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JOINTED DOLL

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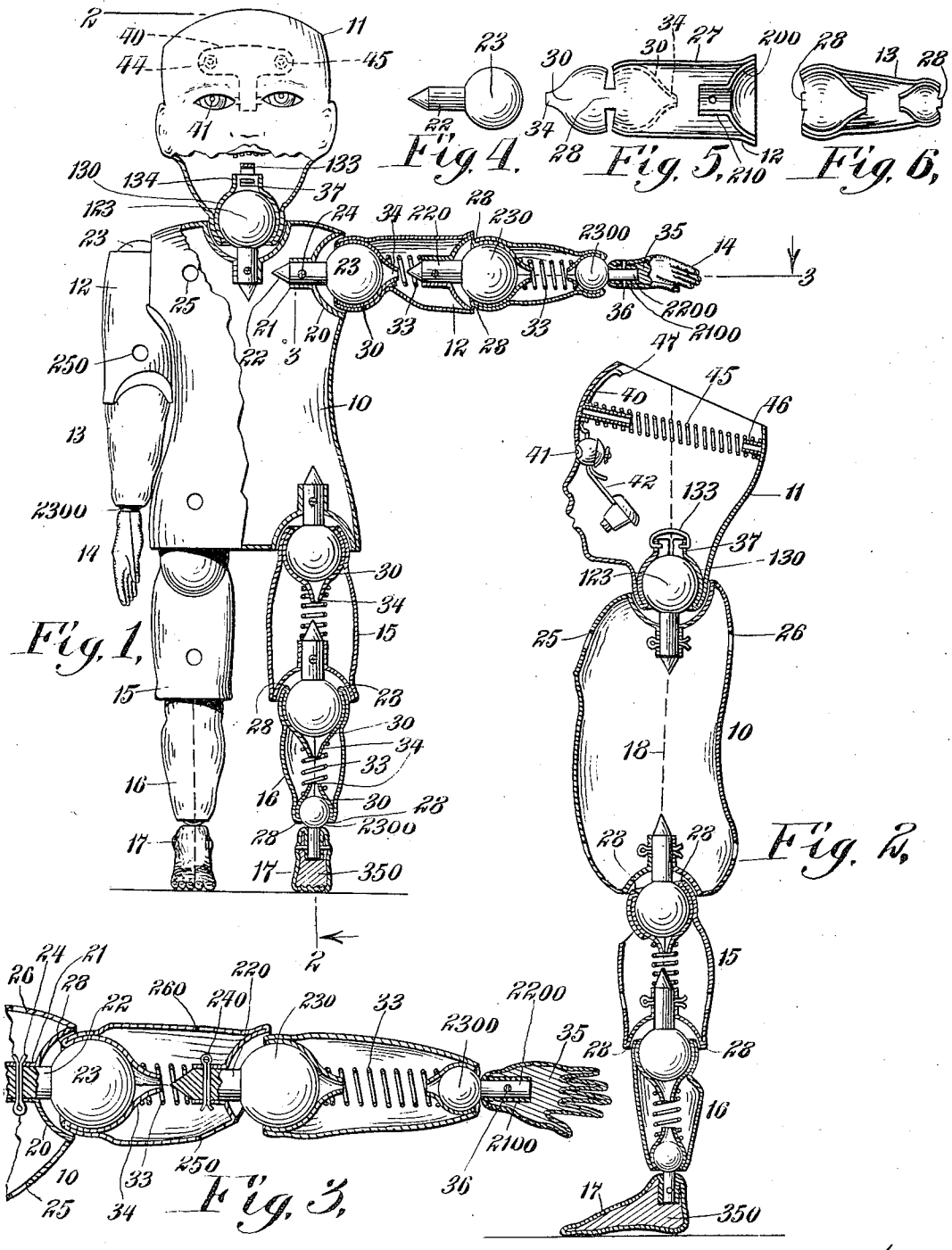


Fig. 1.

Fig. 4. Fig. 5. Fig. 6.

Fig. 2.

Fig. 3.

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JOINTED DOLL.

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To all whom it may concern:

Be it known that I, CHARLES CÁBANA, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Jointed Dolls, of which the following is a specification.

This invention relates to a jointed doll or toy child in which the head, trunk and limb portions thereof are all connected together by ball and socket joints; and more particularly relates to a doll in which substantially all the parts are constructed of stamped sheet metal or other sheet material.

One of the objects of the invention is to produce a "machine made" doll which requires a minimum of manual labor in its manufacture and which when fractured, may be quickly and readily supplied with such new part or parts as may be required.

A further object of the invention is to provide a novel and simple means of obtaining frictional resistance in the ball and socket joints, so as to prevent a too free movement of the same.

A still further object of the invention is to prevent the doll's eye balls from becoming detached by reason of a child's poking its finger into the eye socket of the doll.

Further objects and advantages are more minutely disclosed in the accompanying drawings and following description wherein Figure 1 is a front elevation of the complete doll with certain parts in section. Figure 2 is a vertical longitudinal section thereof, taken on line 2—2, Fig. 1. Figure 3 is an enlarged horizontal section through the doll's arm, taken on line 3—3, Fig. 1. Figure 4 is a side elevation of one of the balls of a ball and socket joint. Figure 5 is a side elevation of one of the doll's upper arm sections, in an unfinished stage of its construction. Figure 6 is a side elevation of one of the forearm sections of the doll.

Similar characters of reference indicate corresponding parts throughout the several views.

In its general organization, this improved doll or mechanical toy child comprises a sheet metal body, trunk or torso 10, the same having connected thereto a sheet metal head 11, and a number of sheet metal limb members which in their appearance and in their mechanical movement are intended to emulate the appearance and action of a human being. The mechanical operation of the arms of the doll is substantially identical with the operation of the legs, so that a description of the one answers for both. Broadly speaking, however, the doll's arms comprise upper arm members 12, forearm members 13, hands 14 and all of the foregoing are equivalent collectively to the doll's legs which comprise thigh members 15, calf members 16 and feet 17.

The torso 10 of the doll is constructed of two pieces or sections of stamped or pressed sheet metal whose edges are indicated by the broken dash line 18, said edges being placed together and then suitably soldered, brazed or welded to each other, so as to connect the two pieces suitably together. This construction permits of a light but strong doll torso in which the finer, human characteristics such as wrinkles, small rolls of fat, irregular protuberances etc., can be very closely and accurately imitated by reason of the fact that the stamping of sheet metal permits of very accurate shaping of the same between the forming dies.

Formed on the upper outer corners of the torso 10 are two shoulder concavities 20 of substantially semi-spherical form, the concavity being made in two parts or concavity sections similar to the construction of the torso sections to each of which one of said concavity sections is integrally joined as will be hereinafter more exactly described. Extending inwardly from the inner part of the concavity is a stem supporting tube or cylindrical stem support 21 which is adapted to receive the stem 22 of a shoulder-joint ball 23, the same being retained in place by a transverse cotter or other suitable pin or brad 24. This cotter pin is adapted to be inserted in place or entirely removed from the doll, as best shown in Fig. 2, through a front access aperture 25 which is formed in the breast of the doll, this operation being facilitated by reason of a rear access aperture 26 which is formed in the rear of the doll's torso in line with the aforesaid front access aperture 25.

Rotatably mounted on said ball 23 is the

aforesaid upper arm member 12, which is made up of two sections which are soldered or otherwise joined along their edges, one of said sections being shown separate in Fig. 5, wherein is illustrated one of these upper arm sections as the same appears in an intermediate stage of its construction and before being soldered to its companion upper arm section. This upper arm section comprises a main semi-cylindrical trough or half sleeve 27 and when said section is first formed there projects integrally from the middle of each of its opposite ends or edges a narrow bridging piece 28. To one of these bridging pieces is integrally connected a socket cup section 30 which lies in the position shown in Fig. 5 just after the blank has been stamped; that is, the concave side of the main trough 27 of the upper arm section faces in a direction opposite to the direction in which the concave side of the socket cup section 30 faces. The same condition obtains with respect to all of the socket cup sections of the doll and also all of the concavity sections, such for instance as the concavity section 20 at the shoulder joint of the doll. After the stamping operation, each of the socket cup sections and concavity sections is folded inwardly into position, for instance, the socket cup section 30, Fig. 5, is folded from the full line position inwardly into the final position, as indicated by the dotted lines. It will now be obvious why the bridging piece 28 is and should be very narrow, as otherwise such a reverse bending of the curved parts could not be accomplished without necessitating a very expensive machine operation. As it is, the socket cup sections and the concavity sections may be easily and manually folded inwardly without crimping or otherwise preparing the stamped blank for this operation. Furthermore, the parts which are folded inwardly are supported on their outer faces by the inner wall of the trough 27.

The outer end of the upper arm member 12 is provided with a concavity 200 and with a stem supporting tube 210 both of which are similar in their construction and fabrication to the analogous concavity 20 and tube 21 of the shoulder joint of the doll, the same being constructed, as aforesaid, in the same manner as the concavity 30 is constructed, that is by bending the same inwardly into place after the same has been stamped. This stem supporting tube 210 of the upper arm member receives the stem 220 of a ball 230 both of which are identical to the ball and stem of the shoulder joint and are similarly held in place by means of a cotter or other suitable pin 240. As best shown in Fig. 3, the upper arm member is provided with access apertures 250 and 260 (similar to the access apertures in the doll's torso), so that the cotter pin 240 may be pressed into position or entirely removed through these apertures. This permits the parts of the doll to be securely assembled and also permits the replacement of fractured parts which may result after the doll has been in use for some time.

A novel means is employed for obtaining a sufficient frictional resistance of the ball and socket joints so as to prevent the movable members of the doll from moving about too easily and freely, as otherwise the same would not stay in position when it is desired to have the doll assume a certain posture. This is accomplished by providing a longitudinally disposed helical compression spring 33 within the hollow part of the upper arm member 12, the other members of course being supplied with similar springs. The stem 220 of the ball 230 is pointed so as to both act as a seat for and also center the outer end of the helical compression spring 33, the pointed end of the stem entering a short distance into the bore of the spring. The opposite or inner end of this spring, receives, within its bore, a pair of tapered compression lips 34 which are integrally formed on and project outwardly from their respective socket cup sections 30. The spring 33 in bearing longitudinally inwardly against the outer oppositely tapered faces of these compression lips 34 causes the same to be pressed toward each other. By reason of the leverage obtained, this pressing together of the companion compression lips 34, causes the companion concavity sections 30, upon which the lips are formed, to be likewise compressed together against the peripheral curved face of the ball 23, thus obtaining a frictional resistance between the said ball and the upper arm member which is mounted thereon. Thus the arm member will retain any position in which it is placed, even though weighted down by a considerable amount of doll's clothing. It will be readily apparent that all of the limb members are similarly arranged so as to provide for a sufficient frictional resistance between each of the said members and the ball with which each is connected.

The outermost ball 2300 of each limb, that is, of the wrist and the ankle joint, is preferably somewhat smaller than any of the other balls. Each of the small balls of the wrist joint is provided with a stem 2200 which is received within the aforementioned sheet metal hand 14. Said hand is constructed of two sections of pressed sheet metal and each of the sections is provided with a stem supporting tube section 2100 which is formed in a manner similar to that adopted in the rest of the doll, as for instance, shown in Figs. 5 and 6. The hollow hands 14 are filled with a small quantity of molten lead, cement or similar material 35 for the purpose of preventing any crushing

of the small and delicate fingers. The whole hand is then held in proper place on the stem 2200 of the small ball by means of a brad or other suitable securing pin 36 which passes entirely through the sheet metal of the hand and also through the lead or cement filler and the stem 2200 of the ball. The feet 17 of the doll are likewise filled with lead 350 but the purpose of the same in this case is somewhat different from that presented in the case of the doll's hands. In the case of the feet, there is small danger of either crushing or distorting the shape of the toes, but on the other hand, the weight of the feet is an important element. Inasmuch as these feet 17 have a relatively large volume, a considerable weight of molten lead may be poured into them, so that the feet become sufficiently heavy to retain the balance of the doll when it is placed in a standing position on its feet.

The ball 123 connecting the head of the doll to the torso 10 is retained frictionally in a manner somewhat different from the means employed in the other doll joints. The doll's head 11 is constructed of sheet metal sections which are provided on their lower parts with the upwardly-extending socket cup sections 130 in a manner similar to that already described. Each cup section 130 has formed thereon an upstanding compression lip 134 which is provided, intermediate of its longitudinal edges, with a clamping hole 37. A transversely disposed, crescent-shaped spring 133 is arranged above the said clamping lips, its opposite, outer curled ends entering inwardly into the said clamping holes 37. Thus this crescent-shaped spring functions to the same ends as do all the other springs 33, namely to resiliently compress the companion socket cup sections 130 in toward each other.

Arranged against the inner side of the forehead of the doll's head is a slip plate 40 upon whose lower end is pivotally mounted the usual movable eye balls 41. These eye balls are provided with the usual weighted arm 42 so that when the doll is erect, the eyes will assume the position shown in the drawings and appear to be "open," whereas when the doll is laid on its back or "put to sleep," the eyes will rotate sufficiently so as to appear to be "closed." It has been found in practice that the usual doll construction is such that the eyes are quickly put out of commission whenever the child owner of the doll curiously pokes his fingers against the doll's eye balls to see what "makes them work." In the present invention this defect in construction is eliminated by providing a resilient connection between the said slip plate 40 and the doll's head, the same being effected preferably as follows:

Secured rigidly by means of solder or otherwise to the inner front part or face of the doll's head, is a pair of rearwardly extending tubular guides 44, one being arranged on each side of the inner forehead. The slip plate 40 is suitably drilled at two points to somewhat loosely receive the tubular guides 44, so as to permit the slip plate to slide longitudinally thereon. Extending clear across the interior of the doll's head from its front face to the back of its head, are a pair of retaining compression springs 45 whose rear ends are suitably held in position by a pair of studs 46 while their forward ends receive the tubular guides 44 within their bore and bear with their front faces against the rear face of the said slip plate 40. Thus the slip plate is normally held in its proper forward position by reason of the pressure of the two springs 45. But when the curious child pokes its fingers against the eye balls 41, the latter, together with their appurtenances, are free to move rearwardly with the slip plate 40 and against the pressure of the said retaining springs 45. Then when the pressure of the child's finger is released, the eye balls and the slip plate return automatically to position. The movement of the slip plate is not a pure sliding action, being partially a rotary movement with the upper edge of the slip plate for a pivot. For this reason the upper corner of the slip plate is provided with the anti-friction edge or curled flange 47, so as to permit of a free movement of the slip plate. The construction of this slip plate and its co-operating parts is such that a rearward movement of the slip plate is resisted frictionally to a greater extent than is a corresponding forward movement. Consequently, the resistance to displacement is rendered greater and yet the tendency to assume the proper normal position is also rendered greater. This results by reason of the fact that when the slip plate is forced rearwardly, its upper curled edge 47 is forced upwardly against a surface which is inclined in a direction which impedes the movement; while, on the other hand, when said slip plate is moved forwardly the conditions are reversed and the inclination of the face against which the flange 47 moves is such as to aid in such an outward movement.

The value of the novel features of this improved doll will now be apparent. Being such as to permit of the use of stamped sheet metal in almost its entire construction, the doll is light and yet very strong. Of course, any suitable material other than sheet metal may be used in constructing the different parts. For instance, celluloid when in a partially plastic state, may be cut and formed in dies in the same manner as sheet metal. Or, if desired, each body member may be constructed of two cast or molded sections connected together at their

peripheral edges. Its feet are easily weighted so that the doll may be made to stand upright of its own accord, and the hands are prevented from becoming crushed or distorted in shape. It is almost impossible to derange the usually very delicate eye balls of the doll. A heavy frictional resistance is obtained in the ball and socket joints, both in the limbs and in the neck, in a very simple and efficient manner. The construction of the ball socket cups and the semi-spherical concavities is remarkably ingenious and durable and yet capable of being manufactured in large "machine made" quantities at low cost. And, furthermore, there exists no tendency of the doll to fall apart by reason of dampness or old age, and the all metal construction is such as to permit the use of metal enamel or an agate, lacquer in covering the parts so that the whole is rendered extremely durable.

I claim as my invention:

1. A jointed doll comprising a member provided with a ball, a limb member, and a socket cup-section extending inwardly into said limb member and provided integrally on its outer edge with a bridging piece which is narrower than said socket cup-section and is integrally connected to the outer edge of said limb member.

2. A jointed doll comprising a member provided with a ball, a pair of limb sections of substantially semicylindrical form, and a substantially semi-spherical socket cup-section extending inwardly from and integrally connected with the outer end of each of said limb sections.

3. A jointed doll comprising a member provided with a ball, a pair of limb sections of substantially semicylindrical form, and a substantially semi-spherical socket cup-section provided integrally at its outer edge with a comparatively narrow bridging piece which is, in turn, integrally connected with the outer edge of each of said limb sections.

4. A jointed doll comprising a member provided with a ball, a limb member, socket cup-sections arranged within said limb member and arranged to receive said ball, and a spring connected at opposite ends to said cup sections and resiliently forcing said socket cup sections in toward each other.

5. A jointed doll comprising a member provided with a ball, a limb member, socket cup sections arranged within said limb member and arranged to receive said ball and provided with compression lips, and a spring arranged to bear against said lips and to resiliently force the same toward each other.

6. A jointed doll comprising a member provided with a ball, a longitudinally disposed limb member, socket cup sections disposed transversely relatively to each other, compression lips connected to said cup sections and extending longitudinally inwardly therefrom, and a spring resiliently drawing said compression lips toward each other.

7. A jointed doll comprising a member provided with a ball, a longitudinally disposed limb member, socket cup sections disposed transversely relatively to each other, compression lips connected to said cup sections and extending longitudinally inwardly therefrom, and a longitudinally disposed helical compression spring whose bore is arranged to receive said compression lips.

8. A jointed doll comprising a member provided with a ball, a longitudinally disposed limb member, socket cup sections disposed transversely relatively to each other, compression lips connected to said cup sections and extending longitudinally inwardly therefrom and having their outer surfaces tapering toward each other, and a longitudinally movable spring arranged to resiliently bear against the said outer tapered surfaces of said compression lips.

9. A jointed doll comprising a hollow member provided with an integral socket cup section extending inwardly into the hollow interior of said hollow member, a ball secured to said hollow member concentrically with and in spaced relation with respect to said socket cup section and a limb member swivelly mounted on said ball.

10. A jointed doll comprising a member provided with an integral socket cup section extending inwardly into the hollow interior of said hollow member, a stem supporting tube formed integrally with and extending inwardly from the said socket cup section, a ball disposed in spaced relation to said cup section and having a cylindrical stem arranged to be received by said stem support, and a limb member mounted on said ball.

11. A jointed doll comprising a sheet metal hollow member provided with an integral sheet metal socket cup section and with an access aperture, a stem supporting tube formed integrally with and extending inwardly from the inner part of said socket cup section, a ball having a stem which is arranged to be received within said stem supporting tube, and a pin passing through said stem tube and the stem of said ball and adapted to be placed in position or removed through the said access aperture.

12. A jointed doll comprising a body member, limb member sections joined together along their peripheral edges and forming a hollow inner space, stem supporting tube sections of semi-cylindrical form and connected integrally at their outer ends with the outer parts of said limb member sections, and a filling material filling up the hollow inner space formed by the limb member sections.

13. A jointed doll comprising a body member, limb member sections joined together along their peripheral edges and

forming a hollow inner space, stem supporting tube sections of semi-cylindrical form and connected integrally at their outer ends with the outer parts of said limb member sections, a filling material filling up the hollow inner space formed by the limb member sections, a ball provided with a stem which latter is received between the stem supporting tube sections, and a transverse pin passing completely through the limb member, tube sections and the stem of said ball.

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