb due also to remote control of the end sleeve.

We claim:

A camera for taking photographs of cavities of the body, which comprises a flexible tube, a tubular bulb pivotally connected to the top end of said flexible tube and normally held at the axial position by a tension string against the bias of a spring to tilt said bulb in one direction, a sleeve fixed to the lower end of said flexible tube serving as an operating head, an electric light source and a reel of film enclosed in said bulb, a lens secured in position opposite to the path of the film in said bulb, a film take-up means mounted on said sleeve, a tension strip extending through said flexible tube and connected to one end of the film, a time switch secured in said sleeve and connected in the circuit

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of said electric light source and the electric supply source, and a knob threaded in said sleeve having said tension string connected thereto for tilting said bulb, characterized in that the film wound around the reel in said bulb is pulled out linearly and successively before said lens and the time switch is operated with a definite time interval to close and open the circuit of the electric light source, whereby a number of photographs of various parts of body cavities are taken without a special shutter device.

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