Feb. 4, 1969 J. W. RYAN ETAL 3,425,155

DOLL CONSTRUCTION FOR NATURAL MOVEMENTS AND POSITIONS

Filed July 15, 1966 Sheet 1 of 2

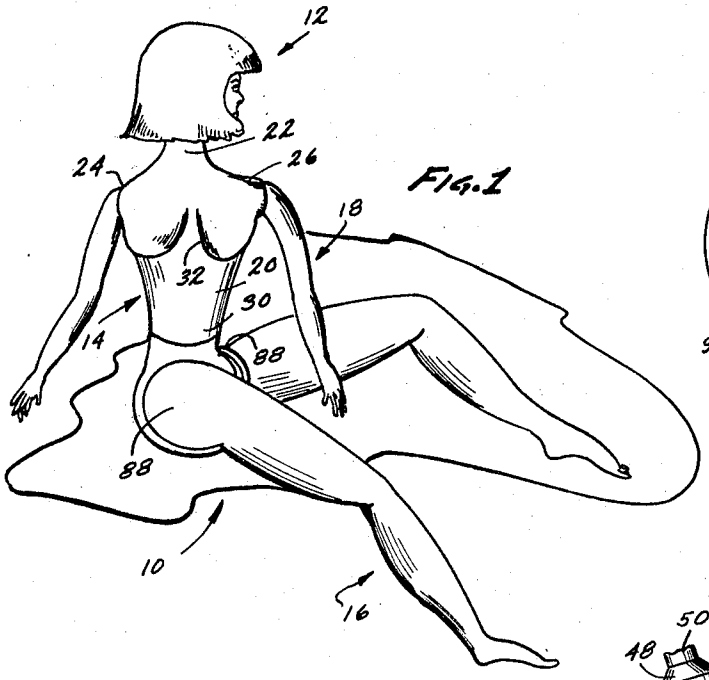


FIG. 1

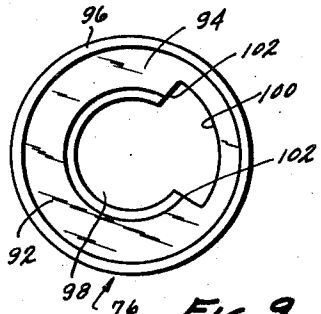


FIG. 9

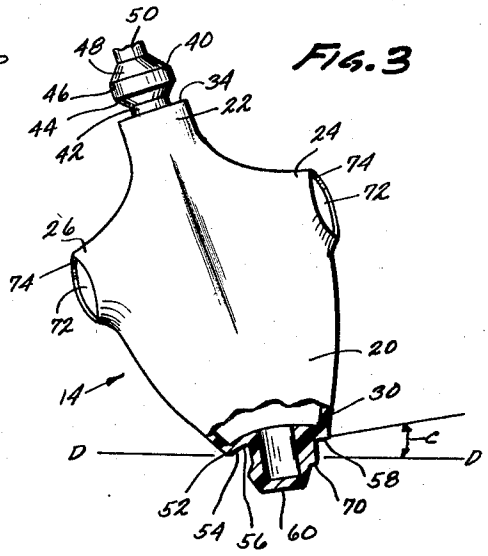


FIG. 3

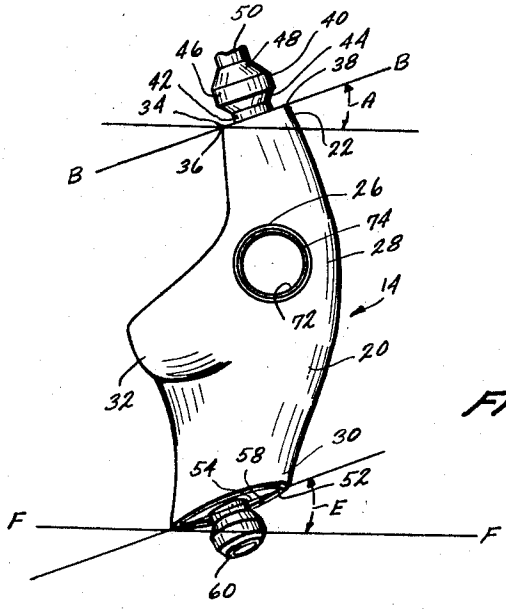


FIG. 2

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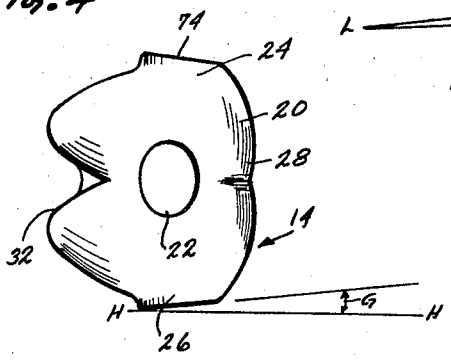
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Sheet 2 of 2

Fig. 4



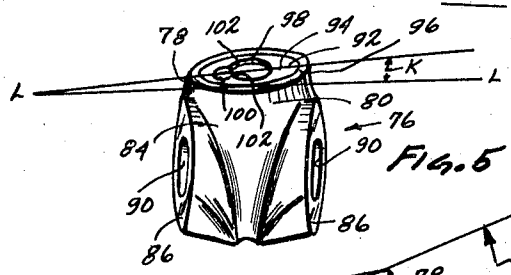


Fig. 5

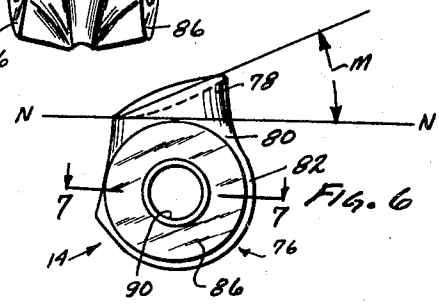


Fig. 6

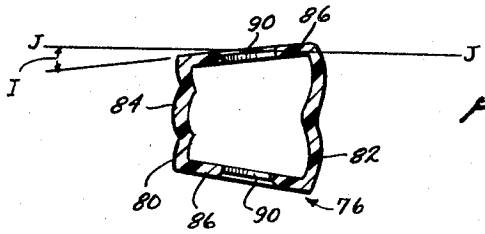


Fig. 7

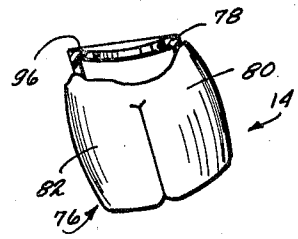
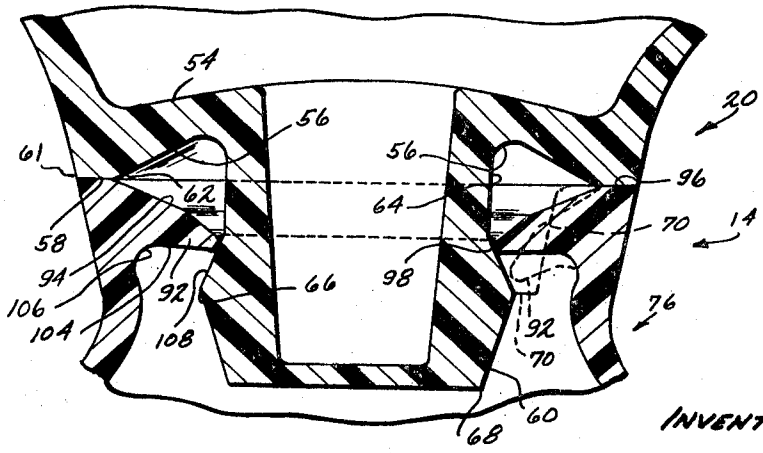


Fig. 8

Fig. 10



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3,425,155

DOLL CONSTRUCTION FOR NATURAL MOVEMENTS AND POSITIONS

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Filed July 15, 1966, Ser. No. 565,577
U.S. Cl. 46—162 8 Claims
Int. Cl. A63h 3/36, 3/14, 3/46

The present invention relates to a new and useful doll construction for natural movements and positions and more particularly to a doll having an upper torso portion and a lower torso portion which are connected together for twisting body movements.

Certain dolls are favorites of children today because of the realism which is associated with a particular doll in different play environments. These environments are created by different accessories which may be used with the doll. Some of these play environments are limited, however, by the lack of natural movements and positions for the doll.

This problem was partially overcome by a doll construction wherein an upper torso portion has a lower end defined by a ball which is seated in an undersized socket provided in a lower torso portion. Since the ball is larger than the socket, a noticeable gap is left between the upper torso portion and the lower torso portion so that, because of the universal movement offered by the ball joint, unwanted tilting and leaning of the upper torso portion with respect to the lower torso portion results.

In another doll construction, the torso is cut in two parts along a horizontal plane and then joined together by pivot means. This construction also results in unnatural body movements because there is no predetermined action between the mating torso halves.

Accordingly, it is a primary object of the present invention to provide a new and useful doll construction for natural movements and positions.

It is another object of the present invention to provide a doll construction having a "twist" type of posture and action.

It is another object of the present invention to provide a doll having upper and lower torso portions pivotally connected together by coplanar end portions forming a predetermined first angle with a side-to-side horizontal axis and a predetermined second angle with a forward-rear horizontal axis for producing a predetermined twisting action when one torso portion is pivoted on the other torso portion.

Yet another object of the present invention is to provide a new and useful doll of the type described having bendable legs swingably connected to a torso which includes an upper torso portion and a lower torso portion connected together for twisting movements with respect to each other.

According to the present invention, a doll is provided with bendable legs which are swingably connected to a torso including an upper torso portion and a lower torso portion.

The upper torso portion includes a neck having an upper end which includes an upstanding attachment means for connecting a head to the doll. The upper torso portion also includes a lower end forming a predetermined

first angle with a side-to-side horizontal axis and a predetermined second angle with a forward-rear horizontal axis. Removal of the upper torso portion from a mold during the manufacturing of the doll may be facilitated by forming at least one of these same angles on the upper end of the neck. The upper end of the lower torso also forms these same predetermined first and second angles with a side-to-side horizontal axis and a forward-rear horizontal axis, respectively.

Pivotal attachment means connects the two torso portions together so that the upper end of the lower torso portion and the lower end of the upper torso are placed in face-to-face relationship in the same plane for producing a self-imposed, predetermined twisting action when the torso portions are pivoted with respect to each other. The bendable leg may be of the type disclosed in co-pending application No. 339,631, filed Jan. 23, 1964.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which like reference refer to like elements in the several views.

In the drawings:

FIGURE 1 is a perspective view of a doll of the present invention shown in a sitting position with the torso twisted to a predetermined position clockwise and the head turned to a predetermined position counterclockwise;

FIGURE 2 is an enlarged, side-elevational view of the upper torso portion of the doll of FIG. 1;

FIGURE 3 is an enlarged, rear-elevational view of the upper torso portion shown in FIG. 2 with parts broken away to show internal construction;

FIGURE 4 is an enlarged, plan view of the upper torso portion of FIG. 2;

FIGURE 5 is an enlarged, front view of the lower torso portion of the doll of FIG. 1;

FIGURE 6 is an enlarged, side-elevational view of the lower torso portion of FIG. 5;

FIGURE 7 is a cross-sectional view taken along line 7—7 of FIG. 6;

FIGURE 8 is a rear-elevational view of the torso of FIG. 5 with parts broken away to show internal construction;

FIGURE 9 is a plan view of the torso portion shown in FIG. 8; and

FIGURE 10 is an enlarged, partial cross-sectional view taken along line 10—10 of FIG. 1 with the upper torso portion rotated back to a straight-ahead position.

Referring again to the drawings and more particularly to FIG. 1, a doll constituting a presently preferred embodiment of the invention, generally designated **10**, includes a head **12**, a torso **14**, a pair of bendable legs **16** of the type disclosed in said co-pending application, and a pair of arms **18**.

Referring now to FIGS. 1–4, the torso **14** includes an upper torso portion or member **20** having a substantially cylindrical neck portion **22**, a pair of shoulders **24**, **26**, a back portion **28**, a midriff portion **30** and a bust-line forming means **32**. The neck portion **22** includes an upper end **34** forming a shelf for supporting the head **12** on a predetermined angle A formed between a substantially horizontal plane and a forward-rear axis B—B extend-

ing from the front edge **36** through the rear edge **38** of the shelf **34**.

The torso member **20** also includes a head-receiving spool **40** which is formed on the shelf **34** during a molding operation wherein the entire torso member **20** is formed during a single step. The spool **40** is affixed to the shelf **34** by a cylindrical member **42** and includes a lower frustoconical portion **44**, a central cylindrical portion **46** and an upper frustoconical portion **48**. The portion **48** is surmounted by a cylindrical molding spur **50** which may be removed after the molding operation, if desired.

The upper torso member **20** also includes a lower end **52** which is closed by a bottom wall **54** which, as shown in cross-section in FIG. 3, includes an annular undercut portion **56** and a peripheral, annular planar portion **58** formed integrally with a depending connecting means **60**. The planar portion **58** forms a first predetermined angle C with a substantially horizontal side-to-side axis D—D and a second predetermined angle E with a forward-rear horizontal axis F—F. It is an important feature of the present invention that the angle A equal the angle E to facilitate separating the upper torso member **20** from a split mold (not shown) having a front mold half and a rear mold half, as will be apparent to those skilled in the art.

Although a number of different design parameters may be used for the bottom wall **54**, it is shown herein for purposes of illustration, but not of limitation, in FIG. 10 as having a 0.840 inch diameter at the outer edge **61** of the annular planar portion **58**, a 0.740 inch diameter at its inner edge **62**, a 0.75 inch spherical radius for the undercut portion **56**, a 0.400 inch diameter for an upper, cylindrical portion **64** of the connecting means **60**, a 0.470 inch diameter at a mid-portion **66** of the connecting means **60**, and a 19° slope from the mid-portion **66** to the lower end **68** of the connecting means **60**. The connecting means **60** includes a key **70** formed integrally therewith during the aforementioned molding operation.

Referring again to FIGS. 1–4, the shoulders **24**, **26** are each provided with an arm-receiving aperture **72** formed in a planar portion **74** of an associated shoulder **24**, **26**. Preferably, the planar portion **74** forms an angle G of approximately 7° with a substantially horizontal, forward-rear axis H—H.

Referring now to FIGS. 1 and 5–10, the torso **14** also includes a lower torso portion or member **76** having an upper, midriff portion **78** and a lower trunk portion **80**. The lower trunk portion **80** is substantially hollow and includes a rear rump-forming wall **82**, an abdomen-forming front wall **84** and a pair of parallel, hip-receiving sidewalls **86**.

Each of the walls **86** forms an angle I of approximately 8° with a forward-rear horizontal axis J—J so that the hip-portions **88** of the legs **16** form a suitable angle with the torso **14**. An aperture **90** is provided in each wall **86** for receiving an associated hip portion **88**.

The lower torso member **76** includes a top wall **92** having an undercut portion **94** formed on a 0.75 inch spherical radius and annular planar member **96** forming a predetermined angle K with a substantially horizontal side-to-side axis L—L and a second predetermined angle M with a substantially horizontal forward-rear axis N—N. It is an important feature of the invention that the angles K and M be the same as the corresponding angles C and E on the upper torso member **20** so that, when the connecting means **60** is engaged in an aperture **98**, provided in the top wall **92**, the portions **58** and **96** will be coplanar.

The aperture **98** includes an arcuate sector **100** forming shoulders **102** in the undercut portion **94** so that, when the connector means **60** is in position in the aperture **98**, the key **70** will limit the rotation of the upper torso portion **20** to approximately 100°. As shown herein for purposes of illustration, but not of limitation, the angles M and E may each be 20°, 42° and the angles K and C may each be approximately 6°. It has been found that these angles result in a more realistic twisting of the upper torso portion **20** with respect to the lower torso portion **76**. Thus, the coplanar wall portions **58** and **96** produce a self-imposed, predetermined twisting action.

Referring now more in particular to FIG. 10, the aperture **98** has a 0.420 inch diameter and a $\frac{1}{32}\times 45°$ chamfer and the underside **104** of the top wall **92** is undercut as indicated at **106** so that, during assembling of the connecting means **60** into the aperture **98**, the top wall **92** will flex to the position shown in broken lines in FIG. 10 to pass the midportion **66** of the connector means **60** and then flex back to the solid line position where it locks against the sloping portion **108** forming a transisitional section between the cylindrical portions **64** and the lower portion **68** of the connector means **60**.

In use, the doll **10** may be caused to assume any number of different positions by manipulating the bendable legs **16**, the arms **18**, the head **12** and the torso **14**. As the head **12** is rotated about the connector means **40**, the shelf **34**, because of the angle it forms with a forward-rear horizontal axis, will more nearly simulate the turning of a human head. Additionally, the angles C, E, K and M will cause the torso to twist in a realistic manner by lowering one shoulder and raising the other shoulder during twisting movements.

The torso **14** is preferably made from a fairly rigid material, such as a linear polyethylene plastic, which may also be used for the arms **18**.

While the particular doll herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

What is claimed is:

1. In combination with a doll having a head, a torso comprising:

upper torso means forming a neck portion and a midriff portion;

lower torso means forming a midriff portion and a trunk portion;

means for connecting said head to said neck portion; and

means for connecting said midriff portions together in such a manner that said torso means may be subjected to twisting movements;

said midriff portions are joined together by coplanar end portions forming a predetermined acute angle with a substantially horizontal forward-rear axis for imposing a predetermined twisting action on said torso means during said twisting movements.

2. A combination as stated in claim **1** wherein said midriff portions are joined together by coplanar end portions are joined together by coplanar end portions forming a predetermined first angle with a side-to-side horizontal axis and a predetermined second angle with a forward-rear horizontal axis for guding said torso means through predetermined paths during said twisting movements.

3. A combination as stated in claim **1** wherein said connecting means comprises a protuberance provided on one of said torso means and a socket provided on the other of said torso means for receiving said protuberance.

4. A combination as stated in claim **2** wherein said neck portion includes an upper end forming a shelf for said head, said shelf forming the same predetermined angle with one of said horizontal axes as said coplanar end portions for facilitating removal of said upper torso means from a mold following the formation thereof by molding operations and for guiding said head through realistic paths during the turning thereof of said neck.

5. A combination as stated in claim **2** wherein said

first predetermined angle is approximately 6° and said second predetermined angle is approximately 22°.

6. A combination as stated in claim 3 including a key provided on said protuberance and stop means provided in said socket for limiting the amount of rotation of said protuberance in said socket.

7. A combination as stated in claim 6 wherein said protuberance includes an enlarged mid-portion for locking said socket to said protuberance.

8. A combination as stated in claim 7 wherein each of said coplanar end portions includes an undercut portion and an annular edge portion.

References Cited

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R. F. CUTTING, *Assistant Examiner.*

U.S. Cl. X.R.

46—154, 173

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,425,155 Dated February 4, 1969

Inventor(s) John W. Ryan and Jack Lewis Lemkin

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In claim 2, line 3, delete the phrase "are joined together by coplanar end portions".

Signed and Sealed this

Eleventh Day of January 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks

Disclaimer

3,425,155.—*John W. Ryan*, Bel Air, and *Jack Lewis Lemkin*, Torrance, Calif. DOLL CONSTRUCTION FOR NATURAL MOVEMENTS AND POSITIONS. Patent dated Feb. 4, 1969. Disclaimer filed Aug. 30, 1976, by the assignee, *Mattel, Inc.*

Hereby enters this disclaimer to claims 1, 3, 6 and 7 of said patent.

[*Official Gazette January 18, 1977.*]