A shoulder joint for a use in a doll whose arm can be pivoted at the shoulder and whose hand can be opened and closed by moving a lever on the doll body, including a connector with a hole extending through the axis of pivoting of the arm on the body. A cable which connects the hand to the operating mechanism on the body, extends through the hole in the connector, so that tension in the cable is not changed when the arm pivots. The connector is constructed of rubber and installed in a stretched condition, so that it forces surfaces of the arm and body into contact to create friction that permits posing of the arm in a variety of positions.
DOLL HAVING POSABLE ARM JOINED THERETO 
BY ELASTICALLY STRETCHED CONNECTOR

BACKGROUND OF THE INVENTION

This invention relates to dolls, and more particularly to a joint for dolls.

One type of animated doll has controllable hands for grasping and releasing objects, the hands being controlled by operating levers on the doll body. Movement of a control lever can pull a cable that extends through the shoulder joint and along the arm to the hand for transmitting forces to the hand mechanism. This type of doll is described in patent application Ser. No. 163,202, filed July 16, 1971 by Lewis et al., which describes a doll whose left hand has a movable thumb for grasping and releasing objects and whose right hand has a movable magnet for attracting and releasing iron objects. Where the remotely operated hand mechanisms are on an arm that can pivot at the shoulder relative to the doll body, it is desirable that a construction be used which enables pivoting of the arm without affecting tension in the cable, so that the hand does not automatically release or grasp an object just because the arm is moved. It is also desirable that the joint construction enable posing of the arm at a variety of positions.

SUMMARY OF THE INVENTION

In accordance with one embodiment of the present invention, a doll is provided which has a relatively simple shoulder joint that enables posing of the arm at a variety of positions, and which has a control mechanism for remote manipulation of the hand from the doll body which is not affected by pivoting of the arm. The doll includes an elongated connector of rubber or other elastic material having opposite ends respectively mounted on the arm and body, at least one of the mountings enabling pivoting so that the arm can pivot on the body. The connector has a hole extending therethrough with opposite ends respectively opening into the arm and the body, and a cord extends through the hole and has one end connected to an operating lever in the body and an opposite end connected to a mechanism on the hand to move it. The hole in the connector extends along an axis of pivoting of the arm on the body, so that pivoting of the arm does not affect the cord and therefore does not affect the condition of the hand mechanism. The connector is initially installed in a stretched condition, so that it resiliently urges bearing surfaces of the arm against corresponding surfaces of the body. This creates sufficient friction to enable posing of the arm in a variety of orientations to which it may be pivoted.

The novel features of the invention are set forth with particularity in the appended claims. The invention will be best understood from the following description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional front view of a doll constructed in accordance with one embodiment of the invention; FIG. 2 is a view taken on the line 2—2 of FIG. 1; FIG. 3 is a view taken on the line 3—3 of FIG. 2; and FIG. 4 is a partial perspective view of the operating mechanism and connector of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG. 1, the doll 10 of the invention has a body 12 and a pair of arms 14, 16 pivotally mounted on shoulder portions of the body. Each of the arms 14, 16 has an animated hand mechanism 18, 20. The mechanism 18 on the right arm includes a magnet 22 that can move against and away from a palm region 24 of the doll to attract and release iron objects therefrom. The mechanism 20 on the left arm includes a pivotally mounted thumb 26 that can open and close on a finger portion 28 to release and grasp objects. Each of the hand mechanisms 18, 20 is operated by a cord 30, 32 that extends through the shoulder joint and into the doll body. A pair of operating buttons 34, 36 at the sides of the doll body can be depressed to pivot levers 35, 37 that pull on the cords 30, 32 to operate the mechanisms. A spring in each of the hand mechanisms returns the mechanism to its original state when the tension in the cord is released as the operating button is released.

Each of the arms 14, 16 is pivotally mounted on a shoulder portion 38, 40 of the doll body. The joints are constructed to enable a wide degree of pivoting about substantially horizontal axes 42, 44 relative to the body, so that the arms can be raised and lowered. The joints also allow for a limited amount of pivoting about perpendicular horizontal axes 46, 48. Unless special precautions are taken, pivoting of the arms would be likely to affect the tension in the cords, so that the hand mechanisms would be affected by the position of the arms. This is undesirable, inasmuch as this could prevent effective operation of the hand mechanisms at certain positions of the arms on the body, and also could hamper a child from moving the arm while it firmly held an object.

In accordance with the invention, connectors 50, 52 are provided that join the doll body 12 to the arms 14, 16 in a manner that enables pivoting of the arms without affecting the hand mechanisms 18, 20, and which also enables posing of the arms at a variety of pivotal positions. The joint mechanisms operate in similar manners, so that a description of one of them applies to the other. The connector 50 has a hole 60 that extends along its length and which is substantially coaxial with the axis of pivoting 42 of the arm on the body. The cord 30 extends through the hole 60, with an inner end 301 of the cord within the body and an outer end 300 within the arm. The inner end 301 of the cord extends through a slot 62 in a portion of the operating lever 35 and the cord has a bushing 64 fastened on its extreme inner end to retain it in position. The lever 35 has an axle portion 66 pivotally mounted on the doll, so that depression of the button 34 causes the lever 35 to pivot in a direction that pulls on the cord so that the outer end 300 is pulled against a spring 68 to retract the magnet 22. When the arm 14 pivots to a large extent about the axis 42 relative to the doll body, there is not increase or decrease in cord tension. Accordingly, if the doll hand 14 is magnetically holding an object, the object will not be released regardless of pivoting of the arm about the axis 42.

The arm 14 can pivot to only a limited extent about the axis 46, but this is often sufficient for realistic play. When the arm is pivoted about the axis 46, there is a small change in cord tension, because a cord-guiding
post 70 is displaced from the axis of pivoting 46. However, the displacement is small and pivoting about the axis 46 is limited to only several degrees, so that a very small change in tension occurs.

The inner end portion 141 of the doll arm 14 is spherically rounded and is designed to be received in a recess or aperture 72 at the shoulder portion of the doll body. This permits realistic pivoting over a small angle about the axis 46 and also allows pivoting about the axis 42 of the arm on the body. The hole 72 is of smaller diameter that the largest diameter of the inner arm portion 141, so that the arm can be pushed only to a limited amount into the hold 72, and then the walls of the arm bear against the walls of the hold 72. The arm is constructed with an inner web 74 that has a hole which is only slightly greater than the diameter of the connector portion 54, to retain the connector in position while allowing pivoting of the arm on the connector about the axis 42. Similarly, the doll body has an inner web 76 with a hole that receives the center connector portion 54 to retain it in place. The hole in the web 74 is large enough to permit free pivoting of the arm on the connector, to provide a rotational shoulder joint. Both the arm 14 and doll body 12 are constructed of front and rear halves that are fitted and glued together to permit installation of the connectors 50, 52.

The connectors 50, 52 are constructed of an elastic material such as a moderately soft rubber. The connectors are installed in a stretched state: That is, when the inner end 141 of the arm is pushed as far as it can be pushed into the shoulder recess 72, the connector 50 is still stretched in extension between the web 74 on the arm and the web 76 on the body. This assures that the inner arm end 141 will bear hard against the walls of the hole 72. The friction created by the force of bearing of the arm on the body enables posing of the arm. Thus, when the arm 14 is pivoted about the axis 42 to a desired position, the friction will prevent the arm from falling down, and therefore it will remain posed in the desired position. This friction also enables posing of the arm when it is pivoted to a limited extent about the axis 46. Of course, the connector resists pivoting about the axis 46, since this results in bending of the connector portion 54, but the friction can be high enough to allow posing over several degrees of bending about the axis 46.

Thus, the connector construction allows pivoting of an arm on a doll body without affecting a cable that transmits forces from a mechanism in the body to a mechanism at the outer end of the arm, and which also permits posing of the arm at a wide variety of positions. The transmittal of forces from an operating mechanism on the arm is accomplished by providing a cable-guiding hole that extends through the connector along the axis of pivoting of the arm on the body. A simple pivotal connection that permits posing is accomplished by using an elastic connector and installing it in a stretched condition to create frictional forces where the arm bears against a surface of the body. Such frictional forces not only permit posing of the arm when it is rotated about an axis which does not bend the connector, but also enables posing for up to several degrees of arm pivoting about an axis that does cause bending of the elastic connector.

Although particular embodiments of the invention have been described and illustrated herein, it is recognized that modifications and variations may readily occur to those skilled in the art and, consequently, it is intended that the claims be interpreted to cover such modifications and equivalents.

What is claimed is:
1. A doll comprising:
   a body having a shoulder portion, said body also having a movable operating member thereon;
   an arm having inner and outer end portions and having a movable part at said outer end portion;
   an armature having opposite ends respectively mounted on said shoulder portion of said body and said inner end portion of said arm to connect them and constituting a pivot permitting pivoting of said arm on said body about a first axis, said armature having a hole extending therethrough along said first axis;
   a cord extending through said hole in said armature and having an outer cord portion in said arm and an inner cord portion in said body;
   means coupling said inner portion of said cord to said operating member, so that movement of said member pulls and releases said cord;
   means coupling said outer portion of said cord to said movable part in said arm to cause said part to move as said cord is pulled and released;
   said armature being constructed of an elastic material;
   said body and arm having slidably abutting portions and having means engaging said opposite ends of said armature so that said armature is stretched, to cause said abutting portions to bear against each other, whereby to permit posing of said arm at different orientations.

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