June 20, 1967 J. W. RYAN ETAL 3,325,939

ADJUSTABLE FIGURE TOY HAVING IMPROVED ARMATURE MEANS

Filed Nov. 21, 1966 2 Sheets-Sheet 1

Fig. 1

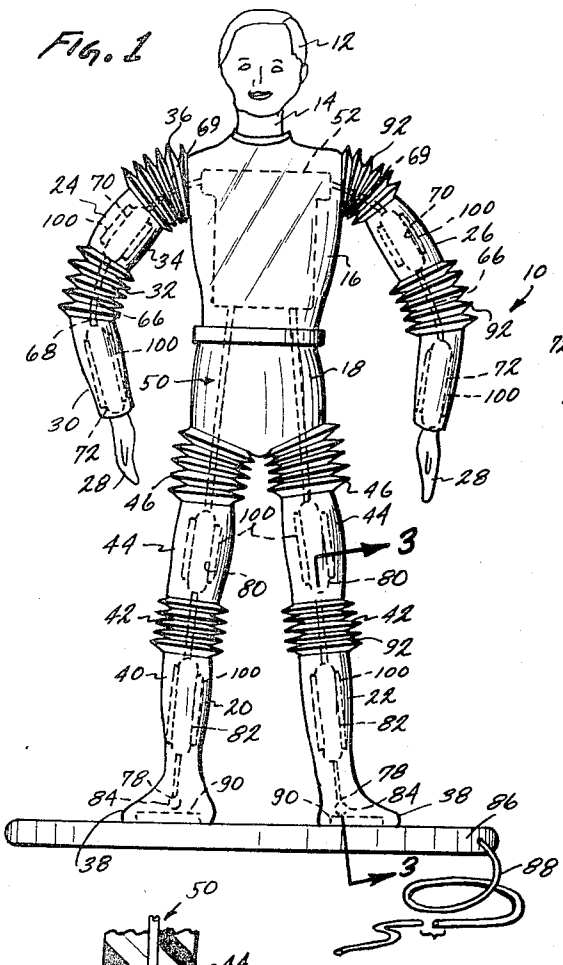
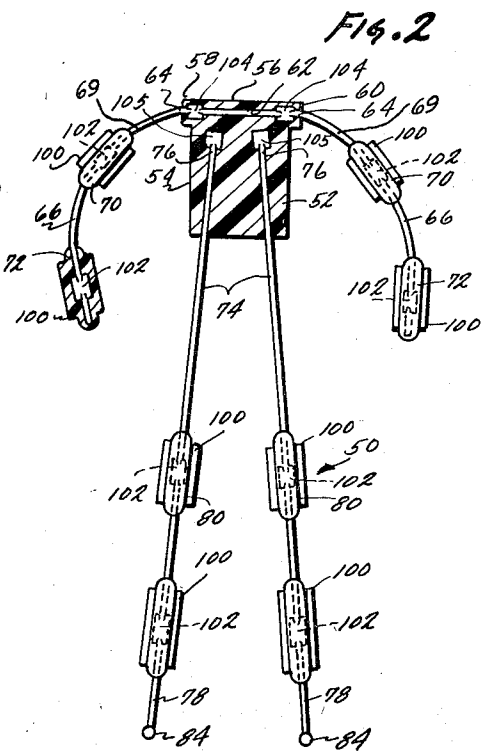


Fig. 2



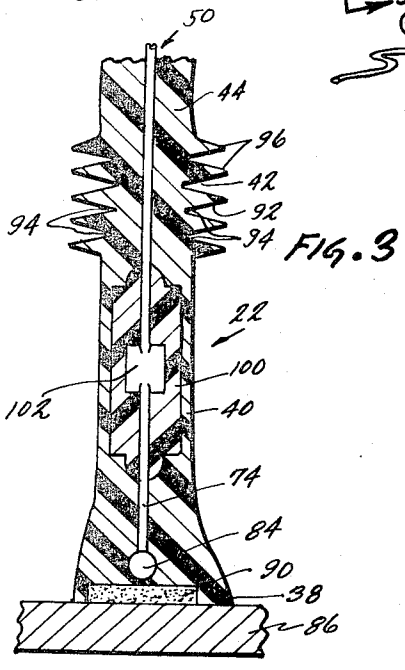


Fig. 3

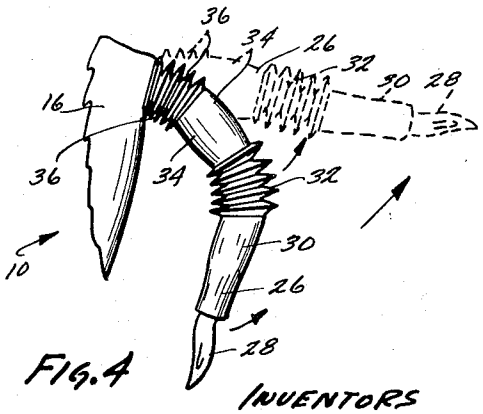


Fig. 4

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Filed Nov. 2J, 1966 2 Sheets-Sheet 2

Fig. 5

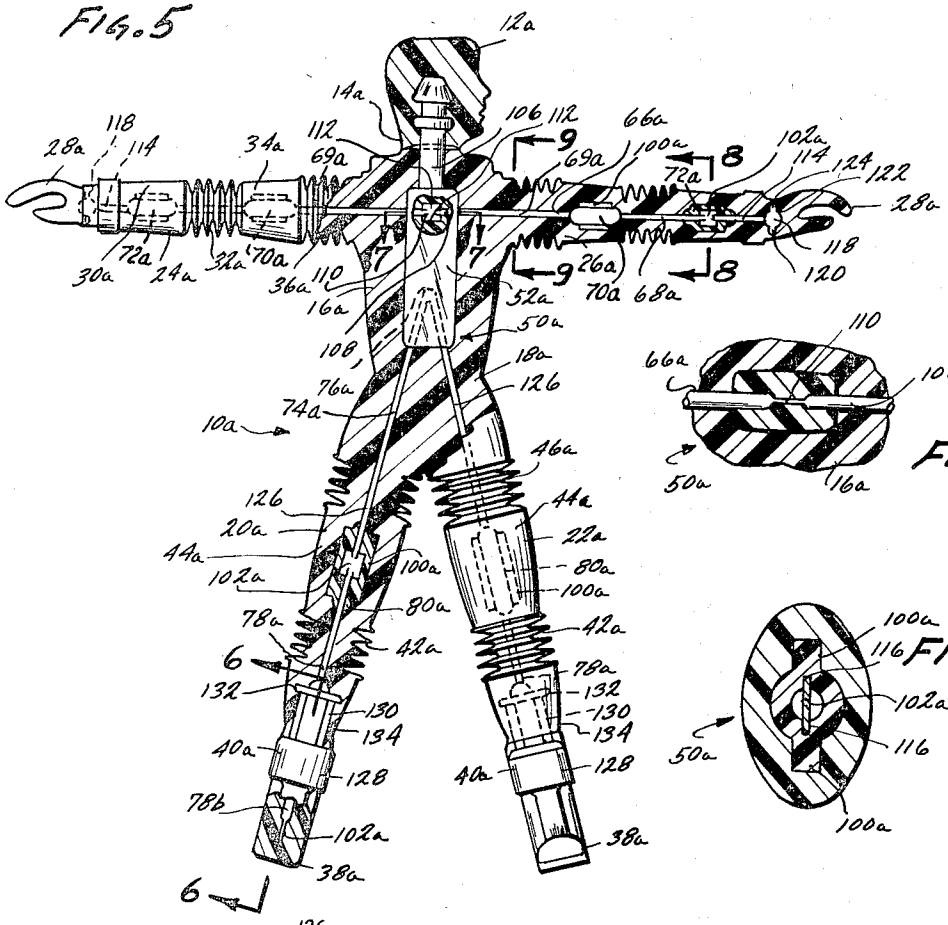



Fig. 7




Fig. 8




Fig. 6

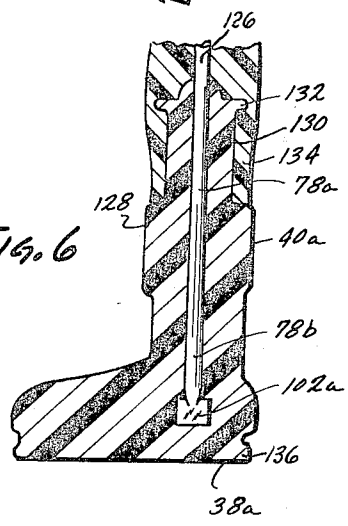
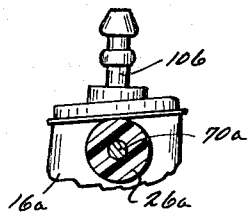



Fig. 9




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# ADJUSTABLE FIGURE TOY HAVING IMPROVED ARMATURE MEANS

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## ABSTRACT OF THE DISCLOSURE

A simulated spaceman doll has a soft, pliable body supported by a soft wire armature which is encompassed by rigid stiffeners embedded in the limbs of the doll between its joints and in its body for preventing bending of the limbs and body between the joints. The stiffeners have a non-cylindrical shape and the portions of the wires which are encompassed by the stiffeners are flattened to a non-cylindrical shape for preventing relative rotation between the limbs of the toy and the stiffeners and between the stiffeners and the wires, respectively.

The present invention relates to a new and useful pliable figure toy and, more particularly, to a toy of the type disclosed in United States Patent No. 1,189,585, which includes improved armature means for supporting the toy in various bent and twisted positions.

The play value of certain prior art figure toys is enhanced by making them of a soft, flexible material, such as rubber or soft plastic, so that the toy may be bent into different shapes. While generally satisfactory, such toys are subject to the disadvantage that they have no inherent ability to retain themselves in different positions against the resiliency of the material forming the toy.

This disadvantage may be overcome to a large extent by embedding a flexible, non-resilient metal armature in the toy for retaining the toy in bent positions. Although such armatures will overcome the disadvantage associated with flexible toys which would not retain themselves in different positions, the armatures introduce an additional disadvantage. This disadvantage resides in the fact that unwanted bending will often be imparted to a limb of the toy when a child-user attempts to bend the limb at a joint.

This disadvantage may be overcome to a large extent by the dummy model shown in U.S. Patent No. 1,189,585, wherein a flexible, non-resilient armature is encompassed by soldered wire coils between the elbow, shoulder, thigh and knee joints for rendering the armature rigid between these joints.

While generally satisfactory, this type of armature has the disadvantages that the wire coils add to the first cost of the product in an amount making such an armature impractical for use in an inexpensive toy and that neither the wire coils nor the portions of the armature between the coils resists relative rotation between the armature and the material in which it is embedded.

### *Summary of the invention*

In view of the foregoing factors and conditions characteristic of flexible figure toys having flexible, non-resilient armatures embedded therein, it is a primary object of the present invention to provide a new and useful pliable figure toy not subject to the disadvantages enumerated above and having an improved armature means for supporting the toy in various bent and twisted positions.

Another object of the present invention is to provide a toy of the type described having soft wire armature means



embedded in the limbs of the toy for maintaining them in bent positions only at the joints and rigid, non-rotatable stiffener means embedded in the toy between the joints for preventing bending and twisting of the limbs between the joints.

Yet another object of the present invention is to provide an armature means for a figure toy of the type described which includes a neck post for mounting a head on the toy.

A further object of the present invention is to provide a pliable figure toy which simulates a space man in a space suit and which includes simulated, accordion-type pleats at the shoulder, elbow, hip and knee joints in combination with an armature means of the present invention.

A still further object of the present invention is to provide an armature means for a figure toy of the type described which is provided with unitary appendages for the toy.

Yet another object of the present invention is to provide a figure toy of the type described having means provided in the feet of the toy for retaining the toy in position on a base member.

According to the present invention, a pliable figure toy is provided with an improved armature means for maintaining the toy in various bent positions while preventing unwanted bending and twisting of predetermined portions of the toy. The toy may be molded from a suitable soft, pliable plastic material, such as polyvinyl chloride, in a shape which simulates a space man wearing a space suit.

The toy is provided with simulated accordion-type pleats at the shoulder, elbow, hip and knee joints to magnify the space man simulation and facilitate bending the limbs of the toy at its joints. The armature means includes elongated, soft wires which are embedded in the joints and which are encompassed by rigid stiffeners embedded in the limbs between the joints and in the body of the toy for preventing bending of the limbs between the joints. The stiffeners have a non-cylindrical shape and the portions of the wires which are encompassed by the stiffeners are flattened to a non-cylindrical shape for preventing relative rotation between the limbs of the toy and the stiffeners and between the stiffeners and the wires, respectively.

The armature means also includes a permanent magnet which is embedded in each foot for retaining the toy in an erect position on a magnetizable base member. A suitable cord may be attached to the base member for pulling the toy over a suitable surface.

In a modified form of the toy, each foot simulates a space man's boot, is formed integrally with the armature and is shaped to include an annular flange engageable with associated groove means provided on the base member. The armature is also provided with a neck post for supporting a separate head on the toy.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, 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 like reference characters refer to like elements in the several views.

### *Brief description of the drawings*

FIGURE 1 is a front elevational view of a figure toy of the present invention;

FIGURE 2 is a front elevational view, with parts shown in cross-section, of an armature means shown in phantom in FIG. 1;

FIGURE 3 is an enlarged, cross-sectional view taken along line 3—3 of FIG. 1;

FIGURE 4 is a partial, elevational view of the figure toy of FIG. 1 showing one of the limbs thereof in two different positions;

FIGURE 5 is a front elevational view, with parts broken away to show internal construction, of a modified form of a figure toy of the present invention;

FIGURE 6 is an enlarged, partial cross-sectional view taken along line 6—6 of FIG. 5;

FIGURE 7 is an enlarged, partial cross-sectional view taken along line 7—7 of FIG. 5;

FIGURE 8 is an enlarged, partial cross-sectional view taken along line 8—8 of FIG. 5; and

FIGURE 9 is a partial, cross-sectional view taken along line 9—9 of FIG. 5 with the head of the toy removed.

*Description of the preferred embodiment*

Referring again to the drawings and, more particularly, to FIGS. 1–4, a pliable figure toy of the present invention, generally designated **10**, includes a head **12**, a neck **14**, a chest **16**, a trunk **18**, a pair of legs **20**, **22** and a pair of arms **24**, **26**. Each arm **24**, **26** includes a hand **28**, a forearm **30**, an elbow joint **32** and an upper arm **34** and is connected to the chest **16** by a shoulder joint **36**.

Each leg **20**, **22** includes a foot **38**, a lower leg portion **40**, a knee joint **42**, an upper leg portion **44** and a hip joint **46**.

The toy **10** also includes an armature means **50** which may be embedded in the top **10** by positioning the armature means **50** in a suitable mold before molding the toy **10** therein by conventional injection molding techniques or the like. The armature means **50** includes a substantially T-shaped chest plate **52** which is embedded in the chest **16** and which includes a depending stem portion **54** and a cross bar portion **56**. The cross bar portion **56** includes a first end **58** and a second end **60** which are positioned adjacent associated shoulder joints **36** and is provided with a channel **62** extending through the ends **58** and **60** for receiving associated ends **64** of a pair of soft, wire, non-resilient armatures **66**. One armature **66** is embedded in the arm **24** and the other armature **66** is embedded in the arm **26** constituting support means therefor. Each armature **66** extends from an associated hand **28** to the chest plate **52** and includes a bendable elbow portion **68** and a bendable shoulder portion **69** for retaining associated arms **24**, **26** in bent positions at the elbow joints **32** and the shoulder joints **36**, respectively. Unwanted bending of the upper arms **34** and the forearms **30** is prevented by an associated upper, rigid member **70** and a lower, rigid member **72**, respectively. The members **70** and **72** may be made from any suitable rigid plastic material which may be bonded to the armatures **66** before the armature means **50** is placed in a mold (not shown).

The armature means **50** also includes a pair of soft, wire, non-resilient armature members **74**, each of which includes an upper end **76** and a lower end **78**. The upper ends **76** are embedded in the stem portion **54** of the chest plate **52** and extend angularly, downwardly therefrom through the lower portion of the chest **16**, the trunk **18** and associated legs **20**, **22** with the lower ends **78** being embedded in an associated foot **38**. Each armature member **74** also includes an upper, rigid member **80** and a lower, rigid member **82** and a rigid spherical member **84** which are embedded in an associated upper leg portion **44**, a lower leg portion **40** and a foot portion **38**, respectively, for preventing unwanted bending thereof. The members **80**, **82** and **84** may be made from a suitable rigid plastic material which is bonded to associated armature member **74** before the armature means **50** is positioned within a mold (not shown). The armature members **66** and **74** may be made from a suitable soft, non-resilient wire, such as copper or annealed iron.



The toy **10** also includes a base member **86** made from a suitable magnetizable material and simulating a space sled which may be pulled over a suitable surface by a cord **88** attached to the base member **86**. The figure toy **10** may be maintained in position on the base member **86** by a pair of magnets **90**, each of which is embedded in a foot **38**.

The joints **32**, **36**, **42** and **46** are each formed integrally with the associated portions of the toy **10** during the molding operation and are each provided with simulated accordion-type pleats **92** (FIG. 3), each of which includes a plurality of root portions **94** and a plurality of crowns **96** for enhancing the space suit simulation of the toy **10** and for reducing the diameter of the limbs, as clearly shown in FIGURE 3 for leg **22**, to facilitate bending of the associated joints **32**, **36**, **42** and **46**.

In use, the toy **10** may be bent to a number of different positions, as shown in FIG. 4 for the arm **26**, by bending the soft wire portions of the associated armature members **66** and **74** at associated joints **32**, **36**, **42** and **46**. Unwanted bending between the joints is prevented by associated rigid members **52**, **70**, **72**, **80** and **82**. The spherical members **84** prevent associated ends **78** of the armature members **74** from piercing the bottom of the foot **38**.

It is an important feature of the invention that unwanted relative rotation between the arms **24**, **26** and their associated rigid members **70**, **72** and between the legs **20**, **22** and their associated rigid members **80**, **82** is prevented. This may be accomplished by providing each of the rigid members **70**, **72**, **80** and **82** with lateral extensions **100**.

It is also an important feature of the invention that relative rotation between the rigid members **70**, **72**, **80** and **82** and their associated armature members **66** and **74**, respectively, is prevented. This may be accomplished by flattening a portion of the armature members **66**, **74** where they are encompassed by their associated rigid members to provide lateral projections **102** on associated armature members **66** and **74**.

In addition, relative rotation between the ends **64** of the armature member **66** and the chest plate **52** is prevented by flattening the ends **64** to produce lateral projections **104** thereon. The projections **104** may become firmly embedded in the chest plate **52** during a suitable molding operation. Also, the ends **76** of armature members **74** are flattened in like manner to produce lateral projections **105**.

Referring now to FIGS. 5–9, a modified pliable figure toy of the present invention, generally designated **10***a*, includes a head **12***a*, a neck **14***a*, a chest **16***a*, a trunk **18***a*, a pair of legs **20***a*, **22***a* and a pair of arms **24***a*, **26***a*. Each arm **24***a*, **26***a* includes a hand **28***a*, a forearm **30***a*, an elbow joint **32***a* and an upper arm **34***a* and is connected to the chest **16***a* by a shoulder joint **36***a*.

Each leg **20***a*, **22***a* includes a lower leg portion **40***a*, a knee joint **42***a*, an upper leg portion **44***a* and a hip joint **46***a*.

The toy **10***a* also includes an armature means **50***a* which may be embedded in the toy **10***a* by positioning the armature means **50***a* in a suitable mold (not shown) before molding the toy **10***a* therein by conventional injection molding techniques or the like. The armature **50***a* includes a chest plate **52***a* having an upstanding neck post **106** provided thereon for receiving the head **12***a* and the neck **14***a*.

The armature means **50***a* also includes a one-piece, soft-wire, non-resilient armature **66***a* having a mid-portion **108** embedded in the chest plate **52***a* and prevented from rotating with respect thereto by a flattened section **110** forming lateral projections **112** on the mid-portion **108**. The armature **66***a* includes opposed ends **114** which may be embedded in associated hands **28***a*, a pair of bendable elbow portions **68***a* and a pair of bendable shoulder portions **69***a* which may be embedded in associated arms **24***a*, **26***a* for maintaining the elbow joints **32***a* and the shoulder

joints 36*a*, respectively, in bent positions. Unwanted bending of the upper arms 34*a* and the forearms 30*a* is prevented by associated upper and lower rigid members 70*a* and 72*a*, respectively. Relative rotation between the members 70*a* and 72*a* and their associated arms 24*a*, 26*a* is prevented by providing lateral flanges 100*a* on each of the members 70*a*, 72*a*. Relative rotation between the armature 66*a* and associated members 70*a*, 72*a* is prevented by flattened sections 102*a* of armature 66*a*, thereby forming lateral flanges 116 which become embedded in associated members 70*a*, 72*a* during the formation thereof by suitable molding operations. During such molding operations, a spherical member 118 may be formed on each end 114 of the armature 66*a*. Each spherical member 118 carries a lateral flange 120 and a lateral tab 122 for preventing relative rotation between the spherical member 118 and an associated hand 28*a* after the armature 66*a* has been embedded in associated arms 24*a*, 26*a*. The spherical member 118 also prevents the ends 114 from rupturing associated hands 28*a* during use of the toy 10*a* by a child user. Each tab 122 may be used to support the armature means 50*a* in a mold (not shown) during the molding operation which embeds the armature means 50*a* in the toy 10*a*. Each tab 122 may then be broken away from the mold (not shown) leaving a jagged edge 124 embedded within an associated hand 28*a*.

The armature means 50*a* also includes a one-piece, soft-wire, non-resilient armature 74*a* comprising an inverted V-shaped member having a bight portion 76*a* embedded in the chest plate 52*a* and depending arms 126 which become embedded in the trunk 18*a* and associated legs 20*a*, 22*a* during the molding operation which forms the toy 10*a*. The arms 126 include lower ends 78*a*, each of which carries a simulated space boot 128 forming a foot 38*a* and the lower leg portion 40*a* on the toy 10*a*. Each boot 128 includes an upper end 130 which is provided with an annular flange 132 for keeping the soft pliable material 134 forming the lower end of associated legs 20*a*, 22*a* from working up on the lower ends 78*a* during use of the toy 10*a* by a child user. Each boot 128 and the upper ends 130 thereof prevent unwanted bending of the armature 74*a* below associated knee joints 42*a*. Unwanted bending of the upper leg portions 44*a* is prevented by associated rigid members 80*a* which also include lateral flanges 100*a* for preventing relative rotation between associated rigid members 80*a* and their associated upper leg portions 44*a*. Relative rotation between the arms 126 and rigid members 80*a* is prevented by providing lateral flanges 102*a* on members 80*a* which become embedded in associated rigid members 80*a* during the formation thereof by a suitable molding operation.

Relative rotation between the boots 128 and associated arms 126 is prevented by lateral flanges 102*a* formed on the lower end 78*b* of associated arms 126 by flattening the lower ends 78*b* before the arms 126 are embedded in associated boots 128. The toy 10*a* may be supported on a suitable base member (not shown) by an annular flange 136 provided on the bottom of each boot 128.

While the particular figure toy herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

What is claimed is:

1. In combination with a figure toy having a torso and pliable limbs joined to said torso, said limbs including shoulder, elbow, hip and knee joints, improved armature means comprising:

soft wire support means embedded in said limbs and extending through said joints for maintaining said limbs in bent positions only at said joints; and

rigid members affixed to said support means and embedded in said figure toy between said joints for preventing the bending of said limbs between said joints, said rigid members including means preventing relative rotation between said limbs and said rigid members, said support means including means preventing relative rotation between said support means and said rigid members.



2. A combination as stated in claim 1 wherein said rigid members include a T-shaped chest plate having a stem portion extending along the major axis of said torso and a cross bar portion, the ends of said cross bar portion being positioned adjacent said shoulder joints, said soft wire support means including an end portion connected to each of said ends of said cross bar portion and an elongated portion extending through an associated shoulder joint, said soft wire support means also including soft wire members connected to said stem portion and extending through each of said hip joints.

3. A combination as stated in claim 1 wherein said figure toy is molded from a pliable material and is shaped to simulate a space man wearing a space suit and wherein said joints include molded, simulated accordion-type pleats formed integrally with said limbs and said torso during a molding operation, said simulated pleats including root portions and crown portions for reducing the diameter of said limbs only at said joints to facilitate the bending of said limbs at said joints.

4. A combination as stated in claim 1 wherein said rigid members include a chest plate having an upstanding neck post provided thereon, said chest plate being embedded in said torso with said neck post extending exteriorly thereof for supporting a head on said torso.

5. A combination as stated in claim 1 wherein said limbs include a pair of legs simulating human legs having feet and including magnet means embedded in at least one of said feet for maintaining said figure toy in position on a magnetizable base member.

6. A combination as stated in claim 1 wherein said armature means includes simulated boots connected to said support means and extending exteriorly of said limbs.

7. A combination as stated in claim 6 wherein said simulated boots include annular flange means for connecting said toy to a base member.

8. In combination with a figure toy having a torso and pliable limbs joined to said torso, said figure toy being molded from a pliable material and being shaped to simulate a spaceman wearing a spacesuit, said limbs including shoulder, elbow, hip and knee joints, improved armature means comprising:

soft wire support means embedded in said limbs for maintaining said limbs in bent positions only at said joints; and

rigid members affixed to said support means and embedded in said figure toy between said joints for preventing the bending of said limbs between said joints, said rigid members including means preventing relative rotation between said limbs and said rigid members, said joints including molded, simulated accordion-type pleats formed integrally with said limbs and said torso during a molding operation, said simulated pleats including root portions and crown portions reducing the diameter of said limbs only at said joints to facilitate the bending of said limbs at said joints, said rigid members including a separate member embedded in each of said limbs between each of said joints, said wire support means including soft wire members extending through said joints into operative association with said separate members, said soft wire members including at least one soft wire passing through at least one of said joints and having means provided at sections adjacent each side of said one joint non-rotatably connecting said one wire to

one of said separate members, whereby relative rotation between said one wire and said one rigid member is prevented.


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