We, CPG PRODUCTS CORP., a Corporation of the State of Delaware, United States of America,

of 9200 Wayzata Boulevard, Minneapolis, Minnesota, United States of America,

hereby apply for the grant of a Patent

for an invention entitled "IMPROVEMENTS RELATING TO TOY FIGURES"

which is described in the accompanying complete specification.

This application is a Convention application and is based on the application numbered 48465/77 for a patent or similar protection made in United Kingdom on 21st November, 1977 and the complete specification filed in respect thereof on 30th May, 1978.

Our address for service is: CALLINAN AND ASSOCIATES Patent Attorneys, of 48-50 Bridge Road, Richmond, State of Victoria, Australia.

Dated this 19th day of November 1978.

CPG PRODUCTS CORP.
By its Patent Attorneys:
CALLINAN AND ASSOCIATES

To The Commissioner of Patents.
Declaration in Support of

(a) A Convention Application

(b) An Application for a Patent or Patent of Addition

In support of the Application/Convention Application made by

(c) CPG PRODUCTS CORP 41714/78

for a patent/patent of addition for an invention entitled:

(d) Improvements relating to toy figures

1/We (e) EUGENE PAUL PREISS

of (f) 9200 Wayzata Boulevard, Minneapolis, Minnesota, United States of America.

do solemnly and sincerely declare as follows:—

1. (a) I am/nor am the applicant(s) for the patent/patent of addition.

(b) I am/nor am authorised by CPG PRODUCTS CORP the applicant for the patent/patent of addition to make this declaration on its behalf.

2. (i) The basic application(s) as defined by Section 141 of the Act were/ were made in United Kingdom on the 21st day of November 1977.

(ii) and the complete specification filed in respect thereof on the 30th day of May 1978 by PALITOY LIMITED, William Alec Gibson Pugh, Robert Ivor Edmunds, Peter Beck Mansell, Robert Brechin and Hubert Alexander Langton.

3. (i) x

(ii) x

WILLIAM ALEC GIBSON PUGH, of 182 Bradgate Road, Anstey, Leicestershire; ROBERT IVOR EDMUNDS of Nemesis, Mill Street, Barwell, Leicestershire; PETER BECK MANSELL, of Flat F12, Deveron Way, Hinckley, Leicestershire; ROBERT BRECHIN of 63 Glebe Road, Thringstone, Leicestershire; and HUBERT ALEXANDER LANGTON of 116 Queens Road, Leicester.

of x/are the actual inventor(s) of the invention and the facts upon which

x

I am/we are/the said Company is entitled to make the application are as follows:

X

The said Company is the assignee of the invention and priority right from the said actual inventors and Palitoy, Limited have merged into Tom's Foods Limited, who have changed their name to CPG Products Corp.

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

5. The Declaration is made at Minneapolis this 30th day of April 1979

To: The Commissioner of Patents.
Claim 1. A limb member for a toy figure, including a skeletal structure having a first element comprising an elongate tubular member having a first jointing portion formed at one end thereof, and a second element comprising an elongate member one end of which is insertable in the other end of said tubular member and is adapted, when so inserted, automatically to make unwithdrawable engagement with said tubular member whilst being axially rotatable relatively thereto, a second jointing portion being formed at the other end of said second element; the skeletal structure being encased in an outer tubular shell formed to the desired outward shape of the limb member, the said shell being rotatable on the skeletal structure.
The following statement is a full description of this invention, including the best method of performing it known to me:

*Note: The description is to be typed in double spacing, pica type face, in an area not exceeding 250 mm in depth and 160 mm in width, on tough white paper of good quality and it is to be inserted inside this form.

TO BE COMPLETED BY APPLICANT

Name of Applicant: CPG PRODUCTS CORP.

Address of Applicant: 9200 Wayzata Boulevard, Minneapolis, Minnesota, United States of America.

Actual Inventor: WILLIAM ALEC GIBSON PUGH, ROBERT IVOR EDMUNDS, PETER BECK MANSELL, ROBERT BRECHIN and HUBERT ALEXANDER LANGTON.

Address for Service: Care of Callinan and Associates, Patent Attorneys, of 48-50 Bridge Road, Richmond, Victoria, 3121, Australia.

Complete Specification for the invention entitled: "IMPROVEMENTS RELATING TO TOY FIGURES"
This invention relates to toy figures, particularly but not essentially toy human figures, and is especially concerned with the provision of improved limb and limb joint structures therefor.

One well-known form of limb joint in a toy figure comprises a first jointing portion formed as an integral terminal portion of one limb member, and a second jointing portion formed at one end of a pin which is an axially rotatable friction fit in a complementary axial bore in the other limb member. The jointing portions may be of various kinds, for example respectively a ball and socket, or respectively a slot and a tongue pivotally mounted therein.

One disadvantage of this kind of arrangement is that it is inconvenient to mould the first jointing portion as an integral terminal portion of a limb (or hand or foot) member, it being sufficiently difficult to provide that member with a realistic external shape without the added problem of forming a jointing portion on one end of it. Another disadvantage is that it is inconvenient to form such a limb member with an accurately dimensioned bore to receive the pin which mounts the other jointing portion, as a tight but rotatable friction fit. Yet another disadvantage is that it is not possible to achieve a disconnectible friction fit between the said pin and its bore; in other words the joint is likely to come apart by disengagement of the pin from the bore as a result of wear and tear.
Accordingly the present invention provides a limb member for a toy figure, including a skeletal structure having a first element comprising an elongate tubular member having a first jointing portion formed at one end thereof, and a second element comprising an elongate member one end of which is insertable in the other end of said tubular member and is adapted, when so inserted, automatically to make unwithdrawable engagement with said tubular member whilst being axially rotatable relatively thereto, a second jointing portion being formed at the other end of said second element; the skeletal structure being encased in an outer tubular shell formed to the desired outward shape of the limb member, the said shell being rotatable on the skeletal structure.

With such a limb member, the jointing portion on the said first element provides for engagement with a jointing portion on another limb member (or on a hand or foot or on the torso) whilst the jointing portion on the second element is located at the other end for a similar purpose. It will be understood that such an arrangement obviates all of the disadvantages of the prior proposals described above.

The said jointing portions may be of any convenient kind. The two such portions in one limb member may be the same, e.g. two balls for respective ball and socket joints, or different, e.g. a ball on one element and a socket on the other, or even of different types, e.g. a ball
on one element for a ball and socket joint and a tongue on the other element for a tongue and slot joint. Preferably however the jointing portion on said first element includes a slot whose general plane is parallel to the length of the element, for the rotatable reception of another jointing portion in the form of a tongue, whilst the jointing portion on said second element is a tongue whose general plane is parallel
to the length of the element, for rotatable reception in a slot of another jointing portion.

The manner of unwithdrawable engagement between the two elements may obviously take various different forms. In a simple and preferred embodiment the first element is formed with an internal shoulder constituting the above mentioned abutment means, and the second element is formed with a mating external shoulder on a resiliently laterally depressible portion thereof which is depressed to insert the second element in the first and then automatically snaps into engagement with the shoulder on the first element once it has passed the latter. Preferably the shoulder on the first element is annular and a pair of diametrically opposed mating shoulders are formed on the second element.

When the jointing portions are of the slot and tongue type already mentioned, said slot is preferably open at both ends for freedom of rotation of a tongue to be received in it, but it could if desired take the form of a slot-like recess with closed ends. Preferably the slot is formed in a substantially ball-shaped terminal portion of its associated element, preferably extending diametrically of the ball and substantially parallel to the length of the element. The tongue is preferably disc-shaped. Preferably the tongue is formed with two oppositely extending pins and the opposite walls of the slot have corresponding holes or recesses to receive the same, so dispensing with a separate pivot pin.
The invention further provides a toy figure incorporating a limb member as already set forth. In one toy figure according to the invention each upper arm, each forearm, and each lower leg are formed by such limb members.

A preferred embodiment of the present invention is also concerned with the additional provision of an improved hip joint for a toy figure as already set forth.

It is well known to provide a ball joint at the hip of a toy figure. In one known arrangement a part-spherical surface is formed on the upper end of each upper leg member and is rotatably received in a mating recess in the torso. In another arrangement a whole sphere is interposed between mating recesses in the torso and the top of the upper leg member. In both cases the parts are held together by an elastic member secured internally of the torso and internally of the leg member. A disadvantage of these earlier proposals is that when the figure is put in a sitting position the legs tend to splay apart into an unnatural posture, under the tension of the elastic member.

According to a preferred embodiment of the present invention a toy figure as already set forth is additionally provided with a hip joint comprising an upper leg member provided with a hollow part-spherical top end portion formed with an elongate slot in its wall and, either in or for incorporation in the bottom of the torso, a leg mounting member comprising an elongate connecting element extending
through said slot and movable along the slot to permit swinging movement of the leg member relative to the torso, and a mounting element carried by said connecting element and having a part-spherical surface which makes a rotary sliding fit inside said slot on the leg member for rotation of the leg member relative to the torso.

Preferably the said top end portion of the upper leg member comprises a terminal hemispherical portion formed with the said slot and rotatably mounted on the leg member for rotation about the longitudinal axis of the latter. Preferably the said slot extends in a plane containing said longitudinal axis. Preferably the slot extends over an arc of about 90° of the part-spherical top end portion downwardly from the top thereof. Preferably the said mounting element is substantially disc-shaped with a part-spherical edge element. Preferably the said leg mounting member comprises a unitary member for mounting both legs of the toy figure, comprising two of said connecting and mounting elements, adapted to be secured in the torso.

An embodiment of the invention, together with a modification, will now be described by way of example and with reference to the accompanying drawings, in which:-

Figure 1 is an exploded view of a toy figure embodying
the invention;

Figure 2 is a sectional view of the assembled figure; and

Figure 3 is a sectional view of the torso illustrating a modification.

Referring to Figures 1 and 2, the toy figure comprises a head 1, a neck assembly 2, front and rear torso shells 3, two shoulder elements 4, two upper arm assemblies 5, two forearm assemblies 6, two hands 7, a leg mounting member 8, trunks 9, two hip joint elements 10, two pairs of upper leg shells 11, two knee elements 12, two lower leg assemblies 13, and two feet 14.

The head, the neck assembly, and the torso shells do not themselves form part of the present invention and will not therefore be described in any further detail.

Each of the upper arm assemblies 5, each of the forearm assemblies 6, and each of the lower leg assemblies 13, comprises a limb member incorporating a skeletal structure in accordance with the invention. All of assemblies 5 and 6 are substantially identical in structure; the assemblies 13 differ only in that the aforementioned second element of the skeletal structure is formed with a slot rather than a tongue.

Thus referring to one of the assemblies 5 by way of example, this assembly comprises a skeletal structure comprising a first elongate tubular element 15 having a slotted
portion in the form of a ball 16 formed with a slot 17 at one end thereof, and a second elongate element 18 carrying a tongue in the form of a disc 19 provided with a pair of axial pins 20. The element 18 is formed with two shoulders 21 and a central slot 22 whereby the shoulders 21 are resiliently depressible inwardly. This enables the element 18 to be inserted in the tubular element 15 so that the shoulders 21 snap behind an annular shoulder 23 (see Figure 2) in the element 15 to prevent withdrawal of the element 18 whilst permitting relative rotation. The limb assembly 5 is completed by an outer shell 24 formed to resemble the outward shape of the upper arm, into which shell the element 15 is inserted before the element 18 is engaged with it. The shell 24 is formed with terminal cup-like portions which frictionally engage the ball 16 and the disc 19 respectively to assist in maintaining the limb member in a desired position.

Each fore-arm assembly 6 is assembled in the same way and is connected to the upper arm assembly by snapping the pins 20 into holes 25 (Figure 2) in the opposite side walls of the slot 17 of the fore-arm. The hand 7 is formed with a slotted ball 26 at the wrist for connection to the fore-arm in the same manner. The shoulder element 4 comprises a disc formed with pins 27 for engagement in the holes 24 (not shown) of the slot 17 of the upper arm element 15, the disc being rotatably mounted in a shoulder recess 28. The discs make a fairly tight friction fit in their respective slots,
again to assist in maintaining the limb members in desired positions.

In the case of the lower leg assemblies 13 each of the elements 18 terminates in a slotted ball 16 rather than a disc, the feet being formed with discs 19 for connection thereto. The knee element 12 is similar to the shoulder element 4.

The various equivalent parts of the other limb assemblies are indicated in the drawings by the same reference numerals as used above, and need not be described in further detail.

The hip joint comprises the leg mounting member 8 which includes two connecting elements 29 each carrying a disc-like mounting element 30 formed with a part-spherical edge surface 31 which is rotatably received in the hollow interior of the hemispherical hip joint element 10 which forms the rotatable top of the respective upper leg member, the hemisphere being formed with a slot 32 through which the connecting member 29 extends. The element 8 is mounted via a ring 33 on pins 34 in the torso shell.

In a modification shown in Figure 3 the member 8 is mounted on a pin 35 rotatably confined in a shell 36 mounted in the torso so as to provide unlimited rotation of the trunks 9 and the legs relative to the torso.

All of the parts are moulded from suitable hard-wearing plastics materials such as polythene and nylon.
The leg mounting member 8 is substantially rigid and non-elastic.
The claims defining the invention are as follows:

1. A limb member for a toy figure, including a skeletal structure having a first element comprising an elongate tubular member having a first jointing portion formed at one end thereof, and a second element comprising an elongate member one end of which is insertable in the other end of said tubular member and is adapted, when so inserted, automatically to make unwithdrawable engagement with said tubular member whilst being axially rotatable relatively thereto, a second jointing portion being formed at the other end of said second element; the skeletal structure being encased in an outer tubular shell formed to the desired outward shape of the limb member, the said shell being rotatable on the skeletal structure.

2. A limb member as claimed in claim 1, wherein the jointing portion on said first element includes a slot whose general plane is parallel to the length of the element, for the rotatable reception of another jointing portion in the form of a tongue.

3. A limb member as claimed in claim 2, wherein the said jointing portion of the first element is ball-shaped with a diametric slot.

4. A limb member as claimed in any one of claims 1 to 3, wherein the jointing portion on said second element is a tongue whose general plane is parallel to the length of the element, for rotatable reception in a slot of another jointing
5. A limb member as claimed in claim 4, wherein the said tongue is disc-shaped having a pair of oppositely extending axial pivot pins for rotatable reception in complementary apertures in the opposite walls of a said slot.

6. A limb member as claimed in any one of the preceding claims, wherein the said first element is formed with internal abutment means for engagement with the said second element so as to prevent withdrawal of the latter.

7. A limb member as claimed in claim 6, wherein the said abutment means comprises an internal shoulder and the second element is formed with a mating external shoulder on a resiliently laterally depressible portion thereof which is depressed to insert the second element in the first and then automatically snaps into engagement with the shoulder on the first element once it has passed the latter.

8. A limb member as claimed in claim 7, wherein the shoulder on the first element is annular and a pair of diametrically opposed mating shoulders are formed on the second element.

9. A limb member as claimed in claim 3 or claim 5, wherein the said shell frictionally engages the said ball-shaped slotted jointing portion and/or the said disc-shaped jointing portion.

10. A limb member as claimed in claim 1, substantially as hereinbefore described with reference to Figures 1 and 2 of
the accompanying drawings.

11. A toy figure incorporating at least one limb member as claimed in any one of claims 1 to 10.

12. A toy figure as claimed in claim 11, which is a human figure and in which each upper arm, each forearm, and each lower leg are formed by such limb members.

13. A toy figure as claimed in claim 11, having a hip joint comprising an upper leg member provided with a hollow part-spherical top end portion formed with an elongate slot in its wall and, in the region of the torso, a leg mounting member comprising an elongate connecting element extending through said slot and movable along the slot to permit swinging movement of the leg member relative to the torso, and a mounting element carried by said connecting element and having a part-spherical surface which makes a rotary sliding fit inside said top end portion of the leg member for rotation of the leg member relative to the torso.

14. A toy figure as claimed in claim 13, wherein the said top end portion of the upper leg member comprises a terminal hemispherical portion formed with the said slot and rotatably mounted on the leg member for rotation about the longitudinal axis of the latter.

15. A toy figure as claimed in claim 14, wherein the said slot extends in a plane containing said longitudinal axis.

16. A toy figure as claimed in any one of claims 13 to 15, wherein the slot extends over an arc of substantially 90° of
the part-spherical top end portion and downwardly from the top thereof.

17. A toy figure as claimed in any one of claims 13 to 16, wherein the said mounting element is substantially disc-shaped with a part-spherical edge element.

18. A toy figure as claimed in any one of claims 13 to 17, wherein the said leg mounting member includes a unitary member for mounting both legs of the toy figure, comprising two of said connecting and mounting elements, secured in the torso.

19. A toy figure substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

20. A toy figure as claimed in claim 19 but modified substantially as hereinbefore described with reference to Figure 3 of the accompanying drawings.

DATED this 14th day of January, 1982.

CPG PRODUCTS CORP.

By its Patent Attorneys:

CALLINAN AND ASSOCIATES

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