DOLL INCLUDING A JOINT MEMBER WITH FILLING OPENING AND GAS VENT THEREIN

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ABSTRACT

Apparatus for attaching a doll's limb to a torso in which a relatively rigid synthetic resin, socket-forming-like element having a frusto-conical central boss provided with a top having a central opening and provided with cross slots forming resilient fingers is adhered in a torso recess in the soft skin of the torso at a location to receive a frusto-conical plug connected by a neck to a base cemented over a filling opening in a relatively rigid plug-receiving cup-like member cemented in a recess in the limb end with the member opening registering with a filling opening in the recess and with gas exhaust ports in the plug-receiving member and in the limb recess in registry, thus to mount the limb on the torso for pivotal movement around an axis and for limited swinging movement in directions perpendicular to the pivotal axis.

11 Claims, 3 Drawing Figures
DOLL INCLUDING A JOINT MEMBER WITH FILLING OPENING AND GAS VENT THEREIN

This is a continuation of application Ser. No. 311,227, filed Dec. 1, 1972, now abandoned.

BACKGROUND OF THE INVENTION

In the manufacture of one type of jointed doll known in the prior art, the torso and limbs first are formed individually as relatively soft, thin-walled, hollow members from a suitable synthetic resin such as polyvinyl chloride and by any suitable molding process. Next, in order to give the doll "body" and a realistic feel, the hollow members are filled with polyvinyl chloride together with a foaming agent. Following that operation, relatively rigid, injection molded synthetic resin joint-forming parts are glued to the limbs and to the torso. Finally, the joint-forming parts are connected to complete the assembly of the doll.

Owing to the relatively high temperature necessary to cure the polyvinyl chloride foam the molded joint-forming elements cannot be adhered in place before filling. Moreover, the joint-forming elements of the prior art provide no filling openings.

We have invented a doll's limb attaching means which overcomes the defects of attaching means of the prior art pointed out hereinabove. Our attaching means enables us to fill the limb with foam after the attaching means has been assembled on the limb. It enables us to form a softer and lighter doll than are foam-filled dolls of the prior art. The cost of producing a doll embodying our attaching means is less than that of producing foam-filled dolls of the prior art.

SUMMARY OF THE INVENTION

One object of our invention is to provide a doll's limb attaching means which permits the doll to be filled after securing of the attaching means to the limb and to the torso.

Still another object of our invention is to provide a doll's limb attaching means which enables us to form a softer and lighter foamed resin-filled jointed doll than do attaching means of the prior art.

A still further object of our invention is to provide a doll's limb attaching means which reduces the cost of producing a foam-filled jointed doll.

Other and further objects of our invention will appear from the following description.

In general, our invention contemplates the provision of means for attaching a limb to a doll's torso in which a cup-like socket-forming member of relatively rigid molded synthetic resin is secured in a recess formed in the relatively soft skin of the torso at a location at which a central boss on the member having a top formed with an opening and provided with cross slots forming resilient fingers can receive a frusto-conical molded plug connected by a neck to a base secured over a filling opening in a relatively rigid molded synthetic resin cup-like plug-mounting member adhered in a limb recess having a filling opening with the two filling openings aligned and with vent ports in the plug-mounting member and in the limb recess in alignment to permit filling of the limb and curing of the foam after the plug-mounting member is secured to the limb.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views.

FIG. 1 is an elevation of a doll provided with our doll's limb attaching means with a part broken away.

FIG. 2 is a sectional view of our doll's limb attaching means taken along the line 2--2 of FIG. 1 and drawn on an enlarged scale.

FIG. 3 is an exploded view of our doll's limb attaching means illustrating the details of the various parts making up the attaching means.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, a doll, indicated generally by the reference character 10, incorporating our attaching means includes a torso 12, the skin of which is molded from a suitable soft synthetic resin such as polyvinyl chloride by any appropriate molding method. Preferably we rotational mold the torso 12. The torso 12 is formed with a head support 14 opening into the interior of the skin and provided with a peripheral retaining flange 16 adapted to be inserted within the head 18 so as to retain the head on the body in a manner known to the art. The neck 20 formed as an integral part with the head extends down to the shoulder portion of the torso. The torso 12 contains a filling 22 of any suitable material. For example, in a manner to be described hereinafter, we provide the torso 12 with a filling of flexible polyurethane foam. This material provides a softer, lighter and more desirable doll than does the polyvinyl chloride foam filling of the type used in the prior art. Polyurethane foam can be cured at room temperature.

The doll 10 includes a right arm 24, a left arm 26, a right leg 28, and a left leg 30. All of these limbs are secured to the torso 12 by our attaching means to be described in detail hereinafter.

One of our attaching means indicated generally by the reference character 32 secures the left leg 30 to the torso 12. In the course of molding the skin of the torso 12, we form a recess 34 in the left hip region of the torso. Similar recesses are formed at the locations at which the right arm, the right leg and the left arm are to be secured to the torso. If desired, we may provide the recess 34 with a central locating boss 36. The attaching means 32 includes a first cup-like socket-forming element 38 which may, for example, be injection molded from a polyvinyl chloride to form an element which is rigid as contrasted with the soft vinyl skin. We mold the member 38 with a central boss 40 having a frusto-conical shape. We form a central opening 42 in the top wall 44 of the boss 40. At the same time, in the course of the molding operation, we form opposite pairs of slots 46 and 48 which divide the upper portion of the boss into a plurality of resilient fingers 50. In molding the element 38 we form the top 44 of the boss 40 with a thickness which tapers from a generally thicker region adjacent to the hole 42 to a thinner region at the periphery for a reason to be explained hereinafter. As will be explained hereinafter, before filling the torso 12 with the material 22, we cement the members 38 associated with the arms and legs in place in the recesses provided therefor.

We form the end of the leg 30 to be attached to the torso 12 with a recessed portion 52 having a central filling opening 54. We provide this recessed portion 52
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with a gas exhaust port 56 at one side of the filling
opening 54.

We injection mold a cup-like plug-mounting member
58 provided with a central recess 60 surrounding a fill-
ing opening 62. We also form a gas exhaust port 64 in
the member 58 outside the recess 60. Before filling the
leg 30 in a manner to be described, we cement the cup-
like member 58 in the recess 52 with openings 54 and
62 in registry and with the two gas exhaust ports 56 and
64 aligned. An injection molded plug 66 connected to
a base plate 68 by a neck 70 make up a plug-forming
member which is adapted to be cemented in position
within the recess 60 after the arm has been filled with
the foamed plastic. We may form the parts 38, 58 and
66 from any suitable material such, for example, as
“CYCOLAC” which is the registered trademark of
Marbon Chemical Division, Borg-Warner Corporation,
of Gary, Indiana, for a high-impact, styrene-type, rigid
thermoplastic resin suitable for injection molding.

In making a doll 10 incorporating our means 32 for
attaching the limbs thereto, we first make the head in
the usual manner and then mold the skins of the torso
12, arms 24 and 26, and legs 28 and 30, from a material
such as soft polyvinyl chloride by a rotational molding
technique. Next, we injection mold the relatively rigid
parts including the cup-like member 38 having the boss
40 with its top 44 having an opening 42 as well as slots
46 and 48 providing the resilient fingers, the cup-like
member 58 having the recess 60 with the filling open-
ing 62 and the plug 66 connected by the neck 70 to the
base 68. After those parts have been injection molded,
the members 38 and 58 are adhered in the respective
cavities 34 and 52 in the torso and in the ends of the
limbs. It will readily be appreciated that the elements
making up the leg-connecting means are the same as
those making up the arm-connecting means but are of
a somewhat larger size. Further in adhering the mem-
ber 58 in the recess 52 the openings 62 and 54, as well
as the vent holes 64 and 56 are aligned.

Next, the filling operation takes place. We fill the
torso skin 12 and the arms and legs with a flexible poly-
urethane foam with the filling and foaming operations
performed at room temperature. The operation of fill-
ing the torso skin can be performed through the neck
opening within the flange 16 without the necessity of
providing any separate vent holes. In the course of fill-
ing the limbs such, for example, as the arm 26, the foam
may be inserted through the aligned openings 62 and
54 and the gases are permitted to escape through the
vent holes 64 and 56 in the course of the curing op-
eration. When the filling operation is complete the base 68
is inserted in the recess 60 and adhered in place by use
of a suitable cement.

When all of the parts have thus been made and foam
filled, the neck portion of the head 18 is assembled
over the flange 16. Similarly, the plugs 66 of all of the
limbs are inserted in the openings 42 of their associated
socket members 38. The doll is now completely assem-
bled.

In use of a doll incorporating our means for attach-
ing the limbs thereto, each limb is capable of a full 360°
of rotation around an axis which is substantially that of
the neck 70 connecting the plug 66 to base 68. In addi-
tion, our construction permits of a limited movement
of the limb in a direction perpendicular to the axis of
pivotal movement. By way of example, we have illus-
trated an alternate position of the left leg 30 in broken
lines in Fig. 1.

It is to be noted that we form the underside of the top
44 of the boss 40 with a slope of about 12°. This slope
ensures that the limb is securely retained in position on
the torso. If an attempt is made to remove the limb as
by moving it beyond a limited amount in a direction
perpendicular to its axis of pivotal movement, the
result is a wedging action which acts in a direction per-
pendicular to the sloped undersurface to offer resist-
ance to that movement.

It will be seen that we have accomplished the objects
of our invention. We have provided a means for attach-
ing limbs to a doll’s torso which overcomes the defects
of attaching means of the prior art. It enables us to fill
the doll with foam at room temperature. It enables us
to form a softer, more natural-feeling doll. It further en-
ables us to produce a foam-filled jointed doll at less
cost than is possible with joint-forming means of the
prior art.

It will be understood that certain features and sub-
combinations are of utility and may be employed with-
out reference to other features and subcombinations.
This is contemplated by and is within the scope of our
claims. It is further obvious that various changes may
be made in details within the scope of our claims with-
out departing from the spirit of our invention. It is,
therefore, to be understood that our invention is not to
be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. In a doll, an assembly including a torso skin of rela-
tively soft synthetic resin formed with a joint recess, a
generally cup-shaped socket-forming member of rela-
tively rigid synthetic resin secured in said recess, said
socket-forming member having a frusto-conical boss
provided with an end wall having an opening therein,
said boss being provided with slots extending into said
opening to form a plurality of resilient fingers around
said opening, a filling of foamed synthetic resin in said
torso skin, a filled limb on said doll, said limb com-
prising a limb skin of relatively soft synthetic resin and
a filling of foamed synthetic resin in said limb skin, said
limb skin having a joint recess, a generally cup-shaped
plug-mounting member of relatively rigid synthetic
resin secured in said limb joint recess, said limb having
means enabling the filling of the limb skin with the
foamed resin after said plug-mounting member has
been secured in said limb joint recess, said means com-
prising a filling opening and gas vent in said limb skin
recess and a corresponding filling opening and gas vent
in said plug-mounting member and registering with said
limb recess filling openings and gas vent, and a plug
member of relatively rigid synthetic resin comprising a
base plate and a frusto-conical head and a neck con-
necting said head to said base plate, said base plate se-
cured in said plout-mounting member over the filling
opening thereof on the surface facing away from said
limb joint recess, said head adapted to be inserted into
said boss through the boss opening and to be retained
therein by said fingers.

2. An assembly as in claim 1 in which said boss end
wall tapers radially outwardly from said opening.

3. An assembly as in claim 2 in which said wall tapers
at an angle of about 12°.

4. In a doll an assembly including a torso comprising
a skin of relatively soft synthetic resin formed with a
joint recess, and a filling of foamed synthetic resin in said torso, a socket-forming member of relatively rigid synthetic resin having a frusto-conical boss provided with an end wall having an opening therein, said boss being provided with slots extending into said opening to form a plurality of resilient fingers around said opening, a plug-forming member of relatively rigid synthetic material, a filled limb on said doll, said limb comprising a limb skin of relatively soft synthetic resin and a filling of foamed synthetic resin in said limb skin, said limb skin having a joint recess formed with a filling opening and a gas vent, first means mounting said socket-forming member in one of said recesses, and second means mounting said plug-forming member in the other of said recesses, the mounting means associated with said limb joint recess comprising a cup-shaped member of relatively rigid synthetic resin, a filling opening and gas vent corresponding to the opening and vent in the limb skin recess to enable the filling of the limb skin with the foamed resin after said cup-shaped member has been secured in said limb recess.

5. An assembly as in claim 4 in which said cup-shaped member is formed with a recess around said filling opening, said plug-forming member including a base plate and a plug and a neck connecting said base plate to said plug, said vent being outside said cup-shaped member recess, said base plate being received in said cup-shaped member recess and adapted to cover said filling opening.

6. An assembly as in claim 5 in which said socket-forming member is on said torso and said plug is on said limb.

7. An assembly as in claim 6 in which said plug is frusto-conical.

8. An assembly as in claim 7 in which said base end wall is tapered radially outwardly from said opening.

9. An assembly as in claim 8 in which said plug and neck and base plate are formed as an integral unit.

10. An assembly as in claim 4 in which said second mounting means is associated with said limb joint recess and in which said plug-forming member comprises a base plate, said cup-shaped member being assembled in said limb joint recess with the filling opening aligned with said limb joint recess opening, said plug-forming member being assembled on said cup-shaped member with said base plate covering said filling opening.

11. An assembly as in claim 10 in which said skins are polyvinyl chloride and in which said foamed resin is a polyurethane.

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