VIEWER WITH ENHANCED DEPTH PERCEPTION

The present invention relates to a viewer for viewing an object under magnification, which provides the observer with enhanced depth perception.

Various magnifying apparatus exist for viewing objects, including stereoscopic magnifying apparatus as disclosed in the applicant's earlier US-A-5477385.

The present inventor has, however, recognized that it is possible to provide an observer with significantly enhanced depth perception, in mono or stereo viewing apparatus, by configuring the apparatus to employ effects of focus, parallax and superimposition, which can all contribute to the interpretation of the observer to depth perception.

In one aspect the present invention provides a viewer for viewing an object under magnification, the viewer comprising: an objective lens for producing an image of an object located at an object plane and having a radial extent defined by an aperture stop; a partially-transmissive reflector for allowing transmission of light therethrough from the objective lens to a mirror arrangement and providing for reflection of light which is returned thereto from the mirror arrangement; a mirror arrangement which receives a light component from the partially-transmissive reflector, and is located such that a focussed image of the object is produced at the mirror arrangement and light received by the mirror arrangement is reflected back to the partially-transmissive reflector and relayed to produce an image of the object; a viewing lens arrangement for producing an optical image of the object which is viewable by an observer at an exit pupil at a viewing plane; wherein the objective lens has a beam path angle (α) which is an angle subtended from a point where an optical axis of the objective lens meets the object plane and defined by a distance along the optical axis from the object plane to the objective lens and a radial extent of the aperture stop; wherein the viewer has a viewing angle (β) which is an angle subtended from a point on the mirror arrangement at an optical axis of the mirror arrangement and defined by a distance along the optical axis from the mirror arrangement to the viewing plane and a radial extent of the exit pupil at the viewing plane; wherein the viewer is

CLAIMS

1. A viewer for viewing an object under magnification, the viewer comprising:

an objective lens for producing an image of an object located at an object plane and having a radial extent defined by an aperture stop;

a partially-transmissive reflector for allowing transmission of light therethrough from the objective lens to a mirror arrangement and providing for reflection of light which is returned thereto from the mirror arrangement;

a mirror arrangement which receives a light component from the partially-transmissive reflector, and is located such that a focussed image of the object is produced at the mirror arrangement and light received by the mirror arrangement is reflected back to the partially-transmissive reflector and relayed to produce an image of the object;

a viewing lens arrangement for producing an optical image of the object which is viewable by an observer at an exit pupil at a viewing plane;

wherein the objective lens has a beam path angle (α) which is an angle subtended from a point where an optical axis of the objective lens meets the object plane and defined by a distance along the optical axis from the object plane to the objective lens and a radial extent of the aperture stop;

wherein the viewer has a viewing angle (β) which is an angle subtended from a point on the mirror arrangement at an optical axis of the mirror arrangement and defined by a distance along the optical axis from the mirror arrangement to the viewing plane and a radial extent of the exit pupil at the viewing plane;

wherein the viewer is configured such that a displacement ratio of the beam path angle (α) to the viewing angle (β) is at least 3:1, whereby the observer is provided with a greater change in depth perception of the object being observed relative to an extent of displacement of a head of the observer.

2. The viewer of claim 1, wherein the displacement ratio of the beam path angle (α) to the viewing angle (β) is at least 4:1.