

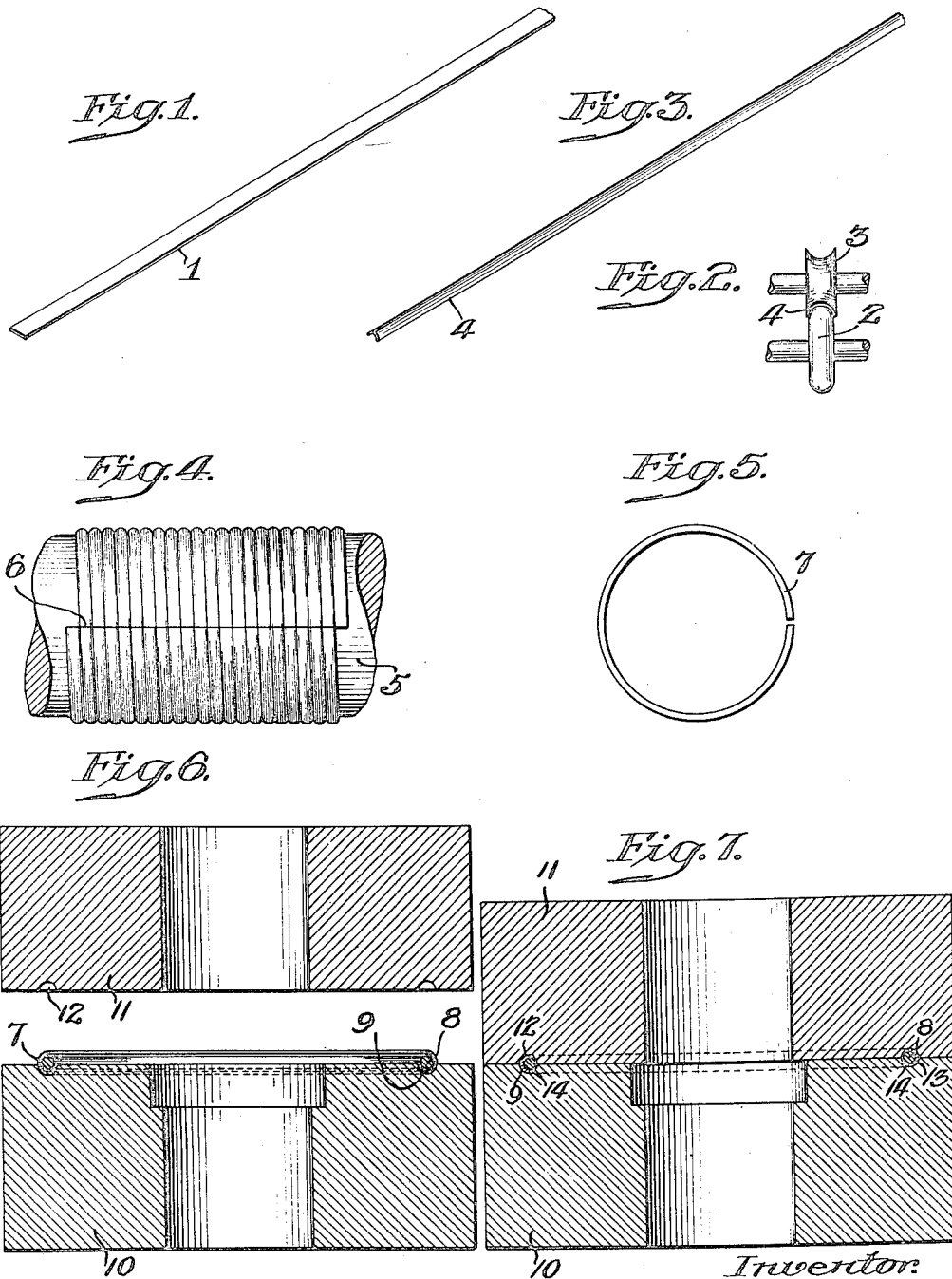
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E. R. DURGIN

PROCESS OF PRODUCING RIMS OF CELLULOID FOR EYEGLASSES

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PROCESS OF PRODUCING RIMS OF CELLULOID FOR EYEGLASSES.

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To all whom it may concern:

Be it known that I, EDGAR R. DURGIN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented an Improvement in Processes of Producing Rims of Celluloid for Eyeglasses, of which the following is a specification.

My invention relates to improvements in the process of producing rims of celluloid or other suitable non-metallic material for eyeglasses and spectacles, more particularly the non-metallic rim portions of combination metal and non-metal eyeglass and spectacle rims of the character shown in several United States Letters Patent, such for example as Patent No. 1,335,942, dated April 6, 1920.

The principal object of my invention is to provide a process by means of which the non-metallic encircling portions of such combination eyeglass and spectacle rims may be more expeditiously and economically manufactured than heretofore has been the case.

A further object of my invention is to provide a process by the employment of which relatively thin strips of celluloid or other like equivalent material may be employed in the manufacture of eyeglass and spectacle rims. By the employment of such thin strips it is practical to produce rims of uniform size and thickness; also by the employment of thin sheet stock it is practical to secure a better quality of material than is generally the case when round stock is employed, as has heretofore been the practice.

Another practical advantage incident to the use of relatively thin flat stock is that it has a finished surface, thus avoiding the necessity of expensive polishing when round stock is used.

A further object of my invention is to provide a process by the employment of which rims of required accurate size and thickness may be produced more readily and with less difficulty than is the case when round stock is employed, as has heretofore been the case.

Other objects and advantages of my invention will be pointed out in the detailed description thereof which follows or will be apparent from such description.

For purposes of description and to render my invention more readily understood, I

have shown in the drawings certain tools or devices which may be employed in the carrying out of the process to which reference will be made in the following description, but it will be understood that my invention is not limited to any particular form of tool or tools or apparatus and that the process may be carried out by the employment of tools of other character than those illustrated, if desired.

In the drawing:

Fig. 1 is a perspective view of a portion of a narrow, relatively thin sheet of celluloid ready to be operated upon in accordance with my invention to form an eyeglass or spectacle rim;

Fig. 2 is a view in elevation of a couple of forming rolls or dies to which the strip shown in Fig. 1 is first subjected, the arcuate end of a strip being shown in position between the same;

Fig. 3 is a perspective view of the strip after it has been subjected to the action of the die rolls shown in Fig. 2;

Fig. 4 shows the strip shown in Fig. 3 coiled around a mandrel;

Fig. 5 shows a section of strip removed from the mandrel shown in Fig. 4, formed by cutting the coiled strip as indicated in said Fig. 4;

Fig. 6 is a transverse sectional view of a couple of compressing and shaping dies with a rim strip in engagement with a circular core in position in a circular groove in the bottom die, the upper die being in spaced relation with respect to the lower die; and

Fig. 7 is a view showing the two dies in contact with each other with the rim compressed thereby partially around the said circular core.

As has already been pointed out, my process is especially adapted for the production of rims from celluloid or other like material which are adapted to be placed in encircling relation about the eye-wires of combination metal and non-metal eyeglass and spectacle rims now in very general use.

In the production of rims in accordance with my invention sheets of celluloid of the required thickness are procured and by any suitable means cut into strips of requisite width, such as is shown in Fig. 1 of the drawing. Such strips are then subjected to the action of forming or die rolls 2 and 3, the peripheral surface of the first of which

is convex as indicated while the peripheral surface of the second of which is concave. The die rolls 2 and 3 should be maintained at a temperature corresponding to that at which the celluloid strips 1 are pliable, and the latter should be heated to such temperature before subjecting them to the action of the said die rolls. By subjecting the strip 1 to the action of the forming or die rolls 2 and 3, the strip 4 is formed which is of arcuate shape in cross section, as shown in Fig. 3, the said strip being substantially semi-circular in cross section.

After the strip has been subjected to the action of the die rolls 2 and 3 and given the form as shown in Fig. 3, it is wound helically around a mandrel 5, as shown in Fig. 4. After having been so wound the coils are sawed or otherwise cut along a line 6, as shown, so as to divide the strip into a number of sections of the proper or required size and length to form the rims, one of said sections being shown at 7 in Fig. 5.

By winding the strip around a mandrel such as 5 it is apparent that the rims may be formed of the exact length desired to produce a rim of exactly the required size; that is, of the required diameter.

The rim lengths or sections 7 having been formed by cutting the helical strip along the line 6, as indicated in Fig. 4, the strip sections or lengths are placed about a cylindrical circular metallic core 8 and the said section together with the said core are then placed in position in the circular groove 9 formed in the top surface of a die 10. Said groove is semi-circular in cross section. 11 designates a co-operating die having a circular groove 12 therein which is adapted to co-act with the groove 9 to compress the rim section 7 and bend its edges around the cylindrical circular core 8.

The external diameter of the core is sufficiently less than the external diameter of the grooves 9 and 12 to leave a space of a thickness or width sufficient to readily accommodate the thickness of the material of the rim section which is situated intermediate the said core and the outer peripheral surfaces of the said grooves. It will be observed that the core occupies a substantially central position in the groove of the rim section 7 with the opposite edges of the latter substantially equal distances from the said core. It will likewise be observed that the radius of transverse curvature of the rim section is greater than the transverse radius of curvature of the core, so that the edge portions of the said rim section are separated or spaced slight distances from the said core. Upon bringing the two members 10 and 11 of the compressing die together the edges are forced around and tightly against the core 8. The interior diameter of the core 8 is very slightly greater

than the interior diameter of the grooves 9 and 12, so that the thickness of the space intermediate the inner side of the said core and the adjacent inner surface of the said grooves is substantially less than the thickness of the space between the outer peripheral surface of the said core and the outer surfaces of the said grooves. The purpose of this relationship is that when pressure is applied to force the dies 10 and 11 together, the edges of the rim section 7 will be forced into positions intermediate portions of the inner surface of the cylindrical circular core 8 and the adjacent surfaces of the grooves 9 and 12, whereby the edges of the completed rim 13 are slightly compressed and thinned, as indicated at 14. Upon reference to Fig. 7 it will be noted that upon completion of the compressing action of the dies 10 and 11 the inner edges of the completed rim 13 are spaced a suitable distance apart, the distance being less, however, than the internal diameter of the groove in said rim, so that in effect an under cut is formed upon the inner side thereof.

In the carrying out of the process, the dies 10 and 11 are maintained at a temperature substantially the same as that at which the celluloid or other like material is raised to render the same more or less plastic and workable. The rim sections are raised to this temperature before being placed within and operated upon by the dies 10 and 11.

It will be apparent that by my process rims of the character described may be produced which are accurate as to thickness because such thickness is controlled by the space between the core 8 and the surfaces of the grooves 9 and 12 as heretofore indicated. Furthermore the rims can be produced of the exact size required because the size is controlled by that of the mandrel 5 about which the strip 4 is wound.

It is also apparent that when the rims are formed from sheet material in accordance with my invention any extra polishing which may be necessary may be performed upon the sheet before the same is divided into strips, such as are shown in Fig. 1, thereby reducing to a minimum the cost of such polishing. It is found, however, that in practice the sheets are produced with a surface polish such that it is unnecessary to further polish the same before cutting it into strips for use in the manufacture of eye-glass or spectacle rims.

A rim produced in accordance with my invention in which relatively thin flat stock is employed is sufficiently flexible or yielding to permit it to be placed in position about an eye wire or metal rim for a lens without any special tools and without the necessity of heating the same. This is an important consideration because, as is well known, these celluloid rims frequently break

rendering it necessary to replace them. The importance, therefore, of producing a rim of celluloid or like material which can be readily applied to a metallic eye wire is apparent.

Although my invention is described as applied to the manufacture of non-metallic rims of the character described, it will be understood that the process may be employed in the shaping and forming of rims of like character from thin sheet metal strips.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is:

1. The process of producing eyeglass and spectacle rims, which consists in forming thin strips of suitable material, pressing the said strips respectively into arcuate shape in cross section, shaping the same to circular form and thereafter compressing the same to bring the edges thereof in closer relation to each other so as to form an under-cut groove in the inner side of the finished rim.

2. The process of producing eyeglass and spectacle rims from relatively thin strips of non-metallic plastic material, which consists in pressing the said strips to form them into arcuate shape in cross section, shaping the same to circular form and thereafter compressing the same laterally to reduce the width thereof and to press the edges thereof inwardly to form an under-cut groove on the inner side of said rims.

3. The process of producing eyeglass and spectacle rims from relatively thin strips of celluloid, which consists in shaping the said strips respectively so as to form them into members of semi-circular shape in cross section, shaping the same to circular form, cutting the same into the required lengths to form the said rims, and thereafter compressing the sides of the said semi-circular shaped rim portion so as to simultaneously bend the same inwardly and to slightly reduce the thickness thereof.

4. The process of producing eyeglass and spectacle rims from relatively thin, long, narrow strips of material of the character described, which comprises pressing the said strips while in a plastic state into arcuate shape in cross section, coiling the same about a mandrel, thereafter cutting the said strip to produce a plurality of rim sections therefrom, and thereafter applying lateral and compressive pressure to the said edges to move them in closer relation to each other and to slightly thin the edges thereof.

5. The process of producing eyeglass and spectacle rims from relatively thin, narrow, flat strips of material of the character described which comprises the shaping of said strips so as to render the same arcuate in

cross section, bending the said arcuate shaped strips into circular form, thereafter placing the same upon a circular core, placing the said arcuate and circular shaped strip and core in a die and thereafter compressing the said strip between the said die and said core to force the edges of the said strip partially about the said core.

6. The process of producing eyeglass and spectacle rims from relatively thin, narrow, flat strips of material of the character described which comprises the shaping of said strips so as to render the same arcuate in cross section, bending the said arcuate shaped strips into circular form, thereafter placing the same upon a circular core, placing the said arcuate and circular shaped strip and core in a die and thereafter compressing the said strip between the said die and said core to force the edges of the said strip partially about the said core, and thereby positioning the said edges closer to each other and thus forming an under-cut groove upon the inner side of the rim and simultaneously slightly reducing the thickness of the said edges.

7. The process of producing eyeglass and spectacle rims of the character stated from relatively thin and narrow strips of celluloid, which consists in heating the said strips to render them plastic and while in such state pressing the respective strips into arcuate shape in cross section, shaping requisite lengths of said strips to circular form to form rim sections, placing the said sections, one at a time, in heated dies and while maintaining the said sections in plastic condition compressing the same within said dies to form the completed rim, substantially as described.

8. The process of producing eyeglass and spectacle rims which consists in forming thin strips of suitable flat material, pressing the said strips to bend the same longitudinally so that they are of arcuate shape in cross-section, shaping the same to circular form, thereafter cutting the same into the required lengths to form the said rims and thereafter compressing said rim lengths to form under-cut grooves on the inner sides thereof.

9. The process of producing an eyeglass or spectacle rims which comprises the formation in an elongated member of a groove extending longitudinally thereof, shaping the said member to circular form with the said groove upon the inner side thereof and thereafter shaping the said member to change the said groove into under-cut form.

In testimony that I claim the foregoing as my invention, I have hereunto set my hand this 30th day of September A. D., 1920.

EDGAR R. DURGIN.