April 23, 1935. H. M. DODGE 1,998,864

METHOD OF DOLL ASSEMBLY

Filed July 5, 1934

Fig-1

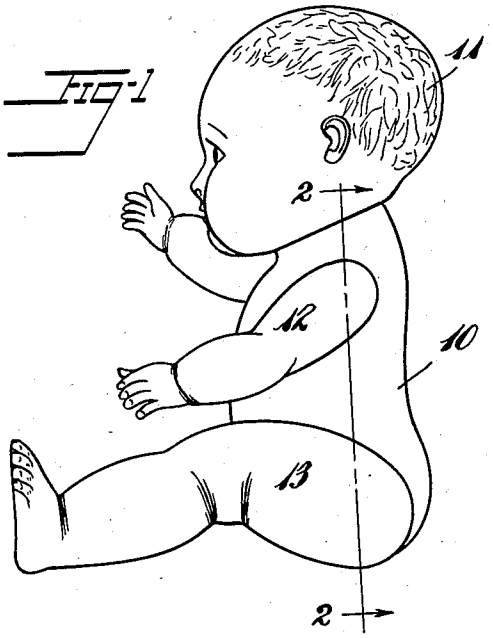
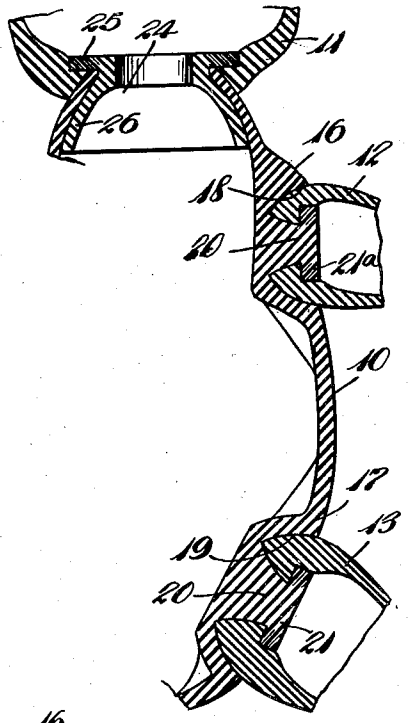


Fig-3



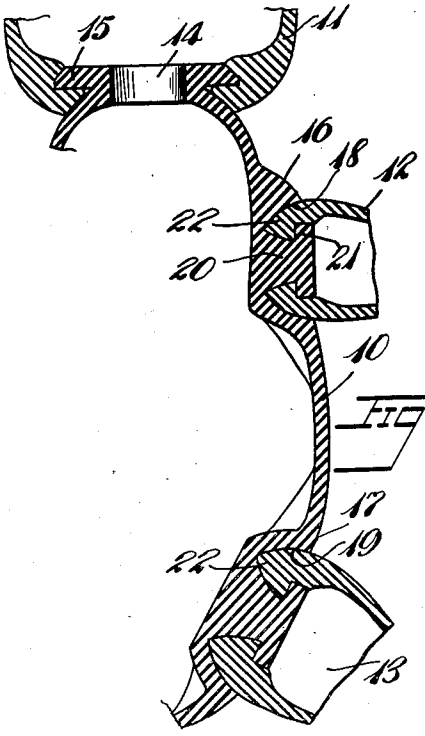


Fig-2

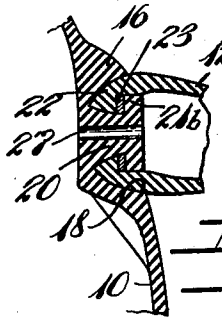


Fig-4

Inventor
Howard M. Dodge
By Eaton & Avery
Attys.

Patented Apr. 23, 1935 1,998,864

UNITED STATES PATENT OFFICE

1,998,864

METHOD OF DOLL ASSEMBLY

Howard M. Dodge, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N. Y., a corporation of New York

Application July 5, 1934, Serial No. 733,820

9 Claims. (Cl. 46—40)

This invention relates to dolls and more particularly to dolls of the jointed type. It is especially useful in the manufacture of jointed dolls of rubber material.

The principal objects of the invention are to improve the appearance and operation of the doll, to reduce the cost of manufacture, and to provide greater security in the fastening of the parts.

Other objects will appear from the following description and the accompanying drawing.

Of the drawing:

Fig. 1 is a side view of the complete doll in its preferred form.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 showing the preferred form of joint construction, parts being broken away.

Fig. 3 is a similar view of a modified form of the invention.

Fig. 4 is a fragmentary detail view of a further modification.

Referring to the drawing, the doll illustrated in Fig. 1 is formed with a one piece hollow head 11, arms 12, and legs 13. These parts are preferably all molded from soft vulcanized rubber although the head may be either rigid or flexible as desired and it is possible to use rigid material for the limbs.

The body 10 is preferably closed except for an opening 14 at the neck for removal of the core when the body is molded. The neck portion is provided with a flange 15 over which the head 11 is buttoned.

As the outer surface of the body is formed in a split mold which causes a rhind to form at its parting line, this rhind must be removed during the finishing of the body. The most economical method of removing the rhind is by a tumbling operation but this tends to wear away projecting ridges and corners, interfering with the fit of the limbs to the body. In order that this may not noticeably affect the appearance of the doll and to provide greater security of the limbs to the body without the presence of unsightly openings, the body walls are thickened at the shoulders 16 and hips 17 and formed with annular grooves 18, 19 defining a preferably spherical recess having a central protuberance comprising a flexible shank 20 and an enlarged button 21. The cross sectional shape of the groove is generally dove-tailed or widened toward its bottom. The limb members are formed with a complemental rounded, preferably spherical, end 22 having a central aperture to embrace the shank of the protuberance, their walls being thickened toward the central aperture so as completely to fill the annular groove. The arrangement is such that the stiffened portions of the body around the annular grooves strongly resist such stretching of the section as would be necessary to remove the limb, while rotation of the limb in its socket is permitted.

The meeting surfaces of the limb and body socket being almost perpendicular to the surface of the body, no unsightly gap appears between the limb and the body and slight imperfections such as rounding off of the socket edge caused by tumbling are not as apparent.

The sockets are preferably so proportioned with relation to the limb that the shank of the protuberance and the walls surrounding the socket are under tension when the limb is in place.

When the limbs are to be assembled to the body, the socket may be distorted as by pressure applied locally from within the body so as to project the protuberance beyond the body. The limb is then forced over the button of the protuberance.

When the protuberance is made of resilient material, the limb may be made of rigid material. It is therefore possible with this construction to use rigid limbs and a rigid head with a pliable rubber body.

Where the limbs are made of soft rubber, greater resistance to withdrawal of the limbs may be accomplished either by making the buttons 21[a] of rigid material such as hard rubber integrally molded to the soft rubber, as illustrated in Fig. 3, or by use of a separate rigid washer 23 of metal or other material embracing the shank of the protuberance below the button 21[a], as illustrated in Fig. 4. Such washers may be split on one side to permit their being passed over the shank.

When it is desired to employ a soft rubber head greater security than that afforded by the soft rubber flange 15 may be secured, and at the same time permit removal of the body core through the opening 14, by employing a separate button or connector 24 having a rigid flange 25 and a resilient shank 26.

In order to permit air to pass from one of the parts to another to overcome sustained collapse of the parts when flattened, a central passage 27 may be formed through each button.

I claim:

1. A joint between two parts of a doll, one of said parts being formed with a hollow rounded centrally apertured end, the other part being formed with a deep rounded socket for rotatably

engaging said first-named part and an integral elastic protuberance located in the socket and adapted to engage in the aperture of the first named part, said protuberance having a head adapted to retain said first-named part in the socket.

2. A joint between two parts of a doll, one of said parts being formed with a hollow rounded centrally apertured end, the other part being formed with a deep rounded socket for rotatably engaging said first-named part and an integral elastic protuberance located in the socket and adapted to engage in the aperture of the first named part with the protuberance in stretched condition, said protuberance having a head adapted to retain said first named part in the socket.

3. A joint between two parts of a doll, one of said parts being formed with a hollow elastic rounded centrally apertured end, the other part being formed with a deep rounded socket for rotatably engaging said first-named part and an integral protuberance located in the socket and adapted to engage in the aperture of the first named part, said protuberance having a rigid head adapted to retain said first named part in the socket.

4. A joint between two parts of a doll, one of said parts being formed with a hollow elastic rounded centrally-apertured end, the other part being formed with a rounded socket for rotatably engaging said first-named part and an integral elastic protuberance located in the socket and adapted to engage in the aperture of the first named part with the protuberance in stretched condition, said protuberance having a rigid head adapted to retain said first-named part in the socket.

5. A joint between two parts of a doll, one of said parts being formed with a hollow rounded centrally apertured end, the walls adjacent the central aperture being thickened toward the aperture, the other part being made of resilient material formed with a rounded socket for rotatably engaging said first-named part and an integral resilient protuberance located centrally of said socket to engage in the aperture of the first named part and having a head adapted to retain said first named part.

6. A joint between two parts of a doll, one of said parts being formed with a hollow rounded end having a central aperture, the walls of said end increasing in thickness toward the aperture, the other of said parts being formed with an annular groove defining a central undercut protuberance, said groove widening towards its bottom to correspond with the walls of said first-named part which it is adapted to receive, at least one of said parts being of resilient material to permit assembly of the parts.

7. A joint between two parts of a doll, at least one part of which is made of resilient material, said joint comprising a rigid button element having an elastic shank portion.

8. A joint between two parts of a doll, at least one part of which is made of resilient material, said joint comprising a resilient button attached to the other portion by an elastic shank of reduced diameter, and a rigid washer embracing the shank below the button to provide rigidity to the button.

9. A doll comprising a hollow soft rubber body open only at the neck, the walls of said body being substantially stiffened at the shoulders and hips, an annular socket defining a central protuberance formed at each hip and shoulder, said protuberances having enlarged button heads, and limb members having hollow attaching ends adapted to fit said annular sockets and centrally apertured to engage over said buttons.

HOWARD M. DODGE.