

Technical Description of Eyeglasses

Mohammed Oguntola

City College of New York

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Professor Jacobson

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Historical Context

Eyeglasses are a pervasive item in society. In fact, 64% of the adult population in the United States wear glasses (Glasses History, n.d). They are employed by many to correct or enhance their vision and for some, they are unable to see in focus without them. The inventor of the first spectacle lenses is unknown and there have been reports in early periods going back to as far as the middle ages of people using glass spheres as magnifying glasses to read (Glasses History, n.d). The first functional form of glasses were single-lens frames made of horn or wood and it is considered to have been produced by Venetians in the 13th century (Glasses History, n.d).

The first representation of the use of eyeglasses was in Tommaso da Moderna's Fresco of Cardinal Ugo di Provenza in 1352 which is located in the San Nicolo Monastery in Treviso, Italy (Gregory, 2013).



Figure 1.1: First representation of eyeglasses in art (Gregory, 2013)

The availability of print books and the discovery of a cheaper material made glasses more affordable and increased the demand for glasses while charging innovation regarding the production of glasses and in 1300, the first eyeglasses were made, the invention of which was

credited to Salvino D'Armate, with rims of metal or leather and frames of whalebone, horn, tortoiseshell, and leather (Eyeglasses Timeline, n.d). However, this form proved to be annoying (because it pinched wearers noses) and unstable and it wasn't until 1700 that a British optician, Edward Scarlett, perfected the temple glasses (Eyeglasses Timeline, n.d).

Later developments of glasses have sought to correct vision problems, introduce features, and set fashion standards. For example, cylindrical lenses were made by Sir George Airy in 1825 to correct astigmatism and bifocal lenses invented by Benjamin Franklin were used to treat nearsightedness and presbyopia, and in 1929, Sam Foster invented the sunglasses (Glasses History, n.d). Furthermore, glasses were further developed with precious stones and came to be seen as objects of social distinction in the 18th century and, in the 19th century, the discovery of new material increased production and allowed frames to be made in different shapes which increased its usage (Eyeglasses Timeline, n.d). In the 20th century to present, research and dissemination of information about the importance of glasses, increased access to eyecare in school and communities, and the portrayal of glasses in media has made them pervasive in society. Media portrayal, in particular, has given their usage an indication of an individual's personality and can and is often used or seen as a form of social expression (Eyeglasses Timeline, n.d).

Components of Eyeglasses

Lenses:

The lenses, apart from the frame, is the most important component of an eyeglass. Without it, the eyeglasses are no more than decorative items. The “glasses” in eyeglasses refers to the lenses so without the lenses, they wouldn’t be known as eyeglasses. Traditionally, lenses were made out of glass, however, due to weight and coating consideration and well as its disposition to break, high tech plastics or polycarbonates are now used (Neufeld, 2017). Lens are separated into multiple kinds. A concave lens is curved inwards and is used to address nearsightedness in patients and works by diverging light rays entering the eyes of a person (Neufeld, 2017). A convex lens, on the other hand, is curved outwards and converges light into the patient’s eye to address farsightedness (Neufeld, 2017).

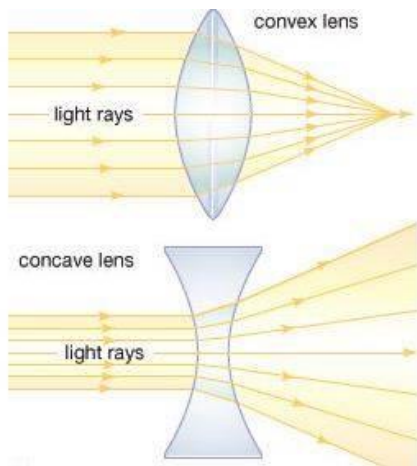


Figure 1.1: An illustration of the mechanism of concave and convex lenses (Neufeld, 2017)

Besides providing people with a better vision, modern lenses also have secondary functions including UV protection, reducing glare, etc. (Neufeld, 2017)

Rims:

The rims are the next part of the glasses and are also known as eye wires. Lenses are inserted and held in place by the rims of the eyeglasses, which is a part of the frame (Parts of an

Eyeglasses Frame, n.d). This really has no need for an extended description and is simply a part of the frame that holds the glasses.

Nose Pads:

Nose pads are small pieces of plastic that help maintain the balance of the frame on the face and keeps it in place (Parts of an Eyeglasses Frame, n.d). Nose pads are built into plastic frames and on plastic frames appear as a protuberance while there are actual pads on metal frames (Parts of an Eyeglasses Frame, n.d).

Pad Arms:

Only found on metal frames. They are adjustable pieces of metal attached to the nose pad that allows it to be adjusted for the wearers' comfort (Parts of an Eyeglasses Frame, n.d). An eyeglass with a plastic frame would have no need for these because the nose pads are built in.

Bridge:

The bridge is the arched portion between the lenses that bears most of the weight of the glasses (Parts of an Eyeglasses Frame, n.d). Whether the bridge refers to the function and the appearance of the component as a bridge between the lenses, to the fact that it rests on the bridge of the wearer's nose, or both is inconclusive.

Temples:

The temples are long arms on the sides of the the frame that curl over the ears and usually keeps the glasses on individuals faces (Parts of an Eyeglasses Frame, n.d). The frame temples are credited to Spanish craftsmen who tied ribbons or strings to the frame and placed them over wearers' heads (Glasses History, n.d). When imported to other locations, they adapted their own version for the frame of the glasses, for example, the Chinese attached metal weights to the strings instead of looping them around the wearers' heads and it wasn't until the 1700s that a

British optician, Edward Scarlett, invented a rigid temple that rested on wearers' ears (Glasses History, n.d).

Temple Tips:

The temple tips are the part of the frame that rests on the wearers' ears, also referred to as the earpieces (Parts of an Eyeglasses Frame, n.d). It was mentioned that the temple are the arms of the glasses, so the temple tips should be thought of as the hands of the glasses that are able to latch on the wearers' ears and provide stability needed for the glasses to stand on the face.

Hinges:

The hinges are movable joints connecting that allow the temples to move (Parts of an Eyeglasses Frame, n.d). They are what facilitate the process of folding in glasses for secure storage.

End Pieces:

The end pieces are small parts in front of the frame that extend outward to connect the front frame to the hinges (Parts of an Eyeglasses Frame, n.d).

Screws:

The screws are tiny pieces, sometimes actual screws or just tiny pointed metal pieces, that are inserted into the hinge and affixes the temple to the end pieces (Parts of an Eyeglasses Frame, n.d). In other words, the screw is what holds the top half, the lenses, rims, to the bottom half, the temples, and the end pieces and hinges are in the middle, also working to hold the entire structure together.

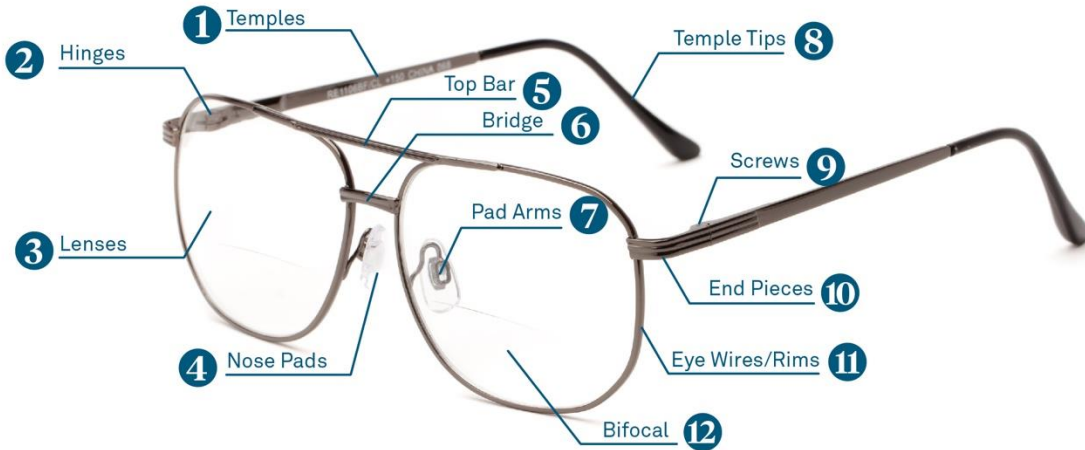


Figure 1.3: The different components of eyeglasses

To illustrate the entire components of eyeglasses, picture the frames, which consist of every component of eyeglasses besides the lenses, and consider the rims of the glasses attached to the end pieces that extend outwards towards the hinges, which has a movement mechanism due to the screws inserted into it and finally the temple extending from the hinges into the temple tips to curl around the wearers' ears.

Conclusion

Human history has been filled with captivation over our spectacular ability to see and has been the subject of ancient peoples who considered eyesight, “the most wonderful of the five senses” (Eyeglasses Timeline, n.d) and glasses have had a rich history that can be dated back to the middle ages in which people used household items made of glass to enhance their vision (Glasses History, n.d). Innovation and demand of glasses soared as we got closer to modern periods and continues to rise even now, and we know have innovation in which there have been attempts to infuse technology into eyeglasses (Gregory, 2013). The components of glasses have been varied throughout history and have continued to change as new input materials are discovered. All in all, the relatively simple and compact design, portability, and function of eyeglasses makes it one of the most powerful pieces of technology humans have access to.

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