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Thorn

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[54] **DOLL LEG CONNECTOR**

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[51] **Int. Cl.** **A63h 3/20**

[58] **Field of Search** 46/161, 173

[56] **References Cited**

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[57] **ABSTRACT**

A limb connector mechanism is provided for use in a toy doll having a torso and a limb including an opening at one end thereof defined by an outwardly extending peripheral flange and rim formed at the free end of the flange. The connector mechanism includes a limb mounting frame secured in the torso and a flat disk or washer inside the limb positioned against the inner surface of the rim. A cap is positioned over the limb opening between the rim and the frame and has a peripheral flange portion, surrounding the limb flange, and keyed thereto in a predetermined position with respect to the limb. The cap, disk, and frame have aligned apertures therein and a connecting member having an enlarged head portion inside the limb, adjacent the disk, includes an elongated stem portion extending through the aligned apertures, with a shoulder facing the limb at its free end. A helical compression spring surrounds the stem and has one end thereof engaged against the frame and the other end thereof engaged against the shoulder to urge the disk and frame towards each other, to hold the rim and cap therebetween, so that the limb is rotatably connected to the frame and torso.

3 Claims, 3 Drawing Figures

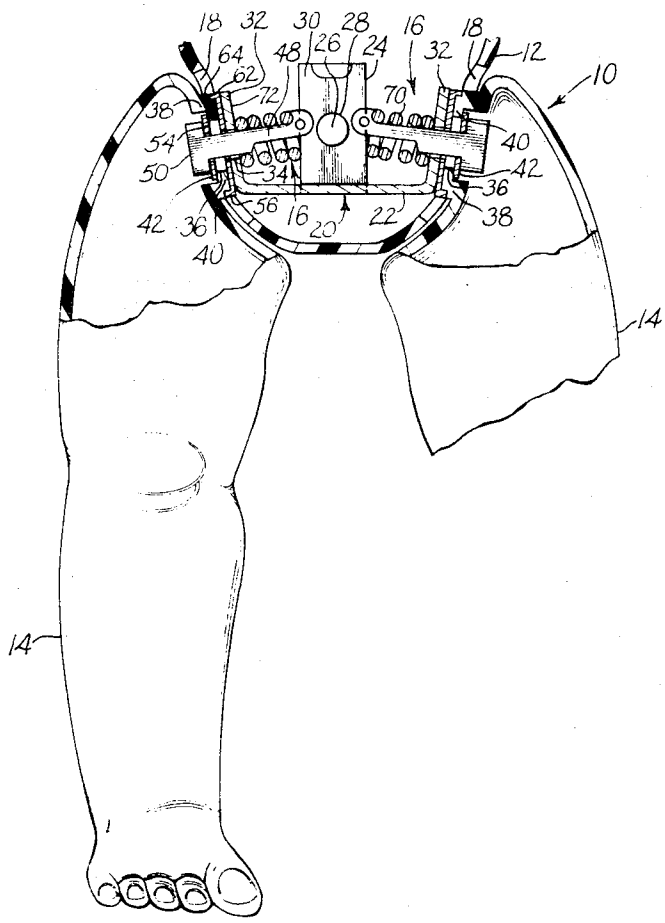


Fig 2

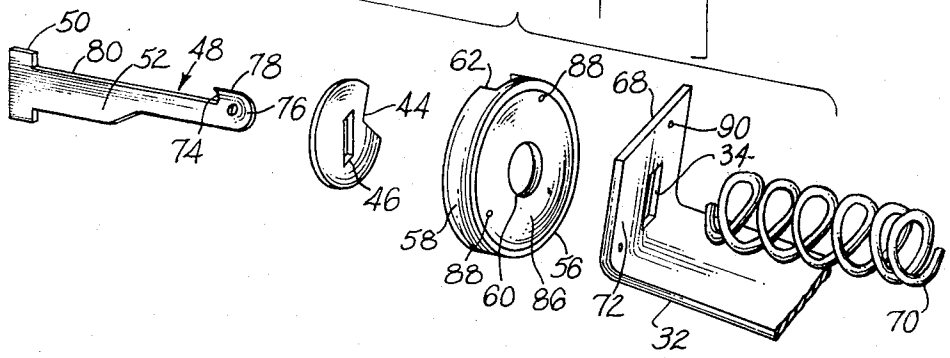


Fig 1

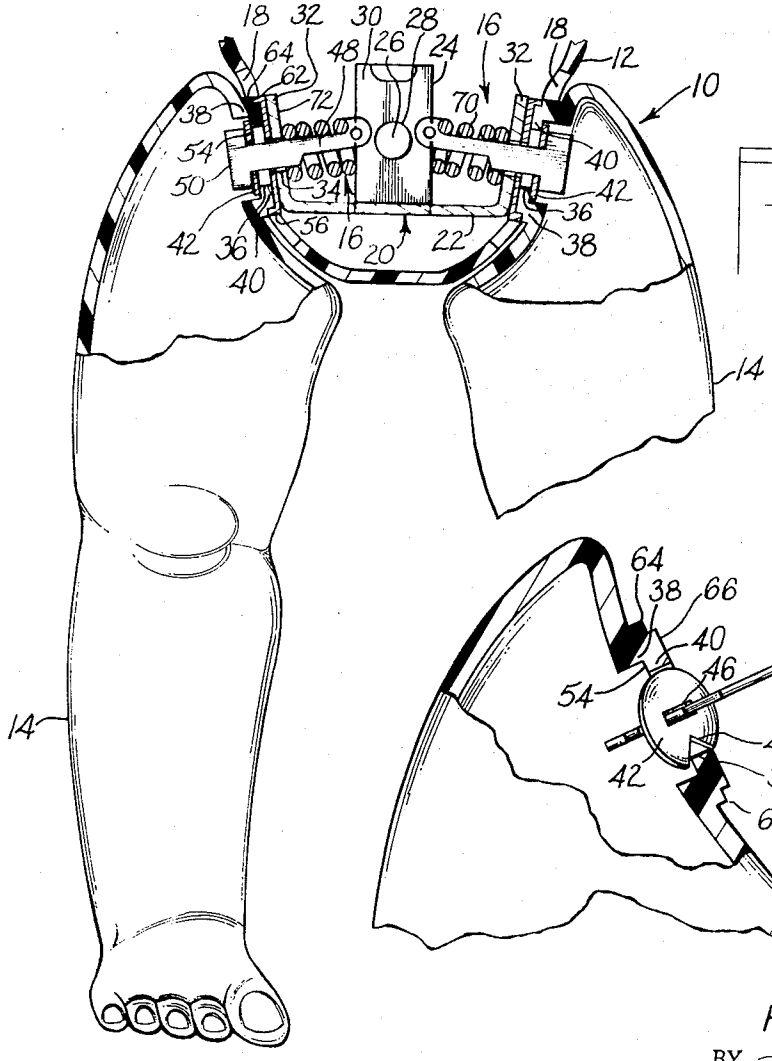


Fig 3

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DOLL LEG CONNECTOR

The present invention relates to toy dolls and, in particular, to connecting mechanisms for rotatably securing a limb of the doll to its torso.

Numerous connecting members of the above type have been previously proposed and such mechanisms include those which have to be built or molded into the legs and body of the doll in a relatively expensive manufacturing process. Other methods of connecting the limbs of the doll to its torso include molding annular slots in the limb which slots are adapted to be snap fitted in complementary apertures formed in the torso. While such connecting systems are relatively inexpensive, they are of course, not very permanent and thus the limb can be readily severed from the torso by a child, even during normal play.

Accordingly, it is an object of the present invention to provide a relatively inexpensive and simply constructed connecting mechanism for securing a limb to the torso of a toy doll.

It is another object of the present invention to secure a limb to the torso of a toy doll in a convenient and substantially permanent manner while permitting adjustment of the relative position of the limb with respect to the torso.

Another object of the present invention is to rotatably connect a limb to the torso of a toy doll or the like and to provide predetermined adjustable positions in which the limb may be set during play.

In accordance with an aspect of the present invention, the limb connector mechanism is provided for use in a toy doll having a torso and a limb, to be connected thereto, including an opening at one end thereof defined by an annular flange extending outwardly from the limb and having a rim formed at its free end. A mounting frame is secured in the torso and has a generally rectangular aperture adjacent the end thereof to be secured to the limb. A generally circular disk, having a larger diameter than the limb opening and a generally rectangular aperture therein is positioned inside the limb adjacent the inner surface of the rim. A bearing cap is positioned between the outer surface of the rim and the frame in engagement with both the rim and the frame and has an annular wall portion surrounding the outer surface of limb flange. The cap also has a circular opening therein located in alignment with the apertures in the disk and the frame and the annular wall of the cap has recesses therein complementary to and receiving key members formed on the exterior surface of the limb flange to maintain the cap in a predetermined position with respect to the limb.

A relatively flat connecting member, having a head portion inside the limb adjacent the disk, includes an elongated stem portion extending through the aligned apertures in the disk, frame, and cap, with a shouldered portion facing the frame, formed at its free end. A helical compression spring surrounds the stem with one end thereof engaged against the frame and the other end thereof engaged against the stem's shoulder to urge the washer and frame towards each other and to hold the limb and cap therebetween. As a result, the limb is firmly connected to and rotatably mounted on the frame and torso. The cap and frame members are provided with a plurality of cooperating detents and complementary recesses, located at predetermined positions which define a plurality of stable fixed positions

into which the limb may be rotated. In the preferred embodiment of the invention three such cooperating detents and recesses are provided which are located in positions corresponding to the standing and sitting positions of the toy doll.

The above, and other objects, features and advantages of this invention, will be apparent in the following detailed description of an illustrative embodiment thereof which is to be read in connection with the accompanying drawings, wherein:

FIG. 1 is a partial front view, partly in section, of a toy doll having its legs connected to its torso by a connecting mechanism constructed in accordance with an embodiment of the present invention;

FIG. 2 is an exploded perspective view of the connector mechanism of the present invention; and

FIG. 3 is a sectional view illustrating the manner of installation of the disk and connector member in the limb.

Referring to the drawings in detail, and initially to FIG. 1, it will be seen that a toy doll **10** has a torso section **12** and legs **14** operatively connected to the torso by connecting mechanisms **16.** The latter rotatably secure the limbs to the torso which has a pair of enlarged openings **18** adjacent the point of connection thereof with legs **14,** and the connecting mechanism **16** extends therethrough for connection to a frame **20.**

Frame **20** comprises a pair of generally U-shaped members **22** and **24,** secured at right angles to each other, and is pivotally mounted in the torso by stud members **26** in the front and rear of the torso (only one of which is seen if FIG. 1), which extend through apertures **28** in the legs **30** of frame member **24.** Frame member **22** includes leg portions **32** adjacent openings **18,** and each leg portion has a generally rectangular aperture **34** therein.

Legs **14** are hollow molded plastic members and each have an opening **36** therein which is defined by an upstanding flange portion **38,** molded into the leg, and an inwardly extending annular rim **40** formed at the upper edge of the flange.

As seen in FIGS. 1 and 3, a portion of connector mechanism **16** is received within openings **36,** to hold legs **14** adjacent their associated frame leg member **32.** To accomplish this, each connector mechanism **16** is provided with a circular disk **42** having a larger diameter than openings **36.** This disk or washer, is provided with a generally sector-shaped notch **44** which facilitates insertion of the disk within opening **36,** as is more fully described hereinafter. In addition, disk **44** includes a rectangular aperture **46** which is complementary to the aperture **34** formed in legs **32** and receives an elongated connecting member **48** therethrough. The latter is a generally flat member, rectangular in cross-section, having an enlarged head portion **50,** of smaller diameter than aperture **36** but having a larger major dimension than the aperture **46.** Connector **50** also includes a stem portion **52** which extends through aperture **46** and through opening **34** in frame member **32** to provide a common interconnecting member between the limb **14** and torso **12.**

Prior to insertion of disk **42** in limb **14,** stem **52** of connector **48** is inserted through aperture **46** and the disk is positioned in aperture **36** as illustrated in FIG. **3.** As seen therein, rim **38** is received in notch **44** so that disk **40** may be readily inserted in leg **14** through aperture **36** by placing it edgewise in the aperture and

moving the disk inwardly with respect to the leg. The stem **52** is held firmly during the installation operation so that it does not fall into the hollow leg **14.** After disk **42** is thus inserted in leg **14,** the stem **52** is pulled tightly so that the disk **42** is moved into engagement with the inner surface **54** of rim **40.**

A bearing or cap member **56** is then positioned over rim **40** and flange **38.** This cap member is generally circular and has an annular side wall or flange **58** which surrounds flange **38.** A generally circular opening **60** is formed in the cap so that the cap may receive and pivot about stem **52.** In addition, flange **58** is provided with at least one, and preferably two, recesses **62** therein which receive enlarged bosses or key members **64,** formed at predetermined locations on the outer periphery of flange **38.** These key members are preferably of different sizes, with each of the recesses **62** in the flange **58** being of respective complementary sizes so that the cap can only be positioned on the limb in one configuration, for reasons more fully described hereinafter.

With disk **42,** connector **48,** and cap **62** secured in this manner, stem **52** is inserted through aperture **34** of its associated frame leg **32,** with the cap **62** in bearing relation against the outer surface **66** or rim **38** and the inner surface **68** of leg **32.** A helical compression spring **70** is then placed about the stem **52** of connector **48** with one end thereof in bearing engagement against the outer surface **72** of leg **32** and its other end engaged in a notch or shoulder **74** formed in the enlarged head portion **76** of stem **52.**

As seen in FIG. **1,** the side **78** of head **76** extends beyond the side **80** of stem **52** to define enlarged head **76** and notch **74.** In this manner disk **42** is urged towards frame member **32** to hold rim **36** and cap **56** tightly therebetween. Since rim **40** defines a generally circular aperture and since cap **62** has a circular aperture therein, it is seen that the limb **14** is rotatably mounted on stem **52** by the arrangement of the present invention. Stem **52,** being secured in the rectangular recess **34** of frame leg **32,** is held in a fixed position with respect to the torso and does not rotate upon rotation of the leg **14.** Similarly, disk **42** does not rotate since it is fixed in position by the engagement of the fixed stem **52** in its rectangular opening **46.** Since cap **62** is fixed with respect to leg **14** by the engagement of keys **64** with its recess **62,** the cap will not rotate with respect to the plastic leg **14** but rather, its outer surface **86** provides a rotational bearing surface against the inner surface **68** of the leg **32.** As a result the toy doll will have a longer life since metal to metal bearing surfaces are provided as opposed to the plastic to metal bearing surface of previously proposed arrangements which cause the plastic to errode, and thus eventually destroy the integral connection between the limb and the torso.

As seen in FIG. **2,** cap **56** is provided with a plurality of recesses **88** on its outer surface **66** while the inner surface **68** of legs **32** are provided with a complementary number of corresponding detents **90.** These detents are located on the cap and leg to define the sitting and standing positions of the leg with respect to the torso. When these detents are engaged in their cooperating recesses, the leg is held firmly in position and cannot be moved without the application of a predetermined force. Thus, inadvertent and undesired swinging movement of the leg **14** is avoided, but ready adjustment of the leg positions is provided. Moreover, the recesses **88** on cap **56** are located in predetermined relation to recesses **62** so that the sitting and standing position of the doll are automatically set when the connector mechanism **16** is assembled.

It is thus seen that frame **20** is thereby securely connected to each of the limbs **14** by the connector members **16** of the present invention to provide a stable platform for the torso of the doll. As mentioned above, the torso is connected to the frame by the stud members **26** which are received in recesses **28** of the legs of frame member **30.** This provides a pivotal mounting of the torso on frame member **20,** and thus legs **14** which permits the torso to be rocked side to side about the pivoted axis formed by the lugs **26.** This may be accomplished by the provision of an oscillating mechanism such as an electric motor mounted in the torso and having an eccentric cam or the like secured to its output shaft and operatively engaged with one of the legs **30** of the frame. Accordingly a relatively simple, inexpensive and durable connecting mechanism is provided for securing the limb of the doll to its torso while permitting the limb to be moved to a plurality of positions.

The leg mounting mechanism herein described may be entirely assembled exteriorly of the doll's leg thus improving and simplifying the assembly process over other known constructions.

Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to that precise embodiment, and various changes and modifications may be effected therein by one skilled in the art without departing from the scope and spirit of this invention.

What is claimed is:

1. A limb connector mechanism for use in a toy doll having a torso and a limb to be connected to the torso, said limb having a circular opening of a given diameter at one end thereof defined by an upstanding peripheral flange extending from said limb and an inwardly directed rim formed at the free end of the flange, said connector mechanism comprising a one-piece generally U-shaped limb mounting frame mounted in said torso and having a pair of generally upstanding leg portions, each having a generally rectangular aperture therein for mounting a limb to said frame, a flat disk of a diameter larger than said given diameter inside said limb having a generally rectangular aperture therein and positioned against the inner surface of said rim, a cap positioned over said limb opening, between said rim and said frame, and having a peripheral flange portion surrounding the flange on said limb, said cap having an opening therein located in alignment with the apertures in said disk and said frame, a relatively flat connecting member having an enlarged head portion inside said limb positioned adjacent said disk and an elongated stem portion having a generally rectangular cross-section and extending through the aligned rectangular apertures in said disk and frame and the opening in said cap, and having a shoulder facing said rim formed adjacent its free end, and a helical compression spring surrounding said stem with one end thereof engaged against said frame and the other end thereof engaged against said shoulder to urge said disk and frame towards each other and hold said rim and cap therebetween, said limb including at least one key member extending from the outer surface thereof adjacent said flange, said cap having a cooperating recess therein

complementary to and receiving said key member, said cap being thereby fixed in a predetermined position with respect to said limb for rotation therewith whereby said limb is connected to said frame and torso and said limb and cap are adapted to pivot on said stem to vary the position of said limb with respect to said torso.

2. A limb connector mechanism for use in a toy doll having a torso and a limb to be connected to the torso, said limb having an opening at one end thereof defined by an annular wall extending outwardly from said limb, said wall having an inner annular surface within said limb, and at least one key member extending from the outer surface thereof, said connector mechanism including a one-piece generally U-shaped limb mounting frame mounted in said torso and having a pair of upstanding leg portions each having a generally rectangular aperture therein for mounting a limb thereon, a generally circular disk having a larger diameter than said opening and a generally rectangular aperture therein, said disk being located in said limb against said inner annular surface and having a sector-shaped notch therein to facilitate edgewise insertion of the disk through said opening; a cap positioned between the free annular edge of said wall and said frame and having an annular flange portion surrounding the outer surface of said wall, said cap having a circular opening therein located in alignment with the aperture in said disk and said frame, and said flange having a recess therein complementary to and receiving said key member to maintain said cap in a predetermined position with respect to said limb, a relatively flat connecting member having an enlarged head portion inside said limb positioned adjacent said disk and an elongated stem portion having a generally rectangular cross-section and extending through the aligned rectangular apertures in said disk and frame and said circular opening in said cap; said elongated stem having a shoulder facing said limb formed adjacent its free end, and a helical compression spring surrounding said stem with one end thereof engaged against said frame and the other end thereof engaged against said shoulder to urge said disk and frame towards each other and hold said wall and cap therebetween, whereby said limb is connected to and rotatably mounted on said frame and torso; said cap and frame having a plurality of cooperating detents and complementary recesses defining a plurality of stable fixed positions into which said limb may be rotated.

3. The limb connector mechanism as defined in claim 2 wherein said stem has a flat head portion at its free end with one side thereof extending beyond the side of the adjacent intermediate portion of the stem, and having a notch therein defining said shoulder for receiving and retaining said other end of said spring.

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