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MULTIFOCAL OPHTHALMIC LENS

Lowell L. Houchin, Columbus, Ohio, assignor to
The Revalens Co., Columbus, Ohio, a corpora-
tion of Ohio

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My invention relates to multifocal ophthalmic lenses. It has to do, more particularly, with a lens made from a single piece of glass and having a plurality of fields of vision produced by forming areas of different curvature on the surface thereof.

Lenses of this general type are commonly referred to as one-piece lenses. The most common type of multifocal one-piece lens in use at the present time is the one-piece bifocal lens. This lens embodies a single piece of glass which usually has one surface thereof ground in such a manner that areas of different curvature are formed thereon. The lens usually has an outer area which is ground to the proper curvature to serve as the distance portion and an inner area which is ground to a different curvature to serve as the near portion. The near portion or near field has been made in various shapes and is usually located in the lower portion of the lens.

I have found that this type of one-piece lens does not meet all the requirements of a person who ordinarily desires to use the distance portion but frequently desires to use the near portion. For example, storekeepers, doctors, dentists, or persons doing certain types of desk work, who must wear glasses, would prefer to have a distance portion so located in the lens that it would be used in viewing persons on the opposite sides of a desk or counter merely by looking straight ahead. Such a distance portion should be disposed horizontally substantially at the center of the lens and have considerable width but need not have much height. However, since such a person frequently does close work, he would like to have a near vision portion so located that it could be readily used when looking down or up at close objects. For example, when a storekeeper is looking for an article disposed on the shelves of his store, he would desire to have the near vision portion so located that if he looked upwardly to a high shelf or downwardly to a low shelf, the near portion could be readily used.

One of the objects of my invention is to provide a one-piece multifocal ophthalmic lens which meets all the requirements discussed in the preceding paragraph.

Another object of my invention is to provide a one-piece lens of the type indicated which is very neat and attractive in appearance.

Another object of my invention is to provide a lens which meets all the requirements previously discussed but which is of such a nature

that it may be produced at a comparatively low cost.

In its preferred form, my invention contemplates the provision of a one-piece multifocal ophthalmic lens which is made from a single piece of glass which has substantially the same refractive index throughout its mass. This piece of glass is preferably of concavo-convex form having its convex surface formed with a predetermined curvature throughout its entire area and having separate areas of different curvature formed on the concave surface thereof. These areas of different curvature form the different vision portions of the lens. These different vision portions preferably include an elongated horizontally disposed distance vision portion located substantially at the center of the lens, a near vision portion disposed directly above and a near vision portion disposed directly below the elongated distance vision portion, and a surrounding distance vision or intermediate vision portion.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein in similar characters of reference designate corresponding parts and wherein:

Figure 1 is a vertical sectional view taken through a rough lens blank which may be used in producing my lens.

Figure 2 is a similar view showing the lens blank after one surface has been ground to form thereon a centrally disposed circular near vision portion and a surrounding distance vision portion.

Figure 3 is a similar view illustrating the lens blank after a cavity has been ground in the circular near vision portion to produce a centrally disposed distance vision portion.

Figure 4 is a similar view illustrating how the surrounding outer area of the lens blank may be ground to a curvature suitable for intermediate vision rather than distance vision.

Figure 5 is a similar view showing how a protecting segment of glass may be disposed in the cavity, forming the inner distance portion, during the polishing of the other vision portions.

Figure 6 is a plan view of the blank shown in section in Figure 2.

Figure 7 is a plan view of the concave side of a lens blank made according to my invention.

Figure 8 is a perspective view of the lens blank shown in Figure 7.

Figure 9 is a view similar to Figure 7 but showing a lens blank wherein the outer area serves as intermediate vision portion.