TO: KSI/Scientific & Technical Information Division  
Attention: Miss Winnie M. Morgan  

FROM: GP/Office of Assistant General Counsel for Patent Matters  

SUBJECT: Announcement of NASA-Owned U.S. Patents in STAR  

In accordance with the procedures agreed upon by Code GP and Code KSI, the attached NASA-owned U.S. Patent is being forwarded for abstracting and announcement in NASA STAR. 

The following information is provided:  

U.S. Patent No.: 3,764,309  
Government or Corporate Employee: Government  
Supplementary Corporate Source (if applicable):  
NASA Patent Case No.: ARC-10468-1  

NOTE - If this patent covers an invention made by a corporate employee of a NASA Contractor, the following is applicable:  

Yes ☒ No ☒  

Pursuant to Section 305(a) of the National Aeronautics and Space Act, the name of the Administrator of NASA appears on the first page of the patent; however, the name of the actual inventor (author) appears at the heading of column No. 1 of the Specification, following the words "... with respect to an invention of ..."

Elizabeth A. Carter  
Enclosure  
Copy of Patent cited above
ABSTRACT

A hand-held, small, portable, lightweight photomicroscope is provided including a housing having a top plate, an objective lens removably mounted on the top plate and extending in a viewing direction upwardly from the plate, a specimen holder adjustably mounted on the top plate and extending upwardly therefrom to hold a specimen above the upper end of the objective lens, a light source movably mounted on the top plate so as to direct light onto the specimen, and a lens system within the housing including a beam splitter for splitting the light beam emerging within the housing from the objective lens into two beams, one beam being directed to a camera mounting device on the housing where the lens system of a suitable camera mounted on the housing is positioned and the other beam being directed onto the lens system of a suitable eyepiece mounted on the housing for viewing of the specimen by the operator. Control means is mounted on the housing for operating the shutter of the camera therefrom, and means is provided within the housing for securely storing one or more extra objective lenses for replacement of the objective lens in use.

19 Claims, 6 Drawing Figures
HAND-HELD PHOTOMICROSCOPE

The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

BACKGROUND OF THE INVENTION

The standard form of photomicroscope in present day usage is a laboratory instrument not suited for portable, hand-held applications in the field. The specimens to be examined and photographed are collected in the field and removed to a suitable location such as a laboratory for processing. Attempts to provide a portable hand-held instrument for field use have generally resulted in heavy and bulky devices with limited use for simultaneous viewing and photographing.

SUMMARY OF THE PRESENT INVENTION

The present invention provides a small, lightweight, compact, hand-held photomicroscope providing simultaneous viewing and photographing, with adjustable specimen illumination and exchangeable camera format.

The novel photomicroscope comprises a main housing having a top plate, bottom plate, and side walls. The objective lens is mounted on the top plate in an inverted manner relative to the normal type of mounting, i.e., mounted so as to be viewing upwardly from the housing, and focuses on a specimen holding structure mounted on the top plate and extending over the upper end of the objective lens. The specimen holding structure comprises an adjusting mechanism for adjustably moving the specimen vertically along an axis extending through the objective lens as well as transverse of the axis.

A lens system within the housing serves to split the beam of light emerging from the objective lens and into the housing into two paths, one path extending to an eyepiece mounted on the top plate where the specimen may be viewed by the operator. The other path extends to a camera mounting means on the housing adapted to mount a motion picture, still, or television camera system in alignment with the path of said second beam. The lens system within the housing comprises a beam splitter for directing one beam along a path via a pair of reflectors or mirrors and for directing the other beam along a path to the camera mount.

A light source is mounted on the top plate and extends over the specimen holder to direct light onto the specimen. The light holder is adjustable so that the light may be moved relative to the sample holder. A rheostat device is mounted on the top plate and coupled to the power supply for the light source so that the intensity of the light may be varied.

The housing is provided with a support means therein for securely holding extra objective lenses in a protective manner, these lenses being easily accessible for use as replacements for the objective lens in use.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the portable photomicroscope of the present invention.

FIG. 2 is another side view of the photomicroscope taken from the right hand side of FIG. 1 with the camera removed.

FIG. 3 is a top view of photomicroscope of FIG. 1.
What is claimed is:

1. A hand-held photomicroscope comprising a housing including a top plate, an objective lens mounted on said top plate and extending upwardly therefrom, a specimen stage mounted on said housing and including a specimen holding means positioned above the upper end of said objective lens for holding a specimen aligned with said objective lens, a light source mounted on said housing for directing light onto said specimen holding means, a lens system within said housing for providing an optical path for the light beam emanating from said objective lens within said housing, said lens system including a beam splitter for splitting said light beam into two paths, means on said housing for mounting a camera in one of said beam paths and external of said housing in said second beam path whereby the image of said specimen may be viewed by the operator.

2. A photomicroscope as claimed in claim 1 wherein said specimen stage comprises means for adjustably moving said specimen holding means above said objective lens.

3. A photomicroscope as claimed in claim 2 wherein said lens system within the housing comprises a plurality of beam reflectors in one of said two beam paths.

4. A photomicroscope as claimed in claim 3 wherein said plurality of beam reflectors include a 45° reflector and a 30° reflector.

5. A photomicroscope as claimed in claim 3 wherein said eyepiece is mounted on said top plate and extends upwardly therefrom.

6. A photomicroscope as claimed in claim 2 wherein said means for moving said specimen holding means includes means for moving said holding means along the direction of a vertical axis extending through said objective lens and for moving said holding means transverse to said axis.

7. A photomicroscope as claimed in claim 1 including means mounted on said housing for controlling the intensity of the light from said light source.

8. A photomicroscope as claimed in claim 1 wherein said light source is mounted on said top plate, and including means for adjustably moving said light source relative to said specimen holding means.

9. A photomicroscope as claimed in claim 8 including means mounted on said housing for controlling the intensity of the light from said light source.

10. A photomicroscope as claimed in claim 1 including a side wall in said housing, said camera mounting means being mounted in said side wall.

11. A photomicroscope as claimed in claim 1 including means mounted on said housing and adapted to be coupled to said camera for controlling the shutter mechanism of said camera.

12. A photomicroscope as claimed in claim 1 wherein said lens system within the housing comprises a plurality of beam reflectors in one of said two beam paths.

13. A photomicroscope as claimed in claim 12 wherein said plurality of beam reflectors include a 45° reflector and a 30° reflector.

14. A photomicroscope as claimed in claim 12 including means mounted on said housing for controlling the intensity of the light from said light source.

15. A photomicroscope as claimed in claim 12 wherein said light source is mounted on said top plate, and including means for adjustably moving said light source relative to said specimen holding means.

16. A hand-held photomicroscope as claimed in claim 15 including means mounted on said housing for controlling the intensity of the light from said light source.

17. A photomicroscope as claimed in claim 1 including a side wall in said housing, said camera mounting means being mounted in said side wall.

18. A photomicroscope as claimed in claim 17 including means mounted on said housing and adapted to be coupled to said camera for controlling the shutter mechanism of said camera.

19. A photomicroscope as claimed in claim 1 including means within said housing for securely carrying one or more extra objective lenses therein.