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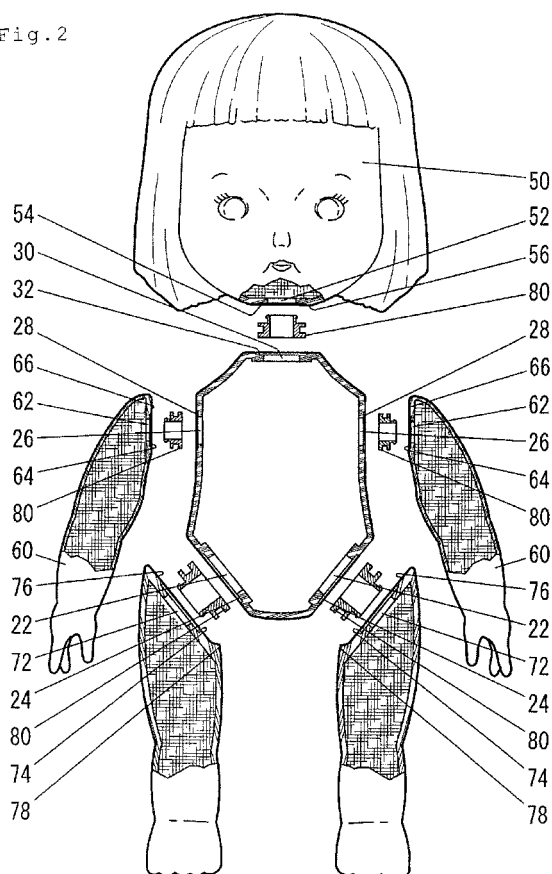
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(54) **Doll toy**

(57) The invention provides a doll toy of which the head part (50), arm parts (60) and leg parts (70) are slidable and which is stably supported in the standing or sitting pose. A trunk part (20) has a head mounting hole (30), arm mounting holes (26) and leg mounting holes (22), where the leg mounting holes each have a central axis obliquely down to the front. The leg parts (70) each have a ring mounting recessed part (74) and a flat sliding contact surface (76) along the peripheral edge of the ring mounting recessed part (74), where they are inclined to the leg part and a protruded stepping part is formed so as to connect the lower peripheral edge of the sliding contact surface and the upper end of the inner thigh part of the leg part, and the head part, arm parts and leg parts are turnably fit to the trunk part by a connection ring.

Fig. 2



Description

[0001] This invention relates to a doll toy, the head part, arm parts and leg parts of which can be freely moved.

[0002] Conventionally, a doll, the head part, arm parts and leg parts of which can be freely moved, is provided, for example, such as described in Japanese Patent Application Publication h10-33833 "INTERNAL STRUCTURE FOR DOLL AND DOLL", where the doll has an upper portion structure body which is internally fitted in the upper part of the body or constitutes the upper portion itself, a slender long-length body for an arm core which is fit to the upper portion structure body so as to extend in the direction of both sides thereof and can be freely bent and keep the bent shape, a pair of the slender long-length bodies for leg cores which are fit to the upper portion structure body so as to extend in the lower side direction and can be freely bent and keep the bent shape, and flexible freely bendable bend limiting bodies which cover the long-length body for the arm core and long-length bodies for leg cores and limits the bending angle from the outer periphery of the long-length bodies so that the curvature radius for the bending of these long-length bodies may become a specified value or higher. The arms and legs of this doll may be freely bent, and by arranging the freely bendable bend limiting bodies, the inner wire of the long-length bodies may be smoothly bent many times without undulating even if the arms and legs are repetitively bent.

[0003] In the prior art, the pose of the doll is not deformed unless relatively large force is given for bending the wire metal in changing the pose. And, the wire metal hardly extends because being repetitively bent, thus, the balance position of the doll is not stable and the doll can not be stand right enough in standing pose. In addition, the doll has little flexibility because being metal bars to be the core material in the center of arm parts and leg parts.

[0004] In another prior art, a toy doll which is formed from a polyvinyl chloride is provided, the joint connecting parts of this doll are also formed from the polyvinyl chloride. The pose of the doll is changed by changing the shape of the joint connecting parts by pushing hard, thus, this causes the head part, arm parts or leg parts to be lost.

[0005] The present invention was made for solving the problem of the above prior art, the object thereof is to provide a doll toy, the head part, arm parts and leg parts of which can be slidably moved, where the doll is stably supported when being taken various posing such as standing pose or sitting pose, and has the flexibility.

[0006] The above object is accomplished by providing a doll toy having a trunk part, a head part, right and left arm parts and right and left leg parts, wherein the trunk part has a head mounting hole, right and left arm mounting holes and right and left leg mounting holes, where the right and left leg mounting holes each have a central axis obliquely down to the front, the right and left leg parts

each have a ring mounting hole for mounting a connection ring thereto, a ring mounting recessed part along the peripheral edge of the ring mounting hole and a planate sliding contact surface along the peripheral edge of the ring mounting recessed part, where the ring mounting recessed part and sliding contact surface are inclined with respect to the axial direction of the leg part and a protruded stepping part is formed so as to connect the lower peripheral edge of the sliding contact surface and the upper end of the inner thigh part of the leg part, and the right and left arm parts each have a ring mounting hole in the base thereof, wherein the connection ring comprises a large diameter cylinder part, a large diameter flange part and middle flange part which are protruded from the outer periphery of both ends of the large diameter cylinder part, a small diameter cylinder part which is provided on the middle flange part so as to be coaxial with the large diameter cylinder part, and a small diameter flange part which is protruded from the outer periphery of the end of the small diameter cylinder part, where the connection ring is fixed by being bonded to the arm parts and leg parts in the middle flange part and small diameter flange part and is slidably fit to the trunk part in the middle flange part and large diameter flange part.

[0007] In this, a doll toy comprises a trunk part, a head part, right and left arm parts and right and left leg parts, wherein the trunk part has a head mounting hole, right and left arm mounting holes and right and left leg mounting holes, where the right and left leg mounting holes each have a central axis obliquely down to the front, the right and left leg parts each have a ring mounting hole for mounting a connection ring thereto, a ring mounting recessed part along the peripheral edge of the ring mounting hole and a planate sliding contact surface along the peripheral edge of the ring mounting recessed part, where the ring mounting recessed part and sliding contact surface are inclined with respect to the axial direction of the leg part and a protruded stepping part is formed so as to connect the lower peripheral edge of the sliding contact surface and the upper end of the inner thigh part of the leg part, and the right and left arm parts each have a ring mounting hole in the base thereof, wherein the connection ring comprises a large diameter cylinder part, a large diameter flange part and middle flange part which are protruded from the outer periphery of both ends of the large diameter cylinder part, a small diameter cylinder part which is provided on the middle flange part so as to be coaxial with the large diameter cylinder part, and a small diameter flange part which is protruded from the outer periphery of the end of the small diameter cylinder part, where the connection ring is fixed by being bonded to the arm parts and leg parts in the middle flange part and small diameter flange part and is slidably fit to the trunk part in the middle flange part and large diameter flange part. Therefore, a doll toy, arm parts and leg parts of which are freely slidable so as to keep the pose stably various pose such as standing pose or sitting pose, can

be provided.

[0008] The present invention is characterized in that the head part has a ring mounting hole for mounting a connection ring in the base thereof, where the connection ring is fixed by being bonded to the ring mounting hole of the head part in the middle flange part and small diameter flange part, and is slidably fit to the trunk part in the middle flange part and large diameter flange part of the connection part.

[0009] In this, the head part has a ring mounting hole for mounting a connection ring in the base thereof, and the connection ring is fixed by being bonded to the ring mounting hole of the head part in the middle flange part and small diameter flange part. And, the head part is slidably fit to the trunk part in the middle flange part and large diameter flange part of the connection ring, thus, the head part can be slide in the same way as arm parts and leg parts and can be turned.

[0010] The present invention is characterized in that the connection ring and trunk part are formed from a rigid resin and the head part, arm parts and leg parts are formed from a flexible resin.

[0011] By forming connection rings fixed by being bonded to the head part, arm parts and leg parts and the trunk part from the rigid resin, the head part, arm parts and leg parts can be prevented from being dropped out from the trunk part. In addition, by forming the head part, arm parts and leg parts from the flexible resin, a doll toy which head part, arm parts and leg parts are very flexible can be provided.

[0012] The present invention is characterized in that the head part, arm parts and leg parts are formed in hollow and are wadded with cotton.

[0013] Therefore, by forming the head part, arm parts and leg parts in hollow and wadding them with cotton, the flexibility of the doll toy can be adjustable.

[0014] The present invention is also characterized in that micro asperities are formed in the sliding contact surfaces.

[0015] Therefore, by forming the micro asperities in the sliding contact surfaces, the sliding contact surfaces of the head part, arm parts and leg parts can be slide with a relatively small force with respect to peripheral surfaces of the head mounting hole, arm mounting holes and leg mounting holes of the trunk part, thus, the head part, arm parts and leg parts can be turned. In addition, the micro asperities can prevent the head part, arm parts and leg parts from being carelessly turned.

[0016] An example of a toy doll according to the invention will now be described with reference to the accompanying drawings, in which:-

Fig. 1 is a plan view of a doll toy;

Fig.2 is an exploded sectional view of the doll toy of Figure 1;

Fig.3 is a partial sectional view of the doll toy;

Fig.4 is a view showing a connection ring which is a joint of the doll toy; and,

Fig.5 is a view showing the sitting pose of the doll toy.

[0017] A doll toy comprises a trunk part, a head part, right and left arm parts and right and left leg parts, wherein the trunk part has a head mounting hole, right and left arm mounting holes and right and left leg mounting holes, where the right and left leg mounting holes each have a central axis obliquely down to the front, the right and left leg parts each have a ring mounting hole for mounting a connection ring thereto, a ring mounting recessed part along the peripheral edge of the ring mounting hole and a planate sliding contact surface along the peripheral edge of the ring mounting recessed part, where the ring mounting recessed part and sliding contact surface are inclined with respect to the axial direction of the leg part and a protruded stepping part is formed so as to connect the lower peripheral edge of the sliding contact surface and the upper end of the inner thigh part of the leg part, and the right and left arm parts each have a ring mounting hole in the base thereof, wherein the connection ring comprises a large diameter cylinder part, a large diameter flange part and middle flange part which are protruded from the outer periphery of both ends of the large diameter cylinder part, a small diameter cylinder part which is provided on the middle flange part so as to be coaxial with the large diameter cylinder part, and a small diameter flange part which is protruded from the outer periphery of the end of the small diameter cylinder part, where the connection ring is fixed by being bonded to the arm parts and leg parts in the middle flange part and small diameter flange part and is slidably fit to the trunk part in the middle flange part and large diameter flange part.

[0018] The head part has a ring mounting hole for mounting a connection ring in the base thereof, where the connection ring is fixed by being bonded to the ring mounting hole of the head part in the middle flange part and small diameter flange part, and is slidably fit to the trunk part in the middle flange part and large diameter flange part of the connection ring. The connection ring and trunk part are formed from a rigid resin and the head part, arm parts and leg parts are formed from a flexible resin, and the head part, arm parts and leg parts can be formed in hollow and can be wadded with cotton. Additionally, micro asperities can be formed in the sliding contact surfaces.

[0019] The doll toy main body 10 comprises a trunk part 20, a head part 50, right and left arm parts 60 and right and left leg parts 70. Although the doll toy main body 10 of the embodiment is formed in the image of a girl, it may be formed in the image of various figures such as imaginary characters, robots and animals.

[0020] The trunk part 20 is formed in hollow with ABS (Acrylonitrile Butadiene Styrene) resin which is a rigid resin. And the trunk part 20 is formed in the image of a trunk part of a girl and consists of two members, front part and back part (not shown). A round head mounting hole 30 for fitting the head part 50, which has a central

axis toward upwards of the trunk part 20, is formed on the top of the trunk part 20. An annular recessed part 32 being coaxial with the head mounting hole 30 is formed around the head mounting hole 30.

[0021] In addition, arm mounting holes 26 for fitting the arm parts 60, which have each a central axis toward horizontal direction of the trunk part 20, are formed on right and left both side of the trunk part 20. An annular recessed part 28 being coaxial with the arm mounting hole 26 is formed around each arm mounting hole 26.

[0022] Additionally, leg mounting holes 22 for fitting the leg parts 70, which have each a central axis obliquely down to the front of the trunk part 20, are formed on right and left both side of lower parts of the trunk part 20. An annular recessed part 24 being coaxial with the leg mounting hole 22 is formed around each leg mounting hole 22.

[0023] As described above, a total of five mounting holes, the head mounting hole 30, right and left arm mounting holes 26 and right and left leg mounting holes 22, are formed on the trunk part 20. Each of the head mounting hole 30, right and left arm mounting holes 26 and right and left leg mounting holes 22 have its own hole diameters, in the embodiment, the leg mounting holes 22 are formed to the largest size and the arm mounting holes 26 are formed to the smallest size.

[0024] The head part 50 is formed in hollow with non-phthalate polyvinylchloride (PVC) resin which is a flexible resin, and it is formed in the image of a head part of a girl. A round ring mounting hole 52 is formed on the base part of the head part 50, and an annular ring mounting recessed part 54 being coaxial with the ring mounting hole 52 is formed around the ring mounting hole 52. And, a flat sliding contact surface 56 is formed around the ring mounting recessed part 54. In addition, facial parts forming the face of doll such as eyes, nose, mouth and ears are drawn or formed in the head part 50.

[0025] In addition, the head part 50 may be disposed with an eye ball mechanism which eyes are closed and opened according to inclination and declination of the head part 50 and may be had a hair made from an acrylic fiber and the like so as to form a head hair.

[0026] The arm parts 60 are, as with the head part 50, formed in hollow with non-phthalate PVC resin which is a flexible resin, and they are formed in the image of arm parts of a girl. A round ring mounting hole 62 is formed on the base part of each arm part 60, and an annular ring mounting recessed part 64 being coaxial with the ring mounting hole 62 is formed around each ring mounting hole 62. And, a flat sliding contact surface 66 is formed around each ring mounting recessed part 64.

[0027] And, the leg parts 70 are, as with the head part 50 and arm parts 60, formed in hollow with non-phthalate PVC resin which is a flexible resin, and they are formed in the image of leg parts of a girl. A round ring mounting hole 72 is formed on the base part of each leg part 70, and an annular ring mounting recessed part 74 being coaxial with the ring mounting hole 72 is formed around

each ring mounting hole 72. And a flat sliding contact surface 76 is formed around each ring mounting recessed part 74. The sliding contact surface 76 is inclined with respect to the axial direction of the leg part 70 and a protruded stepping part 78 is formed so as to connect the lower peripheral edge of the sliding contact surface 76 and the upper end of the inner thigh part of the leg part 70. By forming the protruded stepping part 78 connecting to the inner thigh of the leg part 70 as described above, this will keep stiffness property in the inner thigh of the leg part 70 made from non-phthalate PVC resin which is a flexible resin, thus this enable thighs of the doll toy main body 10 not to be widely spread from side to side, so that the doll toy main body 10 can be stably stood. Additionally, relatively thick leg parts made from in the image of a girl's legs can be produced.

[0028] A connection ring 80 will be now described referencing Fig. 2 and Fig. 4. The connection ring 80 consists of a short cylindrical large diameter cylinder part 84, a large diameter flange part 90 circularly protruded from the outer periphery of one end of the large diameter cylinder part 84, a middle flange part 88 circularly protruded from the outer periphery of other end of the large diameter cylinder part 84, a short cylindrical small diameter cylinder part 82 provided on the middle flange part 88 so as to be coaxial with the large diameter cylinder part 84 and a small diameter flange part 86 circularly protruded from the end of the small diameter cylinder part 82. The hole penetrated the large diameter cylinder part 84 and small diameter cylinder part 82 is opened so as to be an opening 92. Also, the connection ring 80 is formed from an ABS resin which is a rigid resin.

[0029] The connection ring 80 has a various size so as to fit the head part 50, right and left arm parts 60 or right and left leg parts 70, where the connection ring 80 for the leg part 70 is formed so as to be largest and the connection ring 80 for the arm part 60 is formed so as to be smallest. Total number of five connection rings 80, one for the head part 50, two for right and left arm parts 60 and two for right and left leg parts 70, are provided.

[0030] One of connection rings 80 is fixed by being bonded to the head part 50 so as to hold the ring mounting recessed part 54 of the ring mounting hole 52 of the head part 50 with the small diameter flange part 86 and middle flange part 88. And, two of connection rings 80 are, as with the connection ring 80 fixed to the head part 50, each fixed by being bonded to the right and left arm part 60 so as to hold the ring mounting recessed part 64 of the ring mounting hole 62 of each arm part 60 with the small diameter flange part 86 and middle flange part 88. Also, two of connection rings 80 are, as with the connection rings 80 fixed to the head part 50 and arm parts 60, each fixed by being bonded to the right and left leg part 70 so as to hold the ring mounting recessed part 74 of the ring mounting hole 72 of each leg part 70 with the small diameter flange part 86 and middle flange part 88.

[0031] The head part 50 which the connection ring 80 is fixed to is fit to the trunk part 20 so that a periphery of

the head mounting hole 30 of the trunk part 20 is slidably held with the middle flange part 88 and large diameter flange part 90 of the connection ring 80 while the middle flange part 88 is in contact with the annular recessed part 32 of the head mounting hole 30. In this the head part 50 is turnable to the right and left relative to the doll toy main body 10.

[0032] As with the head part 50 which the connection ring 80 is fixed to, the arm parts 60 which the connection ring 80 is each fixed to are fit to each trunk part 20 so that a periphery of the arm mounting hole 26 of the trunk part 20 is slidably held with the middle flange part 88 and large diameter flange part 90 of the connection ring 80 while the middle flange part 88 is in contact with the annular recessed part 28 of the arm mounting hole 26. In this the right and left arm parts 60 are each vertically turnable relative to the doll toy main body 10.

[0033] And, as with the head part 50 and arm parts 60 which the connection ring 80 is each fixed to, the leg parts 70 which the connection ring 80 is each fixed to are fit to each trunk part 20 so that a periphery of the leg mounting hole 22 of the trunk part 20 is slidably held with the middle flange part 88 and large diameter flange part 90 of the connection ring 80 while the middle flange part 88 is in contact with the annular recessed part 24 of the leg mounting hole 22. In this the right and left leg parts 70 are each turnable about the central axis in obliquely down to the front relative to the doll toy main body 10.

[0034] From the constitution described above, the right and left leg parts 70 are substantially parallel each other in the standing pose of the doll toy main body 10 as shown in Fig. 1. Thus, since rigidity of the inner base part of the leg part is kept by forming the protruded stepping part 78 in the position of inner thigh of the right and left leg parts 70 each and the right and left leg parts 70 are prevented from being spread from side to side by being the protruded stepping part 78, the doll toy main body 10 can be very stably stood. While in the sitting pose of the doll toy main body 10 as shown in Fig.5, the right and left leg parts 70 are slightly opened when the right and left leg parts 70 are each turned by about 90 degrees in the forward direction, where the doll toy can be very stable sit with the buttock part being the lower part of the trunk part 20 of the doll toy main body 10 and the right and left leg parts 70.

[0035] By forming the trunk part 20 and connection rings 80 with the ABS resin which is a rigid resin, a doll toy, which the head part 50, right and left arm parts 60 and right and left leg parts 70 held to the trunk part 20 so as to be freely movable are prevented from being dropped out from the trunk part 20, can be provided. The friction between the ABS resins which are a rigid resin is reduced compared with the friction between the non-phthalate PVC resins which are a flexible resins or one of resins being a flexible resin. In this each part are slidably with relatively small force when being slid, so powerless infants can easily slide each part so as to change the pose of the doll toy main body 10.

[0036] In addition, as shown in Fig.4, by forming the micro asperities in either the sliding contact surfaces of each part, head part 50, right and left arm parts 60 and right and left leg parts 70 or the sliding contact surfaces 34 of the trunk part 20, the friction between the resins can be more reduced, thus, joint parts can be slid for bending with more little force to change the pose of the doll toy main body 10. And, in this embodiment, each sliding contact surfaces of the head part 50, right and left arm parts 60 and right and left leg parts 70 are formed with the non-phthalate PVC resin which is a flexible resin, whereby the friction generated between the sliding contact surfaces of them and the micro asperities of sliding contact surfaces 34 of the trunk part 20 can prevent each part from being turned inadvertently.

[0037] The air in the hollow head part 50, hollow right and left arm parts 60 and hollow right and left leg parts 70 can be sucked from the trunk part 20 and exhausted into the trunk part 20 via the openings 92 of the connection ring 80. Thereby, if the head part 50, right and left arm parts 60 and right and left leg parts 70 are pressed, the air pressure in each part does not increase because the air inside of each part is exhausted into the trunk part 20, thus the non-phthalate PVC resin which is a flexible resin can be prevented from being busted and unsticking of the fixed parts of the each part and connection ring 80 can be prevented.

[0038] A textile material such as cotton 94 can be filled in the hollow of the head part 50, right and left arm parts 60 and right and left leg parts 70, the flexibility in pressing the each part is adjustable by adjusting the filling amount of the textile material. Therefore, the doll toy main body 10 in which textile materials are filled can give the feeling soft when being hold or touched.

[0039] Though, in the case that a metal core is applied to joint part like a conventional doll toy, the metal core is broken because of metal fatigue by repeated bending and the safety problem such as generation of rust causes in case of submerging in water or hot water, the doll toy main body 10 of the embodiment is formed with resin members not metal members, thus, problems such as metal fatigue and generation of rust can be avoided. In addition, by using the ABS resin as a rigid resin and the non-phthalate PVC resin as a flexible resin for forming the doll toy main body, the doll toy main body 10 which is safe even if it is put in the mouth can be provided.

[0040] From the constitution described above, the present invention can provide a flexible doll toy of which the head part, arm parts and leg parts can be slidably moved and which is stably supported when being taken various posing such as standing pose or sitting pose. Although a preferred embodiment of the present invention has been described, those of skill in the art will appreciate that various and modifications may be made without departing from the spirit and scope thereof.

Industrial Applicability

[0041] As described above, the present invention can provide a flexible doll toy of which the head part, arm parts and leg parts can be slidably moved and which is stably supported when being taken various posing such as standing pose or sitting pose.

resin and the head part, arm parts and leg parts are formed from a flexible resin.

Claims

1. A doll toy having a trunk part, a head part, right and left arm parts and right and left leg parts, wherein the trunk part has a head mounting hole, right and left arm mounting holes and right and left leg mounting holes, where the right and left leg mounting holes each have a central axis obliquely down to the front, the right and left leg parts each have a ring mounting hole for mounting a connection ring thereto, a ring mounting recessed part along the peripheral edge of the ring mounting hole and a planate sliding contact surface along the peripheral edge of the ring mounting recessed part, where the ring mounting recessed part and sliding contact surface are inclined with respect to the axial direction of the leg part and a protruded stepping part is formed so as to connect the lower peripheral edge of the sliding contact surface and the upper end of the inner thigh part of the leg part, and the right and left arm parts each have a ring mounting hole in the base thereof, wherein the connection ring comprises a large diameter cylinder part, a large diameter flange part and middle flange part which are protruded from the outer periphery of both ends of the large diameter cylinder part, a small diameter cylinder part which is provided on the middle flange part so as to be coaxial with the large diameter cylinder part, and a small diameter flange part which is protruded from the outer periphery of the end of the small diameter cylinder part, where the connection ring is fixed by being bonded to the arm parts and leg parts in the middle flange part and small diameter flange part and is slidably fit to the trunk part in the middle flange part and large diameter flange part.
2. The doll toy of claim 1, wherein the head part has a ring mounting hole for mounting a connection ring in the base thereof, where the connection ring is fixed by being bonded to the ring mounting hole of the head part in the middle flange part and small diameter flange part, and is slidably fit to the trunk part in the middle flange part and large diameter flange part of the connection ring.
3. The doll toy of claim 1 or claim 2, wherein the connection ring and trunk part are formed from a rigid

4. The doll toy of any of the preceding claims, wherein the head part, arm parts and leg parts are hollow and are wadded with cotton.
5. The doll toy of any of the preceding claims, wherein the micro asperities are formed in the sliding contact surfaces.

Fig. 1

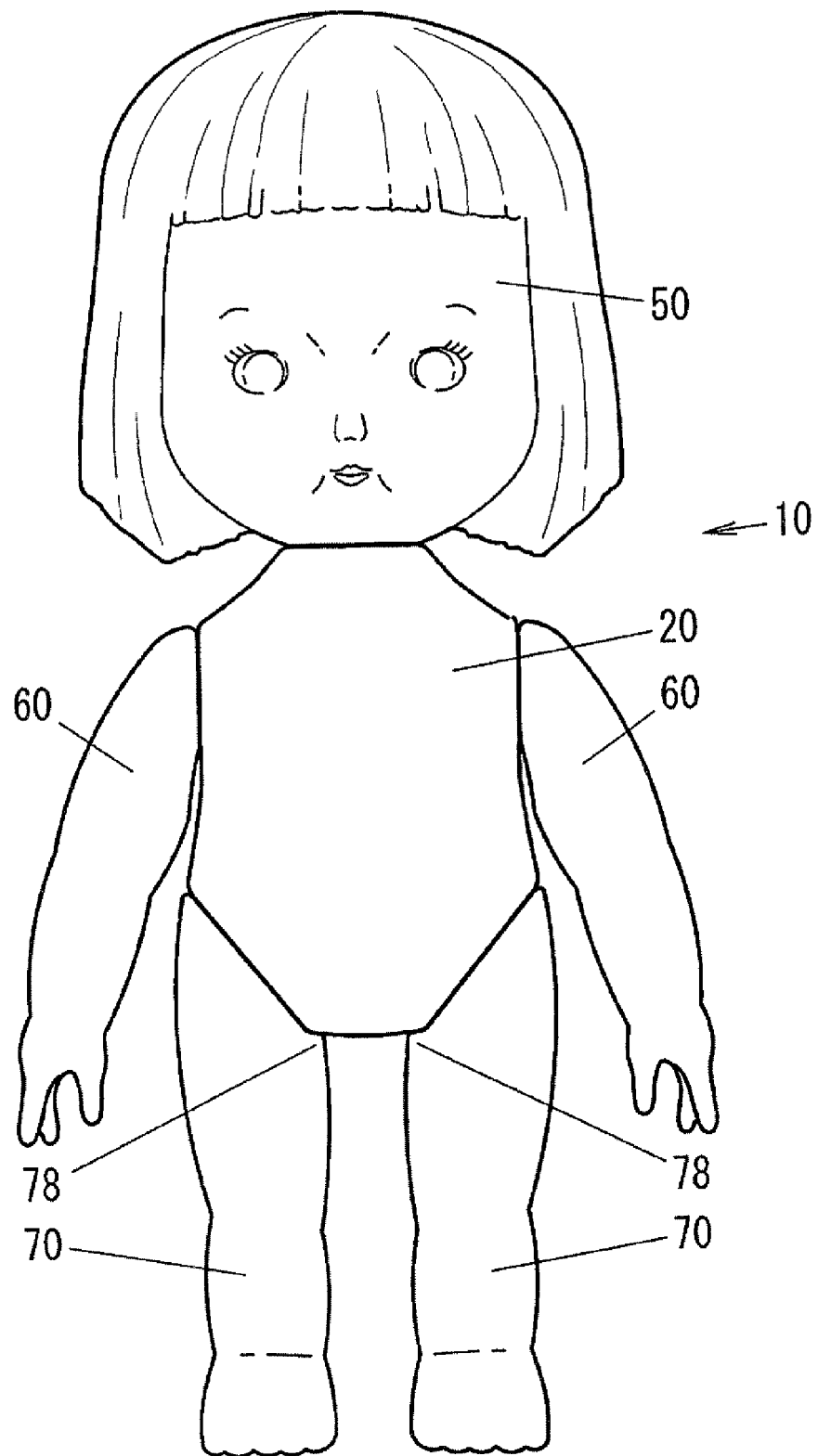


Fig. 2

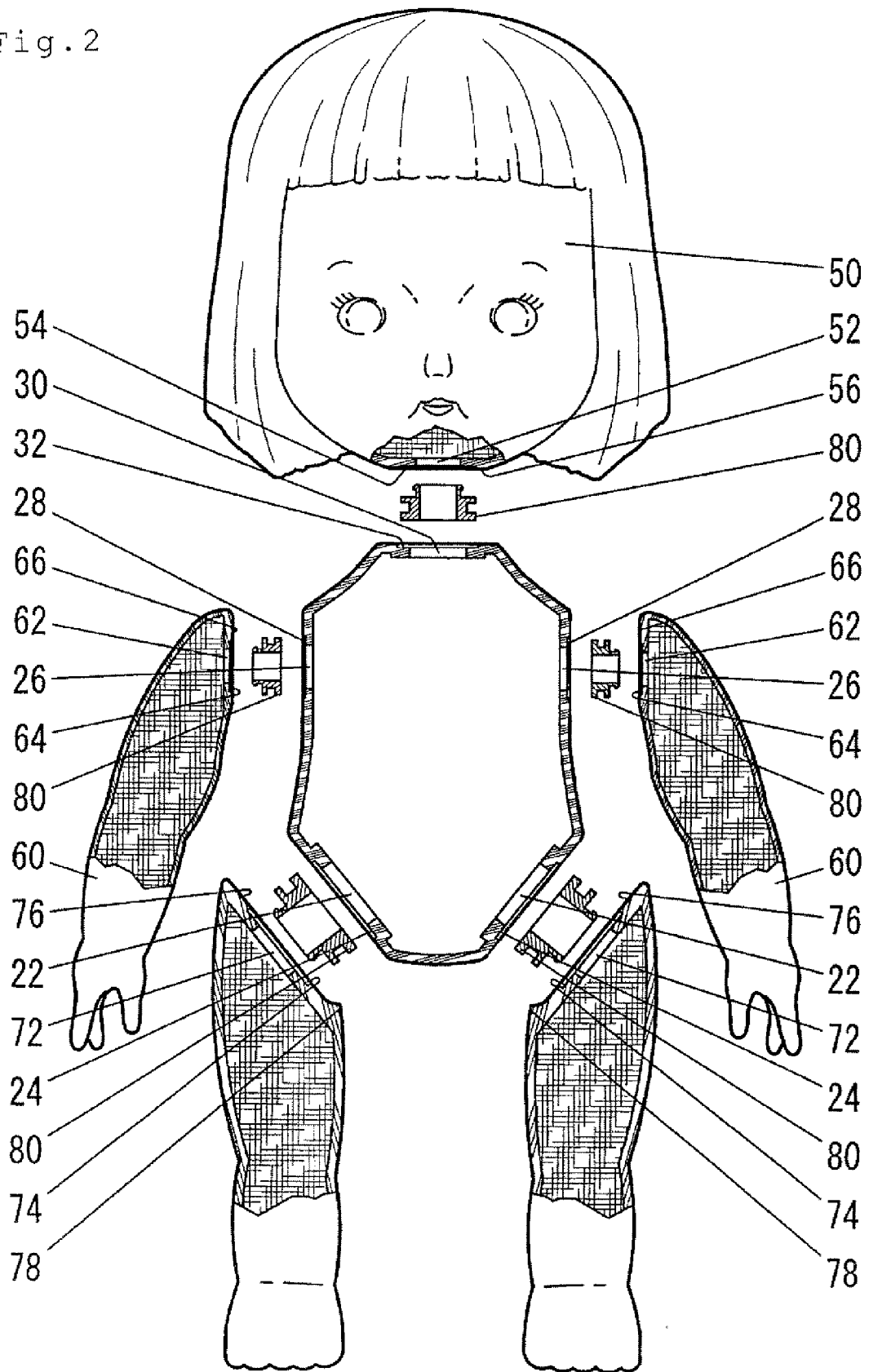


Fig. 3

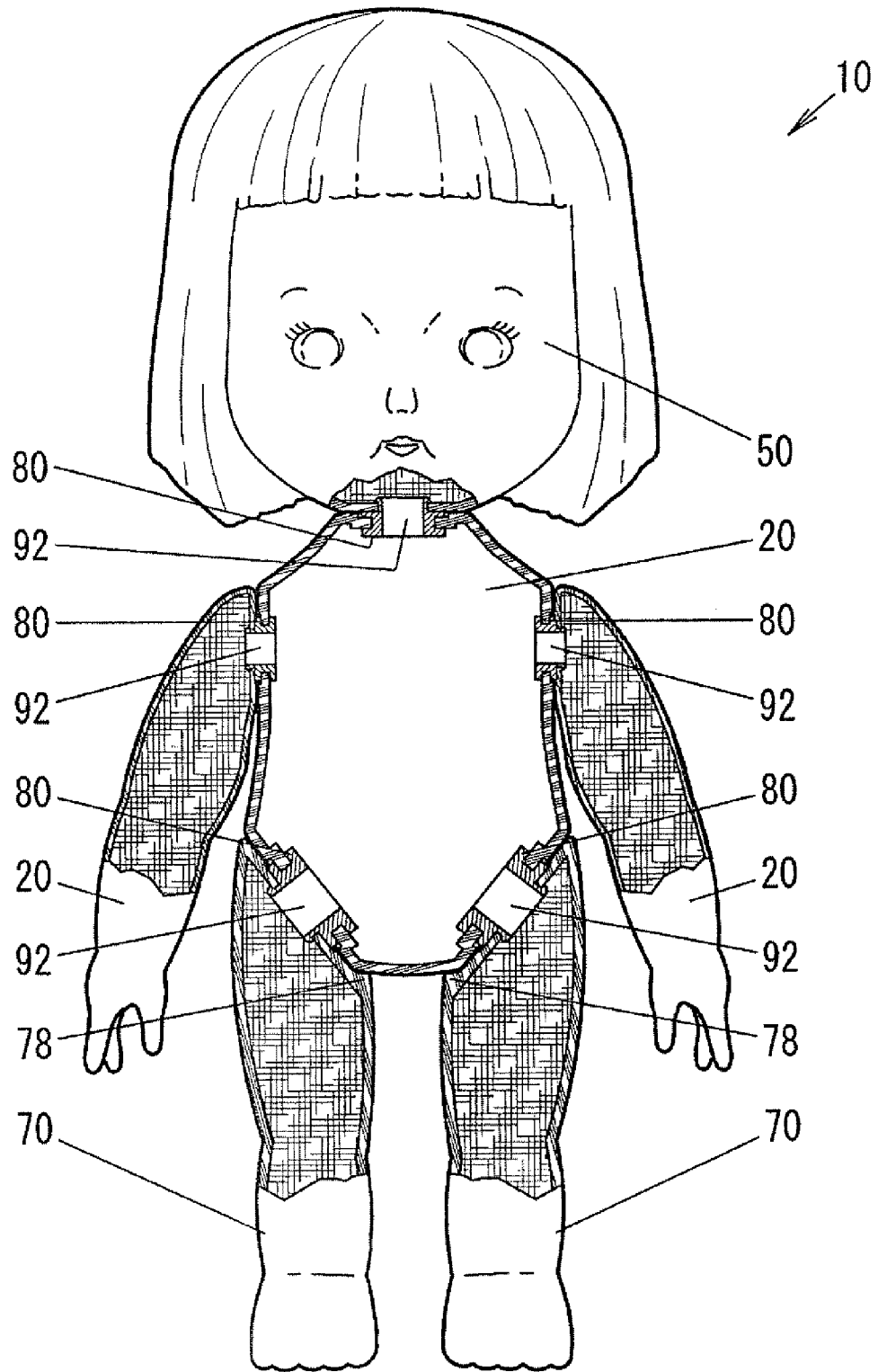


Fig. 4

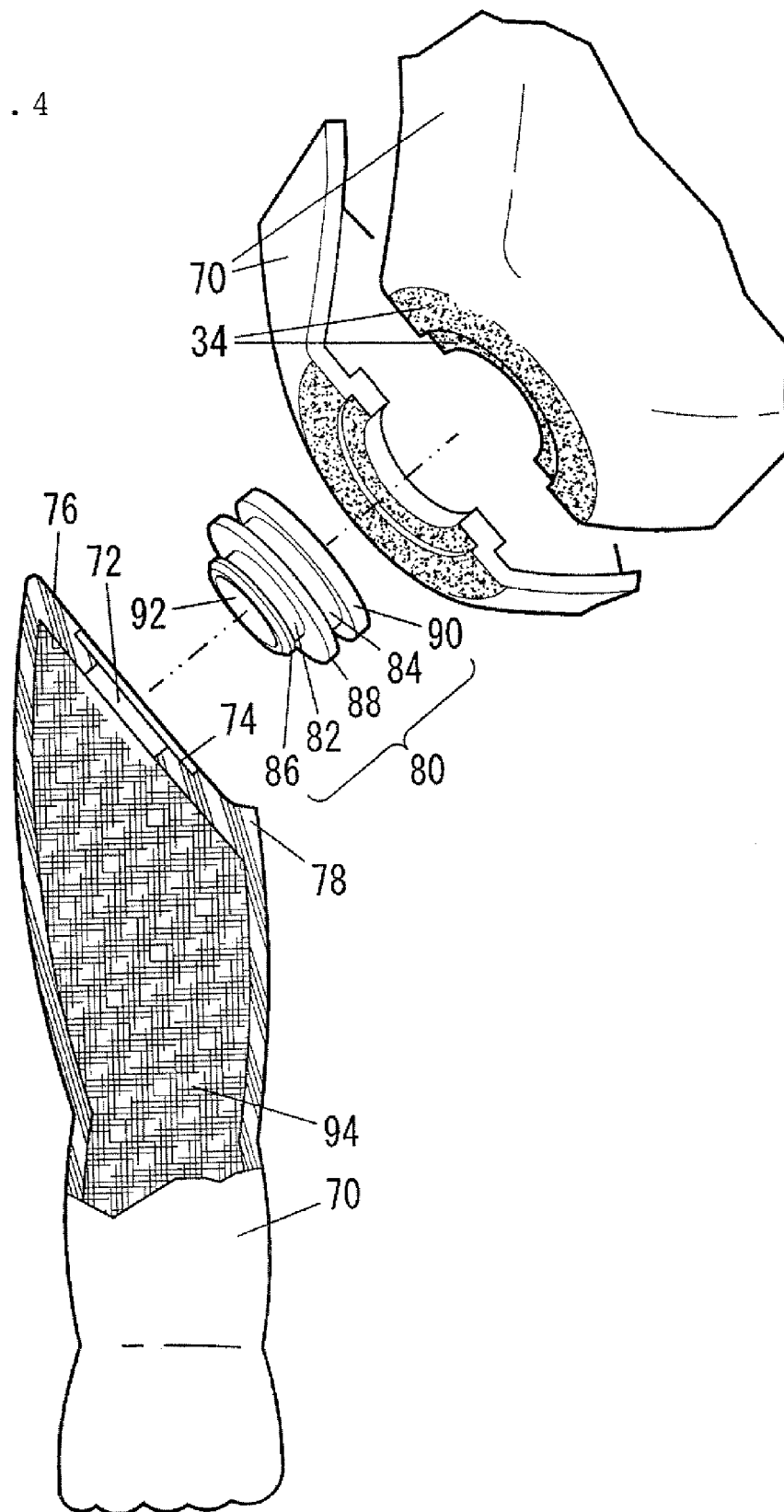
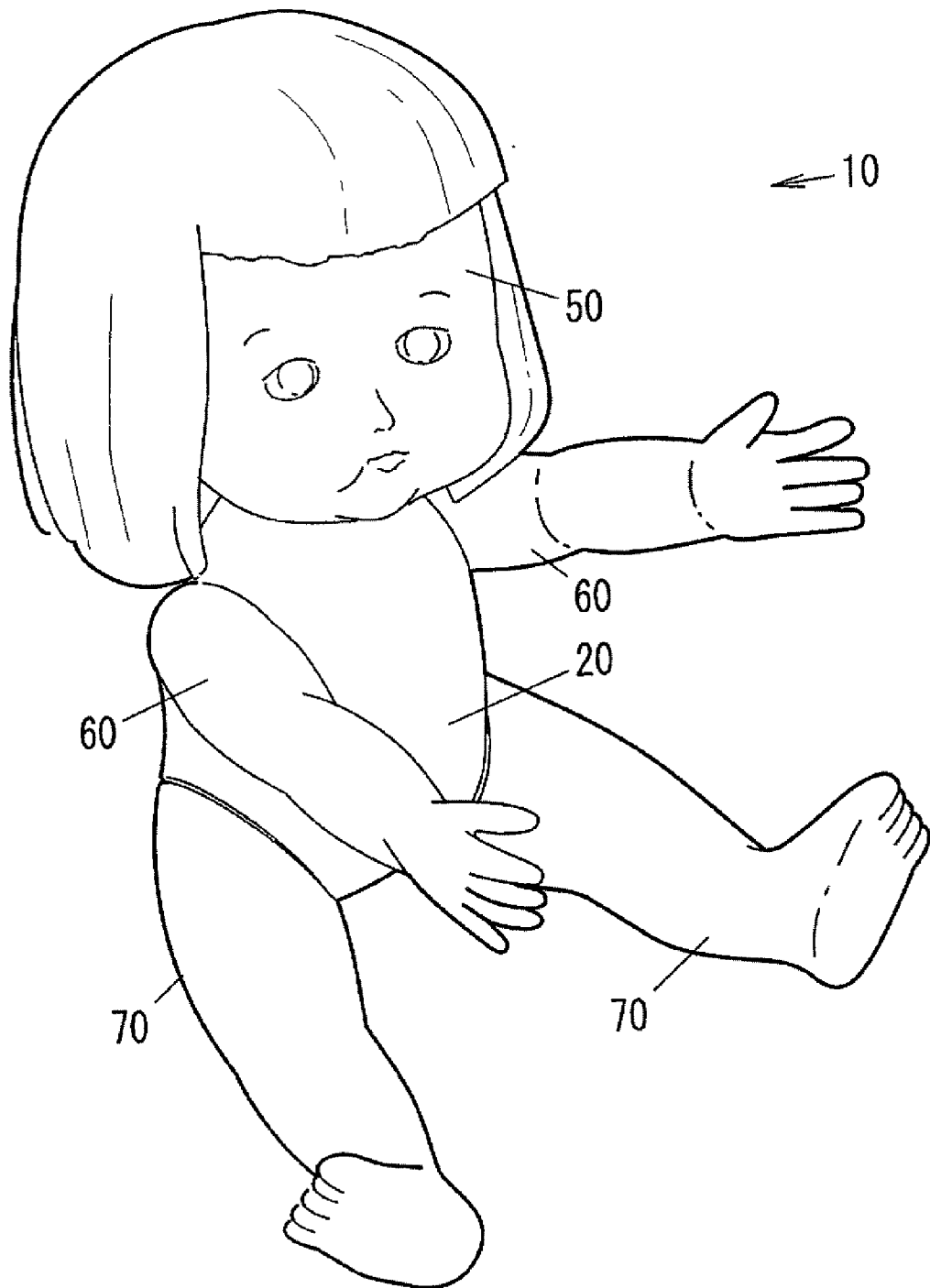


Fig. 5





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 5108

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 1 402 235 A (NAKAJIMA SEISAKUSHO) 6 August 1975 (1975-08-06) * page 2, line 2 - line 95; figures *	1-5	INV. A63H3/46
A	US 5 052 971 A (YOUNG KENNETH [US]) 1 October 1991 (1991-10-01) * column 3, line 4 - column 4, line 16; figures *	1-5	
A	US 4 854 911 A (BERLINER WILLIAM [US] ET AL) 8 August 1989 (1989-08-08) * column 2, line 62 - column 3, line 55; figures *	1-5	
A	WO 2005/056143 A (HIMSTEDT ANNETTE [DE]) 23 June 2005 (2005-06-23) * page 8, line 19 - page 9, line 23; figures *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 July 2007	Examiner Lucas, Peter
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 10 5108

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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06-07-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1402235	A	06-08-1975	CH 563789 A5 15-07-1975
			FR 2202445 A5 03-05-1974
			JP 49072394 U 24-06-1974
			JP 51034376 Y2 25-08-1976
			US 3816957 A 18-06-1974

US 5052971	A	01-10-1991	NONE

US 4854911	A	08-08-1989	NONE

WO 2005056143	A	23-06-2005	NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP H1033833 B [0002]