Oct. 29, 1968 F. SINGER 3,407,718

PHOTOGRAPHIC APPARATUS

Filed Oct. 13, 1965

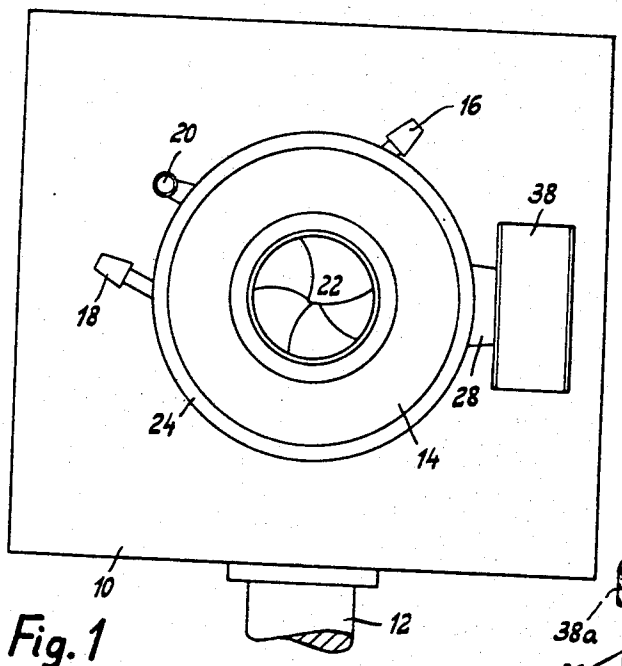


Fig. 1

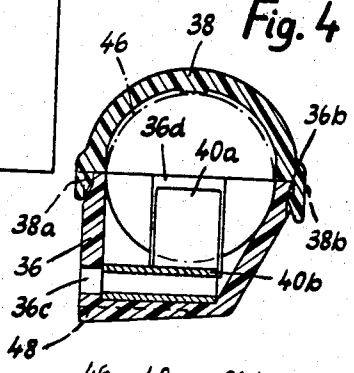


Fig. 4

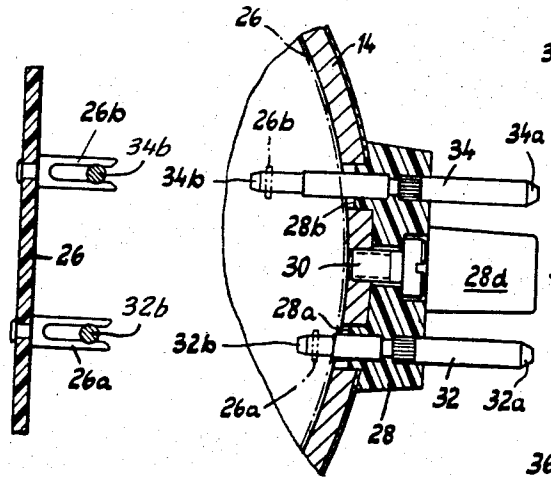


Fig. 3

Fig. 2

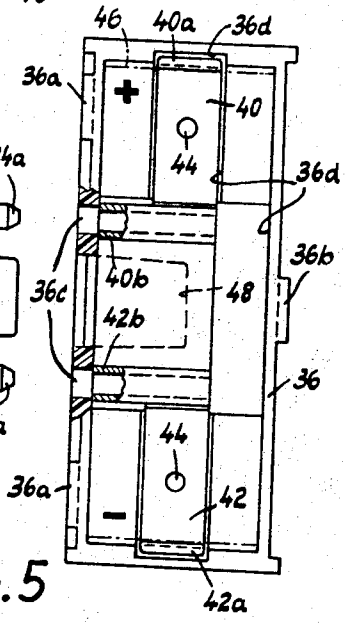


Fig. 5

United States Patent Office 3,407,718
Patented Oct. 29, 1968

3,407,718

PHOTOGRAPHIC APPARATUS

Franz Singer, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany, a firm of Germany

Filed Oct. 13, 1965, Ser. No. 495,573
Claims priority, application Germany, Apr. 9, 1965, C 12,936
5 Claims. (Cl. 95—11)

ABSTRACT OF THE DISCLOSURE

A photographic shutter having electronic equipment within the shutter housing and an external battery to furnish the necessary current. The battery is held in a hollow cylindrical container arranged to be detachably impaled on two metallic pins which project laterally from an adapter mounted between the battery container and the shutter housing. The metallic pins electrically connect the battery to the electrical equipment in the shutter housing. The battery container has a recess accommodating a projection on the adapter to insure correct orientation of the battery container relative to the adapter. The metallic pins on the adapter project into the interior of the shutter housing and are engaged by resilient metallic conducting forks within the shutter housing.

This invention relates to a photographic apparatus having electronic equipment disposed within the housing thereof for conductive connection to a battery arranged externally of the housing.

It is an object of the present invention to afford a connection of this character with a minimum of constructional parts and to implement it in such a way that the connecting parts can be brought into engagement, or disengaged, very readily. Further than this, the intention is that the constructional parts are such that they can be made by mass production and at the same time provide the connecting structure with a pleasing appearance.

These objects are met in accordance with the present invention by the fact that there is secured to the perimeter of this housing an insulating body in the form of a plug with two metallic contact pins, each having one end projecting into the interior of the housing and its other end projecting out of the latter, and that a container for accommodating the battery, and made of insulating material, is provided in the form of a socketed plug having therein two metallic contact springs which, when the battery container is mounted on the plug of the housing, make electrical engagement with the aforesaid contact pins.

Where the insulating body is made by injection moulding from a synthetic plastics material, in accordance with a further advantageous feature of the invention the two contact pins are cast in the insulating body and project outwardly from the latter to equal extents, whilst the ends of these pins projecting into the interior of the apparatus are of differing lengths and are arranged for coupling to resilient clamping means of a contact carrier to be inserted in the interior of the apparatus.

In order to ensure the connection of the constructional parts in correct position appropriate to their function, without special care being exercised by the user, it is of advantage in accordance with a further feature of the invention that the insulating body, which is secured to the housing by a screw has a projection which is parallel to the longitudinal direction of the contact pins but is offset in position relatively thereto, and that the battery container has a recess, appropriately formed and arranged, to accommodate the projections associated with the contact pins when the battery container is mounted on the housing with its pole pieces in correct orientation.

A useful construction of the electrical connections of the battery container is obtained in accordance with a further feature of the invention by the fact that each of the two contact springs is inserted in a corresponding recess in the battery container and is equipped with a contact lug associated with the battery and a contact tongue which receives the plug pin.

According to yet another feature of the invention, in the case of a housing of annular cross section and a battery of rod form, it is of advantage to make the arrangement so that the contact pins are approximately radial in relation to the housing, and that the adjoining openings in the battery container are so arranged to the side that the battery lies approximately tangentially to the housing when the battery container has been mounted on the latter.

It is also of particular advantage if the battery container is divided into two halves along its length, these halves being made by injection moulding and being adapted for connection by a hinged, snap-on fastener.

An embodiment of the invention is illustrated in the accompanying drawings to which reference will now be made.

In these drawings:

FIG. 1 is an elevational view of a photographic camera with an electronically-controlled objective shutter and a battery container mounted thereon,

FIG. 2 is an enlarged cross section through the contact pins which are provided on the housing of the objective shutter,

FIG. 3 is a detail of the mechanism shown in FIG. 2, and

FIGS. 4 and 5 show the battery container respectively in cross section and as a partial elevation.

FIG. 1 shows a camera **10** which is carried by a holder, for example a support or tripod **12**. Fastened to the front side of the camera is the objective shutter **14** which can be cocked by a lever **16** and released by a trip **18**. A further lever **20** is provided on the shutter for opening and closing the shutter blades **22**, to permit interim inspection of the image. During this interim inspection a focussing screen is placed at the rear side of the camera, whereas a film casette, for example, replaces the focussing screen in this position during the actual taking of a photograph. Cameras of this type are known per se and are mostly referred to as studio cameras.

Disposed within the objective shutter **14** is the spring-loaded main drive for the shutter blades **22**, this having associated therewith an electronic regulating device known per se for controlling the period of exposure. This device may for example take the construction disclosed in United States Patent No. 2,978,970 and be adjustable to required exposure periods by means of a setting ring **24**. The main elements of the electronic equipment are arranged in known fashion, together with the associated conductor connections, on a contact carrier **26** of annular disc form and made of insulating material, this carrier being furnished with two sprung contact forks **26*a*** and **26*b*** and being adapted for insertion as a closed unit into the interior of the shutter **14** during assembly.

The electronic regulating device is served by a current source in the form of a rod-type battery which, because of the demand on space, cannot be installed in the interior of the shutter housing **14** but has to be mounted externally of this housing. The following connection arrangement is used to provide a conductive connection between the electronic elements located within the shutter and the battery which is disposed outside this shutter.

Fastened by a screw **30** to the perimeter of the shutter

housing is an insulating body **28**, two boss-like projections **28***a* and **28***b* of the insulating body being engaged in correspondingly-formed openings in the perimeter of the shutter housing **14** for the purpose of locating the body in correct position. The projections **28***a* and **28***b*, and the openings in the housing which accommodate them, may be of different diameters in order to ensure the correct lateral positioning of the insulating body **28** on the shutter housing **14** during assembly. The insulating body itself is made of synthetic plastics materials by injection moulding, two cylindrical contact pins **32** and **34** being firmly injected into the body **28** during this process. The outer ends **32***a* and **34***a* of the pins project to the same extent from the insulating body **28**, whilst the inner ends **32***b* and **34***b* are of differing lengths. After the insulating body **28** has been fastened in the shutter housing **14** the parallel contact pins thus assume the position illustrated in FIG. 2 so that, when the contact carrier **26** is inserted in correct orientation, its contact forks **26***a* and **26***b* resiliently engage the inner ends **32***b* and **34***b* of the contact pins. The outer ends of the contact pins are used first to receive a battery container which is to be mounted in position and secondly to provide a conductive connection between the battery and the electronic equipment in the shutter.

The battery container, which is approximately of hollow cylindrical form, is divided up along its length to provide for insertion of the rod-form battery and is composed, as shown by FIGS. 4 and 5, of two halves, **36**, **38** which are made of insulating material, and preferably a synthetic plastics material by an injection moulding process. The detachable coupling of the two halves is performed through two hinge-forming projections **36***a* on the half **36** on which the other half **38** is hung in to provide for resilient reception of the contact pins. Pole markings + and — are cast in the interior of the part **36** in association with the contact springs **40** and **42** respectively, thereby to facilitate correct insertion of the battery **46**.

In addition an outer recess **48** is provided in the part **36** between the openings **36***c*, and when the battery container is mounted in position, a projection **28***d* can engage in this recess **48**, this projection **28***d* constituting a part of the insulating body **28** and being arranged between the contact pins **32** and **34** but offset relatively thereto. By this means it is automatically guaranteed that the battery container can only be mounted on the shutter housing with the poles correctly orientated.

The two halves **36** and **38** of the battery container, with their openings, grooves and perforations are made as finished parts by injection moulding, and they require no further machining or other treatment. Only the contact springs **40** and **42**, which are stamped out of suitable material and at the same time are appropriately shaped, require to be welded in the parts **36** before the battery **46** is inserted and the two halves **36** and **38** closed by the snap connection referred to. Moreover the plug **28** with pins **32** and **34** is made as a finished part by a moulding technique, so it only requires to be fastened to the shutter housing **14** by means of the screw **30**. As shown by FIGURE 1, the mechanical and electrical connection between the battery container and the electronic equipment within the shutter is made when the battery container **36**, **38** is pushed on to the plug pins **32**, **34**.

It is seen from the foregoing disclosure that the objects and purposes of the invention are well fulfilled. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. Photographic apparatus comprising a housing, electronic equipment disposed within the housing, a battery arranged externally of the housing, a conductive connection between said electronic equipment and said battery, an insulating body in the form of a plug secured to the perimeter of said housing, two metallic contact pins mounted in said insulating body, each of said pins having one end projecting into the interior of the housing and its other end projecting out of the latter, a battery container made of insulating material and in the form of a socketed plug, two metallic contact springs mounted within said battery container, one end of each contact spring contacting one pole of said battery and the other end thereof provided for contacting said contact pin when the battery container is mounted on the housing for the purpose of making electrical engagement between said electronic equipment in said housing and said battery placed in said battery container, characterized by the fact that said insulating body is secured to said housing by a screw and has a projection which is parallel to the longitudinal direction of the contact pins but is offset in position relatively thereto, and that the battery container has a recess formed and arranged to accommodate said projection associated with said contact pins when said battery container is mounted on said housing with its pole pieces in correct orientation.

2. A photographic apparatus according to claim **1**, characterised by the fact that the two contact pins are cast in the insulating body and project outwardly from the latter to equal extents, whilst the ends of these pins projecting into the interior of the apparatus are of differing lengths and are arranged for coupling to resilient clamping means of a contact carrier to be inserted in the interior of the apparatus.

3. A photographic apparatus according to claim **1**, characterised by the fact that each of the two contact springs is inserted in a corresponding recess in the battery container and is equipped with a contact lug associated with the battery and a contact tongue which receives the plug pin.

4. A photographic apparatus according to claim **1**, having a housing of annular cross section and a battery of rod form, characterised by the fact that the plug is arranged on the housing in such a way that the contact pins are approximately radial in relation to the housing, and that the adjoining openings in the battery container are so arranged to the side that the battery lies approximately tangentially to the housing when the battery container has been mounted on the latter.

5. A photographic apparatus according to claim **4**, characterised by the fact that the battery container is divided into two halves along its length, these halves being made by injection moulding and being adapted for connection by a hinged, snap-on fastening.

References Cited

UNITED STATES PATENTS

3,089,071	5/1963	Hartwig	339—184
3,120,632	2/1964	Hopt et al.	240—10.6
3,275,819	9/1966	Laurent	240—10.65

FOREIGN PATENTS

566,286	11/1958	Canada.

NORTON ANSHER, *Primary Examiner.*

F. L. BRAUN, *Assistant Examiner.*