JOINT ASSEMBLY FOR DOLLS

Disclosed is a joint assembly for dolls for connecting two limb portions. A first joining surface and a second joining surface are disposed at a connecting position of the limbs and a first embedding hole and a second embedding hole are formed at the center of the first joining surface and second joining surface respectively, and an expanding portion is formed and extended inwardly along an opening of each of the embedding holes for inserting an embedding column with circular protrusions at both ends, so as to improve the convenience of installation. The circular protrusions and the expanding portions can improve the smoothness of movement and prevent the limb portions from falling out.
FIG. 1
(PRIOR ART)
FIG. 4
JOINT ASSEMBLY FOR DOLLS

BACKGROUND OF THE INVENTION

[0001] Field of the Invention

[0002] The present invention relates to the field of toys, and more particularly to a joint assembly for dolls that connects two joining surfaces by an embedding column to facilitate the installation and removal of limb portions of a doll.

[0003] Description of the Related Art

[0004] In general, a doll is manufactured according to a simulation of real human’s action, and different designs with a rotatable or bendable structure are provided for joints of hands or legs of the doll. To meet the strict requirements of manufacturing technology and simulation, most dolls adopt a pivotal lever as a rotating shaft, and the trunk of the doll has a plurality of holes formed at position corresponding to the head, hands, legs or limb portions for movably assembling the limb portions, such that the head and the limbs of the doll can be rotated in 360 degrees. However, such dolls still cannot simulate the actual rotation of the joints of a real human.

[0005] To allow the joints of the doll’s hands or legs to bend as shown in FIG. 1, the joint assembly 1 comprises a first joining portion 11 and a second joining portion 12 of an upper arm and a lower arm or a thigh and a calf of the doll respectively, wherein the first joining portion 11 is composed of an inserting plate 111 and has a pivoting hole 112, and the second joining portion 12 is composed of two plates corresponding to the inserting plate 111 and has a pivoting plate 121 and an axial connecting plate 122. After the second joining portion 12 is aligned and adhered, the joint assembly 1 of the doll’s hand or leg is bendable, but such arrangement makes the installation or removal relatively difficult.

[0006] Therefore, a joint assembly capable of adjusting the tightness of the joint assembly such as the one disclosed in R.O.C. Utility Model No. 301690 entitled “Joint Assembly” was introduced, wherein the joint assembly comprises two joining members and an elastic element, and the two joining members make use of the resilience of the elastic element to provide an appropriate tightness for a corresponding shaft and a corresponding slot of the two joining members and adjust and position the joining angle of the two joining members. However, the structural designs of this sort not only require a relatively difficult assembling process, but also incurring a high manufacturing cost since metal components (such as screws) are used for fixing the elastic element. In addition, the metal components also cause a poor appearance of the doll. Obviously, the conventional joint assembly requires further improvements.

SUMMARY OF THE INVENTION

[0007] In view of the problems of the prior art, it is a primary objective of the present invention to overcome the problems by providing a joint assembly for dolls for connecting a plurality of limb portions and setting two adjacent limb portions at a movable state, wherein two joining surfaces are disposed at joints of the limb portions respectively, and each joining surface has an embedding hole, and an embedding column is movably embedded into the corresponding embedding hole, such that the frictional force between the joining surfaces can be used to adjust the tightness of the movement and improve the convenience of installation and removal.

[0008] To achieve the aforementioned objective, the present invention provides a joint assembly for dolls, comprising: a first joining surface, being a planar surface formed at a connecting position of one of the limb portions and having a first embedding hole formed at the center of the first joining surface and having a diameter φ1, and a first expanding portion with a diameter φ2 being formed and extended inwardly along an opening of the first embedding hole to a bottom of the first embedding hole, and φ2>φ1; a second joining surface, being a planar surface formed at a connecting position of the other limb portion, and disposed opposite to the first joining surface, and having a second embedding hole with a diameter φ3 formed at the center of the second joining surface, and a second expanding portion with a diameter φ4 being formed and extended inwardly along an opening of the second embedding hole to a bottom of the second embedding hole, and φ4>φ3; an embedding column, having a first circular protrusion and a second circular protrusion with a diameter φ5 of disposed at both ends of the embedding column, and a column body with a diameter φ6 formed at the center of the embedding column and being substantially in a cylindrical shape, and φ5>φ6, and φ2=φ4=φ5>φ1=φ3; during assembling, both ends of the embedding column are inserted into the first embedding hole and the second embedding hole respectively, such that the first circular protrusion and the second circular protrusion are movably snapped into the first expanding portion and the second expanding portion, and the first joining surface and the second joining surface are attached with each other to provide a frictional force for the purpose of positioning after turning the limb portions.

[0009] In a preferred embodiment of the present invention, the joint assembly for dolls further comprises a first cambered surface and a second cambered surface, and the first cambered surface is coupled to a side of the first joining surface, and the second cambered surface is coupled to a side of the second joining surface, and the first cambered surface and the second cambered surface are disposed opposite to each other, so that the limb portions can be extended along the first cambered surface and the second cambered surface to a distance to adjust the angle of movement, so as to simulate the actual movements of a real human.

[0010] In a preferred embodiment of the joint assembly for dolls of the present invention, the first joining surface has a first circular slot formed at a position adjacent to the first embedding hole, and the second joining surface has a second circular slot formed at a position adjacent to the second embedding hole, and the first circular slot and the second circular slot are disposed opposite to each other. The first circular slot and the second circular slot provide space for entering air and reducing the frictional force of the first joining surface and the second joining surface appropriately to avoid the issue of a difficult adjustment.

[0011] Wherein, the first circular protrusion and the second circular protrusion have a surface substantially in form of a cambered surface respectively, and the first expanding portion and the second expanding portion are in form of cambered surfaces corresponding to the first circular protrusion and the second circular protrusion respectively. In addition, the first circular protrusion and the second circular protrusion have a pattern portion concavedly formed a surface of the first circular protrusion and the second circular protrusion respectively and the pattern portions are staggered to form a mesh structure or arranged in parallel with each other to form a strip structure. The joint assembly for dolls further has a lubricant grease applied in the pattern portion to improve the lubricating effect to facilitate rotation. In addition, a stop portion is
disposed in the first embedding hole and/or the second embedding hole for snapping the pattern portion to provide a position limitation of the joint assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a schematic view of a conventional doll joint assembly;
[0013] FIG. 2 is an exploded view of a preferred embodiment of the present invention;
[0014] FIG. 3 is a perspective view of a preferred embodiment of the present invention;
[0015] FIG. 4 is a cross-sectional view of a preferred embodiment of the present invention;
[0016] FIG. 5 is a schematic view of a first implementation mode of an embedding column of the present invention;
[0017] FIG. 6 is a schematic view of a second implementation mode of the embedding column of the present invention; and
[0018] FIG. 7 is a schematic view of another preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] With reference to FIGS. 2, 3 and 4 for an exploded view, a perspective view and a cross-sectional view of a joint assembly for dolls in accordance with a preferred embodiment of the present invention respectively, the joint assembly for dolls 2 is provided for connecting a plurality of limb portions 3 and setting two adjacent limb portions 3 into a movable state, and the limb portions 3 are made of soft rubber, and the joint assembly for dolls 2 comprises a first joining surface 21, a second joining surface 22 and an embedding column 23.

[0021] The first joining surface 21 is a planar surface formed at a connecting position of one of the limb portions 3 and has a first embedding hole 211 with a diameter ø1 formed at the center of the first joining surface 21. A first expanding portion 212 with a diameter ø2 is formed and extended along inwardly extended along an opening of the first embedding hole 211 to a bottom of the first embedding hole 211, and ø2>ø1. In addition, a first cambered surface 213 is disposed on a side of the first joining surface 21, and the first joining surface 21 has a first circular slot 214 formed at a position adjacent to the first embedding hole 211.

[0022] The second joining surface 22 is formed at a joining position of another limb portion 3, and the second joining surface 22 is a substantially planar surface disposed opposite to the first joining surface 21 and has a second embedding hole 221 with a diameter ø3 formed at the center of the second joining surface. In addition, a second expanding portion 222 with a diameter ø4 is formed and extended inwardly along an opening of the second embedding hole 221 to a bottom of the second embedding hole 221, and ø4>ø3. In addition, a second cambered surface 223 is disposed adjacent to a side of the second joining surface 22, and the first cambered surface 213 and the second cambered surface 223 are disposed opposite to each other. In addition, the second joining surface 22 has a second circular slot 224 formed at a position adjacent to the second embedding hole 221, and the first circular slot 214 and the second circular slot 224 are disposed opposite to each other.

[0023] The embedding column 23 has a first circular protrusion 231 and a second circular protrusion 232 disposed at both ends of the embedding column 23 respectively, and the embedding column 23 has a diameter ø5, and a cylindrical column body 233 with a diameter ø6 is formed at the center of the embedding column 23, wherein ø5>ø6, and ø2=ø4 ø5 ø1 ø3. During an assembling process, the first circular protrusion 231 at the end of the embedding column 23 is inserted into the first embedding hole 211, such that the first circular protrusion 231 is movably snapped into the first expanding portion 212, and the second circular protrusion 232 is inserted into the second embedding hole 221, such that the second circular protrusion 232 is movably snapped into the second expanding portion 222. Therefore, the first joining surface 21 and the second joining surface 22 can be attached with each other to provide a frictional force for the rotation and achieve the effect of positioning after turning the limb portions 3. It is noteworthy that the first circular protrusion 231 and the second circular protrusion 232 have cambered surfaces, and the first expanding portion 212 and the second expanding portion 222 corresponding to the first circular protrusion 231 and the second circular protrusion 232 are cambered surfaces.

[0024] To provide a smooth rotation effect, other implementation modes of the embedding column of the present invention as shown in FIGS. 5 and 6 are provided. The first circular protrusion 231 further has a first pattern portion 2311 concavely formed on a surface of the first circular protrusion 231 and the second circular protrusion 232 further has a second pattern portion 2321 concavely formed on a surface of the second circular protrusion 232. In FIG. 5, the first pattern portion 2311 and the second pattern portion 2321 are staggered to form a mesh structure. In FIG. 6, the first pattern portion 2311 and the second pattern portion 2321 are arranged parallel to each other to form a strip structure. To further improve the lubricating effect, a lubricant grease 24 is coated onto the first pattern portion 2311 and the second pattern portion 2321 to maintain a good lubrication with the surfaces of the first expanding portion 212 and the second expanding portion 222 respectively.

[0025] With reference to FIG. 7 for another implementation mode of a preferred embodiment of the present invention, the present invention further comprises stop portions 2111, 2211 disposed separately in the first embedding hole 211 and the second embedding hole 221, and the stop portions 2111, 2211 are protruding plates integrally formed in the first embedding hole 211 and the second embedding hole 221, and the stop portions 2111, 2211 have a height precisely corresponding to the depth of the first pattern portion 2311 and the second pattern portion 2321. Such arrangement not only provides the positioning and engagement effects for the rotation, but also suppress the first pattern portion 2311 and the second pattern portion 2321 to achieve the position limitation effect for rotating the joint assembly for dolls 2 in order to limit the angle of swaying the pair of limb portions 3.

What is claimed is:
1. A joint assembly for dolls, for connecting a plurality of limb portions and setting two adjacent limb portions at a movable state, comprising:
a first joining surface, being a planar surface formed at a connecting position of one of the limb portions, and
having a first embedding hole formed at the center of the first joining surface and having a diameter $\phi_1$, and a first expanding portion with a diameter $\phi_2$ being formed and extended inwardly along an opening of the first embedding hole to a bottom of the first embedding hole, and $\phi_2 > \phi_1$;

a second joining surface, being a planar surface formed at a connecting position of the other limb portion, and disposed opposite to the first joining surface, and having a second embedding hole with a diameter $\phi_3$ formed at the center of the second joining surface, and a second expanding portion with diameter $\phi_4$ being formed and extended inwardly along an opening of the second embedding hole to a bottom of the second embedding hole, and $\phi_4 > \phi_3$; and

an embedding column, having a first circular protrusion and a second circular protrusion with a diameter $\phi_5$ of disposed at both ends of the embedding column respectively, and a column body with a diameter $\phi_6$ formed at the center of the embedding column and being substantially in a cylindrical shape, and $\phi_5 > \phi_6$, and $\phi_2 - \phi_4 = \phi_5 - \phi_1$; during assembling, both ends of the embedding column are inserted into the first embedding hole and the second embedding hole respectively, such that the first circular protrusion and the second circular protrusion are movably snapped into the first expanding portion and the second expanding portion respectively, and the first joining surface and the second joining surface are attached with each other to provide a frictional force for the purpose of positioning after turning the limb portions.

2. The joint assembly for dolls according to claim 1, wherein the first joining surface has a first circular slot formed at a position adjacent to the first embedding hole, and the second joining surface has a second circular slot formed at a position adjacent to the second embedding hole, and the first circular slot and the second circular slot are disposed opposite to each other.

3. The joint assembly for dolls according to claim 1, wherein both of the first circular protrusion and the second circular protrusion have a surface substantially in form of a cambered surface, and the first expanding portion and the second expanding portion are in form of cambered surfaces corresponding to the first circular protrusion and the second circular protrusion respectively.

4. The joint assembly for dolls according to claim 3, wherein both of the first circular protrusion and the second circular protrusion have a pattern portion concavely formed a surface of the first circular protrusion and the second circular protrusion respectively.

5. The joint assembly for dolls according to claim 4, wherein the pattern portions are staggered into a mesh structure.

6. The joint assembly for dolls according to claim 5, further comprising a lubricant grease applied in the pattern portion.

7. The joint assembly for dolls according to claim 4, wherein the pattern portions are arranged parallel to each other to form a strip structure.

8. The joint assembly for dolls according to claim 7, further comprising a stop portion disposed in the first embedding hole and/or the second embedding hole for snapping the pattern portion to provide a position limitation.

9. The joint assembly for dolls according to claim 7, further comprising a lubricant grease applied in the pattern portion.

10. The joint assembly for dolls according to claim 1, further comprising a first cambered surface and a second cambered surface, and the first cambered surface being coupled to a side of the first joining surface, and the second cambered surface being coupled to a side of the second joining surface, and the first cambered surface and the second cambered surface being disposed opposite to each other.

11. The joint assembly for dolls according to claim 10, wherein the first joining surface has a first circular slot formed at a position adjacent to the first embedding hole, and the second joining surface has a second circular slot formed at a position adjacent to the second embedding hole, and the first circular slot and the second circular slot are disposed opposite to each other.

12. The joint assembly for dolls according to claim 10, wherein both of the first circular protrusion and the second circular protrusion have a surface substantially in form of a cambered surface, and the first expanding portion and the second expanding portion are in form of cambered surfaces corresponding to the first circular protrusion and the second circular protrusion respectively.

13. The joint assembly for dolls according to claim 12, wherein both of the first circular protrusion and the second circular protrusion have a pattern portion concavely formed a surface of the first circular protrusion and the second circular protrusion respectively.

14. The joint assembly for dolls according to claim 13, wherein the pattern portions are staggered into a mesh structure.

15. The joint assembly for dolls according to claim 14, further comprising a lubricant grease applied in the pattern portion.

16. The joint assembly for dolls according to claim 13, wherein the pattern portions are arranged parallel to each other to form a strip structure.

17. The joint assembly for dolls according to claim 16, further comprising a stop portion disposed in the first embedding hole and/or the second embedding hole for snapping the pattern portion to provide a position limitation.

18. The joint assembly for dolls according to claim 16, further comprising a lubricant grease applied in the pattern portion.

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