Jan. 25, 1944. B. J. BUCHANAN 2,340,172

DOLL AND METHOD OF MAKING SAME

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Fig. 2.

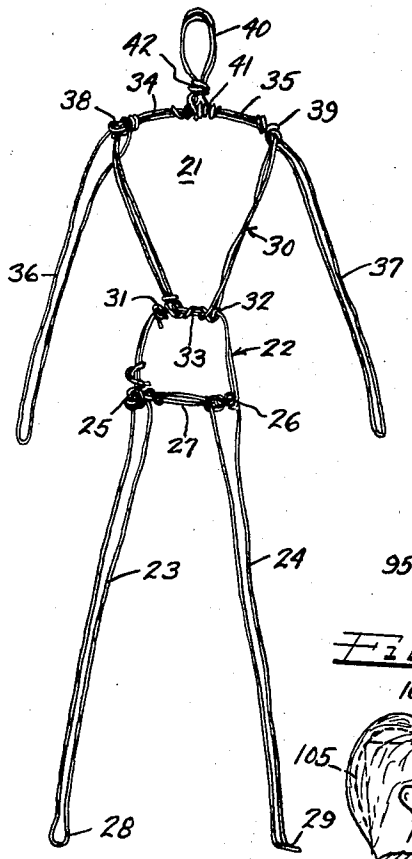


Fig. 1.

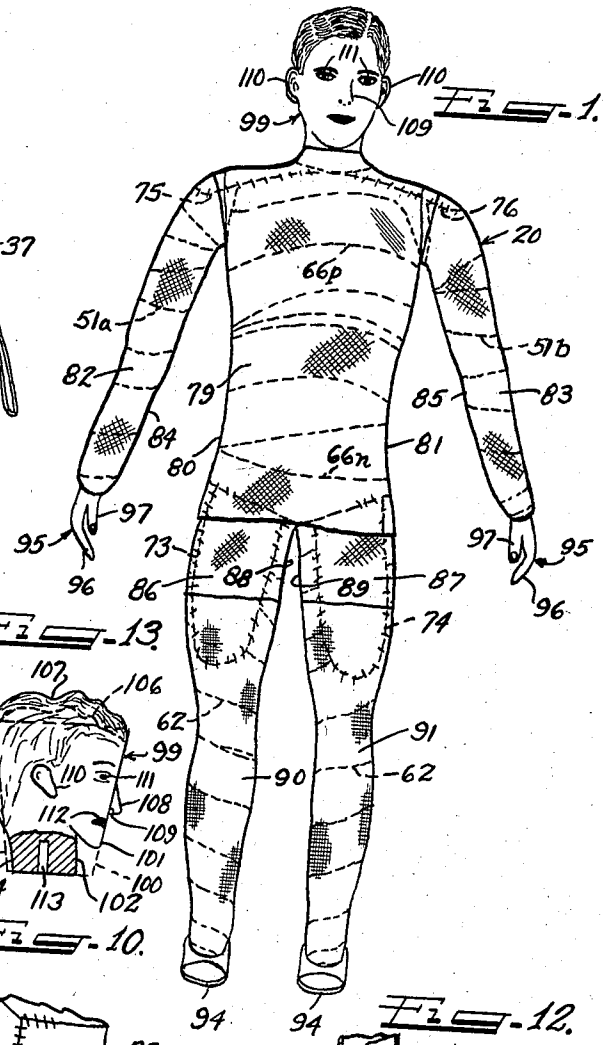
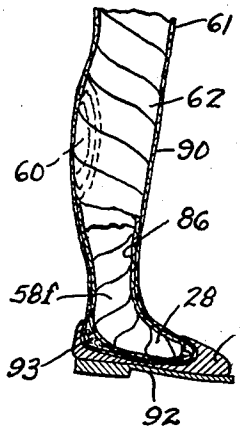


Fig. 13.

Fig. 10.

Fig. 11.



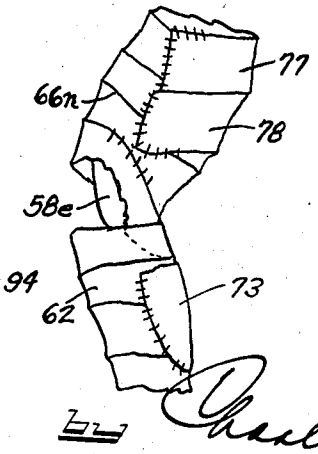
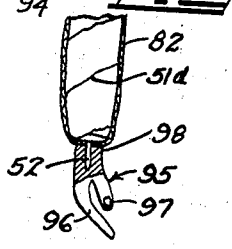


Fig. 12.



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ATTY.

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DOLL AND METHOD OF MAKING SAME

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Fig. 3.

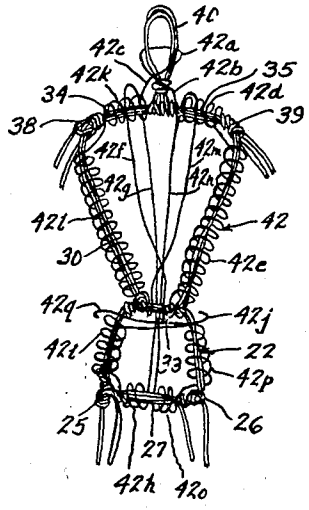


Fig. 4.

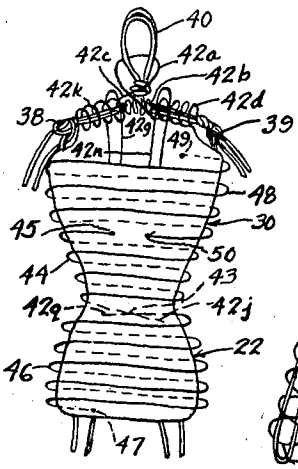


Fig. 5.

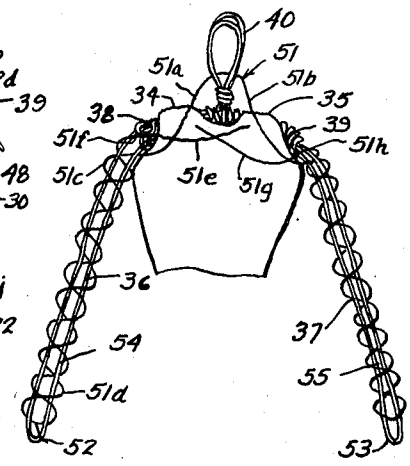


Fig. 9.

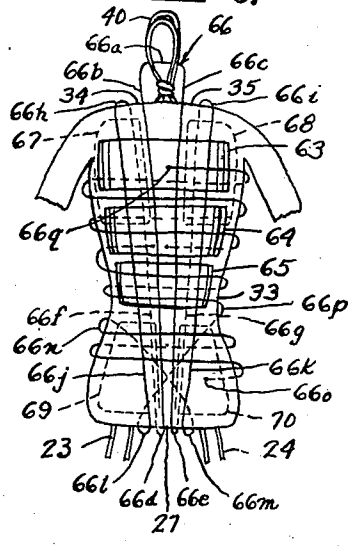


Fig. 7.

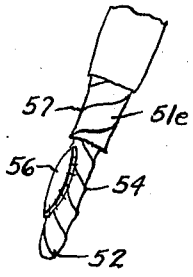


Fig. 8.

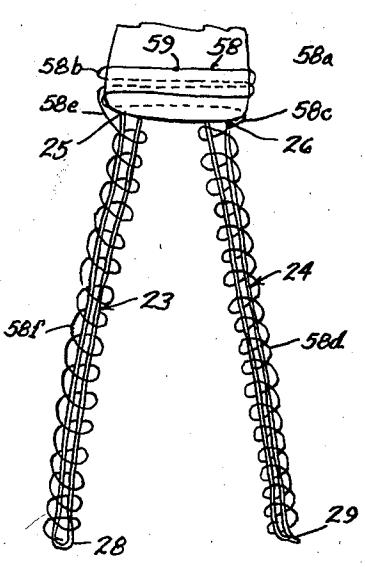
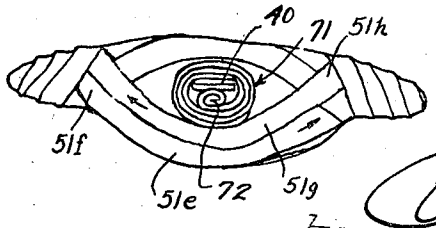


Fig. 6.



Inventor

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By Charles O. Wills Atty.

Patented Jan. 25, 1944 2,340,172

UNITED STATES PATENT OFFICE

2,340,172

DOLL AND METHOD OF MAKING SAME

Betty Jane Buchanan, Oak Park, Ill.

Application March 28, 1941, Serial No. 385,583

3 Claims. (Cl. 46—162)

The present invention relates to the construction of and to a method of making life-like figures and is more particularly directed to a flexible and unbreakable miniature figure such as a doll structure.

In the usual construction of miniature figures or counterparts of human beings, animals or the like, flexibility is provided for by molding or otherwise shaping the figures from such materials as rubber, paper, yarn or numerous fabrics or by merely filling a fabric covering of the shape desired with sawdust, paper, hair or the like. Such constructions are objectionable either because the materials become brittle with age, tear or fail to retain the shapes in which they are originally fabricated.

With the foregoing in mind, it is an important object of the present invention to provide a structure for a life-like figure in which these and other objectionable features are eliminated.

Another object of this invention is to provide a method for making a life-like figure which embodies all of the features to be more fully described hereinafter.

A further object of this invention is the provision of a miniature figure so constructed of metal, fabric and wood as to provide a flexible and jointed body.

A still further object of this invention is the provision of a miniature figure in human or animal form or the like having characteristics providing a life-like appearance.

Among some of the features of the present invention is the provision of a skeleton formed of flexible wires of such metal as copper, the skeleton having joints at the extremities of the limbs, the neck where jointed to the torso, and at the waistline thereof. Other features include winding and padding the skeleton with fabric strips in such a manner as to effect the proper girth, contour and thickness desired whereby the trunk and limbs may be flexed to any position while retaining their fabricated shapes.

The novel features believed to be characteristic of the present invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and manner of construction, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a front view in elevation illustrating a doll construction embodying principles of the present invention;

Figure 2 is a front view in elevation of a flexible wire skeleton around which the figure of Figure 1 is constructed;

Figures 3 to 9 diagrammatically illustrate the steps in winding strips of fabric around the skeleton illustrated in Figure 2;

Figure 10 is a fragmentary side view in elevation illustrating the joint between the trunk and leg when the trunk is bent forwardly;

Figure 11 is an enlarged fragmentary vertical cross-sectional view showing details of construction of the lower portion of the leg and foot illustrated in Figure 1;

Figure 12 is an enlarged vertical cross-sectional view, with portions in elevation, of the fore arm and hand construction illustrated in Figure 1; and,

Figure 13 is a side view, with a portion cut away and shown in vertical cross section, of the head construction illustrated in Figure 1.

The miniature figure or doll construction 20 illustrated in Figure 1 is formed of such materials as metal, fabric and wood. The metal provides a skeleton 21 simulating, as nearly as possible, the bone structure of the figure to be constructed, which in the present instance is that of a miniature figure of a human being. It is preferred that the skeleton be formed of wire and it has been found that copper wire of a size No. 20 provides an excellent skeleton due to its flexibility and because copper is very ductile and has the ability to resist corrosion. It is to be understood, however, that wire of other metals may be used equally as well and the size of the wire used will depend upon the size of the figure to be constructed.

As shown in Figure 2, the skeleton 21 is formed of a plurality of separate lengths of wire in order that the several portions of the body and its extremities may be jointed. If desired, the entire skeleton may be formed of a single length of flexible wire with its flexibility only being dependent upon for twisting and bending to desired positions.

The lower portion 22 of the torso or trunk is trapezoidal in shape and formed of two loops of wire, the ends of which are formed as elongated loops extending outwardly and downwardly from the lower corners at its wide end to provide legs 23 and 24. The upper ends of the legs are coiled around the lower corners 25 and 26 along the pelvic line 27 to provide additional strength and to hold the trapezoidal loops together. The coils at the corners 25 and 26 thereby provide hip

joints. The U-shaped ends of the legs are bent outwardly to form feet 28 and 29.

The upper portion 30 of the torso or trunk, generally trapezoidal in shape, is formed of a length of doubled wire, the ends 31 and 32 of which are coiled around the short waistline 33. The coils 31 and 32 provide joints at the waistline of the body. The wide end of the trunk portion 30 is slightly curved to form the shoulders 34 and 35. Elongated loops 36 and 37 of wire form the arms and their ends are coiled as at 38 and 39 around the upper corners of the trunk portion 30 at the extremities of the shoulders 34 and 35. It is preferred that the arm loops be coiled so as to extend from the rear of the trunk portion 30 to more nearly simulate an actual jointed shoulder construction.

A short loop of double wire forms the neck 40, the free ends of which are centrally coiled at 41 around the wires defining the long side of the trunk portion 30 between the shoulders 34 and 35. The terminals of the short loop are then coiled around the base of the neck 40 as at 42 to provide additional strength.

It will be apparent from the foregoing description that the skeleton construction 21 provides joints at the base of the neck, at the connections of the arms to the shoulders, at the waistline, and at the connections of the legs to the trunk of the body.

The skeleton is now ready for application of the material necessary for the provision of girth and contour to give shape to the body of the figure to be formed. For this purpose, it is preferred that strips of flesh-colored outing flannel be used, although it is to be understood that other materials may be used such as paper, various fabrics, or the like. The width and length of the strips depend entirely on the size of the wire skeleton used and the ease with which such strips may be wrapped around the various portions of the skeleton. In models so far made and which were approximately nine inches in height, the strips were approximately one-half inch wide and of a length necessary for the number of windings to cover a definite length of the skeleton and provide that portion thereof with the proper contour and thickness.

The manner in which the skeleton 21 is wrapped with strips of fabric to form the construction of Figure 1 is diagrammatically illustrated in Figures 3 through 9. In all the windings to be described, each convolution is so wound that a marginal edge thereof overlaps a marginal edge of an adjacent convolution. As shown in Figure 3, a strip 42 of material is looped as at 42*a* intermediate its ends around the neck 40 of the skeleton in such a manner that the ends 42*b* and 42*c* cross at the front of the neck. The strip length 42*b* is then wound under and over the shoulder 35 on a bias as at 42*d*. The end of the strip is so wound as to bridge the shoulder coil 39 and is wound on the bias down a side of the upper trunk portion 30 as shown at 42*e*. The end of the strip is wound to a position adjacent the center of the waistline 33 where it is looped under and passed upwardly along the front of the skeleton as at 42*f* to loop over the opposite shoulder 34 and down the back as at 42*g* to the pelvic line 27. The end 42*h* is then wound on a bias around the left-hand portion of the pelvic line 27 where it bridges the coil 25 and is wound upwardly as at 42*i* around the left-hand side of the lower trunk portion 22. The free end is then brought transversely across the front of the lower trunk portion 22 at the waistline 33 to a position illustrated at 42*j*.

The length of the strip 42*c* is wound on a bias over and under the shoulder 34 as illustrated at 42*k*. The strip then bridges the coil 38 and is wound downwardly on a bias as at 42*l* along the left-hand side of the upper trunk portion 30. The end of the strip 42*c* is then wound to a position adjacent the center of the waistline 33 where it crosses the strip 42*b* and extends upwardly along the front of the skeleton as at 42*m* where it is looped over the shoulder 35 and brought down the back of the skeleton as at 42*n* to the center of the pelvic line 27. The strip is then wound on the right-hand portion of the pelvic line 27 as at 42*o* to bridge the coil 26 and then upwardly as at 42*p* until it reaches a position adjacent the waistline where it crosses transversely of the lower trunk portion 22 to the position as illustrated at 42*q*.

The shoulder and the sides of both trunk portions, the waistline and the pelvic line are thereby wound on a bias for strengthening the trunk of the body and effecting a covered skeleton portion for receiving additional wrappings to give the trunk proper thickness and contour. The strip portions 42*g* and 42*n* form a spinal column at the back of the skeleton.

Continued wrapping of the ends of the strips 42*b* and 42*c* is illustrated in Figure 4. The ends 42*j* and 42*q* cross each other as at 43 at the back of the figure. The end 42*j* is transversely wound upwardly along the lower portion of the trunk 30 and terminates at 45 where it is stitched in place. The strip end 42*q* is wound transversely downward as at 46 along the trunk portion 22 to terminate at 47 where it is stitched in place.

A short strip 48 of material has one end thereof stitched as at 49 and is wound transversely downward on the trunk portion 30 until it meets the terminal 45 of the strip 42*q*. The terminal 50 of the strip 48 is then stitched in place.

In this manner, the entire trunk comprising the portions 22 and 30 are transversely wound along their lengths.

The arms are next wound as illustrated in Figures 5 and 6. A strip 51 of material has an intermediate portion placed against the back of the neck portion 40 with the ends 51*a* and 51*b* thereof drawn forwardly over the shoulders 34 and 35. The strip end 51*a* is passed under the shoulder coil 38 and is then wound downwardly on a bias as at 51*c* along the length of the arm 36. The free end of the strip portion 51*a* is then wound upwardly as at 51*e* on a bias angularly and oppositely disposed to the bias winding of the portion 51*c*. The end of the strip 51*e* is brought diagonally across the shoulder coil 38 as at 51*f*, as shown in Figures 5 and 6. The strip portion 51*b* is wound on a bias down and back along the arm 37 in the same manner as the strip end 51*a* just described. The end 51*g* of the strip 51*b* is diagonally brought over the shoulder coil 39 as at 51*h*. If the ends 51*e* and 51*g* are long enough and it is necessary to provide for additional thickness in the arms 36 and 37, the ends are brought across the chest with the end 51*g* being wound diagonally over the shoulder coil 38 and on a bias down the arm 36 to the wrist portion 52 where it is stitched in place. The end 51*e* is brought diagonally over the shoulder coil 39 and wound on a bias down the arm 37 to the wrist 53 where it is stitched in place.

In order that the arms may taper properly from the shoulder to the wrist, the strips are

wound so that the overlapping of marginal edges of adjacent convolutions is greater near the shoulders than at the wrists.

After the arms 36 and 37 have been wound to provide a longitudinal taper, the forearms 54 and 55 are shaped to the proper contour in a manner now to be described. As shown in Figure 7, oval-shaped strip portions 56 are laid around the back and a portion of the sides of the forearm 54 to provide the desired contour. A short strip of material, not shown, is then wound on a bias in opposition to the bias of the strip 51*e* from the elbow 57 down to the wrist 52 where it is stitched in place. The forearm 55 on the arm 37 is provided with a similar padding and a wound strip to give the contour desired.

The legs 23 and 24 are then wound as illustrated in Figure 8. A strip 58 has an intermediate portion thereof stitched as at 59 to the strip covering the lower end of the trunk portion 22. The ends 58*a* and 58*b* of the strip 58 are then wound transversely around the trunk portion 22 until the coils 25 and 26 defining the hip joints are reached. The strip end 58*a* is wound diagonally, as at 58*c*, over the coil 26 and then on a bias down the entire leg as at 58*d* to the foot 29. The end of the strip 58*b* is wound diagonally, as at 58*e*, over the coil 25 and then on a bias as at 58*f* along the length of the leg 23 down to the foot 28. If the strip ends 58*a* and 58*b* are of a sufficient length, the legs are additionally wound along a bias and in an opposite direction upwardly with adjacent convolutions overlapping in the same manner as the arms 36 and 37 are wound. These windings provide a longitudinal taper downwardly from the hips to the foot on each leg.

The lower portion of the leg from the knee to the foot is shaped similar to the forearm of each of the arms as previously described herein.

As shown in Figure 11, a sufficient number of oval pads 60 are stitched to the back of the leg below the knee 61 to provide a calf portion. A strip 62 is then wound from the hip 25 to the foot 28 along a bias in opposition and angularly disposed to the bias of the winding 58*f*. The leg 24 is finished in a similar manner.

As shown in Figure 9, the trunk of the body is next shaped and wound with strips to a desired girth and contour in proportion to the finished arms and legs.

A strip 63 is folded in a plurality of thicknesses and laid on the chest portion of the upper trunk 30 where the edges are stitched in place to the underlying strip 48. The number of folds will depend on the depth of chest desired. Similarly, a strip 64 is folded and stitched at its edges to the strip 48 in a position below the folded strip 63. Another strip 65 is folded and stitched in place at the waistline 33. Usually the folded strips 63, 64 and 65 are of a thickness to arcuately shape the front of the upper trunk 30 from the neck to the waistline when viewed from the side. However, the thicknesses of the strips may be varied in accordance with the type of figure to be formed. Male and female figures are provided with strips to properly shape the upper trunks accordingly. An athletic type of figure is shaped with the strip 63 being folded to provide the greatest number of folds with the strips 64 and 65 having proportionately fewer numbers of folds whereby the upper trunk 30 tapers sharply to a narrow waist. A stout type of figure requires that the strips 64 and 65 be folded to provide greater thickness at the waist than at the chest. If necessary, additional folded strips (not shown) may be stitched to the strip 46 over the lower trunk portion 22 to provide an abdominal protrusion.

A long strip 66 is looped at an intermediate portion 66*a* behind the neck 40 with the free ends 66*b* and 66*c* brought forwardly over the shoulders 34 and 35 and down the front of the body over the folded strips 63, 64 and 65. The ends 66*b* and 66*c* are then looped, as at 66*d* and 66*e*, between the legs 23 and 24, over the pelvic line 27 and brought upwardly as at 66*f* and 66*g* along the back of the body. The ends are looped as at 66*h* and 66*i* over the shoulders and brought down the front of the body along the portions designated 66*j* and 66*k*. With the ends of the strip hanging downwardly, folded strips 67, 68, 69 and 70 are inserted between the strip portions 66*f* and 66*g* and the underlying wound strip to provide for a seat and shoulder blades.

The remainder of the free ends 66*b* and 66*c* of the strip are then looped as at 66*l* and 66*m* around the pelvic line 27 and are crossed at the back of the lower trunk portion 22. The strip end portion 66*n* is then wound transversely around the lower trunk 22 from the waist down and the terminal 66*o* is stitched in place to the underlying strip 46. The strip end portion 66*p* is wound transversely around the upper trunk 30 from the waist upward where the terminal 66*q* is stitched in place to the underlying folded strip 63.

The wire loop 40 forming the skeleton neck is next wound with a strip 71 as shown in Figure 6. This strip of material is coiled at one end as at 72 and placed against the front of the loop 40 to form the larynx and the end of the strip is wound around the coil 72 and the wire loop until the proper neck thickness is obtained. The terminal of the strip is stitched in place.

In order that the thighs of the legs have a muscular appearance when the figure is that of a man, particularly of the athletic type, strips such as 73 and 74 are stitched in place as shown in Figure 1. Similarly, strips 75 and 76 are sewn on the shoulders to give them a squared appearance. Likewise, as shown in Figure 10, short strips 77 and 78 may be sewn across the abdominal region if desired either to reinforce the transversely wound strip portion 66*n* or to provide additional padding for a stout figure.

The figure, wound as described above, is provided with a smooth covering to give a finished appearance. An oblong strip 79, cut on a bias, has a central opening to slip over the wound neck 71. Adjacent edges are sewn together along seams 80 and 81 extending from the arm pits to the ends of the strip adjacent the hips. Similarly, strips 82 and 83 also cut on the bias, are wrapped around the arms 36 and 37 and adjacent longitudinal edges on the inside of the arms are sewn together along seams 84 and 85. Strips 86 and 87 of bias are wrapped around the legs 23 and 24 and sewn along the inner longitudinal seams 88 and 89.

The figure illustrated in Figure 1 has stockings 90 and 91 made of silk, rayon, "nylon" or other suitable or similar material, the edges of which are either sewn, glued or otherwise suitably connected to form seams depending on the material used. If desired, the entire figure may be covered with the stocking material to provide a smooth skin effect.

Soles 92 for the feet are cut either from sheet cork, heavy paper or other similar or suitable

material. The heel of each foot is formed by inserting a small ball 93 of cotton batting or like material within the stockings 90 and 91 as shown in Figure 11. Plastic wood is then applied to each foot and molded into the shape of a shoe, sandal or other footgear 94 and the sole 92 is applied while the shoe portion is still plastic. If desired, the sole 92 may be glued to the footgear after the plastic wood has hardened.

As shown in Figure 12, each of the hands 95 is cut from cork or wood or is molded from plastic wood or the like. In the preferred form, the body and fingers 96 of the hand are cut from cork or wood and the thumb 97 is molded of plastic wood. The wrist portion 98 has a slot for receiving therein the wire wrist portions 52 or 53 of the skeleton. Connection therebetween is by means of glue or a pivot of metal, thread or the like (not shown) passing through the hand and the wire loop.

A head 99 is formed preferably in the following manner although it is to be understood that it is within the scope of this invention to form the head structure entirely of wood or other suitable material, either cut or molded to the finished shape.

A tapered bottle cork illustrated in dotted lines of Figure 13, has the portion 100 cut away to form the chin 101 and the front portion of the neck 102. Another portion 103 is cut away to form the rear portion of the neck 104. Plastic wood is applied as at 105 around the hair line to properly shape the skull and, if wavy hair is desired, the plastic wood is provided with transversely extending grooves 106.

Hair 107 of mending floss, mohair or other similar material is glued to the plastic wood after it has hardened. A nose 108 is cut from a flat strip of cork and glued to the face with nostrils 109 being formed of plastic wood. Ears 110, also cut from a flat strip of cork, are glued to the head 99. The eyes 111 and the mouth 112 are painted or inked on the face of the head 99.

A transversely extending slot 113 is provided in the neck of the head to receive therein the loop 40 of the skeleton. Connection therebetween is by glue or other suitable means in the same manner as the hands are affixed to the skeleton arms.

The finished body construction is then dressed with whatever garments are desired for depicting historical, dramatical, or other characters. As the garments form no part of the present invention, they are not illustrated or described herein.

It is to be noted that the elbow and knee portions of the limbs have the least number of strips wound therearound thereby permitting greater flexibility for bending the limbs to positions in which the figure assumes various poses.

The joints at the shoulders and hips are so wound as to permit flexibility at the ends of the limbs. As illustrated in Figure 1, the coverings for the arms and the body are not connected in order that the arms may be twisted without the coverings twisting. As shown particularly in Figure 10, the strip material crossing diagonally over the hip coils 25 and 26 at 58e provides the only connection between the wound trunk portion 22 and the wound leg 23. The diagonally extending strip portion 58c connects the wound trunk portion 22 and the wound leg 24. Likewise, the strip of material connecting the arms to the upper trunk 30 crosses the shoulder coils 38 and 39 diagonally as at 51f and 51h as shown in Figure 6.

It will be apparent from the foregoing that I have provided a flexible and jointed life-like figure construction formed of strip material wound in a particular manner on a wire skeleton having a body and limb portions which retain their shape when twisted or bent to various positions.

While a particular embodiment only of this invention has been illustrated, it will, of course, be understood that the invention should not be limited thereto, since many modifications may be made and, therefore, it is contemplated by the appended claims to cover all such modifications as fall within the true spirit and scope of the present invention.

I claim as follows:

1. A skeleton for an imitation life-like figure comprising a trapezoidal-shaped loop of wire forming the lower trunk of a body, a second trapezoidal loop of wire forming the upper trunk of said body, the ends of one of said loops being coiled around the other loop to form a jointed connection, a loop of wire having the ends thereof coiled around the upper side of said second loop to form a jointed neck, and a plurality of elongated loops, separate loops having both ends thereof coiled to the upper corners of said upper trunk of the body and to the lower corners of said lower trunk of the body to form jointed limbs.

2. A foot construction for an imitation life-like figure comprising a leg portion having a wire skeleton core and a covering of material strips around said core, an angularly extending foot on said leg, a ball of material at the heel of said foot, a covering for said leg portion, holding said ball of material at the heel, a molded shoe embracing said covered foot, and a sole connected to said molded shoe.

3. A doll skeleton comprising separate loops of wire formed to provide a bust body section, a pelvis body section coil connected thereto to form a waist-line, a neck coil connected to the bust body section, loop arms having both ends of the wires forming the arms coil connected to the bust body section, and loop legs having both ends of the wires forming the legs coil connected to the pelvis body section, said loop legs having the bight portions thereof bent to form feet.

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