

Jan. 17, 1956

M. J. CRAFTON ET AL  
APPARATUS FOR MAKING HOLLOW  
BODIES WITH SOUND EFFECTS  
Filed Dec. 4, 1952

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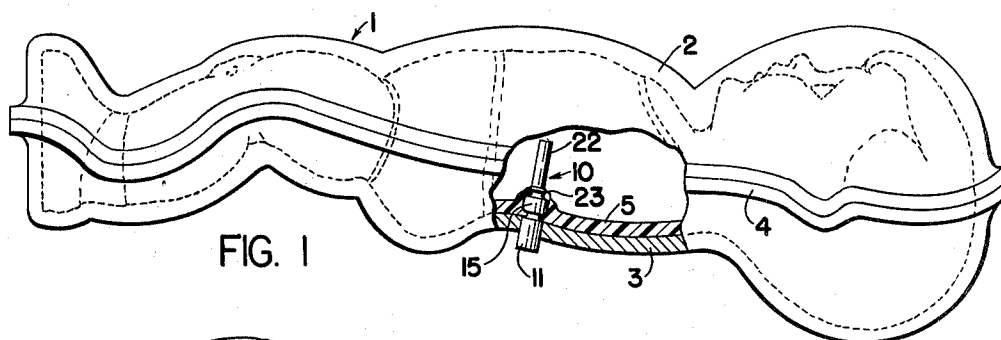


FIG. 1

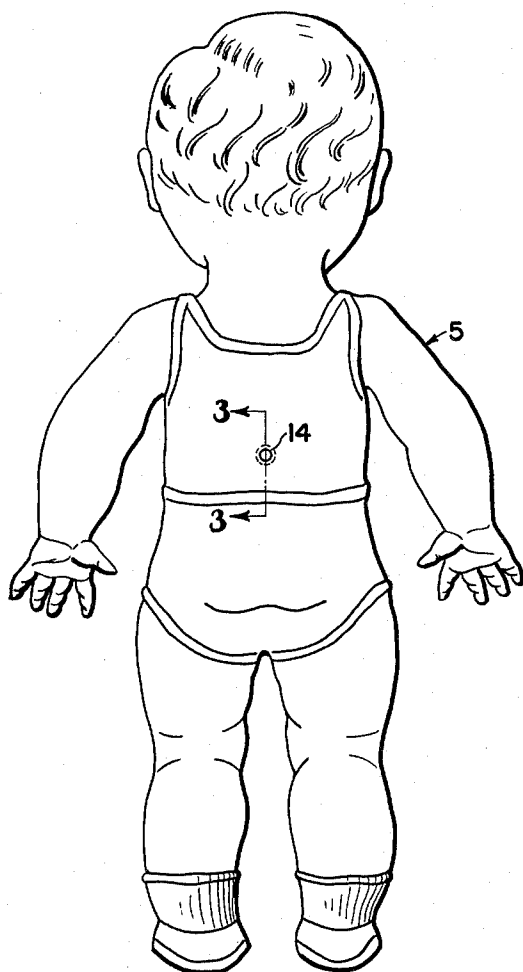


FIG. 2

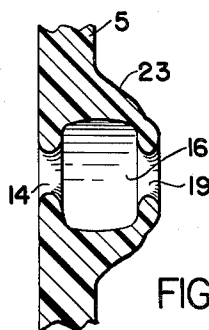


FIG. 3

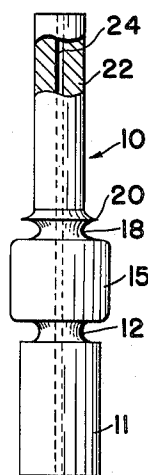


FIG. 4

INVENTORS  
MARVIN J. CRAFTON &  
BY PAUL REKETTIE  
*Clay, Foy & Hamilton*  
ATTORNEYS

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**APPARATUS FOR MAKING HOLLOW BODIES WITH SOUND EFFECTS**

Marvin J. Crafton, Doylestown, and Paul Rekettye, Akron, Ohio, assignors to The Sun Rubber Company, Barberton, Ohio, a corporation of Ohio

Application December 4, 1952, Serial No. 323,982

3 Claims. (Cl. 18—39)

The present invention relates to a new and improved apparatus for the manufacture of hollow bodies which, when compressed, give out sound by the expulsion of air through a noise-making chamber which is formed as an integral part of the article. While the invention has wide application, it is primarily intended and designed for the manufacture of hollow toys which are equipped with whistles or the like. The specific form shown and described illustrates the application of the invention to the manufacture of a doll with a built-in whistle integral with the body of the doll.

Heretofore, toys or articles of the type to which this invention is directed have been provided with metal whistles, reeds or the like embedded or fastened in the wall of the toy. One objection to this practice is that the noise attachment can be worked loose from the toy and is sometimes swallowed by a child. Other objections are the cost of the attachments and the added expense in assembling the attachments in the toy bodies.

The present invention proposes a novel apparatus for making toys with a whistle built directly into the wall or body of the toy. This not only reduces the cost of making these toys, because the whistle is formed during the manufacture of the doll itself, but there is no metal part or fitting in the toy.

In the drawing there is shown one method of manufacturing a doll with the use of the improved apparatus, but it will be understood that the invention is not necessarily limited to this particular embodiment of the invention.

In the drawings,

Fig. 1 is a view of a hollow matrix or mold used for the rotational casting of a doll with the noisemaker or whistle located in the back of the doll.

Fig. 2 is a view showing the finished doll removed from the matrix.

Fig. 3 is an enlarged section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged elevation of the pin or former used in casting the doll. In Figs. 3 and 4 the enlargement is approximately three times actual size of a successful embodiment of the invention.

The invention is intended for use in a rotational casting procedure such as shown in the prior application of Robert P. Molitor, Serial No. 170,515, filed June 27, 1950, now Patent No. 2,629,134, dated February 24, 1953, although it may be adapted to other processes of rotational casting. In this process a hollow sectional matrix having non-porous walls or at least non-porous inner surfaces is employed. A measured charge of a suitable plastisol composed of a resinous material, usually a vinyl chloride polymer or copolymer, and a plasticizer, is deposited in one of the matrix sections. The matrix is then closed, securely locked, and started in a compound rotation which causes the plastisol to be distributed in an even layer of substantially uniform thickness over the entire inner surface of the matrix. During this rotation, the matrix is heated to cause the plastisol to gel over the inner surface thereof. The heating is continued after the plastisol has gelled, either with or without con-

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tinuing the rotation of the matrix, to fuse the plastisol. Thereafter, the matrix is cooled below the fusing temperature of the plastisol, opened, and the finished article removed from the mold, which is then immediately ready for a fresh charge.

In the drawings we have not shown the mechanism for charging the matrix or for rotating the matrix, or for manipulating the sections thereof, or for conveying it through the various chambers in which the matrix is heated and subsequently cooled. Machines for performing all of these functions were known in the art prior to our invention, it being sufficient to say that the matrix 1 is intended to be mounted on a conveyor or support of a type which will perform all of these functions.

The matrix 1, which is to be rotated in different planes simultaneously to distribute the charge of plastisol over its interior, is composed of an upper section 2 and a lower section 3, which meet in a liquid tight parting line 4 which follows the widest dimension of the toy, in this case a doll, so that the finished article is readily removed from the matrix. The walls of the matrix are impervious so that the entire charge of plastisol will set in a wall of the desired thickness over the whole inner surface of the matrix. A typical doll made by the process is indicated at 5.

Anchored in the mold wall, here shown as the section 3 in about the middle of the back of the doll, is a smooth, polished metal post or former indicated as a whole by the numeral 10. The former or post comprises a base portion 11 which is preferably drive fitted into the wall of the matrix. The upper part of the base is flush with the inner surface of the mold, and at this point the post is reduced to form a neck 12. This part of the post forms the aperture 14 on the exterior of the doll.

Above the neck 12, the post is substantially enlarged as shown at 15 to form the resonant chamber 16. The size and shape of this chamber may vary depending upon the sound which is to be created, the particular form of the enlarged or bulbous portion 15 as shown creating a resonant chamber which will produce a sound similar to that of a tin whistle, such as often used for the noisemaker of a doll or hollow toy.

Above the enlargement 15 the pin is reduced as at 18 to form the inlet opening 19 from the interior of the doll to the chamber. Above the neck 18 is formed a flange 20, the edge of which is quite sharp. This sharp edge causes the deposited plastisol to make a clean edge on top of the protrusion 23 which houses the chamber 16. Were it not for this flange 20, the plastisol deposited over the post would not leave a smooth surface around the opening 19.

Beyond flange 20 the post is extended to a substantial degree as shown at 22, so that the plastisol will not deposit across the top of the post during the rotation of the matrix. It is advisable, especially in the manufacture of larger hollow bodies, to vent the interior of the matrix so as to avoid the creation of excessive pressure in the matrix during the gelling and fusing operations. In the drawing, the matrix is vented through a passage 24 located at the axis of the post.

In carrying out the process, the matrix being opened, a charge of sufficient capacity to form the toy is deposited in one section of the matrix, the matrix closed and then given a compound rotation while the plastisol gels or sets in the even layer shown in Fig. 1. During this rotation, the plastisol will flow around the base of the post 10 to form the protrusion 23 with the resonant chamber 16 and the inlet and outlet passages 14 and 19. After the gelled plastisol has been fused and the matrix cooled to a point below the fusing temperature, the matrix is opened and the finished article removed. In removing the article from the matrix that portion

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of the article surrounding the post will be stripped off the post, the sharp edge 20 causing a clear severance around the outer edge of the opening 19, any particles of plastisol inward of this point being sheared from the body of the doll, so that a clean edge is formed around the opening 19. The opening 14 will stretch sufficiently to permit the passage of the formation 15.

It is essential that no residual plastisol be attached to the surface of the sound chamber around the opening 19 in the finished article because any such deposit would destroy or interfere with the sound emitted by the article. The provision of the sharp edge around the flange 20 assures that any such residue will not be present in the finished article. This is because the plastisol will not tend to collect on the sharp edge of the flange and any plastisol which is deposited on the inner surface of the flange 20 or around the base of the extension 22 either will not be connected to the sound chamber or any filament which extends over the edge of the flange 20 will be so thin as to be easily broken. The result is that any residual deposit interiorly of the edge 20 or on the post 10 clings to the post and comes out of the article when it is stripped from the mold.

The hollow body will, upon being squeezed, emit a noise very similar to that created by the usual toy whistle. All of the advantages set forth above and others will be realized, as will be understood by those familiar with this art.

It is not intended that the invention is limited to the details shown and described herein, because the invention may be embodied in other forms and modifications. The invention is not necessarily confined to the manufacture of dolls or toys, or by the use of resinous plastisols as the principles may be employed with other materials.

What is claimed is:

1. Apparatus for the manufacture by rotational casting of hollow compressible bodies with sound effects,

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comprising a matrix, a post projecting inwardly of the matrix and having an enlarged portion spaced inwardly from the inner surface of the matrix to form a resonant chamber, neck portions on opposite sides of the enlarged portion to form reduced passages leading to the chamber, and a sharp edged flange on the post inwardly of the innermost neck portion.

2. Apparatus for the manufacture by rotational casting of hollow compressible bodies with sound effects, comprising a matrix, a post located in the wall of the matrix and projecting inwardly thereof, said post having an enlarged portion near the base thereof to form a resonant chamber, neck portions on either side of the enlarged portion to form reduced passages leading to the chamber, and a flange inwardly of the innermost neck portion, said flange having a sharp edge forming the inner boundary of the innermost neck portion.

3. Apparatus for the manufacture by rotational casting of hollow compressible bodies with sound effects, comprising a matrix, a post located in the wall of the matrix and projecting inwardly thereof, said post having an enlarged portion near the base thereof to form a resonant chamber, neck portions on either side of the enlarged portion to form reduced passages leading to the chamber, and a flange inwardly of the innermost neck portion, said flange having a sharp edge forming the inner boundary of the innermost neck portion and said post being extended substantially beyond said flange.

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