May 8, 1951 A. YUHAS 2,551,781

ARTIFICIAL EYE

Filed Feb. 19, 1948 2 Sheets-Sheet 1

Fig. 1.

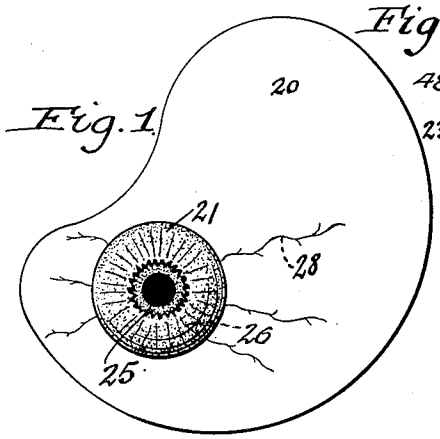


Fig. 3.

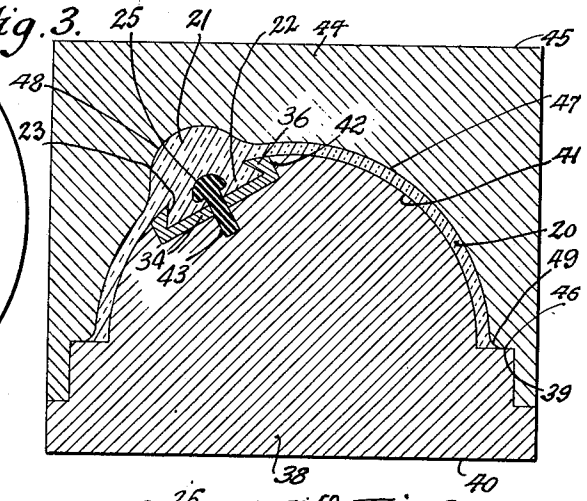


Fig. 2.

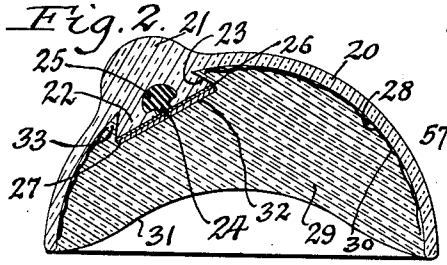


Fig. 9.

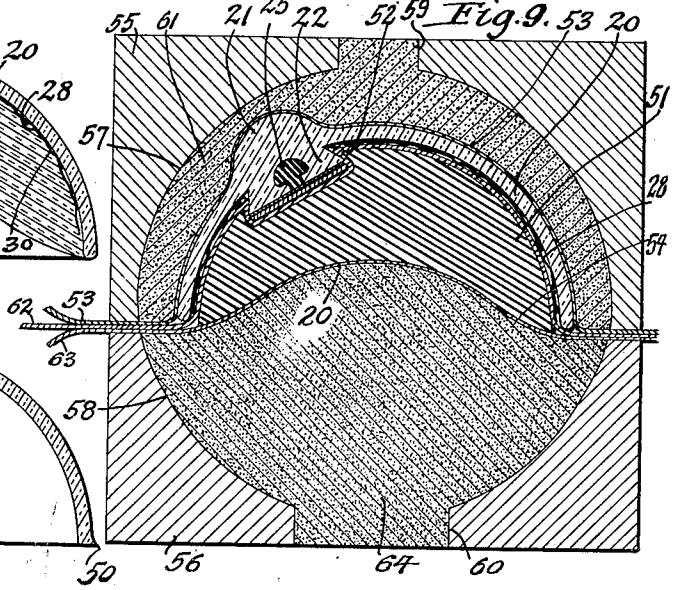


Fig. 4.

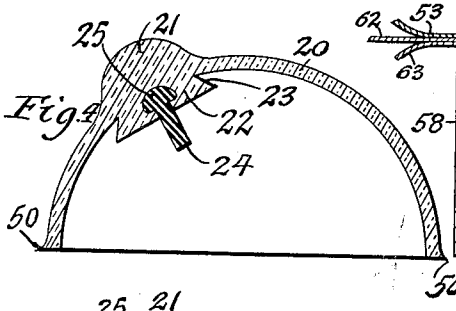


Fig. 8.

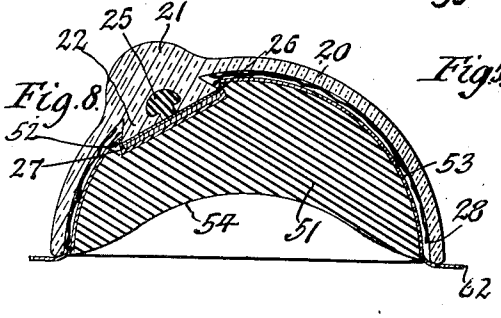


Fig. 5.

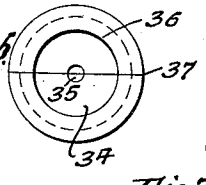


Fig. 6.

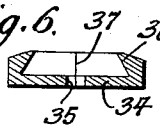
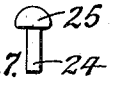


Fig. 7.



INVENTOR.
Alexander Yuhas,
BY
Popp & Popp
Attorneys.

May 8, 1951 A. YUHAS 2,551,781

ARTIFICIAL EYE

Filed Feb. 19, 1948 2 Sheets-Sheet 2

Fig. 10.

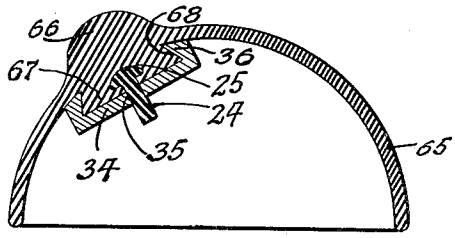


Fig. 11.

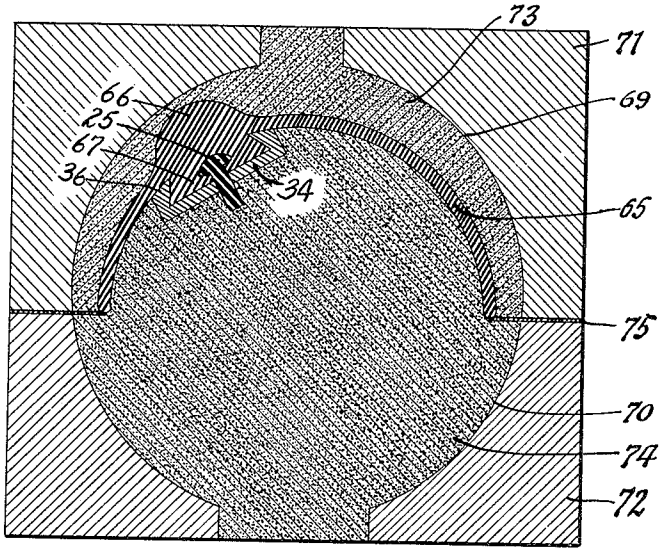
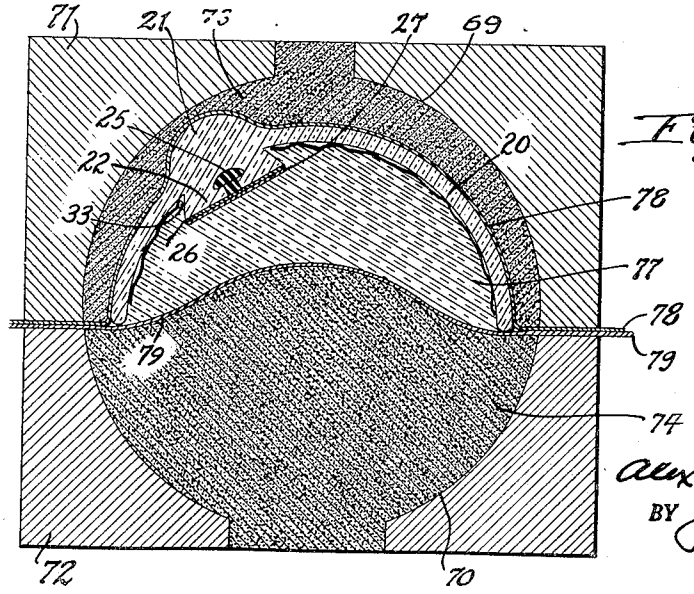


Fig. 12.



INVENTOR.
Alexander Yuhas
BY
Popp & Popp
Attorneys.

Patented May 8, 1951 2,551,781

UNITED STATES PATENT OFFICE

2,551,781

ARTIFICIAL EYE

Alexander Yuhas, Buffalo, N. Y.

Application February 19, 1948, Serial No. 9,540

5 Claims. (Cl. 3—13)

1

This invention relates to an artificial eye and more particularly to an eye which is made mainly of synthetic plastic material such as methyl methacrylate.

It is the object of this invention to provide an eye of this character which closely resembles the natural eye and which is strong and virtually unbreakable and comparatively low in cost.

In the accompanying drawings:

Fig. 1 is a front view of an artificial eye made in accordance with this invention.

Fig. 2 is a cross section of the same.

Fig. 3 is a mold or flask used in the first stages of the method of making an artificial eye embodying this invention.

Fig. 4 is a cross section of a partly completed artificial eye containing the improvement forming the subject of this invention.

Fig. 5 is a top view of the mold member which is utilized in making the iris of the artificial eye of this invention.

Fig. 6 is a cross section of the same.

Fig. 7 is a side view of the pupil member of the artificial eye made in accordance with this invention.

Fig. 8 is a cross section, similar to Fig. 2, showing an intermediate stage in the method of making an artificial eye which embodies this invention.

Fig. 9 is a cross section of a mold or flask and parts of an artificial eye therein indicating one of the stages in completing the formation of the same in accordance with this invention.

Fig. 10 is a sectional view of a pattern, a mold member and a pupil member for making an artificial eye in a modified manner embodying this invention.

Fig. 11 is a sectional view of a mold or flask showing one of the intermediate steps in the manufacture of this artificial eye in this modified manner.

Fig. 12 is a similar view of a mold or flask showing the final stage of making this artificial eye in accordance with this invention.

The artificial eye which is made by the apparatus and in accordance with the method of this invention is shown in Figs. 1 and 2 and constructed as follows:

The numeral **20** represents the hollow shell or clear member of the artificial eye which is of substantially semi-spherical form and provided on one part of its external or convex surface with a projection **21** of semi globular form and on its inner side with an inwardly projecting disk shaped iris member **22** which is arranged axially

2

in line with the axis of the cornea. This shell, cornea and iris correspond to and simulate the front part of the cornea and the iris members of a natural eye and are made integrally from plastic material such as methyl methacrylate which is clear or transparent.

This disk is of round form and of substantially the same diameter as the cornea member and its periphery is of outwardly tapering form so as to provide an undercut circumferential groove **23** on the periphery of this disk for a purpose which will presently appear.

Embedded axially in this iris disk is an artificial eye member which simulates the pupil of a natural eye and which is made of black non-transparent plastic material, or the like, so as to provide an inner stem or pin **24** which is embedded in the inner part of the iris disk and has its inner end terminating flush with the inner side of the iris disk, and an outer enlargement or head **25** formed integrally with the stem **24** at the outer end thereof and embedded in the outer part of the iris disk, as shown in Fig. 2.

On its inner surface the iris disk is provided with a design or decoration which is visible from the front side of the cornea and simulates the appearance .of a natural iris as to color, and design. This simulated iris may be produced in any desired manner but preferably by suitably painting the same in the form of a coating **26** on the rear or inner side of the iris disk.

In order to prevent the pigment or other material used for producing the design effect of an iris on the iris disk from being dissolved and thus rendered indistinct by the solvent in the material which is subsequently placed within the shell to complete the artificial eye, a protecting film **27** is placed over the rear or inner side of the iris design **26** and thereby prevents the same from being dissolved and smeared and thereby prevents the natural appearance of this artificial eye from being impaired. This protecting film preferably consists of a round wafer of thin sheet rubber which is secured by a suitable cement to the rear side of the iris member which is painted on the iris disk.

For the purpose of artificially producing the effect of blood vessels, veins or irregular markings of like character on the shell around the iris in simulation of the human eye, a plurality of solvent proof pencil marks or colored threads **28**, or fibers of like character and suitably colored, are cemented on the inner side of the shell by the use of a solvent such as methylene chloride or the like so that they radiate irregularly from the

iris and are visible through the shell from the front or outer side thereof, as shown in Figs. 1 and 2.

Within the shell and covering the inner surface of the same as well as the vessels or veins 28 and the protecting film 27 is an implant or fillet 29, the front convex surface 30 of which is secured to the inner side of the shell while the rear concave side 31 of the same is made to conform to the convex front side of the eyeball socket to which the artificial eye is to be applied. This implant is made of a white or tinted opaque plastic which is visible through the shell around the iris disk and presents the appearance of the color of a natural eye.

Axially in line with the iris and the cornea of the shell the front side of the implant or fillet is provided with a circular recess 32 which receives the iris disk and the protecting film 27 on the inner side of this disk. The bottom of this recess bears against the rear side of the protecting film, and the front convex surface of the fillet around this recess bears against the concave inner side of the shell and the vein simulating threads 28.

This implant or fillet is held within the shell by means of an overhanging flange 33 formed on the fillet around the outer end of the recess 32 thereon and, in effect, producing annular groove, which flange projects into the groove 23 so as to interlock the iris disk and the fillet. The fillet is further secured in the shell by the adhesive effect of the cement whereby the vein threads 28 are secured to the inner side of the shell.

In its complete form this artificial eye is durable and practically unbreakable under normal conditions and therefor very economical inasmuch as frequent replacing of the same is not required as is the case of glass artificial eyes similar to those heretofore in use.

The apparatus for producing the foregoing artificial eye and the several steps of the method which are followed in such production are as follows:

The pupil of the artificial eye is originally made in the form shown in Figs. 3, 4 and 7 so as to provide the head 25 of the size shown in Figs. 1, 2, 3, 4 and 8 and a stem 24 which is preferably somewhat longer than that required for the finished pupil shown in Figs. 2, 8 and 9. This pupil may be made integrally of black plastic or similar material by casting the same in a mold, cutting the same from a block of this material or in any other suitable manner.

The iris disk 22 of the artificial eye is produced by a metal mold member which has the general shape of a button, as shown in Figs. 3, 5 and 6, and comprises a circular bottom 34 having a central hole 35 and an annular inwardly overhanging flange 36 arranged on the front and side of the peripheral part of said bottom so as to form an outwardly flaring conical pocket on the front side of this mold member. During the operation of forming an artificial eye in accordance with this invention the stem 24 of the pupil is arranged in the hole 35 of the button shaped mold member so that part of the stem is in front and part thereof in rear of the bottom of this mold member and the head 25 of the pupil is spaced from this bottom, as shown in Fig. 3. To permit this mold member to be removed from the finished product formed thereby, as will presently appear, this mold member is divided diametrically into two like parts along a line 37, as indicated in Figures 5 and 6.

The shell or body 20 of the artificial eye is formed between the male and female metal members, respectively, of a mold or flask together with the iris mold member and the pupil. The male shell member of this mold or flask, includes a lower base 38 which has a flat underside 40 whereby the same may be supported on a table or the like, an upwardly facing shoulder 39 arranged on the periphery of the base and a semi-spherical convex surface 41 arranged on the base within the shoulder 40 and provided on its upper side and off-set from the center thereof with a cylindrical seat or socket 42, and a hole 43 in the bottom of this seat, as shown in Fig. 3. The female shell member of this mold or flask includes an upper cap 44 the upper side 45 of which is flat to permit of resting the same on a supporting surface and its underside has a peripheral shoulder 46 adapted to rest on the shoulder 40 of the mold flask member, as shown in Fig. 3. On its underside the female shell member, and within its shoulder, the same is provided with a large semi-spherical concave molding surface 47 and a small semi-spherical concave molding surface 48 on one side of the center of the large molding surface.

In the assembled position of the several members of this molding apparatus the iris forming member 34, 36 is placed in the seat 42 of male member, the stem 24 of the pupil forming member is inserted in the hole 35 of the iris forming member and the hole 43 of the male shell member, and the female shell forming member is placed over the male shell forming member so that the shoulders 39, 46 of the same are in engagement with each other, as shown in Fig. 3. When the several mold members are thus assembled the semi-spherical convex and concave mold surfaces 41, 47 of the male and female members are spaced concentrically from each other and the small concave surface 48 of the female member is spaced from, but arranged axially in line with, the iris forming member 34, 36 and the previously formed pupil in the latter, thereby forming a mold cavity between these members corresponding to the shape of this shell and iris of the artificial eye which is to be produced. The material which composes the shell and iris of the artificial eye preferably comprises a clear plastic powder and a solvent which are mixed and worked into the form of a readily deformable dough and which upon being suitably heated will result in a product which is hard and clearly transparent. In making the shell and iris of the artificial eye a mass of this dough is placed between the male and female flask members and then the latter are closed until their co-operating shoulders 39, 46 engage each other. When these mold members are thus closed the plastic dough between the same is squeezed firmly and caused to conform to the contour of the opposing mold surfaces 39, 46 on the male and female flask members and the iris and pupil members mounted on the male flask member, thereby forming the hollow body or shell 20 between the concave and convex surfaces of the female and male flask members also forming the cornea 21 by the small concave surface 48 on the female flask member and also forming the iris disk 22 with the head and front part of the pupil embedded in the iris disk, as shown in Figure 3.

In practice somewhat more pliable plastic dough than is necessary to form the shell, cornea and iris is placed between the opposing parts of

the mold and any excess is squeezed out from between the opposing shoulders 39, 46 of the flask members and scraped off after the mold is closed.

After the shell, cornea and iris have been thus formed and attached to the pupil by these mold elements, the entire unit is first immersed in water heated at temperature of 160° F. for a period of one hour and then subjected to boiling water for one-half hour for the purpose of curing and hardening the plastic composition of this product. After the product has been thus treated the shell, cornea and iris are strong, hard and transparent and the pupil is securely fastened in the iris and visible from the front of the cornea. Upon separating the metal members of the molding flask the plastic shell, cornea, iris and pupil members together with the metal button shaped mold member 34, 35 are removed for further treatment of the shell and iris, as will later appear. The removal of the shell from the female flask member is facilitated by rounding the outer edge portion of the female mold surface, as shown at 49 in Fig. 3, thereby producing an annular flange 50 on the outer side of the edge of the shell, during the forming operation, as shown in Figs. 3 and 4, which flange is later removed by grinding or otherwise in order to complete the artificial eye for use.

After the molded shell, cornea and iris together with the pupil and button shaped auxiliary mold member have been removed from the metal male and female flask members, the button shaped iris mold member is detached from the united shell, iris and pupil, this being possible due to the diametrical split 37, of the iris mold member which permits both halves of the same to be withdrawn radially from opposite sides of the stem of the pupil and the undercut edge of the iris.

After the shell and associated parts together with the pupil have been removed from the mold members the convex surface of the shell is polished by tripoli or otherwise and the inner end of the pupil stem 24 is ground off until the same is flush with the inner side of the iris disk 22, as shown in Figs. 2, 8 and 9. Thereafter the design 26, in simulation of a natural iris, is applied to inner or rear side of this iris disk. This iris design may be produced either by a paint, stain, dye, or appropriate plastic material to match the color and design of the iris of the patient or individual for whom the artificial eye is intended. In order to prevent the iris design on the iris disk from being dissolved and smeared or rendered indistinct by the solvent for the fillet or implant, subsequently placed into the inner side of the shell and iris, the protecting element 27 is placed over this design, which protecting element preferably consists of a thin film of rubber cemented to the inner side of the iris disk, as shown in Figs. 2, 8 and 9. Imitation blood vessels or veins 28 are then applied to the inner side of the shell around the iris disk which vessels may consist of suitably colored threads, solvent proof pencil marks or the like. When threads are used for this purpose the same are held in place on the inner side of the shell by cement, such as methylene chloride.

In order to fit the artificial eye to the eyeball of the person for whom it is intended, the rear side of the artificial eye is provided with adapting means which are produced and constructed in accordance with this invention as follows:

The numeral 51 represents a matrix of easily deformable material, such as counterwax, of which a mass is temporarily placed in the hollow rear side of the artificial eye shell so as to engage with the concave surface of the same and the flat rear side of the iris mold member also form an overhanging hook shaped flange 52 on its front side which engages with the groove 23 on the periphery of the iris disk and thereby interlock the matrix with the shell and hold the same against displacement therein during the operation of fitting the matrix to the human eye socket. Due to the protecting film 27 over the design 26 on the iris disk any solvent properties which may be contained in the matrix wax is prevented from dissolving the painted design 26 and possibly blurring or smearing the same.

In order to prevent the wax matrix from sticking to the inner side of the shell and associated parts, a separating or lining sheet 62 of thin paper or similar tissue or material is temporarily placed between the surfaces on the hollow rear side of the artificial eye shell and the front side of the wax matrix, as shown in Figs. 8 and 9, this separating lining being subsequently removed with the wax.

After a matrix of deformable wax, or the like, has been thus placed in the cavity on the rear side of the artificial eye shell, this matrix is pressed against the front side of the eyeball of the patient and thereby produce an impression on the rear side of the same corresponding to the contour of the eyeball, as shown at 54 in Fig. 8. This wax matrix is now replaced by a fillet or implant of plastic or like material, which fillet or implant is shown at 29 in Fig. 2 for completing the artificial eye preparatory to being used by the customer. This fillet is formed in the shell of the artificial eye as follows:

The numerals 55, 56 represent the upper and lower members or halves of a finishing mold or flask which may be made of bronze, aluminum or other suitable metal and are provided, respectively, on their opposing inner sides with cavities 57, 58 preferably of spherical form, and openings 59, 60 extending from the upper and lower sides of these flask members to the cavities within the same. The opening 59 in the upper flask member 55 is preferably comparatively small and the opening 60 in the lower flask member 57 relatively large, for a purpose which will be explained later on.

In the further procedure of replacing the temporary wax matrix 51 with a permanent plastic fillet 29 of the same form the upper flask member is first inverted so that its opening 59 is lowermost and is closed by the support on which it rests and its cavity 57 opens upwardly. While the upper flask member 55 is in this position a quantity of plaster or dental stone 61 in pliable form is placed in the cavity of the upper flask member 55, this stone being readily deformable when first placed in the cavity of the inverted upper mold member 55 but soon sets and becomes relatively hard by evaporation of its water content. While this dental stone in the cavity between the respective mold members is still in a pliable condition, the shell and cornea of the artificial eye are pressed downwardly into this soft dental stone until the edge or rim of the shell is even with the edge of the flask member 55 around its cavity, at which time any excess dental stone is struck off from the edge of this flask member.

In order to prevent the convex outer side of the shell of the artificial eye from coming in contact with any possible moisture on the dental

stone in the flask member 55, a protecting sheet 53 of tinfoil, or the like, is placed between the convex surface of the shell and cornea of the artificial eye and the dental stone 61 in this mold member 55, thereby avoiding any injurious effects on the clear plastic of which these parts of the artificial eye are made. While the upper flask member 55, with the dental stone and partly finished artificial eye therein, is still in this inverted position a sheet 63 of separating material, such as cellophane, is placed across the impressed surface 54 of the wax matrix. The lower flask member 56, while in an inverted position, is placed over the upper flask member 55 and also over the separating sheet 63, at which time the cavity in this flask member 56 opens downwardly toward the unimpressed side of the wax matrix. A mass of dental stone 64, while in a soft pliable condition, is now introduced as a backing through the large hole or opening 59 into the flask member 56, which is now inverted, and pressed against the sheet lying over the impressed surface 54, thereby obtaining a transfer of the impression on the matrix to the dental stone 64 in the cavity 58 of the flask member 56 so that the latter conforms to the contour of the impression on the matrix. In this manner a replica of this impression on the inner side 80 of the dental stone 64 and the latter becomes a die after it dries out and hardens.

Due to the presence of the separating sheet 53 over the impression surface of the matrix 51 the dental stone 64 in the flask member 56 is unable to come into contact with this impression surface and thereby prevents adhesion between these surfaces and therefore permits easy separation of the same.

After the dental stone 64 with the impression of the matrix dried and hardened the flask members 56, 55 are separated and the wax matrix is removed from the flask member 55 by heat applied thereto in any suitable manner so that the wax matrix melts and runs out of the shell of the artificial eye. By making the opening 60 in the flask member 56 larger than the opening 59 in this flask member 55 it is possible to fill the flask member 56 with dental stone more quickly whereas the small opening 59 in the flask member 55 need only be of a size sufficient to permit excess dental stone to escape from this last mentioned flask member while filling the same with dental stone or plaster.

After the wax matrix and the separating sheet 63 have been removed from the flask member 55 and the partly completed artificial eye therein, a mass of pliable or dough like plastic is placed in the hollow part of the shell of the artificial eye and the flask member 56 together with the hardened dental stone die or backing 64 is placed over the inverted flask member 55 so that the dental stone 64 exposes the transferred impression or die on its surface 80 to the concave side of the plastic mass 29 in the shell 20 of the artificial eye. The two flask members 55, 56 are now pressed together until their marginal parts meet, whereby the plastic mass 29, therebetween, while still in a pliable condition is squeezed between the impression surface 80 of the dental stone 64 and the inner side of the plastic mass 29, whereby the outer or rear face 31 of this pliable plastic mass for forming the fillet or implant 29 receives an impression of the contour on the dental stone 64 which corresponds to that taken from the eye socket of the customer on the wax matrix. After the plastic mass in the hollow shell, which ultimately forms the fillet 29, has been thus squeezed into shape to conform to the wax matrix, the flask members 55, 56 together with the partly completed artificial eye and the plastic fillet 29 therebetween are first subjected to a heating effect of water at a temperature of 160° for a period of one hour and then boiled in water for one-half hour, thereby curing and hardening this fillet in the same manner that the clear plastic of the shell, cornea and iris disk were treated.

The plastic fillet which replaces the wax matrix may be tinted or toned in any suitable manner to match the color of the patient's sclera.

An artificial eye thus produced is superior to those heretofore made of glass, the same can be made at lower cost and is practically indestructable. When making artificial eyes by these molding and forming means which include the mold shown in Fig. 3 the co-operating mold surfaces of the male and female mold members are formed on metal which is expensive particularly when a considerable number of different sizes are required. In order to reduce the cost of making artificial eyes in accordance with this invention when only a few of any particular size are required, the metal mold members may be omitted and the same result obtained as follows:

In Figure 10 is shown a pattern made of wax or similar readily meltable material which is shaped to provide a hollow semi-spherical shell 65 which simulates the front part of the sclera of the human eye, a spherical cornea projection 66 on the outer side of this shell corresponding to the cornea of the human eye, and a circular iris disk 67 on the inner side of this shell in line with the cornea projection and corresponding generally to the shape of the iris of the human eye. This iris member has its periphery bevelled so as to form an annular under cut conical groove 68 the wall of which tapers outwardly. A split mold member, similar to the mold member shown in Figs. 3, 5 and 6 is attached to the inner part of the iris member 67 of the wax pattern by engaging the bottom 34 of this iris mold member with the inner side of the iris member 67 of the wax pattern and engaging the inwardly overhanging flange 36 on the periphery of the iris mold member with the annular groove 68 on the periphery of the wax iris pattern, as shown in Fig. 10. In forming the shell of the wax pattern the outer part of the stem 24 and the head 25 of the pupil of the artificial eye are embedded in the iris disk 67 of the wax pattern and the inner part of this stem extends through the opening 35 in the bottom of the iris mold member and projects a short distance inwardly therefrom, as shown in Fig. 10.

This wax pattern with the iris mold member and pupil mounted thereon is placed in the opposing cavities 69, 70 of two mold members or sections 71, 72 and the reproductions of the inner and outer surfaces of this pattern and the parts mounted thereon are obtained by introducing masses of plaster or dental stone 73, 74 in a pliant condition into these cavities, as shown in Fig. 11, the opposing surfaces of these masses being preferably separated from each other by a thin sheet 75 of tissue, foil or the like to facilitate subsequent separation of these molding masses.

After the surfaces of the wax shell pattern 65 and associated parts of the iris pattern and pupil have been thus reproduced on the pliable stone masses 73, 74, the wax pattern is melted out of the cavity between these stones 73, 74, by means

of heat which may be applied in any suitable manner, and the stones 73, 74 bearing the reproductions of the pattern thereon and the iris mold member 34, 36 and the pupil 24, 25 are again assembled in the position shown in Fig. 11, minus the wax pattern. Before assembling these parts a mass of pliable plastic which ultimately forms the fillet or implant 29 is placed between the opposiing impression surfaces of the hardened dental stone forming the members 73, 74. Then these stone members 73, 74 are pressed together, thereby causing the plastic to conform to shape of the cavity previously formed on these stones by the wax pattern, corresponding to the shape of the shell and associated parts shown in Fig. 4. This shell is now hardened in the manner previously described and thereafter threads 28, simulating blood vessels, are cemented to the inner concave side of the shell, the inner end of the pupil stem 24 is ground off, the inner side of the iris disk is decorated with a design 26 to match the color and design of the patient's iris, and a rubber protecting sheet 27 is cemented over the iris design in the manner heretofore described with reference to the showing in Figs. 2, 8 and 9. A mass of wax for forming the matrix 51 is now placed in the hollow side of the shell and an impression or contour of the patient's eyeball is made on the inner side of the wax matrix. This shell, with the wax matrix on the inner side thereof is now utilized in the manner indicated in Fig. 9 to produce an impression on the dental stone 74 corresponding to the manner indicated in Fig. 9. This stone is now hardened, the wax matrix is melted out of the cavity between the plastic shell and the dental stone 73 and the wax matrix is reproduced in plastic material by placing a mass 77 of pliant plastic corresponding to the fillet 29, between the eye shell and the dental stone 74 and squeezing this mass and stone together, thereby reproducing the impression of this stone on the plastic mass 74, as shown in Fig. 12. Separating sheet 78, 79 of foil, or similar material, are interposed between the shell 20 and the female dental stone 73, and between the plastic fillet 77 and the male dental stone 74 to avoid sticking together of these parts when the mold is opened. Thereafter the plastic fillet 77 is hardened by heating and boiling in the manner already set forth. The artificial eye is removed from the mold members and the same is ground and polished smooth ready for wear by the customer.

It will be noted from the foregoing descriptions of making the artificial eye in accordance with this invention that both methods are practically the same, the only difference being that in the method described with reference to Figs. 1–9 metal mold members 36, 38 are employed to make the shell 20 in first instance, while in the method described in connection with Figs. 10–12 a wax pattern is used preparatory to making the eye shell of plastic material.

I claim:

1. An artificial eye comprising a hollow semispherical shell having a protruding cornea on its convex outer side and a protruding iris disk on its concave inner side all of which are made integrally of clear transparent plastic, and said iris disk being provided on its periphery with an undercut groove, an opaque plastic pupil embedded in said iris disk and terminating at the rear of said iris disk, a design applied to the inner side of said iris disk, a protecting film applied over the inner side of said design, simulated blood vessels applied to the inner side of said shell around the iris disk, and a fillet of plastic arranged within said shell and provided on its front side with a recess which receives said iris disk, design and film, and an overhangng flange arranged on said fillet around said recess and engaging said groove, and said fillet having a convex surface which surrounds said recess and engages with the inner side of said shell and blood vessels thereon and the rear side of said fillet also having a concave surface adapted to fit the outer side of the eye socket of a natural eye.

2. An artificial eye, comprising a hollow semispherical shell having a protruding cornea on its convex outer side and a protruding iris disk on its concave inner side all of which are made integrally of clear transparent plastic, an opaque plastic pupil member arranged in centered relation to said iris disk, a pigmented design in simulation of an iris arranged against the rear face of said iris disk around said pupil member, simulated blood vessels applied to the inner concave side of said shell around said iris disk, and a fillet of substantially white plastic arranged within said shell and provided on its front side with a recess which receives said iris disk and design and said fillet having a convex surface which surrounds said recess and engages the inner side of said shell and the said blood vessels thereon, and the rear of said fillet also having a concave surface adapted to fit the outer side of the eye socket of a natural eye.

3. An artificial eye, comprising a hollow semispherical shell having a protruding cornea on its convex outer side and a protruding iris disk on its concave inner side all of which are made integrally of clear transparent plastic, an opaque plastic pupil member arranged in centered relation to said iris disk, a pigmented design in simulation of an iris arranged against the rear face of said iris disk around said pupil member, a protecting film applied over the rear side of said pigmented design, simulated blood vessels applied to the inner concave side of said shell around said iris disk and a fillet of substantially white plastic arranged within said shell and provided on its front side with a recess which receives said iris disk, design and film and said fillet having a convex surface which surrounds said recess and engages the inner side of said shell and the said blood vessels thereon, and the rear of said fillet also having a concave surface adapted to fit the outer side of the eye socket of a natural eye.

4. An artificial eye, comprising a hollow semispherical shell having a protruding cornea on its convex outer side and a protruding iris disk on its concave inner side all of which are made integrally of clear transparent plastic, an opaque plastic pupil member embedded in said iris disk and arranged in centered relation to said iris disk, a pigmented design in simulation of an iris arranged against the rear face of said iris disk around said pupil member, a protecting film applied over the rear side of said pigmented design, simulated blood vessels applied to the inner concave side of said shell around said iris disk, and a fillet of substantially white plastic arranged within said shell and provided on its front side with a recess which receives said iris disk, design and film and said fillet having a convex surface which surrounds said recess and engages the inner side of said shell and the said blood vessels thereon, and the rear of said fillet also hav-

ing a concave surface adapted to fit the outer side of the eye socket of a natural eye.

5. An artificial eye, comprising a hollow semispherical shell having a protruding cornea on its convex outer side and a protruding iris disk on its concave inner side all of which are made integrally of clear transparent plastic, said iris disk being undercut to provide a peripheral groove, an opaque plastic pupil member arranged in centered relation to said iris disk, a pigmented design in simulation of an iris arranged against the rear face of said iris disk around said pupil member, a protecting film applied over the rear side of said pigmented design, simulated blood vessels applied to the inner concave side of said shell around said iris disk, and a fillet of substantially white plastic arranged within said shell and provided on its front side with a recess which receives said iris disk, design and film and said fillet having in said recess a bead arranged to extend into said groove and having a convex surface which surrounds said recess and engages the inner side of said shell and the said blood vessels thereon, and the rear of said fillet also having a concave surface adapted to fit the outer side of the eye socket of a natural eye.

ALEXANDER YUHAS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,979,321	Dunner	Nov. 6, 1934
2,129,304	Feinbloom	Sept. 6, 1938
2,394,400	Noles	Feb. 5, 1946
2,433,261	Brent	Dec. 23, 1947
2,442,516	Shriver	June 1, 1948
2,497,872	Erpf et al.	Feb. 21, 1950