

Patented Aug. 20, 1946

2,405,989

UNITED STATES PATENT OFFICE

2,405,989

LENS

Howard D. Beach, Buffalo, N. Y., assignor to
Beach Lens Corporation, Buffalo, N. Y.

Application August 12, 1941, Serial No. 406,488

14 Claims. (Cl. 88—54)

1

This invention relates to optical lenses, spectacles or eyeglasses and particularly to a novel and improved multi-focal spectacles lens.

In bifocal or multi-focal lenses as heretofore made, a body portion formed of glass of a given index of refraction is employed and which has its major portion surfaced for distance vision, the bifocal or multi-focal characteristics being attained by one or more sections or pieces of glass, of different refractive character, each of uniform, but different focal curvature or curvatures which is or are fused or otherwise secured to the main body to provide the addition or power zone for reading vision, and the zone for intermediate vision respectively. Such sections usually constitute only a minor zone or area of the lens surface.

It is well known that all such lenses have the objection that when the user, in shifting his gaze to look through one and then another of the zones mentioned, experiences discomfort and uncertain or aberrant vision as the gaze passes over the juncture of adjoining zones, due to the abrupt line of demarcation between these zones.

An object of this invention is to provide an improved multi-focal spectacles lens, by the use of which the aforementioned disadvantages are avoided and in which no discomfort or sudden jump is experienced as the user directs his gaze through one and then another zone of the lens.

Another object of the invention is to construct a multi-focal spectacles lens, having the stated improved characteristics, and formed of a single piece or body of optical glass or the like material, having a uniform index of refraction throughout.

Another object of the invention is to provide an improved multi-focal spectacles lens, with which objects at a plurality of different distances from the wearer, and viewed through such lens, will appear in proper focus as the gaze is lowered from straight ahead or infinity vision to the close up or reading vision.

A further object is to provide an improved semi-finished spectacles lens blank which may be used by manufacturing opticians and others for filling a spectacles prescription in the provision of a multi-focal spectacles lens in accordance with this invention, and also to provide a set of semi-finished plano lens bodies or lens blanks, each having a uniform index of refraction throughout, which may be stocked by manufacturing opticians and from which blanks may be selected to produce multi-focal lenses according to this invention with a minimum of grinding operations and a minimum stock of blanks.

2

Other objects are to provide an improved and novel multi-focal spectacles lens, which is of minimum thickness for a selected prescription; which has no visible line or lines of demarcation between the various zones thereof, and which, in use, will be of attractive appearance and of maximum light transmitting quality.

Another object is to construct a multi-focal spectacles lens which will be of particular value in aiding the vision of those who have had cataract operations.

Another object of the invention is to provide an improved optical lens with a relatively large lateral field adjoining a zone of maximum magnification, whereby objects at different distances will be in focus as one looks through different parts thereof.

Various other objects and advantages of the invention will be apparent from the following two embodiments thereof, and the novel features will be pointed out in connection with the appended claims:

In the accompanying drawing:

Fig. 1 is a medial section of a plano lens blank used in the production of a multi-focal spectacles lens in accordance with my invention.

Fig. 2 is a similar section of the blank which has been ground to provide a reading or addition zone and intermediate distance vision zone thereon, the section being taken on line 2—2, Fig. 4.

Fig. 3 is an enlarged and exaggerated fragmentary medial section of the central portion of the lens shown in Fig. 2.

Fig. 4 is a face view of the lens of Fig. 2.

Fig. 5 is a similar view view of a finished spectacle lens which has been cut from the lens of Fig. 4.

Fig. 6 is a diagrammatic view illustrating the action of my improved multi-focal lens.

Fig. 7 is a fragmentary medial section of a slightly modified form of my multi-focal lens.

In producing a one piece, multi-focal spectacles lens in accordance with this invention, a plano lens blank or body of the same index of refraction throughout and having a selected or suitable base curve is utilized. A face of such a blank, preferably the outer face, is ground or surfaced so as to produce on a selected and restricted or minor zone thereof, an addition or power area or reading vision zone of given strength and which is surrounded or bounded by a plurality of relatively narrow zones which are ground to give weaker addition or power progressively away from the first mentioned addition zone. In the finished lens, there are no lines of