

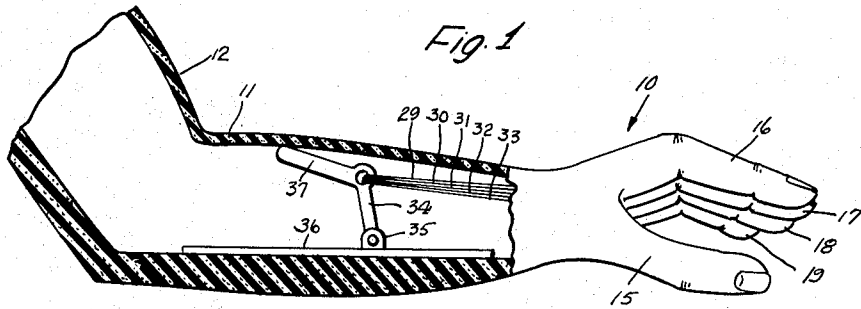
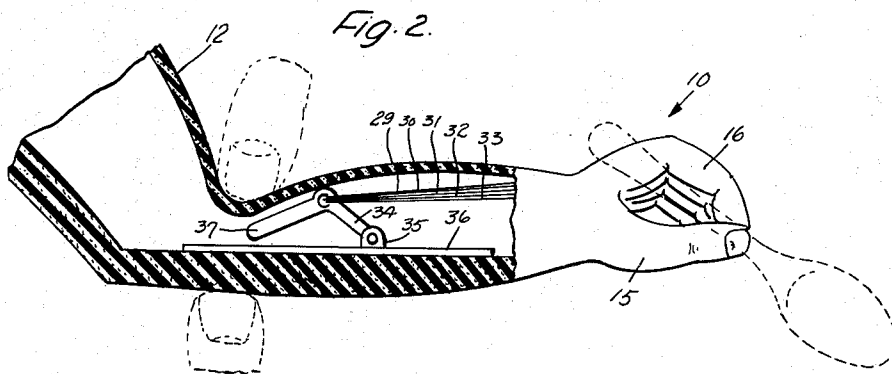
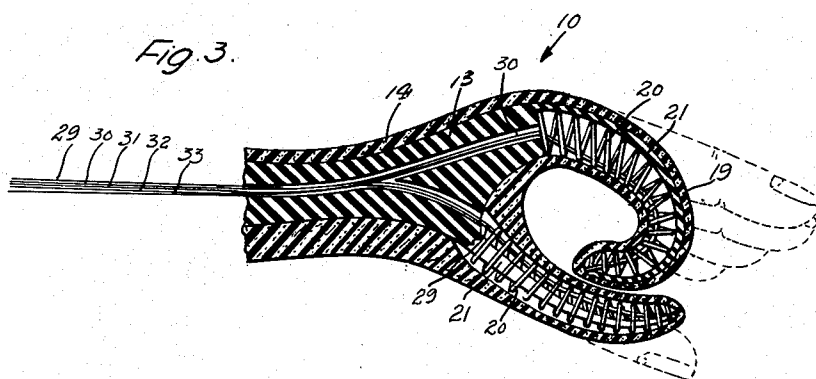
Feb. 7, 1956

C. T. GUADAGNA
MECHANICAL DOLL HANDS

2,733,545

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2 Sheets-Sheet 1



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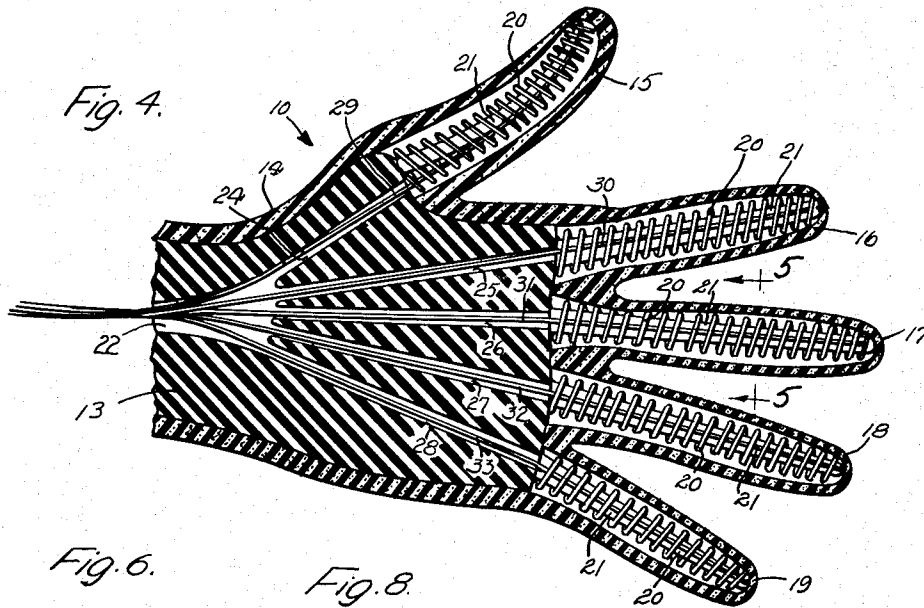
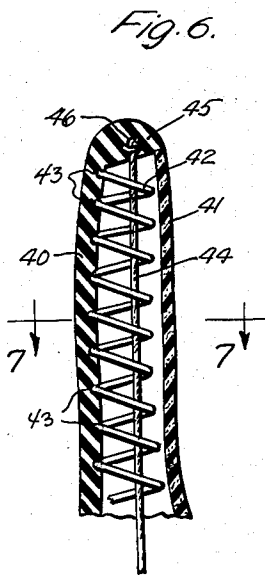
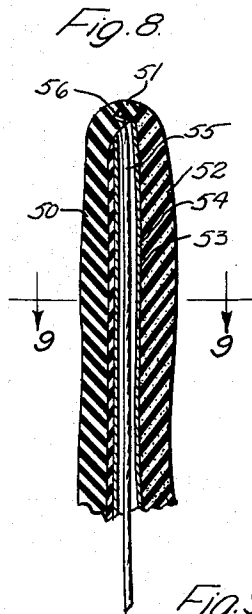
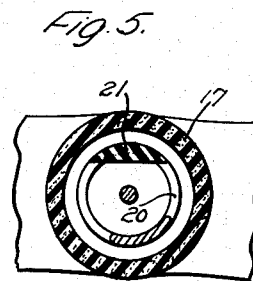
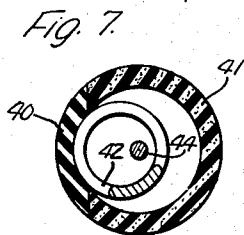
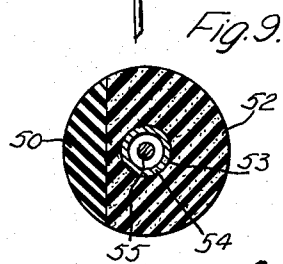
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MECHANICAL DOLL HANDS

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7 Claims. (Cl. 46—126)

The present invention relates to mechanical doll hands and it consists in the combinations, constructions and arrangements of parts herein described and claimed.

Generally there is provided a mechanical doll's hand which is provided with a flexible thumb and flexible fingers each of which is connected at one end to a cord and the cords are all connected at their other ends to a lever which is operable by pressing upon the inner portion of the forearm of the doll, which pressure causes the fingers to curl inwardly in a very natural manner so that the same may be manipulated by the operator or child playing with the doll whereby the fingers may be moved to pick up various objects, this providing a very amusing and instructive toy.

It is accordingly an object of the invention to provide a device of the character set forth which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

Another object of the invention is to provide a novel mechanically operated hand for dolls.

Still another object of the invention is the provision of novel finger constructions forming parts of the invention.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawing, in which:

Figure 1 is a side elevational view, partly broken away, of an embodiment of the invention showing a hand forming a part of the invention in opened condition.

Figure 2 is a view similar to Figure 1 but showing the same in closed condition.

Figure 3 is an enlarged fragmentary vertical sectional view of the device illustrated in Figure 2.

Figure 4 is an enlarged transverse sectional view of the device as illustrated in Figure 1.

Figure 5 is an enlarged sectional view taken along line 5—5 of Figure 4.

Figure 6 is a longitudinal sectional view of a modified form of finger construction which the invention may assume.

Figure 7 is a sectional view taken along line 7—7 of Figure 6.

Figure 8 is a view similar to Figure 6 but showing a still further modification of the invention, and

Figure 9 is an enlarged sectional view taken along line 9—9 of Figure 8.

Referring more particularly to the drawing, there is shown therein a mechanical doll hand generally indicated at 10 and which is attached to a hollow forearm 11 which is, in turn, connected to a hollow upper arm 12.

Referring now to Figures 3 and 4, it will be seen that the hand 10 is provided with a body 13 of hard rubber which body includes a portion of the thumb together with the palm and back of the hand and a portion of the wrist. The body 13 is provided with a covering of soft rubber, as indicated at 14 which cover extends outwardly to form a hollow thumb 15 and four fingers 16, 17, 18 and 19.

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Each of the thumb 15 and fingers 16 to 19, inclusive, is provided with opening and closing means for the same and which comprises, in each case, an elongated compression spring 20 which is embedded upon its outer side in a strip of rubber 21.

A centrally disposed longitudinally extending opening 22 is formed in the body 13 and has communicating therewith a passageway 24 which, in turn, communicates with the interior of the thumb 15 and has also communicating therewith passageways 25, 26, 27 and 28 which communicate at their other ends with the interiors of the fingers 16 to 19, inclusive.

A cord 29 is affixed at one end to the outer end of the rubber strip 21 and extends thence through the opening 24 to the opening 22 and cords 30 to 33, inclusive, are likewise attached to the outer ends of the members 21 in the fingers 16 to 19, inclusive, and thence extend through passageways 25 to 28, inclusive, to the passageway 22 where all of the cords 29 to 33, inclusive, thence extend to a lever 34 which is pivotally connected to an ear 35 mounted upon a plate 36 which is, in turn, attached to the lower portion of the inner wall of the forearm 11. The lever 34 is provided with an angular extension 37 which normally bears against the upper portion of the inner wall of the forearm 11.

In operation, it will be apparent that when the inner portion of the forearm is squeezed, as indicated in Figure 2, that the lever 34 will be moved downwardly, that is to say in a counterclockwise direction as viewed in Figures 1 and 2, thus pulling the cords 29 to 33, inclusive, outwardly of the thumb and fingers. This action causes a bending of the thumb and fingers to the positions indicated in Figure 3, for example, due to the fact that the rubber strip 21 acts to maintain one side of the spring 20 with its convolutions as originally spaced whereas the other side of the spring may have its convolutions brought closer together. Thus the doll's arm may be manipulated by the user of the toy in such manner that the thumb and fingers may be caused to grasp, pick up and release various objects in an amusing and constructive manner.

In Figures 6 and 7 there is shown another form the invention may assume wherein the fingers are each provided with a back 40 of comparatively hard rubber and a front wall 41 of comparatively soft rubber. A spring 42 extends through the interior of the finger and has that portion thereof adjacent the back 40 embedded therein, as indicated at 43. A cord 44 is fastened to a solid tip 45 which is formed integrally with the back 40, as indicated at 46.

The operation of this form of the invention is identical with that above described, the pulling of the cord 44 causing a bending of the finger to the right as viewed in Figure 6.

In Figures 8 and 9, there is illustrated still another form the invention may assume wherein there is provided a finger having a back 50 of hard rubber and provided with a tip portion 51 formed integrally therewith and there is also provided a front portion 52 of relatively soft sponge rubber which is centrally provided with an opening 53 which is lined with a fabric 54 or the like. A cord 55 is attached, as indicated at 56, to the tip 51 and operates in the manner above described. The liner 54 in the instant case, provides a means for the prevention of excessive friction with the cord 55.

While but three forms of the invention have been shown and described herein, it will be readily apparent to those skilled in the art that many minor modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In a mechanical hand, an elastic and normally ex-

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tended jointless digit structure of similar cross-section therealong arranged for its impermanent flexed-curving toward the palm of the hand and comprising an expanded helical spring core normally having its turns solely connected by a body of relatively inelastic rubber along the back of the spring core to provide a lesser degree of longitudinal elasticity of the finger thereat, and a flexible pull member extending longitudinally through the digit from a terminal point of attachment thereof adjacent the digit tip in such relation to the digit that its rearward longitudinal pulling is operative to effect a curving of the digit toward the palm of the hand and its subsequent release permits a return of the digit to its normally extended position solely by reason of the digit structure.

2. In a doll's limb, a hollow arm having a resiliently yielding wall and terminating in a hand, an elastic and normally extended digit structure of the hand formed for its flexed curving toward the palm of the hand for co-operation with the hand in an object-grasping manner, a flexible member extending rearwardly into the arm space through the digit and hand from a terminal point of attachment of the member within the digit its longitudinal displacement to effect a curving of the digit toward the palm of the hand and its subsequent release to permit return of the digit to its normally extended condition, and a lever means provided within the arm space opposite said yielding wall for actuation by the inwardly displaced wall and connected to said member for actuating the latter by and upon squeezing of the arm at the lever means to actuate the same.

3. In a doll's limb, a hollow arm terminating in a hand, elastic and normally extended thumb and finger digits of the hand formed for their individual flexed curving toward the palm of the hand in closing actions of the digits, flexible pull members extending through the digits and rearwardly through the hand and into the arm space from interior points of attachment to the digits and operative to curve the digits toward the palm of the hand solely during and by reason of a rearward pulling of the members, and a lever means mounted within the arm space opposite said yielding wall for actuation by the inwardly displaced wall and connected to said pull members for its actuation to correspondingly operate said members by and upon squeezing of the arm to flex the corresponding digits toward the palm of the hand.

4. In a doll's limb comprising a recessed arm terminating in a hand, a resiliently flexible and normally extended digit structure of the hand formed for its impermanent flexed curving toward the palm of the hand to cooperate with the other members of the hand, in a closing action thereof, a flexible pull member extending rearwardly into the arm through the digit and hand

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from a terminal point of attachment thereof to and within the digit in guided relation to the digit and hand for its longitudinal displacement to effect a curving of the digit toward the palm of the hand, and a lever means operative in the recess of the arm for actuating the pull member and having an actuator arm extending along an exterior wall of the recess, said exterior wall of the recess opposite the actuator arm of the lever being resiliently flexible and inwardly deflectable to provide for an operative rocking of the lever to flex the digit by an application of pressure against its said arm transversely through said wall.

5. In an artificial hand, a normally extended unitary digit structure having elongated and laterally flexible elements of homogeneous elastic material all extending longitudinally of the digit for the full effective length of the digit with a back said element of said digit having the least flexibility to facilitate an impermanent flexing of the digit in a continuous curve toward the palm of the hand in a closing action for the hand, and an inelastic flexible pull member extending rearwardly and slidably through the digit from an interior forward point of attachment to the digit and coactive with the digit elements to curve the digit toward the palm of the hand for its article-gripping cooperation with the palm and/or other digits of the hand solely during and by reason of a rearward pulling of the pull member with respect to the digit.

6. A structure in accordance with claim 5 whereof the back said digit element comprises a body of elastic rubber or the like and a forward said digit element comprises an expanded helical spring having rear portions of its turns solely retained embedded in the body of the back said digit element.

7. A structure in accordance with claim 5 whereof the back said digit element comprises a body of elastic material of minor segmental cross-section and a forward said digit element comprises a body of elastic material of major segmental cross-section and more flexible than the first body, said bodies being integrally joined at their flat faces and the second body providing a longitudinal opening slidably receiving the pull member therethrough.

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