

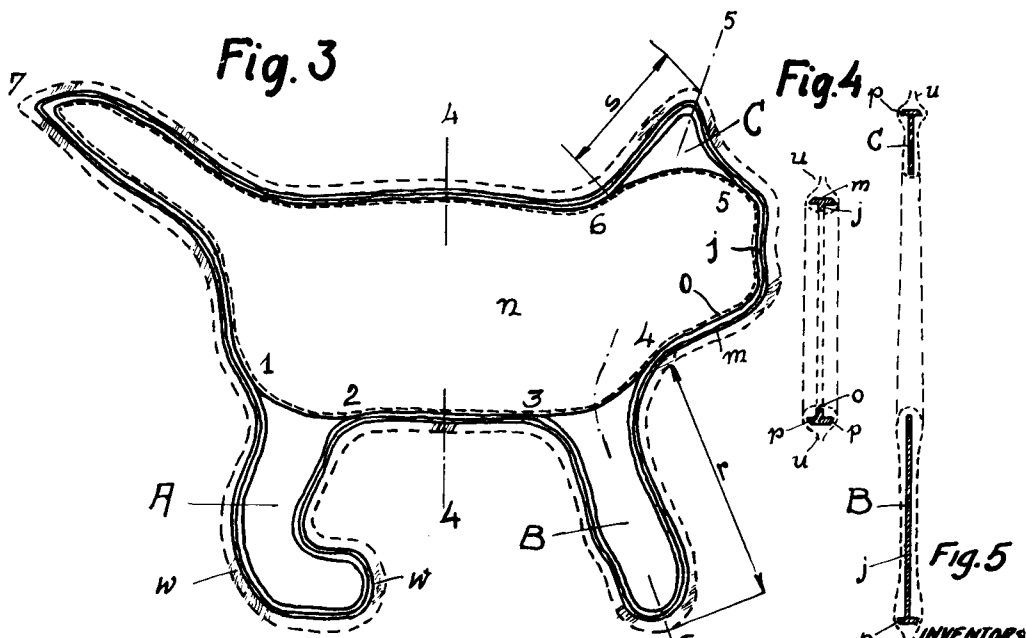
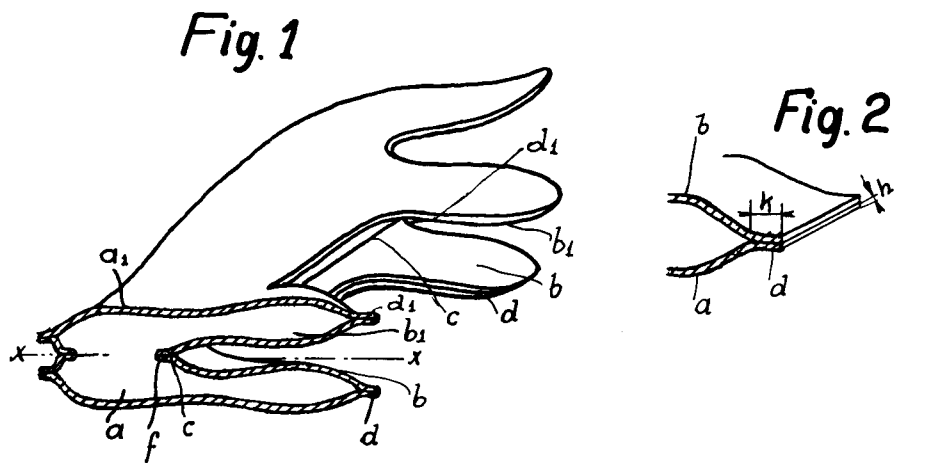
April 24, 1934.

L. KELEMEN ET AL

1,956,533

METHOD FOR PRODUCING INFLATABLE RUBBER ARTICLES

Original Filed June 29, 1929 2 Sheets-Sheet 1



ZOLTAN KELETI AND LEWIS KELEMEN DECEASED
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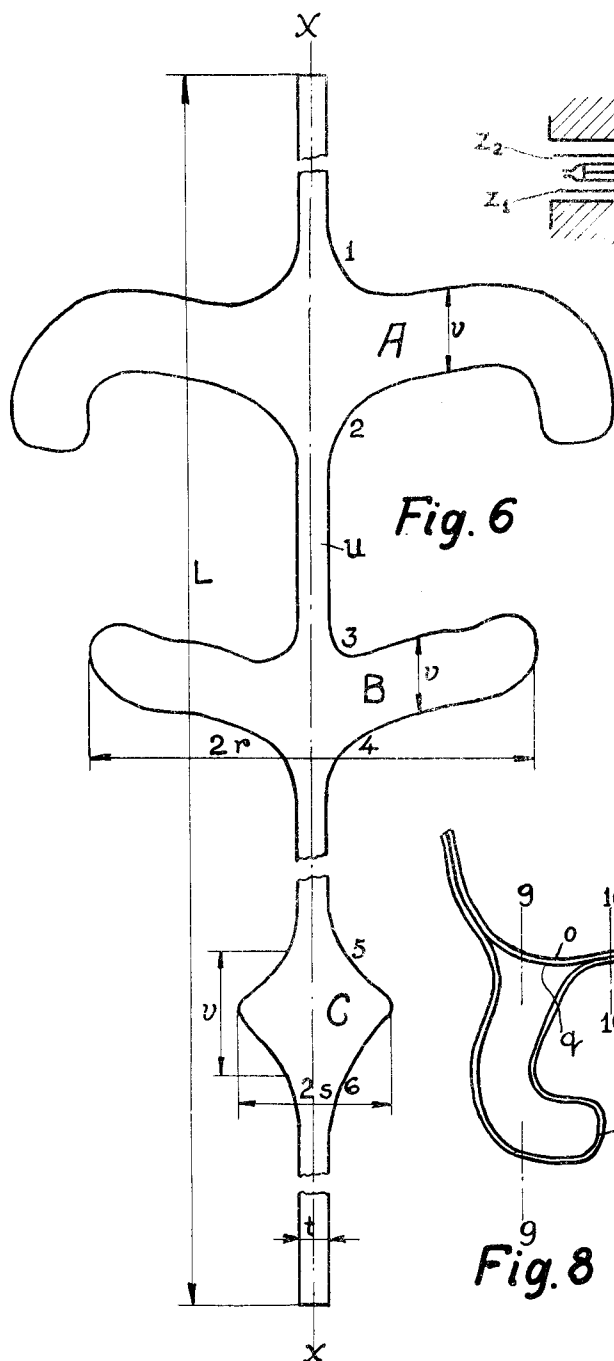


Fig. 6

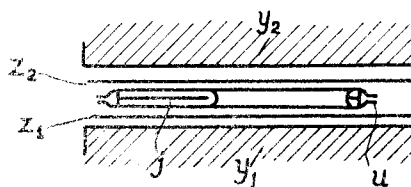


Fig. 7



Fig. 10

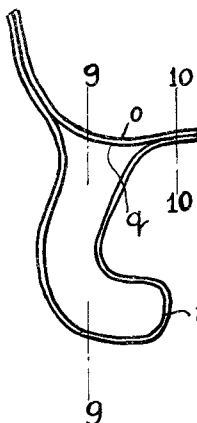


Fig. 8

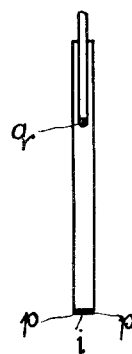


Fig. 9

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UNITED STATES PATENT OFFICE

1,956,533

METHOD FOR PRODUCING INFLATABLE
RUBBER ARTICLES

Lewis Kelemen, deceased, late of Budapest, Hungary, by Janka Kelemen, widow and sole inheritrix, Budapest, Hungary, and Zoltán Keleti, Budapest, Hungary, assignors to Magyar Rugszantárugyár Részvénytársaság, Budapest, Hungary, a limited company of Hungary

Original application June 29, 1929, Serial No. 374,795. Divided and this application July 30, 1932, Serial No. 627,164. In Great Britain June 29, 1928

8 Claims. (Cl. 154—42)

This invention relates to the production of inflatable rubber articles and more particularly to articles such as toys simulating human and animal shapes having projecting parts or limbs offset from the median plane of the shape.

It has been proposed to produce such inflatable toys from rubber sheets by interposing between a pair of superposed unvulcanized sheet rubber forming the sides of the article, a doubled sheet of like material adapted to form the inner faces of the projecting parts, such as the legs of a toy animal and then by cutting the superposed sheets to the desired shape and simultaneously uniting the side parts with the respective part of the intermediate sheet. According to earlier proposals, the doubled intermediate sheet has been formed by folding a rubber sheet along a straight line. The straight fold, however, caused distortions in the shape of the inflated toy. In order to obviate this, it has been proposed to compose the doubled insertion of two sheets united along a curvilinear seam. Such a well known inflated rubber toy as an example in the shape of a quadruped is shown in Fig. 1 of the annexed drawings in a sectional perspective view.

With reference to Fig. 1, a and a_1 are the two side sheets the outlines of which correspond to the outlines of the side elevation of the quadruped, b and b_1 are the two lobes of the doubled insertion which are attached along a curvilinear seam c to each other and by means of seams d and d_1 to the side sheets a and a_1 respectively. The insertion sheets b and b_1 form the inner faces of the limbs offset from the median plane $x-x$ of the shape. Preferably the doubled insertion b, b_1 is formed, as to be seen in Fig. 1, by a bilobate ring extending along the whole circumference of the shape. Such shapes possess three seams situated in three different planes, that is to say the seam c in the median plane $x-x$, the seams d and d_1 at either side of said median plane. The middle seam c has been found hitherto unavoidable in order to avoid the distortion in shape caused by insertion sheets doubled along a straight folding line, which of course could not follow the curvatures of the shape to be reproduced.

While insertions composed of the sheets united along a curvilinear seam obviate the said draw-

back of folded insertions, this result is reached only by a multiplication of the seams and thereby of the weak spots of the toy.

Especially the median seam c , the edge of which is turned towards the hollow of the shape, is liable to come apart. Experience shows that seams with the edge directed towards the hollow of the inflated shape are less resistant than outwardly directed seams. Moreover, broad and flat seams d as shown in the sectional perspective view in Fig. 2, are preferably used in such prior proposals. In such seams the rubber sheets a and b adhere to each other not only at their sectional area corresponding to the thickness h of the sheets, but at their side faces along a strip of a greater breadth k than the thickness h . Such seams do not disfigure the shape as far as they are used at the lateral seams d, d_1 but they ought to be avoided at the median seam c because this latter generally has to follow more minute details of the profile as for example in human or animal heads.

The object of this invention is to combine the advantage of the insertion formed by a folded single sheet and the advantages of insertions composed of two sheets united along a curvilinear seam, while avoiding the drawbacks of either of these insertions.

According to the invention the insertion consists of a single rubber sheet bent along a curvilinear fold following the outlines of the median plane of the uninflated article.

In order to manufacture articles provided with such insertions, said insertion is formed preferably of a rubber strip of varying breadth in conformity to the requirements in breadth of the different sections of the insertion. This strip is then folded and applied along the curvilinear edge of the inner outlines of a ring-shaped die, which determine the median section through the hollow body to be manufactured in the plane of the uninflated article.

The invention is described with reference to the annexed drawings, in which

Fig. 3 shows as an example a cutting die for the production of inflatable toys in the shape of a cat.

Figs. 4 and 5 are cross sections on the lines 4—4 and 5—5 of Fig. 3 respectively.

Fig. 6 is a plan-view of the strip adapted to form the folded insertion.

Fig. 7 is a cross sectional elevation on the line 5—5 of Fig. 3 of the superposed rubber sheets with interposed cutting die, before cutting.

Fig. 8 is a fragmentary plan-view of a modification of the cutting die shown in Fig. 3.

Figs. 9 and 10 are cross sections on line 9—9 and 10—10 respectively of Fig. 8.

With reference to Fig. 3, j is a metal plate the outer outlines m of which follow the outer outlines of the inflatable cat-shape in its uninflated flatly folded state. n is an aperture in plate j . The outlines o of said aperture follow the outlines of the hollow of the shape to be produced in its uninflated, flatly folded state. Cutting edges p, p protruding from the plane of plate j at its either face follow the outlines m of the shape to be cut. The outlines o of the aperture n are used as the shaping edge at folding of the insertion piece.

This latter is formed of a strip u of unvulcanized rubber sheet (Fig. 6) the length L of which corresponds to the length of the circumference of the shape to be cut with the die. The breadth of this rubber strip varies along its length. The parts A and B of the strip u which are to form the inner sides of the legs, have a breadth $2r$, that is to say the double of the length r of said limbs (Fig. 3). At the part C (Fig. 6) intended to form the ears, the breadth of the strip u is $2s$, that is to say the double of the length s (Fig. 3) of the ears. At the remaining sections the strip u has only a very small breadth t , not more than sufficient to cover the die and its shaping edge at their smallest cross sectional areas (Fig. 4). The insertion strip u is folded along the shaping edge o of the aperture n of the die (Fig. 3) by applying the median line x — x of the strip u to the edge o and covering the flanges of the sections 1—2, 3—4 and 5—6 of the die corresponding to the hind legs, the fore legs and the ears respectively with the two lobes of the extensions A, B and C respectively of the strip u , as it is shown with dotted lines in Figs. 3, 4 and 5. The folding line of strip u can be easily shaped in conformity to the curvilinear shaping edge o , because the broad sections A, B and C of the strip u are relatively short, while the longer sections 7—1, 2—3, 4—5 and 6—7 of said strip have a small breadth t . The edges of the strip u extending beyond the outer outlines m of the die are pressed together at the hatched spots w , so that they stick together and secure the position of the insertion on the die.

Thereupon a press plate y_1 (Fig. 7) is covered with an unvulcanized rubber sheet z_1 and the die j provided with the folded insertion strip u in the above described manner, is put on said first sheet z_1 and the whole is covered with a second unvulcanized rubber sheet z_2 . The superposed parts are pressed between the plate y_1 and an upper plate y_2 , whereby the cutting edges p, p of the die cut through insertion strip u and the side sheets z_1, z_2 and unite at the same time the respective rubber sheets along the cutting lines.

By this cutting a shape is produced which has a bilobate insertion piece extending along the whole circumference of the side elevation similar to that shown in Fig. 1, with the difference, however, that instead of the curvilinear median seam c the insertion possesses a curvilinear fold. Hence the insertion in spite of consisting of a single sheet is doubled along a curvilinear fold,

Figs. 8, 9 and 10 show a modification of the die, which can be produced easily by bending a wire i of trapezoid cross section along the cutting outlines of the die, the shaping edge o being formed by a second wire q of circular cross section with a smaller diameter than the breadth of the cutting wire i between the edges p, p . The inner wire q is soldered to the outer wire i at the sections in which both wires run parallel, while at the diverging sections the shaping wire q leaves the cutting wire i and overbridges the parts of the cutting die which form the limbs or protruding parts of the shape.

In the above example a method is described according to which a single insertion strip is used which extends over the whole median circumference of the shape to be produced. Separate insertion pieces, however, can be used for each of the protruding parts A, B, C, because the position of the several insertions can be fixed on the cutting die, so that no difficulty arises in using a plurality of insertions.

Instead of covering the cutting die, which is at the same time the shaping die for the insertion, with a sheet of unvulcanized rubber, the cutting die can be provided with a coating of unvulcanized rubber by any other known method for coating with rubber, for example by dipping.

The inflatable shape produced in the above described manner is vulcanized and finished in the usual way and is provided with a tube or valve for purpose of inflation.

What is claimed is:

1. A method for the production of inflatable rubber articles simulating human or animal forms having projecting parts or limbs offset from the median plane of the article, wherein an unvulcanized rubber layer is folded around a former plate having a curvilinear edge following the outlines of the article so that such fold follows such edge, whereupon said coated former plate is inserted between two unvulcanized rubber sheets and united with these latter along seams corresponding to the side outlines of the uninflated article.

2. A method for the production of inflatable rubber articles simulating human or animal forms having projecting parts or limbs offset from the median plane of the article, wherein a piece of rubber sheet having a breadth varying according to the breadth of the different parts of the insertion is cut out from sheet rubber, and is prior to its being united with the two side sheets, of the finished article, folded and applied along the curvilinear edge of the inner outlines of a ring-like shaped die, these outlines determining the median section through the hollow body in the plane of the article in its flat uninflated state.

3. The method of making hollow inflatable rubber articles comprising folding a single sheet of rubber along a curvilinear line corresponding to the curvilinear outline of the body portion of the article, and joining each marginal free edge of said folded sheet to a sheet of rubber along a marginal line forming the outline of the article before inflation.

4. The method of making hollow rubber articles of sheet material comprising interposing an integral doubled intermediate sheet folded along a curvilinear line between a pair of sheets, and cutting through all of the superimposed sheets to form the outline of the article while leaving the fold of the doubled sheet intact and at the same time forming marginal seams between each outer

sheet and the adjacent leaf of the doubled sheet.

5. A method of making hollow rubber articles which comprises folding an integral sheet around a die having curvilinear inner and outer outline edges, the inner edge corresponding to the outline of the body portion of the article and the outer edge corresponding to the marginal outline of the article, the fold of said sheet following said inner edge, inserting said covered die between a pair of sheets, and uniting each outer sheet to the adjacent leaf of the folded sheet along a line forming the marginal outline of the article.

6. A method of making hollow rubber articles which comprises folding an integral sheet around a die having curvilinear inner and outer outline edges, the inner edge corresponding to the outline of the body portion of the article and the outer edge corresponding to the marginal outline of the article, the folded edge of said sheet following the inner edge of said die and the free edges of said sheet following the outer edge of said die, temporarily securing the free edges together to hold the sheet in position on the die, inserting said covered die between a pair of sheets, and uniting each outer sheet to the adjacent leaf of the folded sheet along a line forming the marginal outline of the article.

7. A method of making inflatable rubber articles having extensions projecting from the body portion thereof comprising forming an in-

tegral sheet of rubber of varying width, folding said sheet along a curvilinear line so that the folded edge follows the curvilinear body portion of the article and the free edges follow the marginal outline of said article, and joining each free edge of said folded sheet to a sheet of rubber along a marginal line forming the outline of said article.

8. A method of making hollow rubber articles comprising folding an integral rubber sheet around a die having curvilinear inner and outer outline edges, the inner edge corresponding to the outline of the body portion of the article and the outer edge corresponding to the marginal outline of the article, said outer edge being formed to provide opposed cutting and seaming surfaces, the folded edge of said sheet following the inner edge of said sheet and the free edges of said sheet contacting the outer edge of said die, inserting the covered die between a pair of sheets of rubber, and subjecting the assembled sheets to pressure to cause the cutting and seaming surfaces of said die to cut and simultaneously join each outer sheet to the adjacent leaf of the folded sheet along a line forming the marginal outline of the article.

JANKA KELEMEN,

Widow and sole Inheritrix of the Estate of Lewis Kelemen, Deceased.

ZOLTAN KELETI.

35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150