

Oct. 23, 1928.

1,688,417

L. J. GRUBMAN
MOLDING APPARATUS

Filed Dec. 16, 1925

2 Sheets-Sheet 1

Fig. 1.

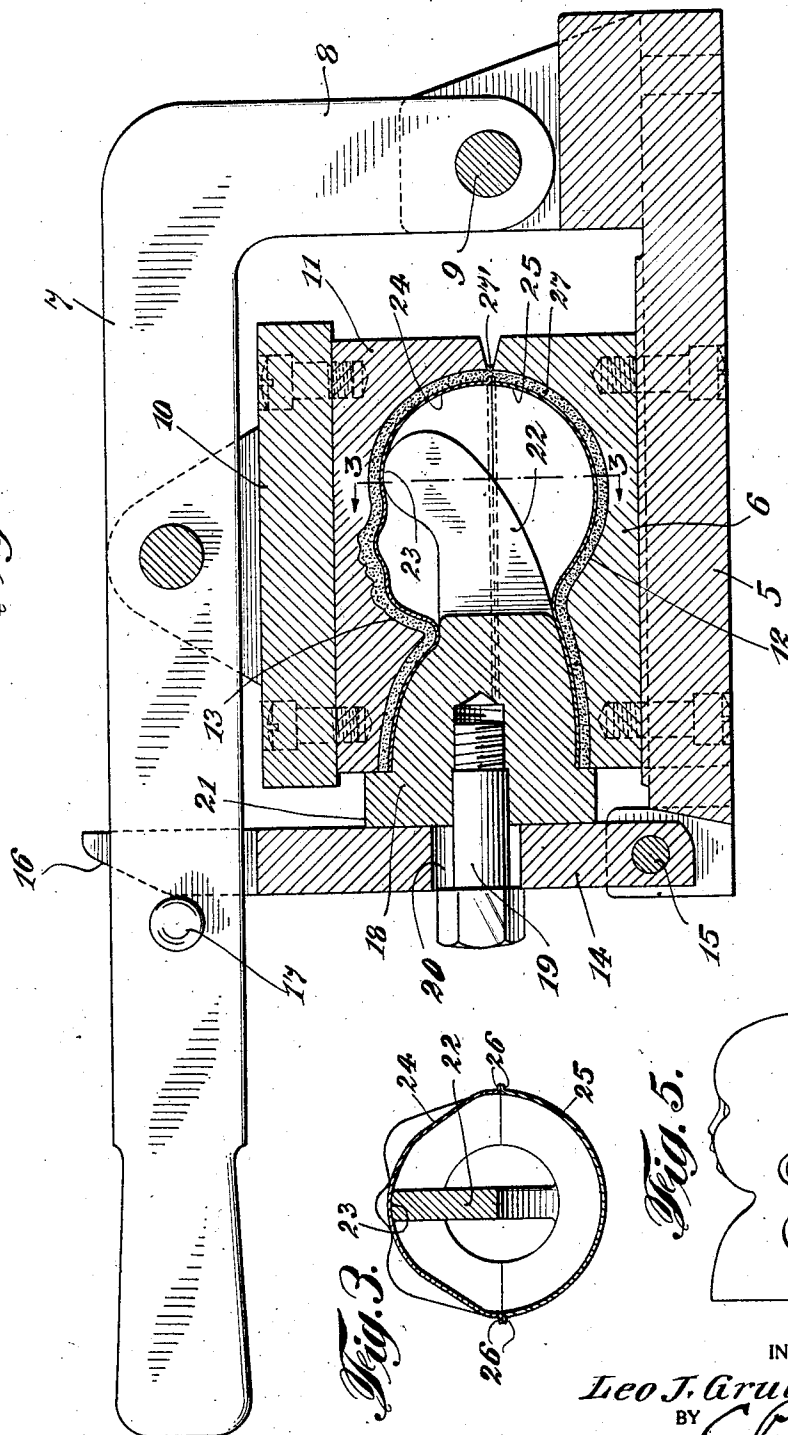


Fig. 3.

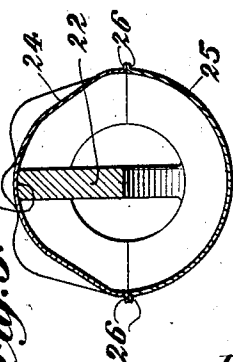
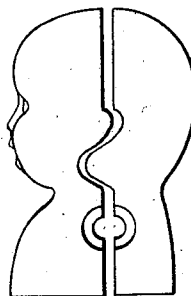


Fig. 5.



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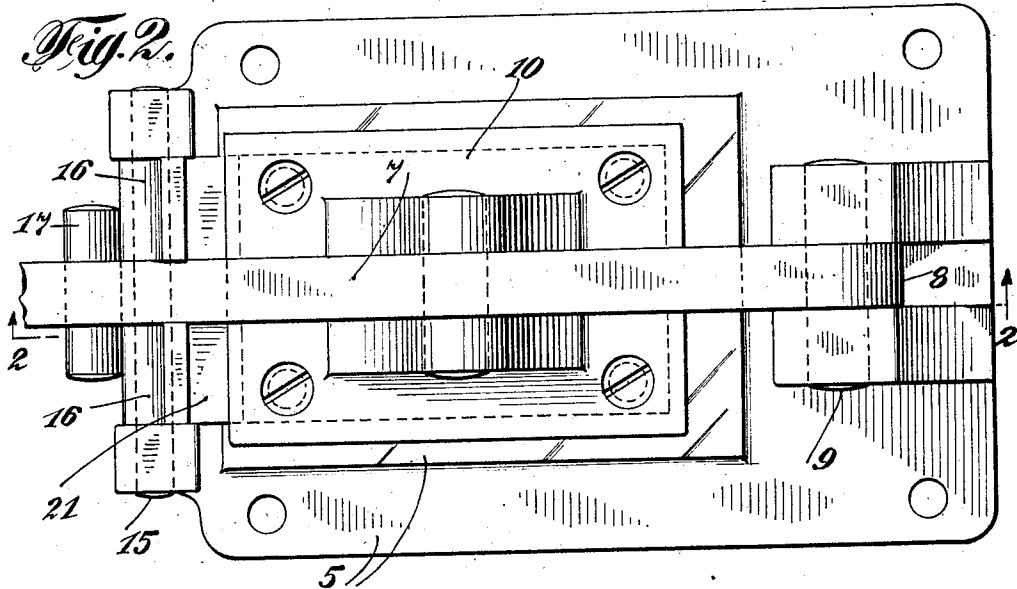
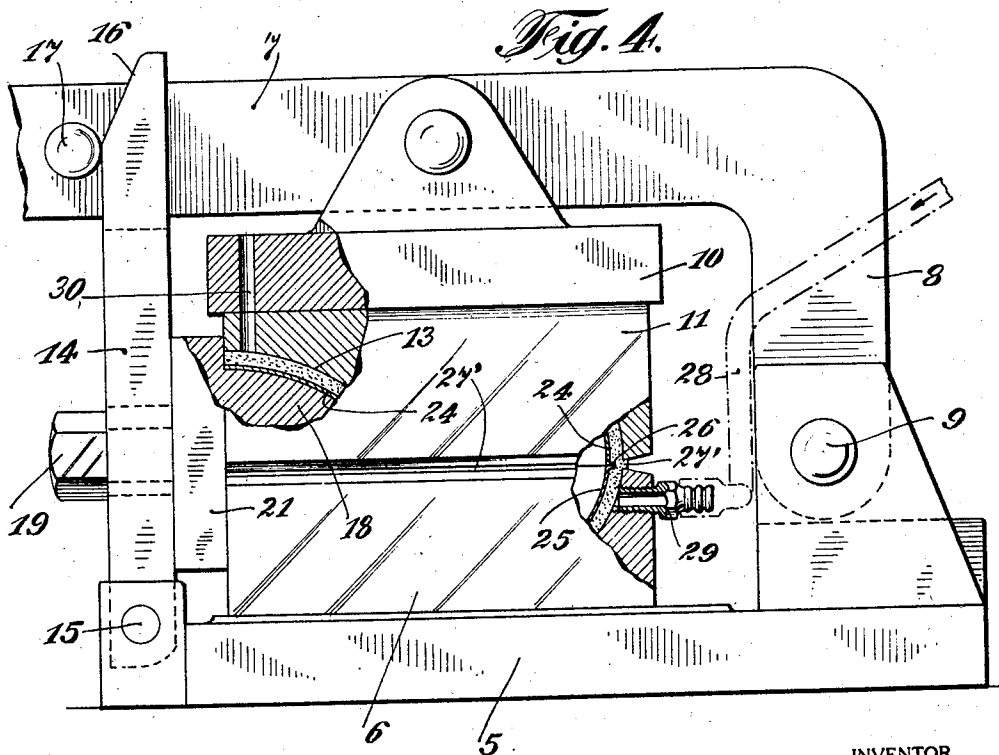
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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

MOLDING APPARATUS.

Application filed December 16, 1925. Serial No. 75,678.

This invention relates to molded articles and more particularly to doll heads and methods and means for making the same, and has for its primary object to provide a doll head or other article wherein the finer surface contours will be sharply delineated and which will have a more realistic and life-like appearance than doll heads as now produced by methods or processes heretofore employed in the art.

It is also an important object of the invention to provide a new and improved method for making such articles whereby production will be greatly expedited with a corresponding decrease in manufacturing costs.

It is also my purpose in one embodiment of the invention to provide a doll head having an internal pressure resistant core upon which a suitable impression receiving composition material is superimposed whereby the thickness of the impression receiving layer of material may be reduced while said composition structure is greatly strengthened and reinforced by the internal core.

It is likewise a particular object of my invention to provide an improved method and means for completely forming, shaping and finishing the surface of the doll head in one operation and eliminating the necessity of subjecting the surfaces of the head to a subsequent rubbing or abrasive action such as has heretofore been required in order to remove any unevenness.

My invention also has for an additional object to provide an improved mold construction which may be easily and quickly operated and automatically assures the correct positioning of the head core with respect to the mold section whereby the accurate formation of the facial features of the head is attained.

With the above and other objects in view, the invention consists in the improved doll head, and in the method and means for making the same, which will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have illustrated one simple and practical embodiment of the apparatus for making doll heads in accordance with my improved method, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a longitudinal vertical section through the mold showing the same in closed

position relative to the head core and the impression receiving material;

Fig. 2 is a plan view of the mold;

Fig. 3 is a detail transverse section taken substantially on the line 3—3 of Fig. 1, the mold sections being omitted;

Fig. 4 is a side elevation partly in section showing a slightly modified form of the apparatus, and

Fig. 5 is a detail side elevation showing an alternative form of the core for the doll head.

In the manufacture of doll heads from wood pulp, papier mâché or other composition material, it has heretofore been customary in the art to mold the head in separate front and rear sections by means of separate molds. The two head sections were then joined edge to edge by means of cement, glue or other suitable adhesive. Owing to the fact that these meeting edges of the two head sections are irregular, it was not an uncommon occurrence that although there was apparently no gap or space left between the two head sections, after the glue had dried and the surplus was removed by sandpaper or otherwise, crevices would appear at intervals between the edges of the two head sections. It was then necessary to fill these crevices and again remove the surplus cement or adhesive material. Thereafter, the surfaces of the head were rubbed down with sandpaper or emery cloth to remove hard projecting particles of the composition material and render the surfaces entirely smooth and even before applying the final or finishing solution to the surfaces of the head. Such rubbing or abrasive action unavoidably obliterated the finer lines or contours, delineating the detail features of the face. Therefore, after the head was finally immersed or otherwise covered by the coating solution which, after hardening, was polished and painted, the completed head failed to bear the desired natural or life-like appearance. I propose by means of my present invention, not only to materially improve the naturalness or realistic appearance of the doll head, but also to eliminate many of the operations required in carrying out such prior art method, thereby reducing manual labor and expediting quantity productions of such doll heads.

To the above end, my improvement in the art may be broadly differentiated from the old prior art method in that, in so far as the molding of the head is concerned, I produce in a single operation in a continuous

layer of impression receiving material both the front and rear parts of the head. Thus, it will be understood that when the head is removed from the mold, it is completely closed except for the longitudinal opening through the neck leading to the interior of the head. It is true that one-piece doll heads have heretofore been produced in the art, but in such cases, in order to mount or arrange an eye setting within the head it was necessary to cut an opening in the top thereof and thereafter close said opening by re-uniting the top section with the body of the head. In the preferable embodiment of my improved doll head, the head cannot be thus opened and therefore, the eye setting must be inserted and applied in its operative position within the head through the neck opening thereof and for this purpose I have devised a certain tool which is shown and described in my pending application for patent filed May 23, 1925, Serial No. 32,302.

In accomplishing the above noted purposes of my present invention, I employ certain apparatus, several practical examples of which I have illustrated in the accompanying drawings. Thus, in Fig. 1 there is illustrated one embodiment of molding apparatus consisting essentially of a suitable base 5 upon which a stationary mold section 6 is suitably fixed. Upon one end of this base 5 the angular end 8 of a lever 7 is pivotally mounted as at 9. A bracket 10 is fixed to this lever and carries the movable section 11 of the mold. The complementary cavities 12 and 13 respectively, of the two mold sections 6 and 11 have their surfaces very accurately machined and finished. The surface of the mold cavity 12 determines the contours of the opposite sides and rear portion of the doll head while the surface of the mold cavity 13 determines the contours of the forward side portions and the front or facial features of the doll head.

Upon the other end of the base 5 with respect to the pivot 9 of the lever 7, an arm 14 is pivotally supported at its lower end as at 15, the other end of said arm being bifurcated to receive the lever 7 and having the inclined cam surfaces 16. With these cam surfaces the ends of a transverse pin 17 fixed in the lever 7 are adapted to coact. To one side of the arm 14 a core supporting member 18 is detachably and adjustably secured by means of the bolt 19 engaged through the slot or opening 20 in said arm. This support has a cylindrical tapering or conically formed body in which the bolt 19 is threaded, said body at its base having an annular flange 21. A longitudinally extending upwardly curved arm 22 projects from the smaller end of said conical body and at its outer end has a rounded or convex edge 23.

In the use of this molding apparatus in the production of one form of the doll head, I ar-

range upon the support 18 a suitable core, roughly conforming in longitudinal and transverse configuration to the outlines of a doll head. As shown in Figs. 1 and 2 of the drawings, this core may consist of front and rear sections 24 and 25 respectively, produced by die stamping from sheet metal or other suitable sheet material. In forming these core sections, the outlines of the ears are not produced so that the meeting edges of the two sections when placed together extend in a straight longitudinal line bisecting the core. These meeting edges of the core sections are provided with narrow outwardly projecting flanges 26 and these flanges are united or secured to each other preferably by electrical welding. After the core has thus been formed, it is inserted over the support until said core at its open end abuts against the flange 21 while the curved edge 23 of the arm 22 bears against the inner side of the core section 24 in proximity to the part thereof corresponding to the forehead. The neck portion of the sheet metal core fits more or less snugly upon the conical surface of the body of the support 18. The arm 14 is then swung upon its pivot 15 until the section 26 of the core is positioned in the cavity 12 of the stationary mold section 6. A thin layer of plastic or semi-plastic composition material indicated at 27 is first arranged over the surfaces of the mold cavity 12 and after the core is positioned thereon, a similar layer of such composition material is disposed upon the surface of the core section 24. By means of the lever 7, the movable section 11 in the mold is then lowered into position in superposed relation to the base or stationary section 6 so that the core section 24 and the plastic material thereon is received within the cavity 13 of the movable mold section. In this operation, the pin 17 coacting with the cam surfaces 16 forces the arm 14 towards the mold and tightly engages the flange 21 thereon against the ends of the two mold sections 6 and 11, thus accurately positioning the core relative to the surfaces of the mold cavities. As the upper mold section 11 bears upon the impression receiving composition material, impressions are formed in such material corresponding exactly with the contours of the surfaces of the mold cavities 12 and 13. Any excess of such material will be exuded from beneath the opposed edges of the two mold sections at 27', at which point a slight projecting fin of the material will form extending longitudinally from the exterior surface of the molded head. It will thus be seen that the sheet metal core becomes a part of the doll head and constitutes an internal lining therefor, the said core being inseparably interlocked by means of the laterally projecting flanges 26 on said core, with the outer coating of composition material in which the physical features of the head are impressed.

The hollow metallic core or lining greatly strengthens or reinforces the head structure and enables me to use a comparatively thin layer of composition material of better quality and more uniform consistency than that heretofore employed. After the head is removed from the mold and permitted to harden and set, it will be found that with the exception of the fin above referred to the head surfaces are perfectly smooth and that the facial features are very sharply delineated. It is, therefore, unnecessary to subject the head surfaces to an abrasive action by sandpapering, the only requirement being to remove the projecting fin of composition material which can be easily and quickly accomplished. Thereafter the head surface can be painted or colored at the appropriate places to enhance the life-like appearance of the head.

It will be seen from the foregoing that the core support 18 constitutes in effect a third mold section since it closes the open end of the mold chamber formed by the complementary cavities in the mold sections 6 and 11. Thus, as seen in Fig. 1 of the drawings, the mold chamber is substantially completely closed when the molding pressure is applied to the plastic material, the only point of escape for the excess material being between the opposing faces of the mold sections 6 and 11 whereby the fin 27' is formed.

In some cases, I may apply the plastic impression receiving and retaining material to the core 24 before the core is mounted on the support 18 by dipping the core into a mass of such material of the proper consistency. This material being of an adhesive nature, will adhere closely to the surfaces of the core and provide a coating of the desired thickness thereon. The surface of this coating will, by contact with the atmosphere dry quite quickly and sufficiently to prevent its adherence to the surfaces of the mold sections. The underlying portion of said coating however, remains relatively soft so that it will readily yield to the molding pressure whereby the details of form and contour will be sharply delineated in the surface of said plastic coating.

In the above manner, I am enabled to very quickly produce in a single molding operation a completely formed doll head in which the finer lines or contours of the various physical features will be sharply defined. By reason of the use of the sheet metal core and relatively thin body of the composition material, it will be apparent that I obtain lightness in weight without sacrificing the strength or rigidity of the head structure.

If desired, instead of using a sheet metal core as above described, I may take the ordinary two part molded head as heretofore produced and roughly unite the same at their meeting edges by glue and then arrange the

same upon the support 18 for use in connection with my improved mold. As shown in Fig. 5 of the drawings, the meeting edges of these two head sections have a more or less rough or irregular outline, but instead of filling up any crevices not filled by the glue or cement, these are permitted to remain and are subsequently completely filled by the layer of plastic material placed over the surfaces of the two head sections and which receives the impression from the mold cavities. Also by reason of the use of this impression receiving material, it is unnecessary to sandpaper the surfaces of the head sections before placing the same in the mold. In other words, I employ the two part head as heretofore made as a core. In both cases however, it will be seen that the core affords a pressure resistant base upon which the composition layer may be superimposed and said layer directly received the impressions from the mold cavities.

In Fig. 4 of the drawings, I have shown another form of the apparatus in which the impression receiving material is of more or less fluid-like consistency and is adapted to be forced under pressure through the conduit 28 and inlet nipple 29 into the lower stationary section of the mold. When the mold is closed, this impression receiving material completely fills the space between the surfaces of the mold cavities and the surface of the core supported therein, it being understood that the material is forced under pressure upwardly about the core into the upper mold cavity. The air is expelled through a suitable outlet opening indicated at 30 provided in the upper movable section of the mold.

While I have referred to my present improvements as particularly intended for application and use in the manufacture of doll heads, it will be apparent that such improvements may also be advantageously employed in the production of various other articles of an ornamental character from plastic materials, and it will accordingly be understood that the essential features of the present disclosure are not limited in their utility to the production of a specific article of manufacture.

From the foregoing description, considered in connection with the accompanying drawings, the construction, manner of operation and several advantages of my present improvements will be fully understood. It will be seen that I have provided a method for making doll heads which may be very expeditiously performed by means of simple and inexpensive apparatus at relatively small cost in labor and materials. Also by reason of this new method, the doll head itself will present a more realistic and natural appearance than doll heads as produced by the prevailing method above referred to. It will further be appreciated that the mold appa-

ratus which I have devised, though capable of rapid operation, enables the heads to be formed with a high degree of accuracy. However, it will be understood that the examples of apparatus as herein disclosed are merely suggestive and that in so far as my new method and doll head structure is concerned, it may be possible to employ other molding apparatus of an equivalent character. It is to be accordingly understood that in carrying out my improvements in practice, I reserve the privilege of resorting to all such legitimate changes in the form, construction and relative arrangement of the several parts of the doll head structure and of the molding apparatus as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

20 1. A molding apparatus consisting of stationary and movable mold sections, means for movably supporting the material to be molded, and means for operating the movable mold section to close the mold and simultaneously move said material supporting means to its final position relative to the mold sections, said means consisting of a pivoted lever carrying the movable mold section, and a pin fixed in said lever to coact with cam surfaces of the material support.

2. A doll head mold comprising stationary and movable mold sections, a pivotally mounted support adapted to receive a hollow head core enveloped in a layer of impression receiving and retaining material, means for operating the movable mold section, and means carried by the operating means coacting with said pivoted support to move the core and the impression receiving material to position for the accurate formation of the impressions in said material as the mold is closed.

3. A molding apparatus comprising mold sections having complementary cavities to form a chamber open at one end when the mold is closed, a support for the material to be molded, and means for relatively moving the mold sections to close the mold and simultaneously position said support with the

50 moldable material thereon through the open end of the mold chamber.

4. A molding apparatus comprising a plurality of relatively movable mold sections, means carried by one of said sections for supporting the material to be molded, and means for operating the movable mold sections to simultaneously bring the same into impression producing contact with the moldable material.

5. A molding apparatus comprising mold sections having complementary cavities to form a chamber open at one end when the mold is closed, an additional mold section adapted to close said open end of the chamber and having means to support a core enveloped in a layer of impression receiving and retaining material, and means for operating the mold sections to bring the same simultaneously into impression producing relation with said material and to confine said material substantially entirely between the several mold sections and said core.

6. A molding apparatus comprising stationary and movable mold sections having complementary cavities to form a chamber open at one end when the mold is closed, a movably mounted support for the material to be molded, and means carried by the movable mold section adapted to cooperate with means on said movable support to move the latter relative to the walls of said chamber as the mold is closed.

7. A molding apparatus of the class described, comprising stationary and movable mold sections having opposed mold cavities, relatively movable means for supporting the open end of a hollow core within said cavities, means associated therewith for internally engaging the core to resist crushing by the molding pressure, and means for closing the mold and automatically positioning said core holding means within the mold cavities.

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

LEO J. GRUBMAN.