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Kosicki et al.

[11] **3,881,276**

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[54] **DOLL INCLUDING A JOINT MEMBER WITH FILLING OPENING AND GAS VENT THEREIN**

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Related U.S. Application Data

[63] Continuation of Ser. No. 311,227, Dec. 1, 1972, abandoned.

[52] **U.S. Cl.** **46/162;** 29/443; 29/453; 156/79

[51] **Int. Cl.** **A63h 3/46**

[58] **Field of Search** 273/DIG. 8; 46/162, 163, 46/173, 161; 29/443, 453; 156/79

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Attorney, Agent, or Firm—Shenier & O'Connor

[57] **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

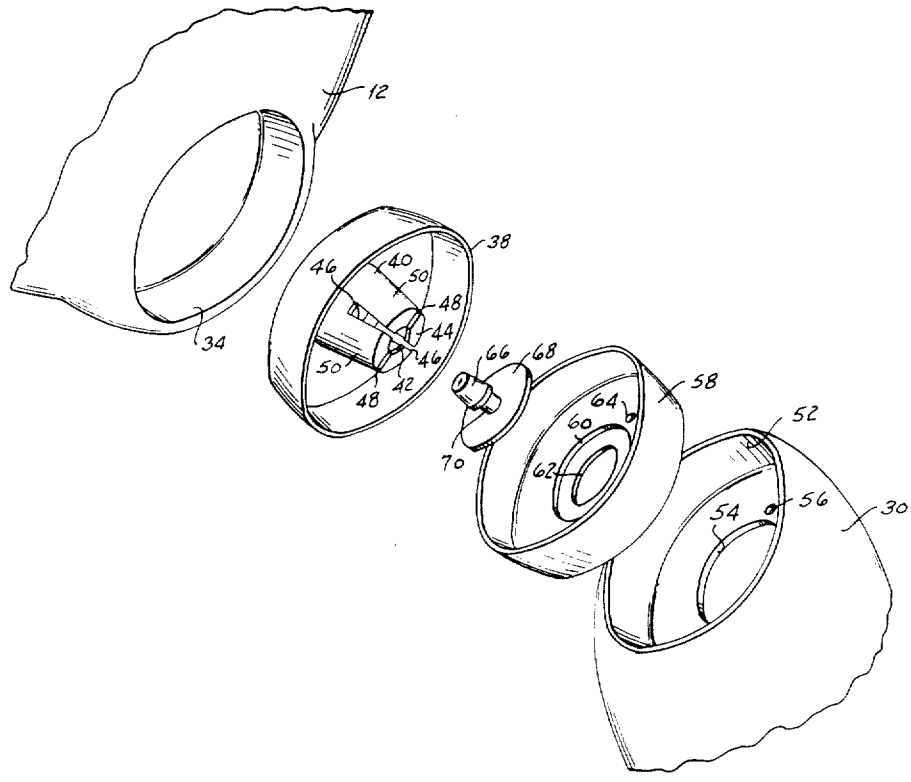


Fig 2

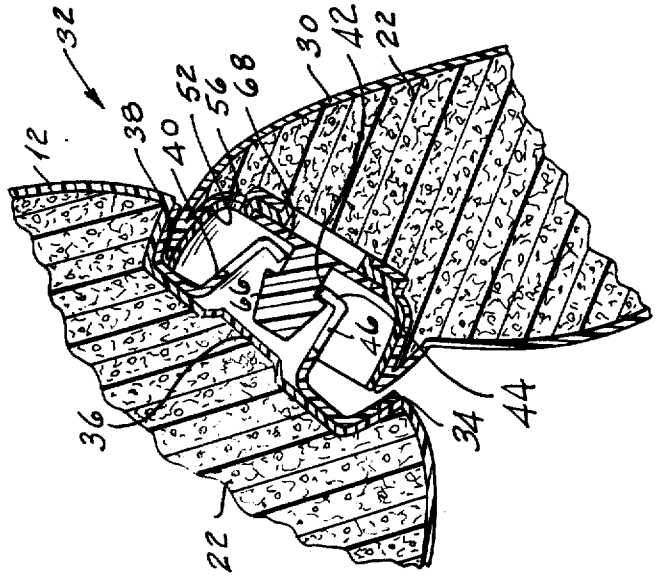

32
12
38
40
52
56
68
30
42
22
36
46
34
44
22

Fig 1

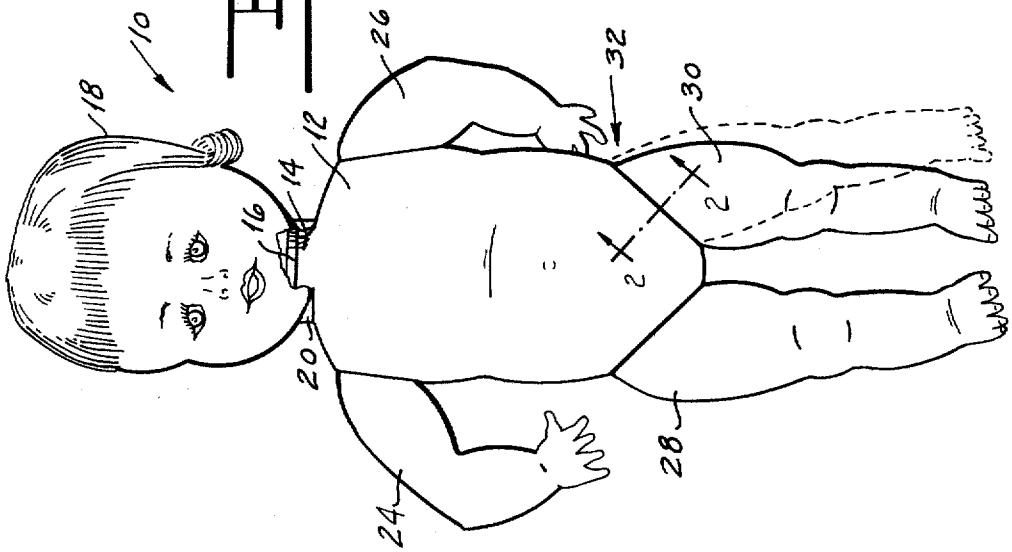
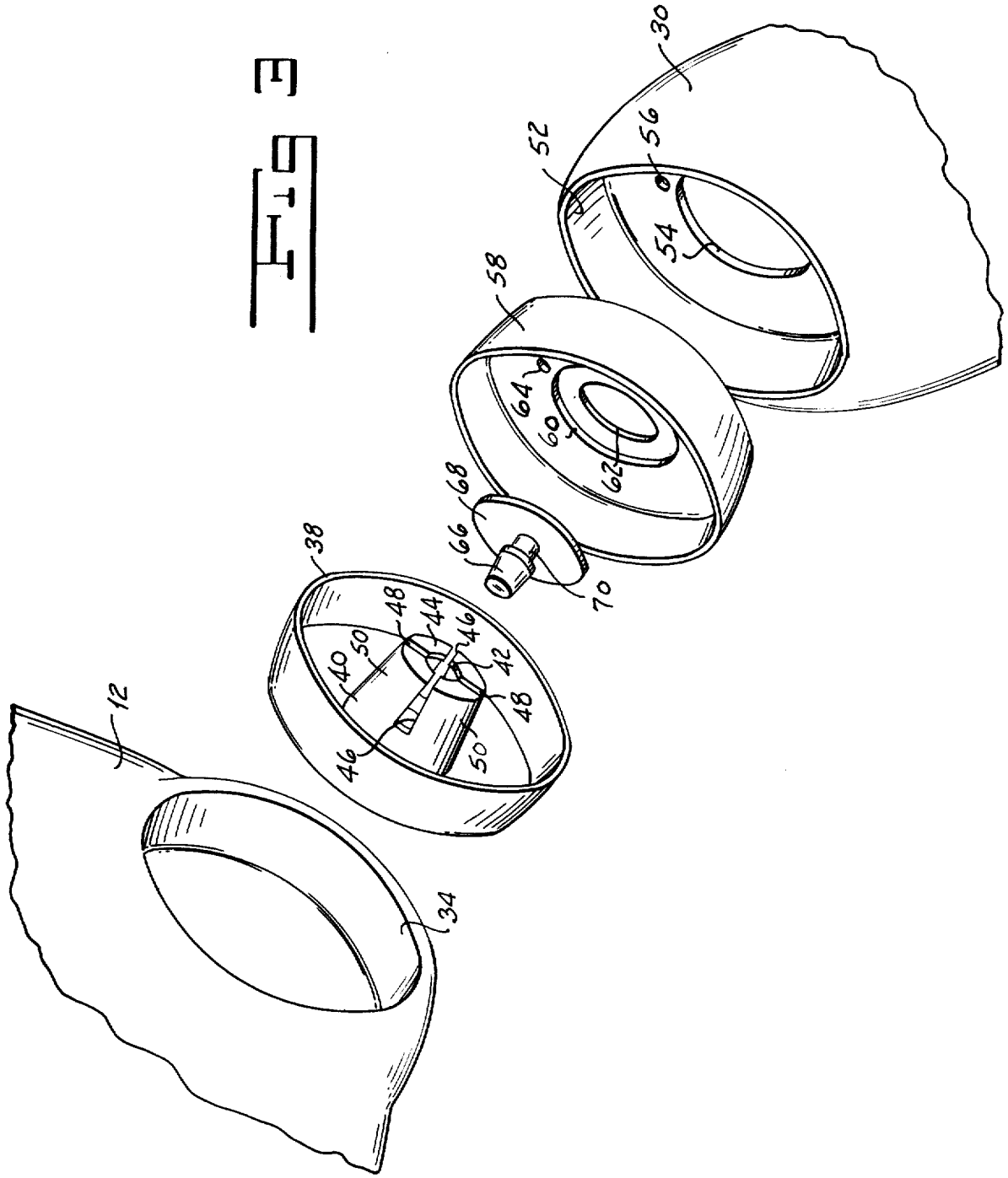

10
18
26
32
30
12
14
16
2
2
20
28
24

FIG. 5



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 hereinbelow.

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 hereinbelow. As will be explained hereinbelow, 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**

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 filling 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 opening **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 recesses **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 member **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 polyurethane foam with the filling and foaming operations performed at room temperature. The operation of filling 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 filling 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 operation. 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 assembled.

In use of a doll incorporating our means for attaching 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 addition, 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 illustrated 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 perpendicular to the sloped undersurface to offer resistance to that movement.

It will be seen that we have accomplished the objects of our invention. We have provided a means for attaching 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 enables 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 subcombinations are of utility and may be employed without 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 without 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 relatively soft synthetic resin formed with a joint recess, a generally cup-shaped socket-forming member of relatively 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 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, 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 comprising 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 opening and gas vent, and a plug member of relatively rigid synthetic resin comprising a base plate and a frusto-conical head and a neck connecting said head to said base plate, said base plate secured in said plut-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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