A document camera device includes a pedestal, a bendable support arm, an image-capturing unit and a fastening mechanism. The pedestal has a concave accommodation space. The bendable support arm has one end pivotally connected with the pedestal. The image-capturing unit is secured to an opposite end of the bendable support arm such that the image-capturing unit is able to be adjusted to a desired position. The fastening mechanism is to secure the image-capturing unit within the concave accommodation space.
DOCUMENT CAMERA DEVICE

RELATED APPLICATIONS

This application claims priority to Taiwan Application Serial Number 96206151, filed Apr. 17, 2007, which is herein incorporated by reference.

BACKGROUND

1. Field of Invention
The present invention relates to a document camera device.

2. Description of Related Art
Document camera devices on present market do not have a proper organized way for convenient storage and portability.

When document camera devices are idle (not used to capture images), users cannot well organize document camera devices compactly such that convenient storage and portability purposes cannot be achieved.

SUMMARY

It is therefore an objective of the present invention to provide a document camera device with a compactly organized function for convenient storage and portability.

In accordance with the foregoing and other objectives of the present invention, a document camera device includes a pedestal, a bendable support arm, an image-capturing unit and a fastening mechanism. The pedestal has a concave accommodation space. The bendable support arm has one end pivotally connected with the pedestal. The image-capturing unit is secured to an opposite end of the bendable support arm such that the image-capturing unit is able to be adjusted to a desired position. The fastening mechanism is to secure the image-capturing unit within the concave accommodation space.

It is to be understood that both the foregoing general description and the following detailed description are by examples, and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are included to provide a further understanding of the invention, and are incorporated in and constitute a part of this specification. The drawings illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention. In the drawings.

FIG. 1 illustrates a side view of a document camera device as described in an embodiment herein;

FIG. 2 illustrates a top view of a document camera device as described in an embodiment herein;

FIG. 3 illustrates a fastening mechanism to secure an image-capturing unit of the document camera device;

FIG. 4 illustrates another fastening mechanism to secure an image-capturing unit of the document camera device; and

FIG. 5 illustrates still another fastening mechanism to secure an image-capturing unit of the document camera device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the present preferred embodiments of the invention, which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

FIG. 1 illustrates a side view of a document camera device as described in an embodiment herein. The document camera device has an image-capturing unit 108, which is equipped with a lens 108a for capturing an image of a document or object, and the image is transferred to an image-displaying device (such as a monitor or projector). The image-capturing unit 108 is secured to a pedestal 102 with an elastic bendable support arm 104. The bendable support arm 104 is pivotally connected with the pedestal 102 at an end by a joint 106 and secured to the image-capturing unit 108 at an opposite end. Therefore, the image-capturing unit 108 can be adjusted to a desired position by means of the bendable support arm 104 and the joint 106 and captures a desired image. In this embodiment, the bendable support arm 104 can be made from metallic bendable tube or plastic bendable tube.

FIG. 2 illustrates a top view of a document camera device as described in an embodiment herein. When the document camera device is idle, i.e. not used to capture an image, the image-capturing unit 108 can be temporarily stored in a concave accommodation space 103 of the pedestal 102 for convenient storage and portability. As the document camera device transitions from an using status (as illustrated in FIG. 1) to an idle status (as illustrated in FIG. 2), the bendable support arm 104 is swiveled along a direction 107 until the bendable support arm 104 is substantially in parallel with a level of the pedestal 102, the bendable support arm 104 is then bent to surround half of the pedestal 102, and the image-capturing unit 108 is finally inserted into the concave accommodation space 103 (as illustrated in FIG. 2). The joint 106 and the concave accommodation space 103 can be otherwise located on the pedestal 102 because of a comparing scale of a length of the bendable support arm 104 to a size of the pedestal 102. When the bendable support arm 104 is longer, the joint 106 and the concave accommodation space 103 can be located at two opposite edges of the pedestal 102, i.e. the joint 106 is located at an edge 102a and the concave accommodation space 103 is located at an edge 102b. When the bendable support arm 104 is shorter, the joint 106 and the concave accommodation space 103 can be located at two adjacent edges of the pedestal 102, i.e. the joint 106 is located at an edge 102a and the concave accommodation space 103 is located at an edge 102c.

In order to properly secure the image-capturing unit 108 within the concave accommodation space 103 to have a resist force against the gravitational force or vibrations, a fastening mechanism is necessarily installed within or around the concave accommodation space 103 to interlock the image-capturing unit 108. Three embodiments of the fastening mechanism are illustrated in the following.

FIG. 3 illustrates a fastening mechanism to secure an image-capturing unit of the document camera device. A compression spring 110a and a steel ball 110b are installed within the concave accommodation space 103 to interlock the image-capturing unit 108. In particular, the compression spring 110a and the steel ball 110b are installed inside a concave hole 109 of the concave accommodation space 103. The compression spring 110a is secured to the steel ball 110b.
at an end and secured to a bottom of the concave hole 109 at an opposite end. When the image-capturing unit 108 is inserted into the concave accommodation space 103, the steel ball 110b (exposed by the concave hole 109) interlocks a ball hole 108b of the image-capturing unit 108 with a push force provided by the compression spring 110a. The resist force against the gravitational force or vibrations is hereby generated. A larger force may be applied to pull the image-capturing unit 108 out of the concave accommodation space 103 or insert the image-capturing unit 108 into the concave accommodation space 103.

[0021] FIG. 4 illustrates another fastening mechanism to secure an image-capturing unit of the document camera device. An elastic ring 112 (such as a rubber ring), which encircles the concave accommodation space 103, is used to secure the image-capturing unit 108. When the image-capturing unit 108 is inserted into the concave accommodation space 103, a contact friction force between the elastic ring 112 and the image-capturing unit 108 would secure the image-capturing unit 108. Alternately, the elastic ring 112 can encircle the image-capturing unit 108, rather than the concave accommodation space 103. When the image-capturing unit 108 is inserted into the concave accommodation space 103, a contact friction force between the elastic ring 112 and the image-capturing unit 108 would secure the image-capturing unit 108. The resist force against the gravitational force or vibrations is hereby generated. A larger force may be applied to pull the image-capturing unit 108 or insert the image-capturing unit 108 into the concave accommodation space 103.

[0022] FIG. 5 illustrates still another fastening mechanism to secure an image-capturing unit of the document camera device. A concave section 114b is disposed within the concave accommodation space 103, and a convex member 114a is disposed on the image-capturing unit 108. When the image-capturing unit 108 is inserted into the concave accommodation space 103, the convex member 114a interlocks the concave section 114b so as to generate a resist force against the gravitational force or vibrations. A larger force may be applied to pull the image-capturing unit 108 out of the concave accommodation space 103 or insert the image-capturing unit 108 into the concave accommodation space 103. The convex member 114a can be made of elastic materials to assist easily pulling the image-capturing unit 108 out of the concave accommodation space 103 or easily inserting the image-capturing unit 108 into the concave accommodation space 103.

[0023] According to discussed embodiments, the document camera device of present has an image-capturing unit 108, which can be easily accommodated inside a pedestal thereof, that the document camera device can be compactly organized for convenient storage and portability.

[0024] It will be apparent to those skilled in the art that various modifications and variations can be made to the structure of the present invention without departing from the scope or spirit of the invention. In view of the foregoing, it is intended that the present invention cover modifications and variations of this invention provided they fall within the scope of the following claims and their equivalents.

What is claimed is:

1. A document camera device, comprising:
   a pedestal, having a concave accommodation space;
   a bendable support arm, having one end pivotally connected with the pedestal;
   an image-capturing unit, secured to an opposite end of the bendable support arm such that the image-capturing unit is able to be adjusted to a desired position; and
   a fastening mechanism for securing the image-capturing unit within the concave accommodation space.

2. The document camera device of claim 1, wherein the bendable support arm is a bendable tube.

3. The document camera device of claim 2, wherein the bendable tube is made of metallic materials.

4. The document camera device of claim 2, wherein the bendable tube is made of plastic materials.

5. The document camera device of claim 1, wherein the bendable support arm is secured to an edge of the pedestal, and the concave accommodation space is disposed at an opposite edge of the pedestal.

6. The document camera device of claim 1, wherein the fastening mechanism comprises an elastic ring encircling the concave accommodation space so as to secure the image-capturing unit within the concave accommodation space.

7. The document camera device of claim 1, wherein the fastening mechanism comprises an elastic ring encircling the image-capturing unit so as to secure the image-capturing unit within the concave accommodation space.

8. The document camera device of claim 1, wherein the fastening mechanism comprises a compression spring and a steel ball within the concave accommodation space, the compression spring is secured to the concave accommodation space at an end and secured to the steel ball at an opposite end.

9. The document camera device of claim 8, wherein the concave accommodation space further comprises a concave hole to accommodate the compression spring and the steel ball, and expose the steel ball.

10. The document camera device of claim 9, wherein the image-capturing unit comprises a ball hole, when the image-capturing unit inserts into concave accommodation space, the ball hole interlocks the steel ball.

11. The document camera device of claim 1, wherein the fastening mechanism comprises a convex member on the image-capturing unit.

12. The document camera device of claim 11, wherein the fastening mechanism further comprises a concave section within the concave accommodation space, when the image-capturing unit inserts into concave accommodation space, the convex member interlocks the concave section.