Aug. 6, 1968 B. Y. SMITH 3,395,484

DOLL FIGURES HAVING AN INTERNAL WIRE SKELETON

Filed June 22, 1966 3 Sheets-Sheet 1

FIG. 1.

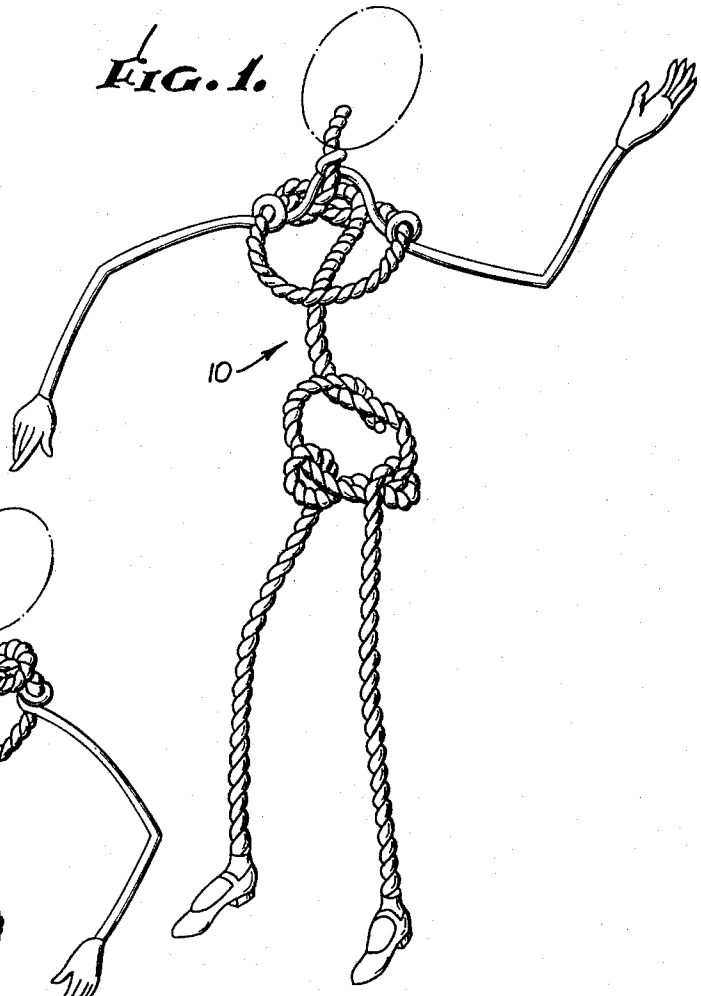


FIG. 2.

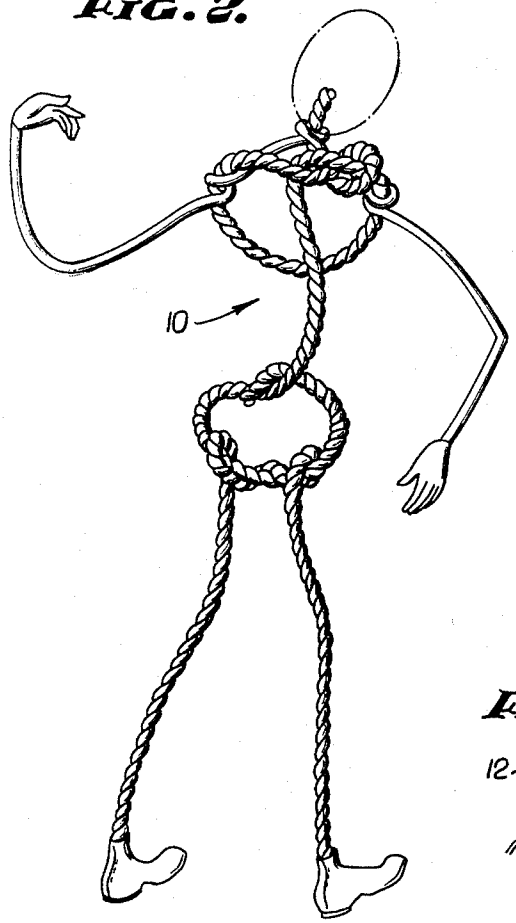
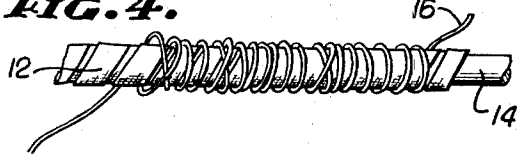


FIG. 3.



FIG. 4.



INVENTOR.
BETTY Y. SMITH
BY
John Joseph Hall
ATTORNEY.

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DOLL FIGURES HAVING AN INTERNAL WIRE SKELETON

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FIG. 5.

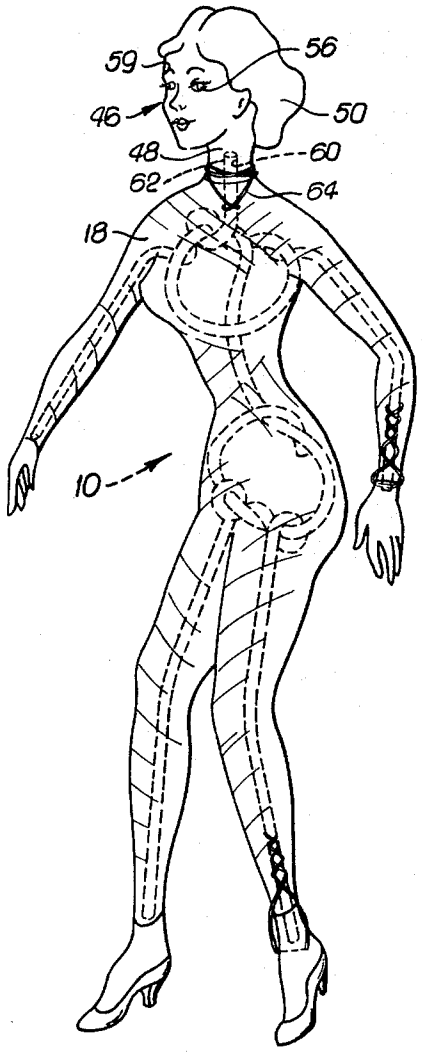


FIG. 6.

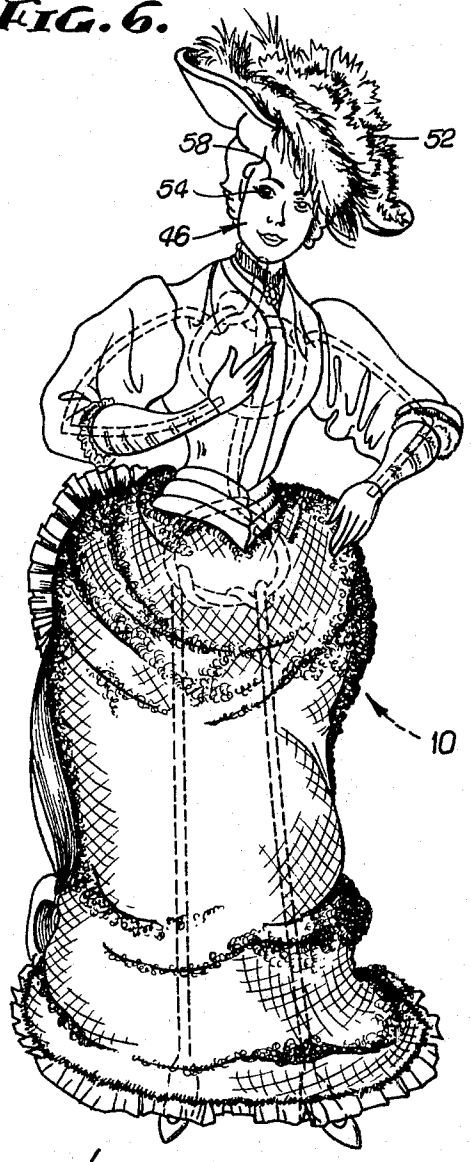


FIG. 7.

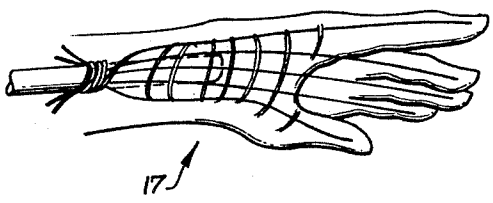
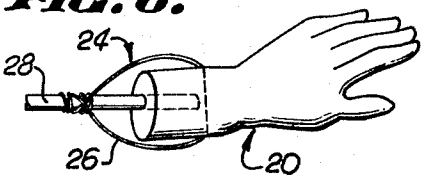


FIG. 8.



INVENTOR.
BETTY Y. SMITH
BY
John Joseph Hall
ATTORNEY.

Aug. 6, 1968 B. Y. SMITH 3,395,484

DOLL FIGURES HAVING AN INTERNAL WIRE SKELETON

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FIG. 12.

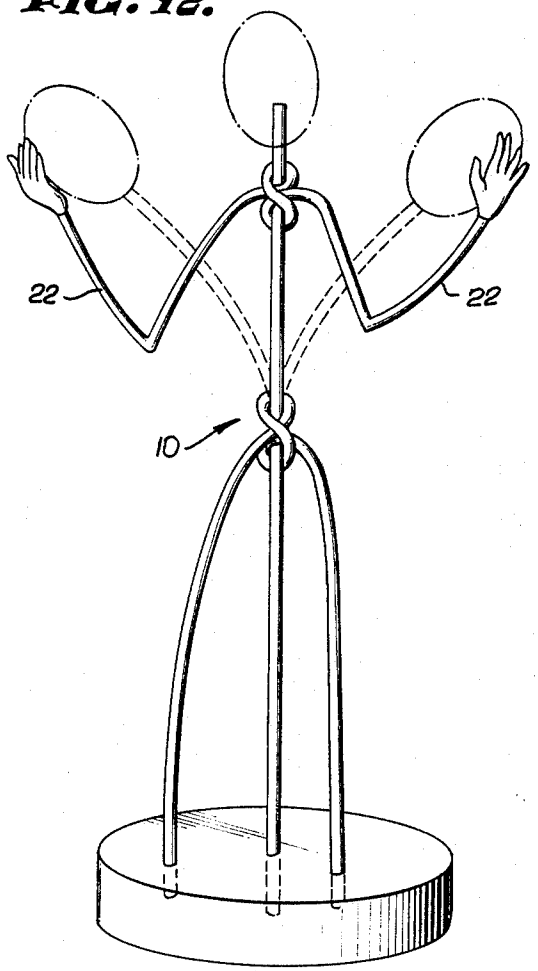


FIG. 13.

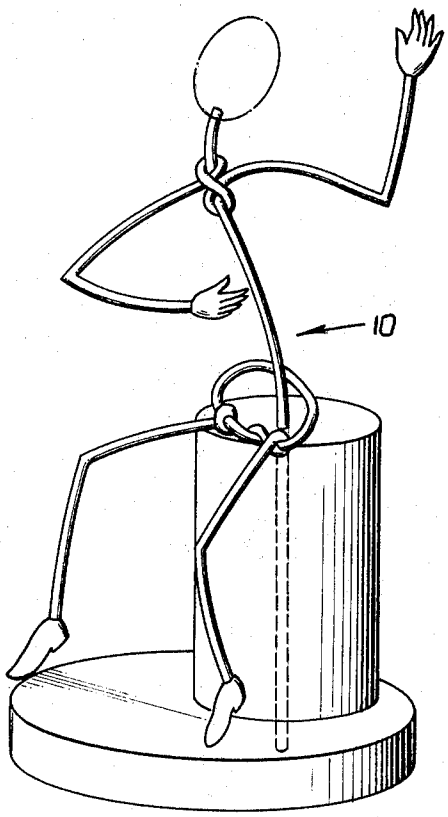


FIG. 9.

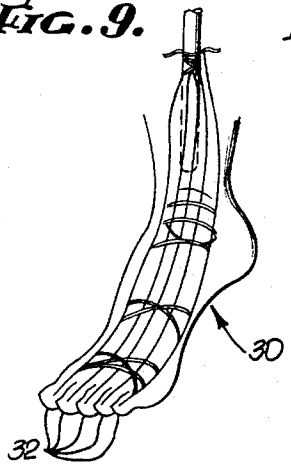


FIG. 10.

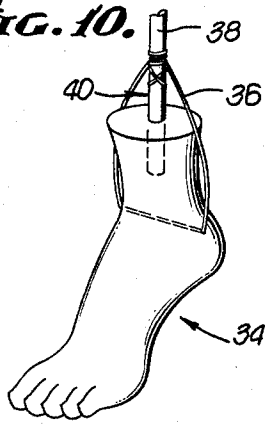
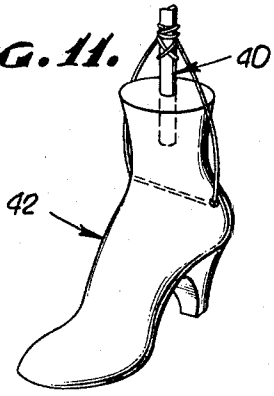


FIG. 11.



INVENTOR.
BETTY Y. SMITH
BY
John Joseph Hall
ATTORNEY.

United States Patent Office

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DOLL FIGURES HAVING AN INTERNAL WIRE SKELETON

Betty Y. Smith, Box 36, Lilliwaup, Wash. 98555

Filed June 22, 1966, Ser. No. 559,498

7 Claims. (Cl. 46—151)

This invention relates to improvements in doll figures and construction and particularly concerns dolls having an internal wire skeleton or armature.

Hitherto, existing types of dolls have definite disadvantages in that slippage occurs between the internal wire and the finishing materials making up the outer part or visible material of the doll. Frequently, the wire skeleton of conventional dolls becomes dislocated from its proper position and it or its parts projects through the outer covering. Also, such conventional dolls often have internal wire construction which severs easily.

It is, therefore, an object of this invention to provide a strong but simple armature or skeleton construction for a doll figure by covering each wire in a wire skeleton of a doll separately with a self-adhesive material before being assembled into parts of a skeleton as well as the completed skeleton itself.

Another object of this invention is to provide dolls having an internal wire skeleton which will not protrude through the outer covering even after prolonged use.

A further object of this invention is to provide dolls which have no slippage between the internal armature or skeleton and covering materials.

These and other object will be more fully understood by reference to the following description and claims, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a front elevational view of the flexible internal skeleton or armature of one of my doll figures.

FIGURE 2 is a rear elevational view of FIGURE 1.

FIGURE 3 is an enlarged fragmentary view showing the manner of covering a section of the wire making up the skeleton or armature of one of my doll figures.

FIGURE 4 is an enlarged fragmentary view showing the manner of reinforcing a section of the skeleton or armature of one of my doll figures.

FIGURE 5 is a perspective view of a skeleton of one of my doll figures covered with padding.

FIGURE 6 is a front elevational view of one of my completed doll figures which is fully balanced by itself and has flexible arms, hands, fingers, thumbs, legs, and ankles, but with inflexible feet.

FIGURE 7 is a detail view of one type of flexible hand having an internal skeleton or armature for each extremity of the hand.

FIGURE 8 is a detail view of an inflexible hand construction and means for attaching it to an arm.

FIGURE 9 is a detail view of a flexible foot with an internal skeleton or armature for each extremity of the foot.

FIGURE 10 is a detail view of an inflexible foot and means for attaching it.

FIGURE 11 is a detail view of an inflexible shoe form including the foot.

FIGURE 12 is another embodiment of my invention showing a flexible skeleton construction in conjunction with a base and stand, the dotted lines showing various positions for placing the flexible torso portion of the skeleton.

FIGURE 13 is another embodiment of my invention showing a flexible skeleton construction in conjunction with a base and illustrating a seated position of a flexible skeleton.

With reference to the drawings, the skeleton or wire armature **10** of FIGURE 1 is constructed by covering

each wire used in the skeleton separately with a self-adhesive material **12** such as a soft, self-sealing, self-adhesive tape before forming any part of the armature **10**. Such material should have a slightly viscous adhesive, but it should not be so sticky as to be difficult to handle.

When this preferred covering material **12** is used, the resulting doll has superior qualities of strength, flexibility, and balance because the wires forming the armature acquire increased tensile strength and durability from the covering material **12**.

The skeleton **10** of my doll figures is preferably constructed from two types of wires having different diameters and weights, 18 gauge steel wire **14**, and 30 gauge steel wire **16**.

The 18 gauge wire, being of a larger diameter and heavier weight is suitable to form the legs, arms, and torso of the skeleton **10**. These parts are preferably each formed by two lengths of 18 gauge wire **14** covered with the self adhesive tape **12** and then twisted together to form a double twisted length. In some instances, a single length of 18 gauge wire may be used for arms. In other cases, three or four lengths of 18 gauge wire may be twisted together.

For added strength, 30 gauge steel wire **16** covered with self adhesive tape **12** may be laced around the 18 gauge wire as shown in FIGURE 4. Also, the 30 gauge steel wire **16** covered with the self adhesive tape **12** is used to form flexible hands, fingers and toes, as shown in FIGURES 7 and 9. 18 gauge wire in conjunction with 30 gauge wire may be used to form feet, as illustrated in FIGURE 9.

By the use of my novel skeleton construction, my dolls need no joints, ball and socket or otherwise, or springs or elastic or other means of joining parts of a skeleton for a doll figure. My novel skeleton construction permits easy and repeated bending of elbow and knee portions, as well as other sections of the skeleton, without resulting in breaks.

My novel skeleton construction can be used for doll figures ranging in height from a few inches to as large as life size or larger human figures. Of course, the larger figures will require steel wire heavier than 18 gauge, in all probability.

It is to be understood that I do not limit my novel skeleton construction to be made from steel wire only. Any material having the requisite tensile strength and flexibility may be used, such as various plastics, to form the skeleton or armature of my doll figures.

Further, any suitable self adhesive material may be used to cover the individual wires making up the skeleton. For example, besides wrapping, the wires may be covered by dipping them in a suitable solution of a plastic material.

My novel skeleton construction, covered by the self adhesive material, prevents any accidental slippage between various parts making up the skeleton, as well as the lengths of wire themselves, even though made from multiple twisting of several lengths of wire together. Further, no slippage or dislocation occurs even after the skeleton is padded or otherwise finished with various materials to form the completed doll figures, as between the wire skeleton and the padding or finishing material.

Instead of single or double twisted 18 gauge wire, multiple-twisted links of wire may be used for arms of a figure which will hold a large or heavy object.

The flexible hand portion **17** of the skeleton as shown in FIGURE 7 may be covered by semi-soft flexible padding **18** made of plastic, latex rubber, or similar material as illustrated in FIGURE 5. The padding may be adapted in various conventional ways to cover the skeleton hand of FIGURE 7, such as by being cast into shape in one or more pieces and then sealed over the skeleton hand, or

cast in the round and then slit to fit the skeleton hand and then folded and sealed in place around the hand and fingers.

Another type of covering for the flexible hand and fingers may be formed by wrapping strips of crepe paper or other similar expandable material over the parts of the skeleton hand. As a final flexible finishing cover, the thin skin-line material is added by applying it to the wrapped hand by painting, dipping or similar means. Such a thin skin finish may be produced by various plastics, latex rubber, or similar materials. In this case also, each of the extremities of the hand is completely flexible.

Still another type of flexible hand may be produced by sewing or otherwise securing cloth, leather, or similar material over the flexible skeleton hand, thereby producing the effect of a gloved hand with fingers and thumb separated.

Where desired, the flexible hand may be weighted in the palm or in the separate fingers without losing flexibility anywhere.

All of these types of flexible hands may be placed in almost unlimited positions similar to those in real life, such as pointing a finger, clenching a fist, or grasping objects of various shapes, sizes and weights.

If flexibility is desired only at the wrist, the inflexible hand **20** illustrated in FIGURE 8 is made by casting, carving, or modeling of inflexible material such as metal, stone, wax, and similar inflexible materials. Such an inflexible hand, of course, must be made in a predetermined position which will permit only movement as a whole from the flexible wrist when attached to a flexible skeleton arm **22** as shown in FIGURE 12.

The wrist portion **24** of the hand **20** is laced with 30 gauge wire **26** to the flexible skeleton arm **28** as indicated in FIGURE 8.

My novel skeleton construction permits completely flexible feet similar to the flexible hands and fingers.

An illustration of a flexible foot **30** with flexible toes **32** is shown in FIGURE 9 of the drawings. The same types of flexible finishing coverings may be used for a flexible foot as for the flexible hands, thereby permitting five flexible and separate toes which can be placed in various positions.

In addition, such flexible feet may be weighted to balance the complete figure by stringing or weaving one or more metal weights, made of lead or other suitable material, into the foot skeleton. However, where the completed figure will be seated or suspended, such weights are unnecessary.

Where flexibility is desired only at the ankle, similar to the wrist of the inflexible hand, the inflexible foot **34** may be made in the same way as the hand, using the same material, and is attached by 30 gauge wire **36** to the flexible skeleton leg **38** as shown in FIGURE 10. The inflexible foot **34**, just like the inflexible hand, must be made in a predetermined position since movement is permitted only at the flexible ankle **40**.

In cases where the foot of the completed doll will be in shoe form **42** as illustrated in FIGURE 11, the completely flexible foot with flexible toes is unnecessary. Only the ankle section **44** need be flexible for the doll figure to have balance and flexibility to and including the ankle, as illustrated in FIGURE 11, with an inflexible foot **34** as illustrated in FIGURE 10. Of course, if desired, the entire shoe form **42** may be made flexible or inflexible for a particular doll figure, using construction similar to the foot in FIGURE 9.

Both the weighted flexible foot **30** and the inflexible foot **34** and shoe form **42** have sufficient weight and support to hold the flexible doll figure when completed, in balance and to permit rebalancing of the flexible figure in different positions.

FIGURES 5 and 6 illustrate the head construction used for my doll figures. The heads **46** may be constructed conventionally by casting inflexible materials such as wax, stone, papier-mache, and similar materials, into head **46** and neck **48** units. Also, heads may be carved out of solid materials or modeled from wet materials such as clay and then dried or fired. The heads **46** may be built up from a light weight porous center using conventional applique methods.

In addition, flexible materials may be used to form heads and neck units.

The same types of skin covering materials previously mentioned for other parts of the body may be used for finishing the heads.

Wigs **50** or wig-hat **52** units are used to complete the head. Colored glass beads **54** or colored glass-beaded pins **56** are used for the eyes. Bits of wig material make eyebrows **58**, or the eyebrows **59** may be painted on.

The heads **46** and neck **48** are provided with a cavity **60** which receives the neck portion **62** of the covered wire skeleton. The cavity **60** may be formed by piercing or drilling the material, or by casting the material with a pocket. The head **46** is secured to the skeleton by lacings of 30 gauge steel wire **64** as shown in FIGURE 5, or by glue or other adhesive means, or by both wire and adhesive means.

The cavity **60** may extend entirely through the head and be fastened at the top of the head **46** under a wig **50** or may alternatively penetrate the head **46** only partially before being secured to the skeleton as previously indicated.

In actual production of the doll figures, the wire skeleton **10** is first formed from the various wires previously mentioned in illustrating preferred embodiments of my invention. Next, the covering material, preferably having the qualities of tape **12** previously mentioned, is used to cover the wire skelton **10**.

Thereafter, the various types of skin covering may be used to make the finished doll. Where it is desired to use solid materials which are cast in imitation of human flesh and which are thick enough to form a doll body without padding underneath, various rubbers, rubber-like materials, synthetic rubbers, or pliable plastic materials, and the like, may be used. Such materials may be cast in dies or molds in one or more pieces and may be patterned to fit closely over the covered wire doll skeletons to form finished doll bodies. Various types of clothing may then be applied and sewn over and around the doll body as desired. Any suitable type of material may be used for such clothing.

Where it is desired to use a relatively thin outside skin coating for the doll figures, padding is needed underneath the outside coating to cover the doll skeleton and to fill out the body of the finished doll figure. Various materials may be used as padding in combination or singly, including crepe paper, cellulose wadding, cotton wadding, tubular knitted cotton, plastic materials in shaped pieces such as spheres, tubes, and the like, as well as other suitable materials. The padding may be wrapped, pinned, sewn, skewered on, or otherwise attached to or over the covered wire doll skeleton.

After the padding has been added to the covered wire doll skeleton, the thin outside skin covering is then applied over the padding. Various suitable materials may be used, including synthetic rubbers, latexes, or other materials capable of being sprayed on, painted over, or placed on by dipping, the padded doll skeleton to form a flexible, glovelike, thin outside skin covering. Thereafter, various types of clothing may be applied and sewn over and around the doll figures as desired.

Although I have described my invention in detail with reference to the accompanying drawings illustrating preferred forms of my invention, it is understood that numerous changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as hereinafter claimed.

For example, I have previously referred to preferred

embodiments of my invention employing double twisted lengths of wires of a particular size or diameter. It is possible to construct my invention in embodiments using single untwisted wires throughout, said wires having various suitable diameters, sizes, and chemical compositions. Thus, my invention is not limited to double twisted lengths of wire or to twisted wire lengths anywhere in the doll construction. Therefore, single lengths of single twisted wire having suitable strength may be used throughout such a construction, as well as single lengths of single wire, and also a single length of double twisted wire as well. Again, each of these embodiments may have various suitable diameters, sizes, and be made up of various types of chemical compositions.

I claim:

1. A flexible wire skeleton construction for a doll figure in which each individual length of wire used has previously been covered with a soft, self-sealing, self-adhesive material, comprising a shoulder and chest portion formed by a loop of wire; a pelvis area formed by a loop of wire and connected to the shoulder and chest portion by a wire length and connected to the shoulder and chest portion by a wire length forming a back bone; two lengths of wire, each of which is connected at its upper end to the pelvis area and each of which has its lower end connected to a flexible foot construction, said foot having individual wires for each toe joined together by lighter weight wire; two lengths of single wire, each of which is connected at its upper end to the shoulder and chest portion and its lower end to a flexible hand, said hand having individual wires for each of the extremities joined together by wire, whereby the entire skeleton including the extremities of the hands and feet may be individually flexed to various positions, and is capable of remaining and balancing in said position.

2. A flexible wire skeleton construction for a doll figure according to claim 1 to which has been added a head, padding, and a flexible outer covering over the padding to form a completed doll body.

3. A flexible wire skeleton construction for a doll figure according to claim 1 to which has been added a head, and material shaped to cover the skeleton to form a completed doll body.

4. A flexible skeleton construction for a doll figure comprising:

a plurality of twisted wire-like lengths connected together and forming a torso area, a pelvis area, a backbone, legs, and a neck portion;

a pair of single strand wire-like lengths each connected at one end to each side of the upper portion of said torso to form arms; and

covering material adhering to each individual length of each of said wire-like lengths, each of said arms has a plurality of wire-like lengths connected at its outer end to form a hand and individual extremities thereon.

5. A flexible skeleton construction for a doll figure according to claim 4 in which each of said legs has a plurality of wire-like lengths connected at its outer end to form an ankle and individual extremities thereon.

6. A flexible wire skeleton construction for a doll figaccording to claim 4 in which each of said arms has a plurality of wire-like lengths connected at its outer end to form a hand and individual extremities thereon, and in which each of said legs has a plurality of wire-like lengths connected at its outer end to form an ankle and individual extremities thereon.

7. A flexible wire skeleton construction for a doll figure comprising, a shoulder and chest portion formed by a loop of wire, each length being covered with a soft, self-sealing, self-adhesive material; a pelvis area formed by a loop of wire, being covered with a soft, self-sealing, self-adhesive material, and connected to the shoulder and chest portion by a single wire forming a back bone, said wire being covered with a soft self-sealing, self-adhesive material; two lengths of wire forming legs, each length being covered with soft, self-sealing, self-adhesive material, each of which is connected at its upper end to the pelvis area and each of which has its lower end connected to a flexible foot construction, said foot having individual wires for each toe joined together by other wire, said wires being covered with a soft self-sealing, self-adhesive material; two lengths of single wire forming arms, each length being covered with a soft self-sealing, self-adhesive material, each of which is connected at its upper end to the shoulder and chest portion and at its lower end to a flexible hand, said hand having individual wires for each of the extremities joined together by, other wire, each wire being covered with a soft, self-sealing, self-adhesive material, whereby the entire skeleton including the extremities of the hands and feet may be individually flexed to various positions.

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LOUIS G. MANCENE, *Primary Examiner.*

R. F. CUTTING, *Assistant Examiner.*