March 20, 1962 E. H. WALTERS ET AL 3,025,635

ROCKET TOY BALLOON

Filed April 14, 1959

Fig. 1.

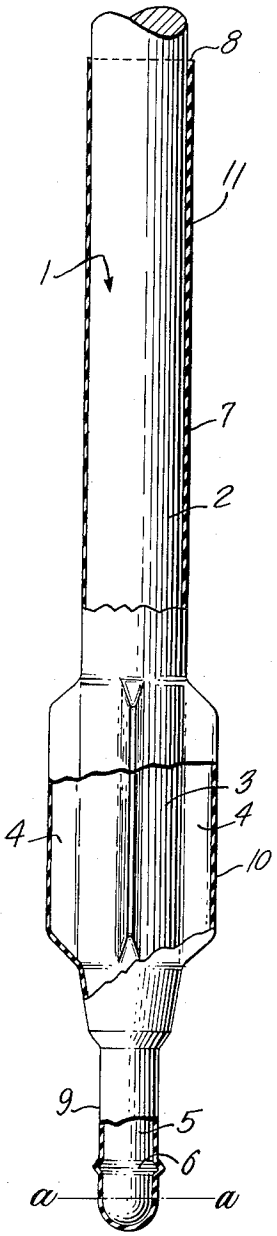


Fig. 3.

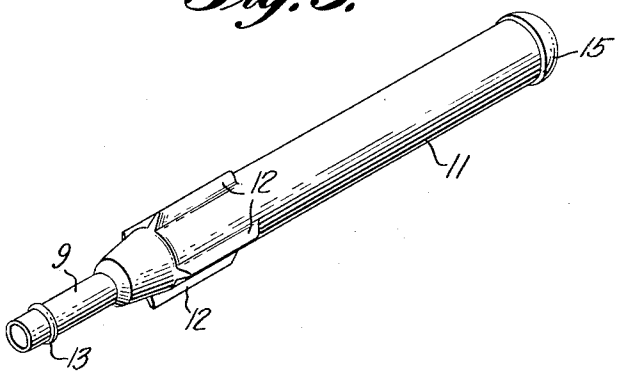


Fig. 2.

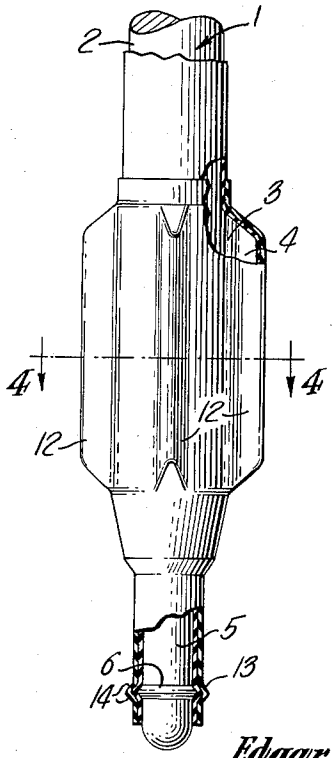
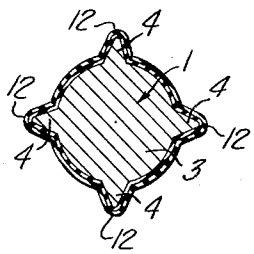


Fig. 4.



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ROCKET TOY BALLOON

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This invention relates to toy balloons, both the method of manufacture and the balloon resulting from the practice of the method.

One of the objects of the invention is the production of a toy balloon having an integral mouthpiece which by virtue of the increased thickness of the wall of said mouthpiece and the presence of an integrally formed circumferential head adjacent the end thereof, is self shape sustaining, to the extent that it will not collapse between the human lips while being inflated and thus prevent the ingress of air, which is a fault common to these types of top balloons which have mouthpiece walls of single thickness and attempt to gain thickness by rolling the end portion of the wall back upon itself.

Another object of the invention is to provide a jet propelled toy balloon having a mouthpiece or nozzle as above described in which the portion of the balloon adjacent the mouthpiece, and including the latter, is weighted, by multiple dipping, to cause the balloon to quickly assume a vertical attitude, with the mouthpiece downward, whereby when freed with the mouthpiece open it will rise under reaction thrust of the jet of air released through the mouthpiece to a greater altitude than other ballons, in which a large part of the thrust is wasted while they are more slowly assuming a vertical position.

A further object of the invention is the provision of a toy balloon as described in shape simulating a space rocket, having a thickened wall in zone adjacent to and including the mouthpiece, the thickening being produced by double dipping, the shape being characterized by molded vanes incorporated in the said thickened wall, the latter by virtue of its thickness being less stretchable under inflation and more self shape retaining than the thinner walled portions of the balloon.

Other objects of the invention will appear as the following description of a practical embodiment thereof appears.

In the drawing which accompanies and forms a part of the following specification, and throughout the figures of which the same reference characters have been employed to denote identical parts:

FIG. 1 is a longitudinal view, partly in elevation and partly in section showing a metallic form, vertically suspended and enveloped, up to a level adjacent its upper end, by a film of latex resulting from a single dipping.

FIG. 2 is a similar view showing an enveloping film of latex on the form, being of double thickness, in the zone embracing the mouthpiece and fins, obtained by double dipping the form in the latex emulsion. This figure also shows the lower terminal end of the latex envelope cut off to form the opening on the mouthpiece.

FIG. 3 is a perspective view of the uninflated balloon showing the cap which closes the open end of the latex envelope through which the metal form is withdrawn.

FIG. 4 is a transverse cross section and is taken on the line 4—4 of FIG. 2.

Referring now in detail to the drawing the numeral **1** represents the form upon which the balloon is molded, it being preferably of metal, generally cylindrical in shape and having the cross sectional dimensions of the balloon in its unstretched or uninflated condition. The form, in plurality with others is suspended vertically above a tank of conventional latex emulsion (not shown), into which it is repeatedly dipped, to different depths, as will appear,

to build upon itself a coating or envelop of latex, of different thickness in different areas, this envelope being the major part of the balloon.

The form as shown **1** has an anterior portion **2** of uniform diameter, an intermediate portion **3** formed with a circumferential series of longitudinal ribs **4**, for embossing vanes upon the corresponding part of the balloon, simulating the guiding vanes of a rocket, and having a posterior portion **5** of reduced diameter on which the neck or mouthpiece of the ballon is formed, which mouthpiece is also the jet nozzle, in the specific embodiment of the invention. Said posterior portion **5** is formed, near its lower end with a circumferential rib **6** which embosses a circumferential reinforcing bead about the mouthpiece adjacent its free end.

The broad concept of manufacturing toy balloons by dipping a form into a latex emulsion to collect thereupon a film of latex which is the skin of the balloon, is not new, but the subject process is a novel specific development of the broad concept, involving multiple dipping of selected zones of the form to produce a toy jet propelled balloon having the general appearance, the attitude, and flight characteristics of a space rocket. These characteristics include *a*, means for causing the balloon to quickly assume vertical altitude when released from the hand for free flight, regardless of its position when released, *b* a jet nozzle (mouthpiece) which is sufficiently stiff to be self shape sustaining and so stiffly related to the adjacent part of the balloon as to remain coaxial therewith to produce reaction thrust in a constant direction, thus promoting vertical flight and avoiding zigzag desultory flight movements that characterise toy ballons having limp mouthpieces, *c* reduction of elasticity of the balloon envelope in the zone embracing the simulated guide vanes to prevent obliteration of the vanes through inflation.

With regard to the above characteristics designated *a* and *b*, the chief functional attribute of a toy rocket balloon is its ability to gain high altitude. When the ordinary rocket balloon is tossed from the hand, the closing pressure upon the mouthpiece being simultaneously released, it may be in any desultory position, and the limpness of the mouthpiece may cause it to dart about before becoming vertical, meanwhile losing a large part of its total thrust. In the subject balloon, the weight causes it to quickly become vertical and the relatively stiff nozzle maintains itself axially parallel to the longitudinal dimension of the balloon.

Another feature of novelty which is not exclusively characteristic of a toy balloon simulating a rocket but appertains to any toy balloon inflatable through the human lips, is the self shape retaining property of the mouthpiece resulting not only from the multiple dipping of the mouthpiece but from the provision of the molded head at its free end, which holds the wall of the mouthpiece against collapse through lip pressure, in the act of inflation.

The process of the invention comprehends the following steps which will be readily understood by reference to the drawing.

The form **1** is first dipped into the latex emulsion to a depth approximately equal to the length of the balloon as indicated in FIG. 1, and withdrawn, enveloped in a primary film **7** of adherent latex which assumes the precise contour of the form.

The numeral **8** indicates the upper boundary of the primary film. The lower end of the form is imperforate, so that the primary film extends over said lower end. The primary film is differentiated into distinct zones, defining a mouthpiece **9**, a vaned section **10** and an anterior section **11**. The primary film is of uniform thinness and elasticity, being quite incapable of preventing obliteration of the vanes through inflation or of inherently sustain-

ing the cylindrical shape of the mouthpiece or its axial relation to the rest of the balloon. Moreover, a balloon of uniform thinness, when inflated, would have no definite gravitational attitude.

The next step of the process is to redip the form with the adherent primary film into the latex emulsion to a depth shown in FIG. 2, substantially at the level of the forward ends of the vanes which submerges the vaned section **10**. The emulsion employed is well known in the art and incorporates a suitable coagulant, the timing of the successive dipping steps being so adjusted that the primary and secondary films become homogeneously united.

While the application of the secondary film, as described, is generally sufficient to accomplish the purposes of the invention, the latter is to be regarded as sufficiently comprehensive to include additional dippings, to further thicken the film in the zones of the mouthpiece and guide vanes if such be necessary to secure the requisite weightiness for vertical attitude, or the perpetuation of the guide vanes **12** under conditions of inflation, or coaxial alinement of the mouthpiece with the axis of the balloon, or maintenance of an open mouthpiece against external lip-pressure during the act of inflation.

This last-named function is the result, not only of the thickened wall of the mouthpiece incident to multiple dipping, but largely to the embossing of the head **13** about the mouthpiece adjacent its free end. This in effect increases the depth dimension of the wall of the mouthpiece and also provides surfaces **14** at an angle to said wall, against which the lips can sealingly press, transmitting only a component of the sealing pressure perpendicularly to the wall of the mouthpiece.

The process of manufacture is completed by stripping the balloon from the form **1** beginning at the edge **8**, cutting off the closed end of the mouthpiece, along the line *a—a* as shown in FIG. 1, providing the molded latex cap **15**, FIG. 3, lapping the edge of this cap over the anterior circumferential edge of film **11** and cementing the lapping edges together.

The conventional jet propelled toy is made of a single thickness skin, so flimsy that when the lips are brought together against the mouthpiece with sufficient force to retain air under pressure in the mouth, the opposite sides

of the mouthpiece are collapsed against each other and no air can enter. Manufacturers of the conventional toy balloon have tried to provide reinforcement for the mouthpiece by rolling the film upon itself, from the free end of the mouthpiece. Due to the higher elasticity of the single-thickness film each lamination when stretched upon another in the act of rolling, becomes stretched thin adding substantially no thickness to the wall of the mouthpiece. Consequently, this expedient for preventing inward collapse of the mouthpiece has proved ineffectual.

What we claim as our invention is:

Jet propelled toy balloon comprising a tubular inflatable skin of latex material including contiguous anterior, intermediate and posterior integrally related portions, said anterior portion being a relatively thin film closed at its forward end, said intermediate portion having a circumferential series of longitudinal outwardly embossed guide vanes and said posterior portion being of reduced diameter forming a longitudinally extending mouthpiece with nozzle function, and a continuous coating of the same material as the skin, covering the latter throughout the zones of said intermediate and posterior portions, terminating substantially at the level of the forward ends of said vanes, and homogeneously bonded throughout the extent of its area to said skin, being of such thickness as to weight the intermediate and posterior portions for quick assumption of verticality, to prevent obliteration of the vanes through inflation and to reinforce the mouthpiece against collapse through normal lip pressure when inflating, as well as stiffening it to resist deviation from its normal longitudinal position.

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