ATTACHMENT OF DOLL LIMB TO DOLL BODY

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The present invention relates to the attachment of a doll limb to a doll body in a novel and effective manner, and is particularly applicable to doll constructions in which the limbs and bodies are formed at least in part of flexible material such as various of the vinyl resins. Today the manufacture of dolls from soft and flexible materials such as vinyl resins is in vogue, largely because of the ease with which such materials may be molded to shape and because of the life-like "feel" which they impart to the finished doll. The desired attributes of "feel" derive from the fact that the material is soft and flexible, but that same characteristic of the material presents problems insofar as the attachment of limbs to the body is concerned. As a practical matter, the limbs, as well as the head, must be molded separately from the body and then subsequently secured thereto. The attachment of limb to body must not present any appreciable assembly difficulty, and it must at the same time be sufficiently secure so that the limb will withstand those extreme efforts at dismemberment which must be expected from the youthful users thereof. In addition, the manner in which the limb is attached to the body must permit realistic articulation of the limbs with respect to the body, so that the doll may be placed in different postures in accordance with the desires of its user.

According to the present invention all of these requirements are met by means of a structure all the parts of which are susceptible of inexpensive mass production and extremely ready assemblyability. The invention is here specifically disclosed as applied to a doll leg, but it could also be applied to a doll arm if and when desired.

The doll body, at the point where the leg is to be attached thereto, is provided with a narrow aperture, preferably surrounded by a flange projecting into the interior of the body. The apertured portion of the body, and the flange if present, are formed of resiliently stretchable material. The leg proper is of any appropriate shape and at least the upper end of the leg is formed of flexible material to which is imparted a shape corresponding to that of the aperture in the body. That portion of the leg shaped similarly to the aperture extends through the aperture beyond the inner surface of the body, and beyond the inner surface of the flange if present, and is there provided with a laterally extending portion which engages the inner surface of the body or body flange and thus prevents the leg from being detached once it has been assembled with the body. Assembly is accomplished by stretching the apertured body portion, that portion resiliently assuming its normal shape after the laterally extending portion of the leg has been passed therethrough. That part of the leg immediately adjacent the outer surface of the doll body, being flexible, permits the leg to articulate relative to the body in an effective manner.

In the form here specifically disclosed, in order to provide a greater degree of security of attachment the upper portion of the leg which is received within the body aperture and which is formed of the same soft and flexible material as the remainder of the leg is surrounded by a rigid bushing to which it is secured, the laterally extending leg portion which engages the inner surface of the doll body or body flange being formed as an integral part of that rigid bushing. The bushing does not in any way detract from the appearance of the doll, because it does not project outwardly beyond the body aperture and consequently is not visible. In order to provide a still further degree of security of attachment, a rigid washer may be interposed between the laterally extending portion of the leg and the inner surface of the doll body.

To the accomplishment of the above, and to such other objects as may hereinafter appear, the present invention relates to a structure by means of which a doll limb may be secured to a doll body, as defined in the appended claims and as described in this specification, taken together with the accompanying drawings, in which:

Fig. 1 is a front elevational view of the lower portion of a doll body, showing one leg sub-assembly secured thereto and the other leg sub-assembly in position to be secured thereto;

Fig. 2 is a cross sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a cross sectional view taken along the line 3—3 of Fig. 2; and

Fig. 4 is a plan view taken in the direction of the arrows 4—4 of Fig. 2.

The doll body, generally designated 2, may be formed in whole or in part of flexible resilient material such as rubber or vinyl plastic. The body may be hollow, its walls being shaped and contoured, as in a molding operation, so as to simulate the body of a child. The front part of the lower portion of the body 2, shown in Fig. 1, is provided with a flattened area 4 having a pair of narrow elongated apertures 6 formed therein and extending from the outer to the inner surfaces thereof. It is preferred that these apertures be surrounded, on the interior of the doll body, by flanges 8 which may be molded integrally with the body when the body is formed. It is important that at least the body portions 6 and 8, together with a surrounding area of the body 2, be made of resiliently stretchable material, for a reason which will become apparent hereinafter in connection with the assembly of the limb to the body.

The doll legs, generally designated 10, are also formed in whole or in part of flexible material such as rubber or vinyl plastic shaped and contoured, in a suitable molding operation or the like, to simulate a child's leg. In order to impart a desired degree of firmness to the legs 10, the main portions thereof may be stuffed with any appropriate soft material 12. The uppermost portions of the legs 10, however, are not stuffed, and the leg is there collapsed so that the walls 14 extend alongside one another to define a structure having a narrow elongated periphery the shape and size of which is similar to the shape and size of the aperture 6 in the doll body 2. A rigid bushing generally designated 16, which may conveniently be formed by molding any suitable plastic material so as to produce a rigid structure, has a main portion 18 the outer dimensions of which correspond closely to the dimensions of the body aperture 6 and the inner dimensions of which are such that the collapsed walls 14 of the leg 10 may be received in the passageway 23 therein, those walls being fixed to the main bushing portion 18 in any appropriate manner, as by means of staples 20 which pass through the main bushing portion 18 and the leg walls 14. The end of the bushing 16 at the uppermost end of the leg 10 carries a laterally extending portion 22 the periphery of which extends outwardly well beyond the periphery of the body aperture 6.
In the form here specifically disclosed another element is employed, to wit, the washer 24, which has an elongated narrow aperture 26 within which the main portion 18 of the bushing 6 is received, the outer periphery of the washer 24 extending outwardly beyond the periphery of the body aperture 6 and the periphery of the laterally extending bushing portion 22.

In assembly, the main portion 18 of the bushing 16 is first passed through the aperture 24 in the washer 24, the latter being prevented from escaping from the bushing 16 because the laterally extending bushing portion 22 is larger than the washer opening 26. The collapsed upper end walls 14 of a doll leg 10 are then caused to enter the passageway 28 in the main bushing portion 18, the staples 20 are inserted, and the leg sub-assembly is completed. In this condition the washer 24 may move downwardly, but cannot escape from the leg sub-assembly because the main portion of the leg 10 is much larger than the washer opening 26.

When it is desired to secure the leg sub-assembly to the body, the appropriate aperture 6 in the doll body is stretched in any appropriate manner to a sufficient degree to permit the bushing 16, and the washer 24 if employed, to pass completely through the aperture 6 into the interior of the body 2, the laterally extending portion 22 on the leg 10, and the washer 24 if used, moving into the interior of the body 2 beyond the inner surface thereof, and beyond the inner surface of the flange 8 if present. The aperture 6 is then released, and because of the resilient nature of the material of which the body 2 is formed immediately surrounding the aperture 6, that aperture will resume its normal size and shape. In so doing it will contact inside the periphery of the laterally extending bushing portion 22 and of the washer 24 if employed. It will preferably frictionally grip the outer surface of the bushing portion 18. It will be noted from Fig. 2 that the length of the main bushing portion 18 is such that its outer end will not extend out beyond the outer surface of the body 2 adjacent the aperture 6, and preferably will be recessed somewhat within the aperture 6.

Any attempt to pull the leg 10 from the body 2 will be effectively resisted by the laterally extending portion 22 carried by the leg 10 and by the washer 24 if employed. These elements cannot pass through the unexpanded aperture 6, and therefore the leg 10 will not separate from the body 2. When the body 2 is provided with the flange 8, which may extend inwardly for an approximate distance of one-half inch, it will be almost impossible to pull the leg 10 strongly enough to force the aperture 6 open unless the pull is so great as to exceed the strength of the materials involved, in which case in all probability the leg 10 will rip before the securing arrangement fails.

As will be clear from Figs. 1 and 2, since that portion of the leg immediately adjacent the outer surface of the body is formed of flexible material, the leg will be freely articulable so that it may be manipulated by the user of the doll to permit the doll to assume either a prone position with the legs extended from the body or a sitting position in which the legs are at right angles to the body. The simplicity and inexpensiveness of the structure, together with the exceptional security of the limb-body attachment which it provides, make it an exceedingly effective and desirable structure.

While the single embodiment of the present invention has been here disclosed, numerous specific variations may be made in the structure thereof, all within the spirit of the invention as defined in the following claims.

I claim:

1. In combination, a doll body having a narrow limb-receiving aperture, said body being formed of resiliently stretchable material at least at the apertured portion thereof, and a doll limb formed at least at its upper end of flexible material, the upper end of said limb being flattened and comprising limb wall portions defining a given narrow peripheral shape substantially similar to the shape of said aperture, said aperture and said upper end of said limb being much narrower than said limb proper, said upper end of said limb passing through said aperture into said body and having a laterally extending portion which engages the inner surface of said body so as to prevent separation of said limb from said body, said limb articulating about that portion of the flexible upper end thereof projecting beyond the outer surface of said body adjacent said aperture on a line substantially parallel to the length of said aperture, the flexible limb wall portions within said aperture being secured inside a substantially rigid bushing, said laterally extending portion which engages the inner surface of said body being a part of said rigid bushing.

2. In the combination of claim 1, a substantially rigid washer received between said laterally extending portion and the inner surface of said body wall.

3. In combination, a doll body having a narrow limb-receiving aperture, said body being formed of resiliently stretchable material at least at the apertured portion thereof, and a doll limb formed at least at its upper end of flexible material, the upper end of said limb being flattened and comprising limb wall portions defining a given narrow peripheral shape substantially similar to the shape of said aperture, said aperture and said upper end of said limb being much narrower than said limb proper, said upper end of said limb passing through said aperture into said body and having a laterally extending portion which engages the inner surface of said body so as to prevent separation of said limb from said body, said limb articulating about that portion of the flexible upper end thereof projecting beyond the outer surface of said body adjacent said aperture on a line substantially parallel to the length of said aperture, the flexible limb wall portions within said aperture being secured inside a substantially rigid bushing, said laterally extending portion which engages the inner surface of said body being a part of said rigid bushing.

4. In combination, a doll body having a narrow limb-receiving aperture surrounded on the inside of said doll by an inwardly extending flange, said body being formed of resiliently stretchable material at least at the apertured portion thereof, and a doll limb formed at least at its upper end of flexible material, the upper end of said limb being flattened and comprising limb wall portions defining a given narrow peripheral shape substantially similar to the shape of said aperture, said aperture and said upper end of said limb being much narrower than said limb proper, said upper end of said limb passing through said aperture into said body and having a laterally extending portion which engages the inner surface of said body so as to prevent separation of said limb from said body, said limb articulating about that portion of the flexible upper end thereof projecting beyond the outer surface of said body adjacent said aperture on a line substantially parallel to the length of said aperture, the flexible limb wall portions within said aperture being secured inside a substantially rigid bushing, said laterally extending portion which engages the inner surface of said body being a part of said rigid bushing.

5. In the combination of claim 4, a substantially rigid washer received between said laterally extending portion and the inner surface of said body wall.

6. In combination, a doll body having a narrow limb-receiving aperture surrounded on the inside of said doll
by an inwardly extending flange, said body being formed of resiliently stretchable material at least at the apertured portion thereof, and a doll limb formed at least in its upper end of flexible material, the upper end of said limb being flattened and comprising limb wall portions defining a given narrow peripheral shape substantially similar to the shape of said aperture, said aperture and said upper end of said limb being much narrower than said limb proper, said upper end of said limb passing through said aperture into said body to a point beyond said flange and having a laterally extending portion which engages the inner surfaces of said body flange so as to prevent separation of said limb from said body, said limb articulating about that portion of the flexible upper end thereof projecting beyond the outer surface of said body adjacent said aperture on a line substantially parallel to the length of said aperture, said limb being formed substantially completely of flexible material, the body of said limb being stuffed but the upper end of said limb being unstuffed, the flexible limb wall portions within said aperture being secured inside a substantially rigid bushing, said bushing being positioned within said aperture and terminating short of the outer end of said aperture, said laterally extending portion which engages the inner surface of said body being a part of said rigid bushing.

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