March 12, 1929. L. J. GRUBMAN 1,704,829

METHOD AND MEANS FOR MAKING DOLL HEADS

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Fig. 1.

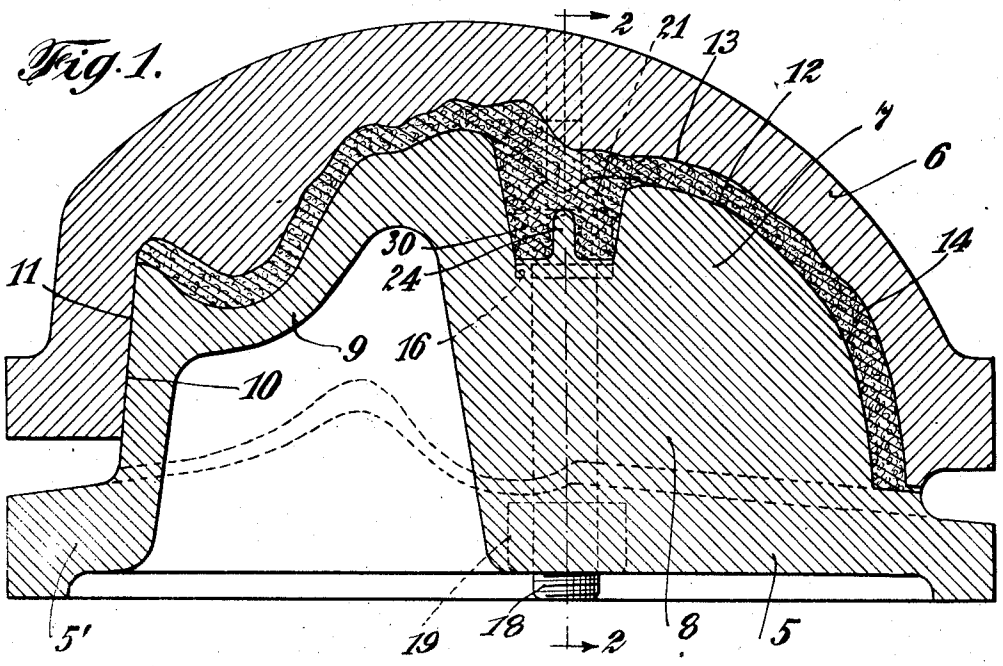
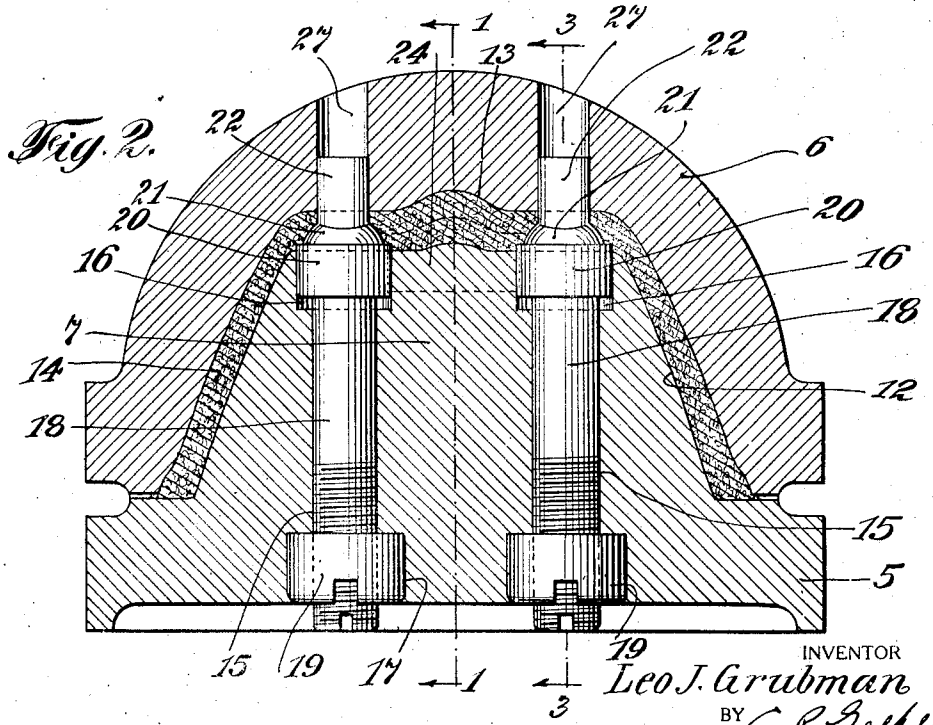


Fig. 2.



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Fig. 4.

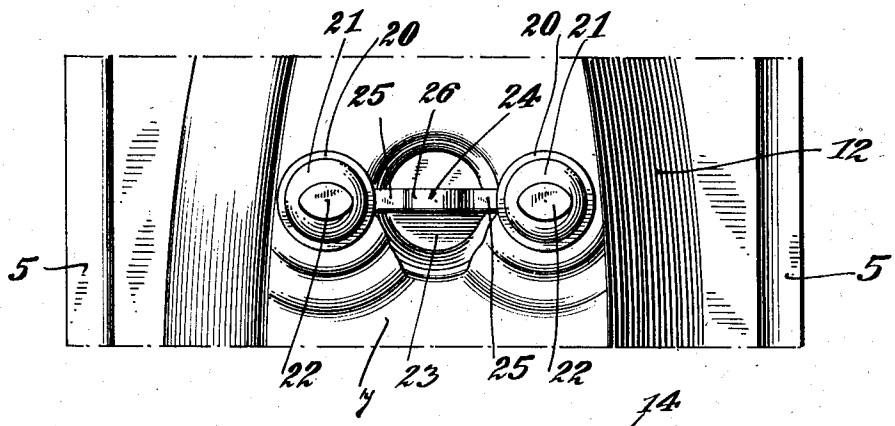


Fig. 5.

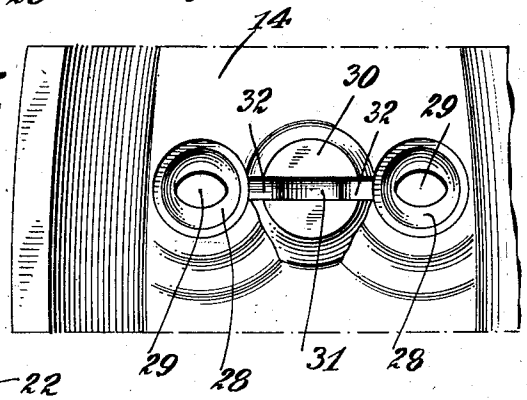


Fig. 3.

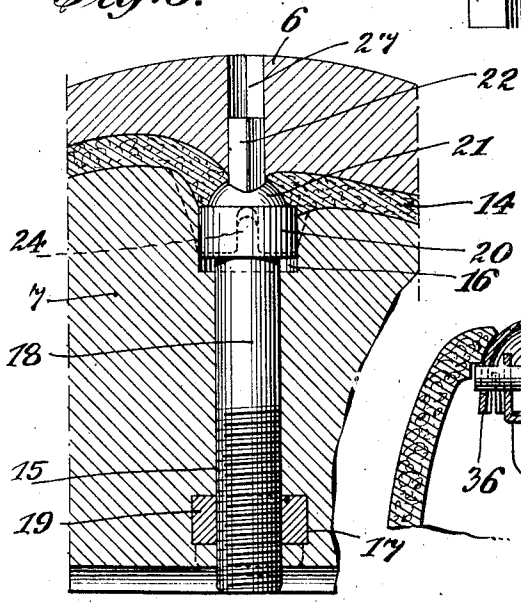
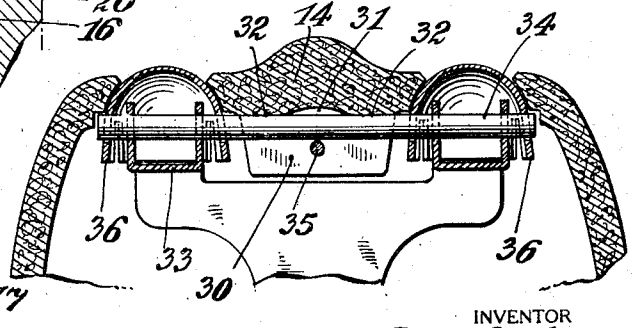


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEO J. GRUBMAN, OF BELLE HARBOR, NEW YORK.

METHOD AND MEANS FOR MAKING DOLL HEADS.

Application filed February 24, 1927. Serial No. 170,449.

This invention relates to methods of making doll heads and the like and to a novel form of mold, and has for one of its objects to provide spaced means on one of the mold sections for accurately forming eye openings through the plastic material constituting the wall of the doll head, with relation to the molded facial features of the head wall, as the mold is closed and the plastic material placed under compression.

Heretofore, it has been the practice in the doll art to mold the head from composition material in front and rear sections to be subsequently joined or connected. After molding, the front section of the doll head was provided with spaced eye openings therethrough, and the proper shape of these openings and their relation to each other vertically and horizontally of the head wall was more or less dependent upon the skill of the individual worker in the art. Such skill was also relied upon in the reaming of concave seats or sockets in the inner face of the doll head wall in accurate relation to the respective openings so that the individual eye members of an oscillatory eye mounting supported upon the head wall would move or oscillate to cause the pupils thereon to traverse the eye openings in such manner as to realistically simulate the opening and closing movements of the human eye.

It is an important purpose of my present improvements to provide means whereby reliance upon mechanical skill in the manufacture of such doll heads may be largely dispensed with, and I therefore, propose not only to produce the eye openings through the doll head wall in the molding thereof, but to also provide in the inner face of said wall the eye member receiving sockets each bearing identically the same relationship to the respective openings.

It is also another important object of my invention to provide a mold structure for the above purpose having means for producing on the front wall of the doll head and between the spaced eye openings horizontally spaced bearing surfaces at opposite sides of a central perpendicular plane and against which the shaft or axis of the eye mounting is adapted to be rotatably held, thus obviating any tendency of said shaft to tilt or rock about a perpendicular axis.

With the above and other objects in view, the invention consists in the improved mold for doll heads and the like and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have shown one simple and satisfactory embodiment of my present invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a longitudinal sectional view through the closed mold taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a transverse sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary top plan view of the lower mold section;

Fig. 5 is a fragmentary elevation of the front molded section of a doll head looking at the inner side thereof, and

Fig. 6 is a horizontal sectional view through the front part of the doll head as produced by means of my improved mold and showing an eye mounting oscillatably suspended from the head wall.

Referring in detail to the drawings, the mold structure as herein shown includes lower and upper sections 5 and 6 respectively, which are preferably of heavy cast metal. The lower mold section includes a suitable formed base 5′ from which the body 7 rises, said body including a solid section 8 and a hollow section 9, said latter section at one end having a vertically inclined external surface 10 serving as a guide with which a corresponding end surface 11 on the upper mold section 6 coacts and directs the latter mold section to its closed position so that the complementary opposed surfaces 12 and 13 of said mold sections which are very accurately formed to produce the required internal and external contours of the wall of the doll head, will be accurately related to each other. The plastic composition material indicated at 14 with which the surface of the body 7 of the lower mold section is first covered to the required thickness before the mold is closed may consist of wood pulp, papier-mâché, or other readily moldable composition material. As the mold is closed and the interposed layer of composition material is placed under compression, the excess material is exuded between the edges of the upper mold section 6 and the base of the lower mold section 5. The mold is then

subjected to heat by any suitable means to evaporate the moisture content of the composition material and cause the latter to set or harden in the condition of a uniformly homogeneous rigid structure.

As heretofore noted, it is one of the important purposes of this invention to provide means whereby spaced eye openings and an eye member receiving socket associated with each of said openings may be provided in the molding operation to thereby assure the accurate relative positioning of said openings in symmetrical relation to the nose and other molded features of the doll head wall. To this end, I therefore, provide the solid portion 8 of the body structure of the lower mold section at the proper predetermined points with the transversely spaced vertically extending cylindrical openings 15 therethrough. Each of these openings at its upper end is counterbored as at 16 and a counterbore 17 is likewise formed at the lower end of each opening. Through each of the openings 15 a metal post 18 is positioned, the lower end portion of each post being threaded to receive a nut 19 which is permanently fixed in the solid body structure 8.

Each of the posts 18 is provided upon its upper end with a cylindrical enlargement 20 fitting within the counterbore 16 and having a dome-shaped projection 21 on its upper face provided with a longitudinally projecting cutting bit 22 of substantially elliptical shape form in cross section. The posts 18 may be rotated in the nuts 19 to adjustably position the dome-shaped projections 21 and the bits 22 relative to the surface of the lower mold section in accordance with the predetermined wall thickness of the doll head to be molded.

Between the upper ends of the opening 15, the body of the lower mold section 5 is formed with a cavity 23 having a central upstanding rib 24 formed on the base wall thereof and extending diametrically of the cavity 23 in a plane intersecting the axes of the openings 15. The end face of this rib 24 has spaced plane portions indicated at 25 separated by a central convex projection 26.

In the use of the mold, the rods 18 are adjusted so that the major axes of the bits 22 are in line with each other and therefore, with the rib 24. The plastic composition material 14 is then applied over the molding surfaces of the lower mold section and over the upper ends of the posts 18 and the bits 22. The upper mold section 6 is provided with the two spaced openings 27 therein of elliptical cross sectional form which receive the bits 22 when said upper mold section is applied and the mold closed. The internal end face 11 of this upper mold section contacting with the opposed face 10 of the lower mold section, guides the upper mold section as it is forced downwardly under pressure upon the plastic material. As this material is thus compressed, it is forced compactly into the cavity 23 and upon the upper end surfaces of the posts 18. Thus, as seen in Fig. 5 of the drawings, the upper end of each post will form, by means of the dome-shaped portion 21 a circular cavity or socket 28 in the inner face of the head wall and an elliptical shaped opening 29 extending through the front part of the head wall and accurately centered with relation to said socket. The cavity 23 and the rib 24 will also produce upon the inner face of the head wall between the sockets 28 an inwardly projecting cylindrical lug 30 bisected by a horizontal slot 31. The end surfaces 25 and 26 of the rib 24 produce the spaced bearing seats 32 at the base of the slot 31 located in equi-distant spaced relation to its central perpendicular plane at right angles to said slot.

As seen in Fig. 6 of the drawings, when the shaft or axis 34 of an eye mounting generally indicated at 33 is positioned in the slot 31, it will have bearing contact at spaced points in its length upon the seats 32. The shaft may be held in such contact upon these spaced seats by a suitable pin indicated at 35 inserted through registering vertical openings in the two parts of the lug 30 at the rear side of said shaft. Before arranging the eye mounting in position in the head, the sockets 28 may be reamed or milled out to the desired depth and the edges of the openings 29 properly finished at the outer side of the head. Thus, the eye members indicated at 36 on the opposite ends of the shaft or axis 34 may have a free rocking or oscillating motion in the sockets 28. These eye members being so formed that the pupils thereon are accurately related to the axis 34, and which axis, by reason of the accurate formation of the sockets 28 and openings 29 in the manner above explained is securely held in accurate parallel relation with the major axes of said openings, an accurate simulation of the movement of the human eye pupils will be produced in the oscillatory motion of the eye mounting. By the provision of the spaced bearing seats 32 for the shaft or axis, I have greatly simplified the means for retaining the mounting in its applied position and at the same time obviated any possible tilting motion of said shaft or axis about an axis in perpendicular relation thereto. Thus the possibility of binding of the eye members against the walls of the eye sockets is prevented. It will therefore, be evident that by means of my new mold structure, not only do I eliminate much of the manual labor, heretofore incident to the manufacture of such doll heads, but I have also assured the very highest degree of accuracy in the location of the eye openings and the eye member receiving sockets with respect to the nose and other molded facial features of the head.

I have herein shown and described an em-

bodiment of my present improvements, which I have found to be entirely satisfactory in practical operation. Nevertheless, it is to be understood that the device as herein described may in its essential features, be produced in various other alternative mechanical structures, and I accordingly reserve the privilege of resorting to all such legitimate changes therein as may be fairly incorporated within the spirit and scope of the invention as claimed.

I claim:

1. The method of making doll heads and the like which consists in subjecting a plastic composition material to pressure in a mold, and during the molding operation forming spaced eye openings of identical form and area through the head wall in appropriate symmetrical relation to the molded facial features on the external surface of said wall, and simultaneously producing eye member receiving sockets in the inner surface of the head wall in coaxially centered relation to the respective eye openings.

2. The method of making doll heads and the like from moldable composition material which consists in subjecting the material to pressure in a mold to form a head wall having external facial features of predetermined contour, simultaneously producing spaced elliptical shaped eye openings through the head wall during the molding operation with the longer axes of said openings in horizontal alignment, and forming upon the inner surface of the head wall between said eye openings and in the plane of their longer axes, horizontally spaced bearing seats for the shaft of an oscillatory eye mounting.

3. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, and means for simultaneously forming spaced eye openings through the head wall and an eye member receiving socket in the inner surface of the wall in coaxially centered relation with each opening during the molding operation.

4. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, means on one of said mold sections operative during the molding operation to simultaneously form spaced eye openings of identical shape and area through the head wall in appropriate symmetrical relation to the molded facial features on the external surface of said wall, and additional means on one of the mold sections for forming horizontally spaced surfaces on the interior of the head wall between the spaced eye openings to constitute bearing seats for the shaft or axis of an eye mounting.

5. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, means on one of said mold sections operative during the molding operation to simultaneously form spaced eye openings of identical shape and area through the head wall in appropriate symmetrical relation to the molded facial features on the external surface of said wall, and additional means on one of the mold sections for simultaneously forming an internally projecting eye mounting supporting means upon the head wall between said spaced eye openings.

6. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, means for simultaneously forming spaced eye openings through the head wall and an eye member receiving socket in the inner surface of the wall in coaxially centered relation with each opening during the molding operation, and means for adjustably securing said socket forming means in a predetermined position relative to the molding surface of the mold section.

7. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, and spaced posts mounted in one of the mold sections and having end portions projecting from the molding surface of said mold section and of predetermined cross sectional form adapted to produce spaced eye openings of identical shape and area through the molded wall structure and in appropriate symmetrical relation to the facial features formed on the external surface of said wall, the projecting end portion of each post having a dome-shaped part adapted to form an eye member receiving socket in the inner surface of the head wall in coaxially centered relation to the respective openings.

8. Means for making doll heads and the like including upper and lower mold sections having complementary surfaces between which the moldable plastic material is subjected to pressure to produce a head wall of predetermined cross sectional contour, spaced posts mounted in one of the mold sections and having end portions projecting from the molding surface of said mold section and of predetermined cross sectional form adapted to produce spaced eye openings

of identical shape and area through the molded wall structure and in appropriate symmetrical relation to the facial features formed on the external surface of said wall, the projecting end portion of each post having a dome-shaped part adapted to form an eye member receiving socket in the inner surface of the head wall in coaxially centered relation to the respective openings, and means for axially adjusting said posts in the mold section to position the projecting end portions thereof relative to the molding surface.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

LEO J. GRUBMAN.