Working model of the human eye

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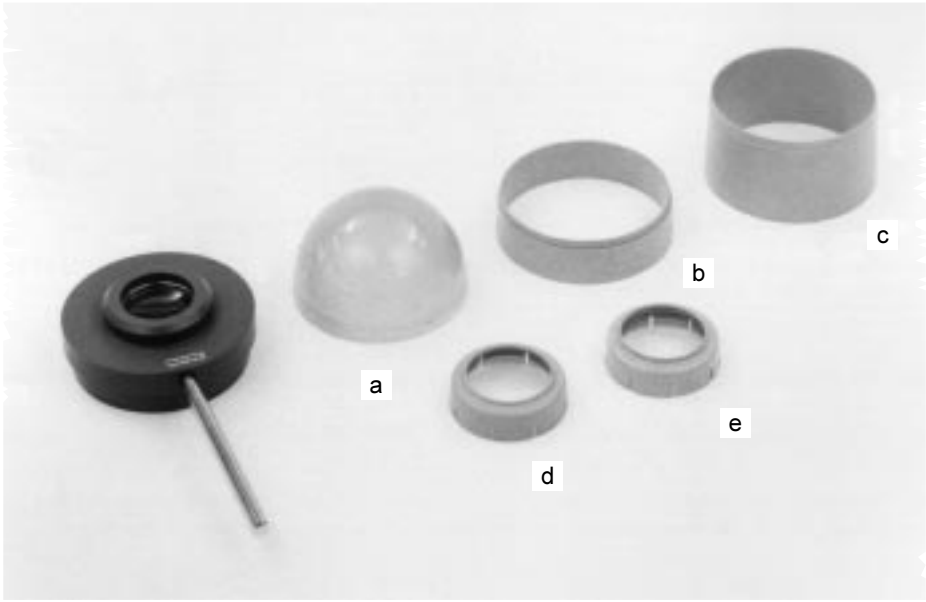
Operating Instructions



1. PURPOSE AND DESCRIPTION

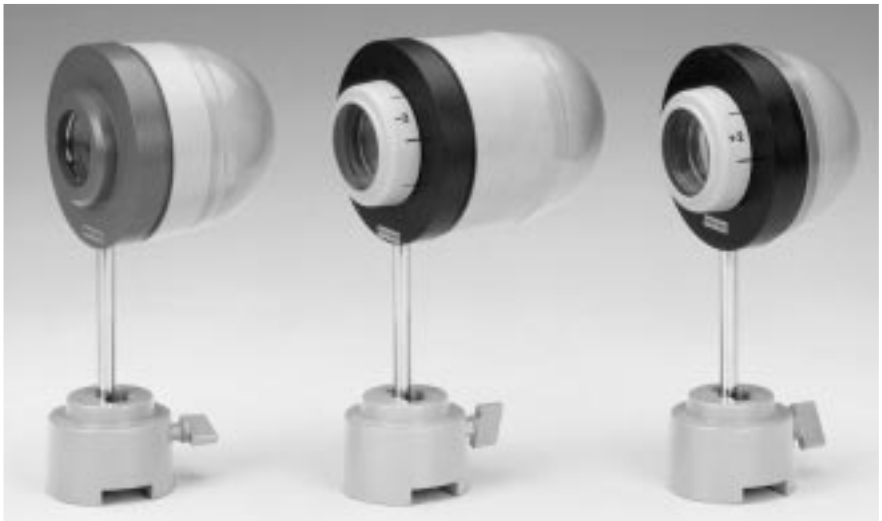
The best-known forms of defective sight in the human eye are short-sightedness and far-sightedness.

In **short-sightedness (myopia)** the eyeball, measured from the centre of the lens to the back of the eye, is too long. The light rays striking the lens do not meet on the retina of the eye after refraction. Instead they meet in front of it. Consequently only objects close or very close to the eye can be seen in focus, depending on the degree of short-sightedness. Objects which are further away appear to be increasingly blurred. A diverergent lens (concave spectacles) has to be placed in front of the eye if these objects are also to be seen in focus.

In **far-sightedness (hyperopia)** the eyeball, measured from the centre of the lens to the back of the eye, is too short. Light rays striking the lens meet behind the retina after refraction. Unlike those with normal sight, a person who is far-sighted must accommodate in order to see distant objects in focus. However, his ability to accommodate is not sufficient for him to form a sharp image on the retina of objects just in front of him. Visual acuity must be corrected in this case with a convergent lens (convex spectacles).

The forms of defective vision which have just been described - short-sightedness and far-sightedness - and possible ways of correcting them can be vividly demonstrated using the working model of the human eye.

The model consists of a schematically reproduced eyeball, the rear part of which, in the form of a surface of projection, can be removed (see Fig. 1a). In order to obtain the different eyeball lengths, spacing rings (see Fig. 1b and c) are inserted between the two parts. Defective vision is corrected by means of supplementary lenses (see Fig. 1d and e).



2. OPERATION

If an eye with normal vision is to be represented, the narrow spacing ring is inserted between the two parts of the model. The eyeball model has normal dimensions, and a sharp image of the objects viewed through the model appears in the plane of projection (retina).

In order to demonstrate the short-sighted eye, in which the distance between the lens and the retina is too great, the wide spacing ring is inserted between the two parts of the model. All the objects viewed through the model of the eye produce a blurred image on the plane of projection (retina). If, however, a divergent lens with a power of refraction of -2 diopters is placed on the lens of the model, the image on the plane of projection immediately comes into focus.

In order to demonstrate the far-sighted eye the two parts of the working model of the human eye are joined together without spacing rings. The distance between the lens and the back of the eye is shorter than normal. All objects viewed through the model produce a blurred image on the plane of projection (retina). If a convergent lens with a power of refraction of + 2 diopters is placed on the lens of the model, the image on the plane of projection immediately comes into focus.

The model can be held comfortably in front of the eye during the demonstration using a stand.