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(54) **INTERFITTING TOY FIGURE**

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(57) **ABSTRACT**

A unitary humanoid figure comprising a robust torso from which projects a head, oppositely extending arms, diverging legs, a neck, shoulders, hands having palms and backs, and feet having bridges, soles, toes, and heels. The body parts of plural figures can be interconnected in a variety of combinations and orientations. Both the projecting body parts and the part-receiving openings, spaces, pockets, etc. have close dimensional tolerances to insure that interfitting parts will easily slide into engagement with one another yet stay in place due to frictional force resisting disassembly.

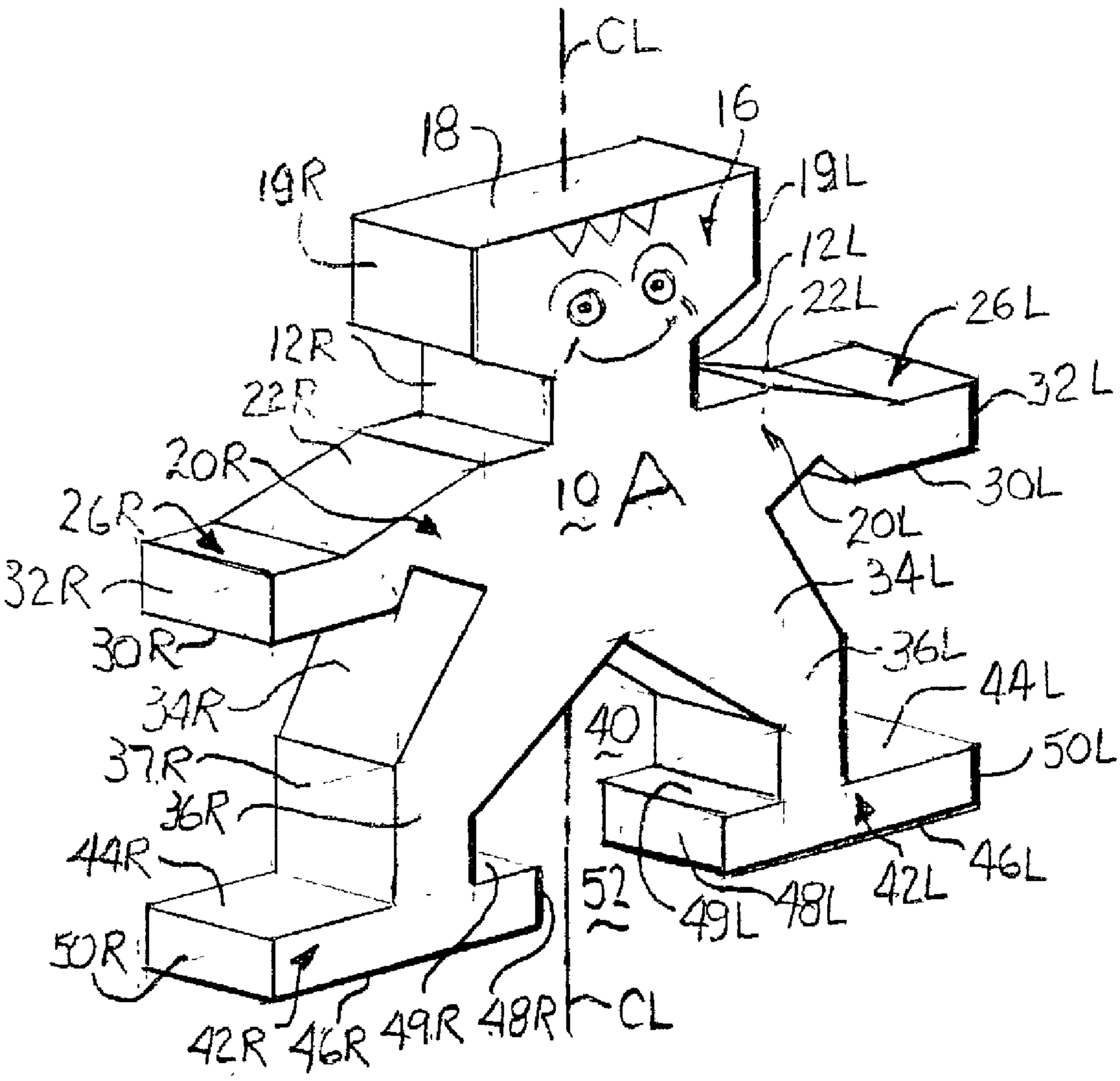


Fig 1

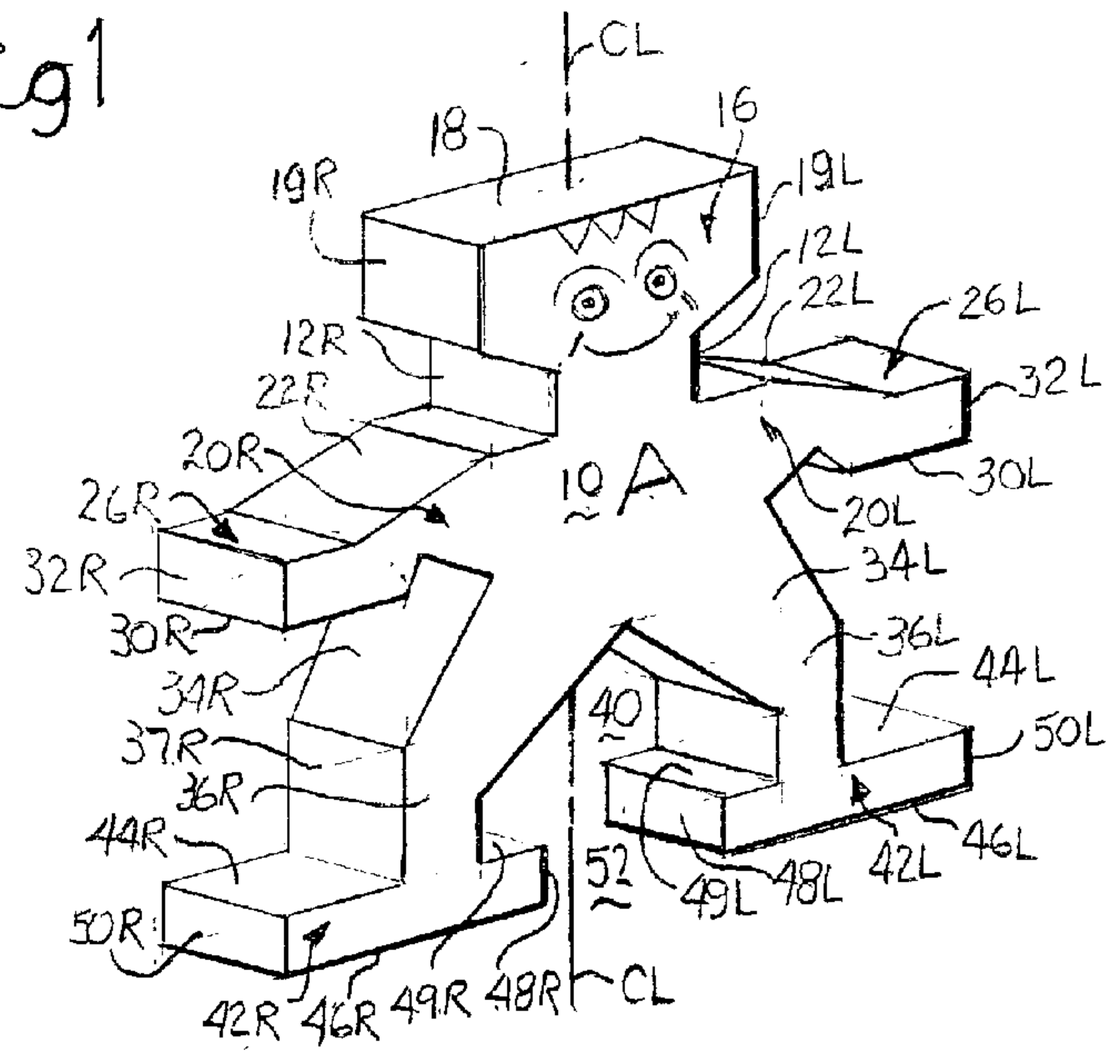


Fig 3

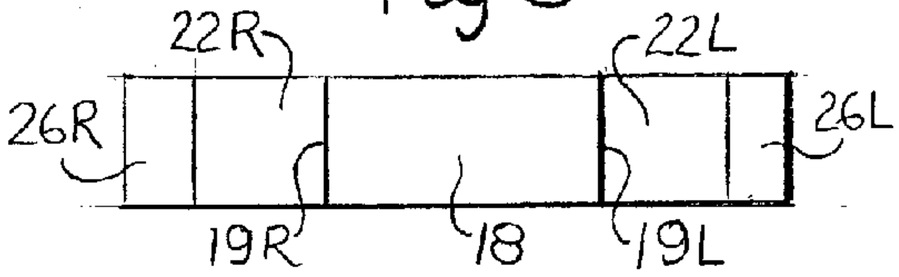
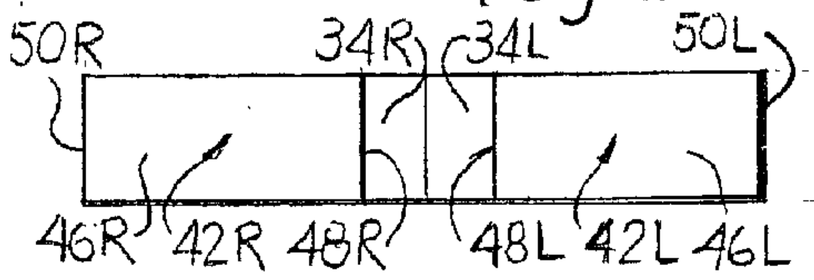


Fig 4



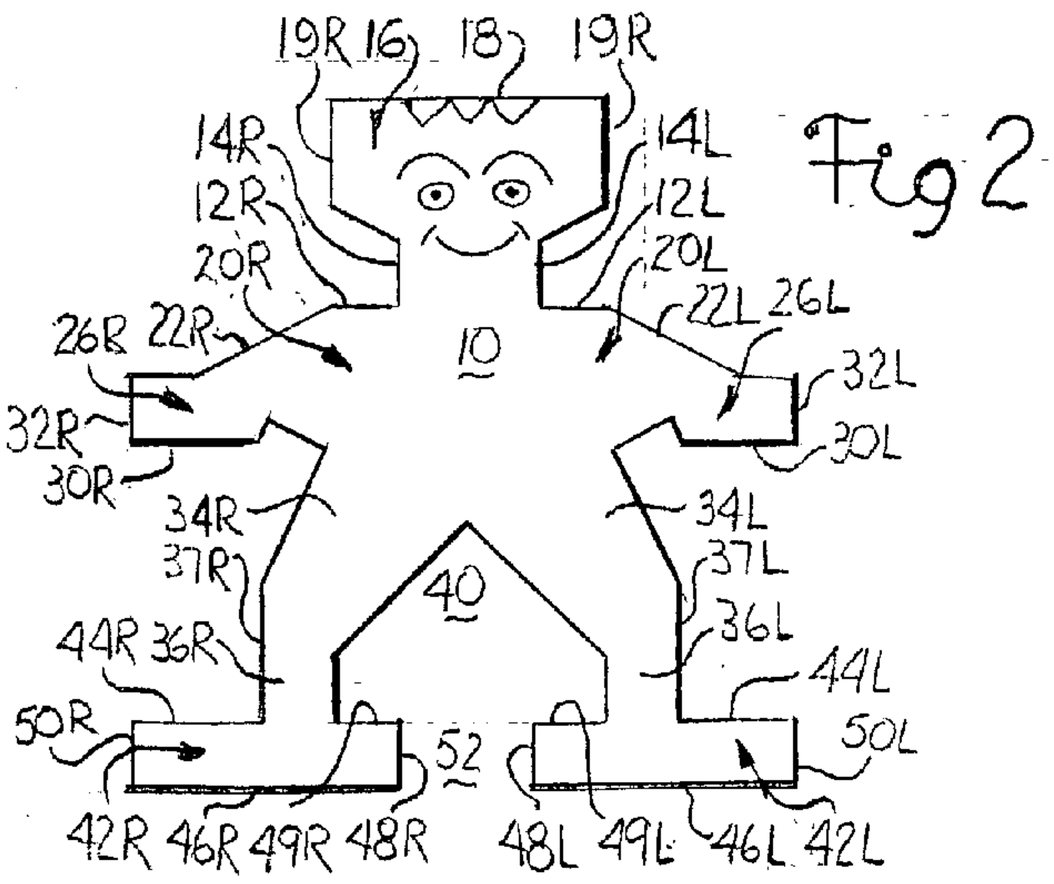


Fig 2

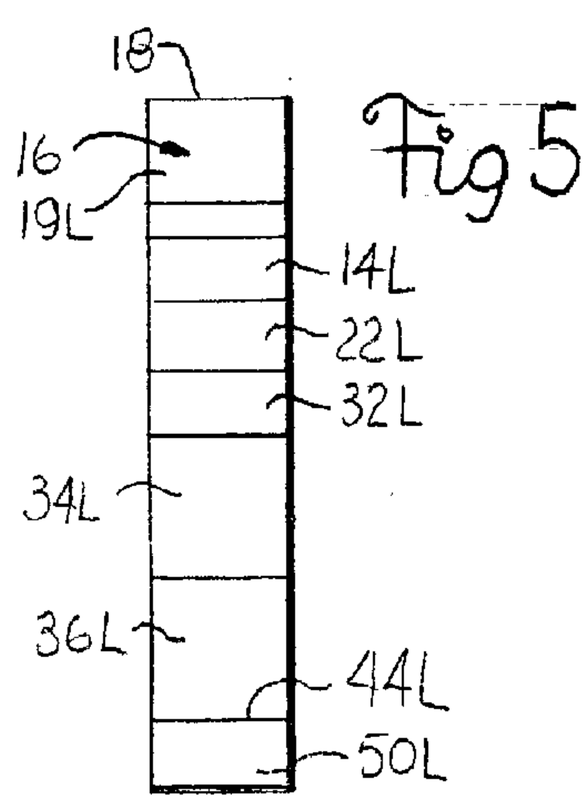


Fig 5

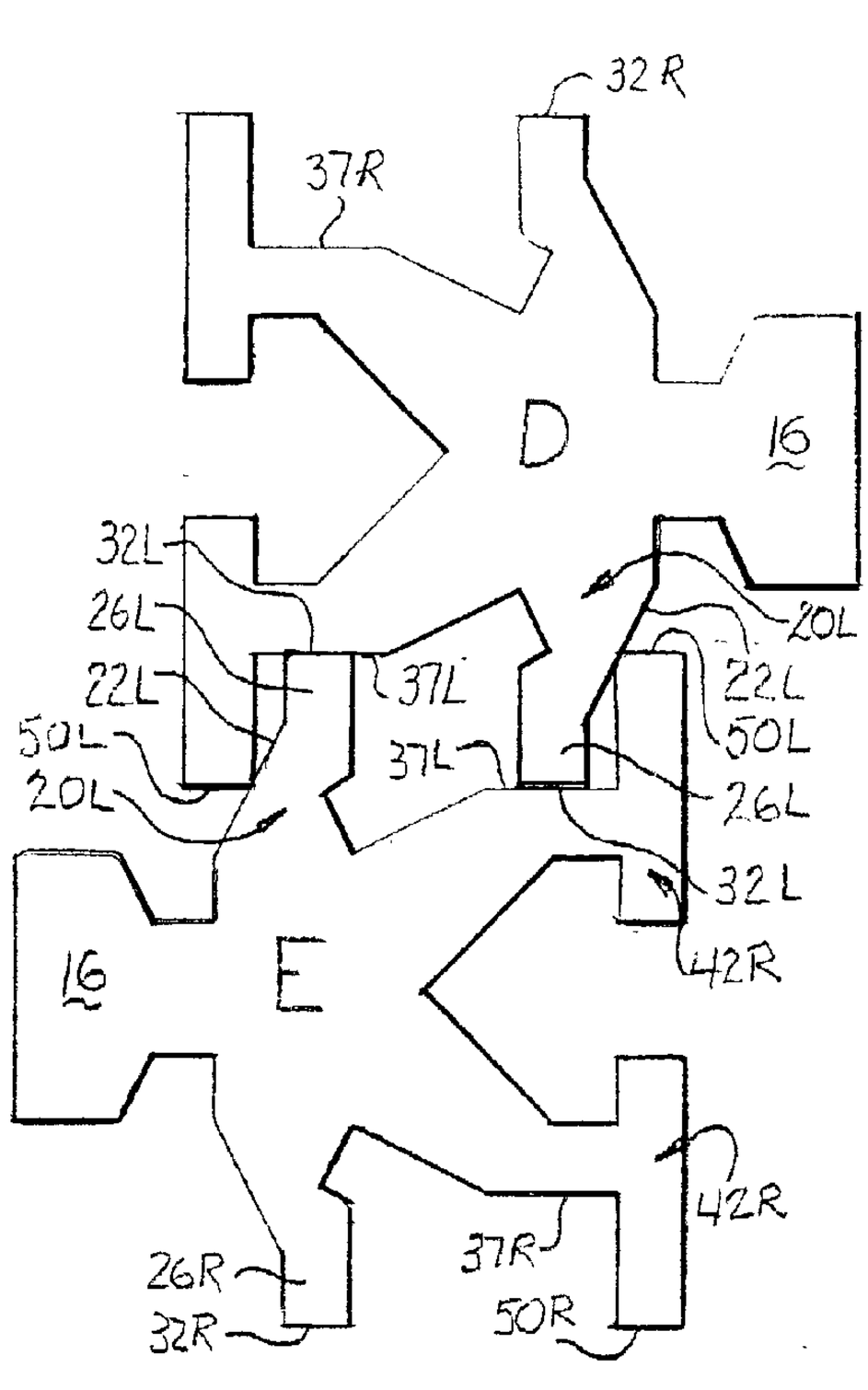


Fig 6

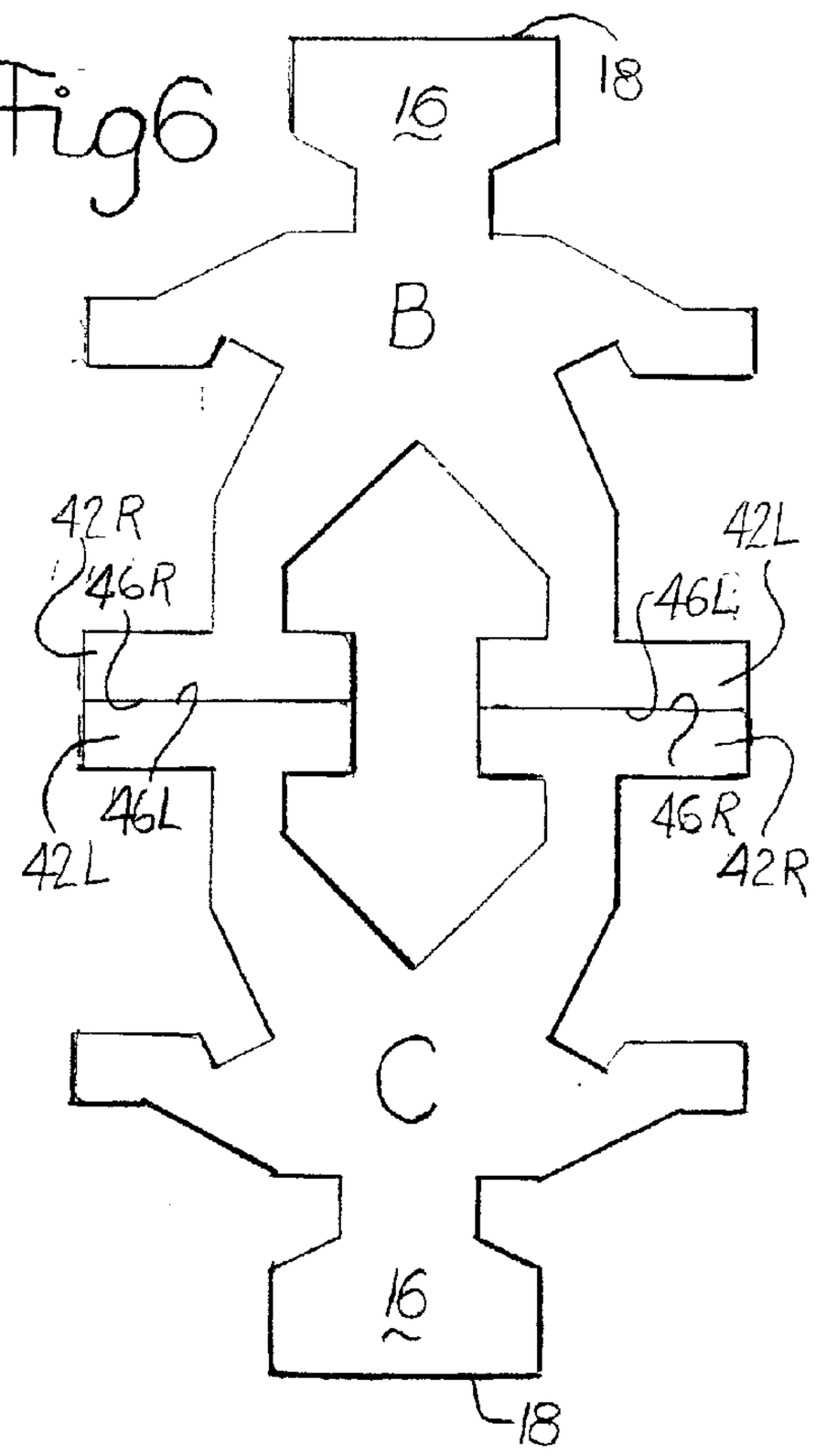


Fig 7

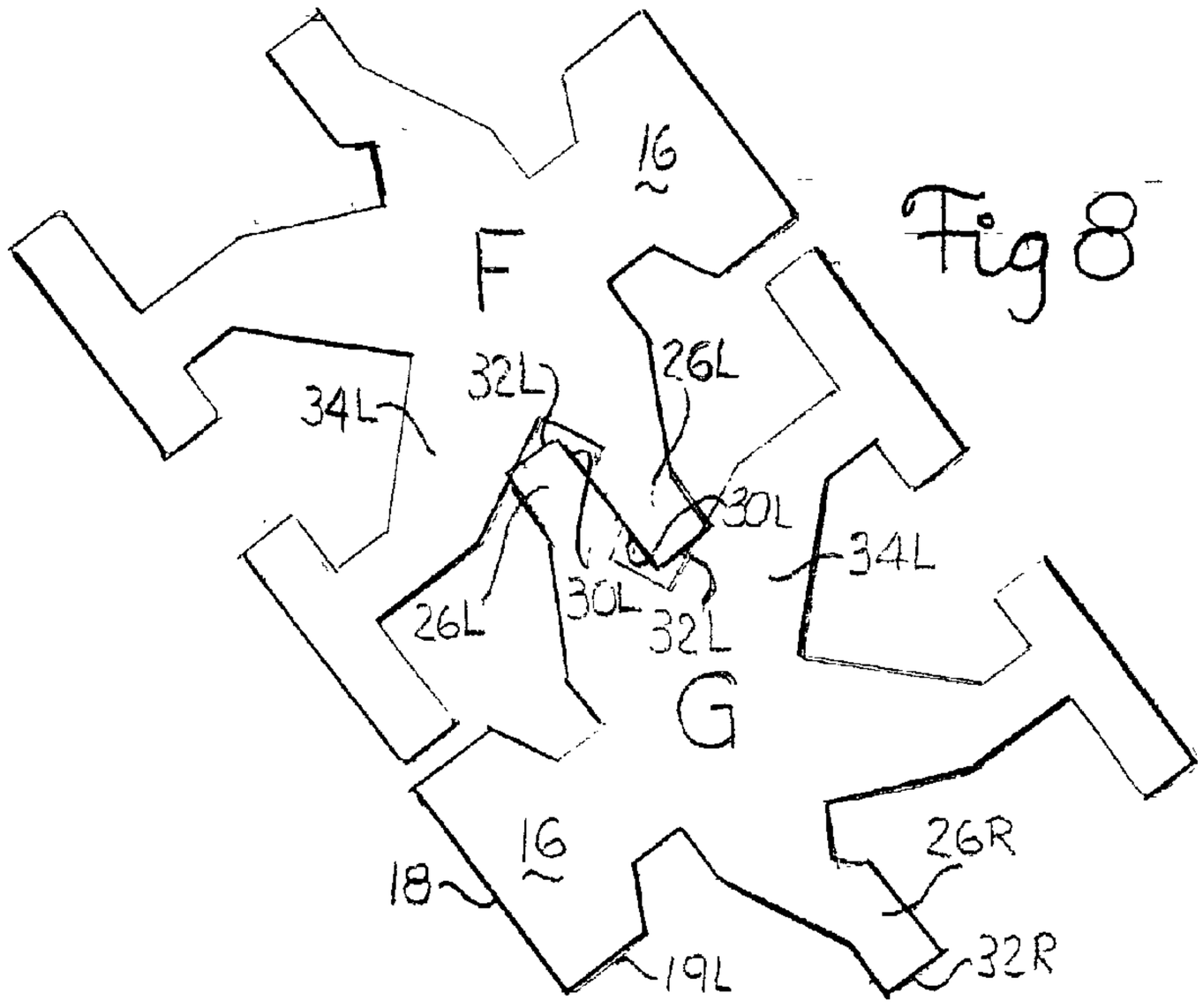


Fig 8

Fig 14

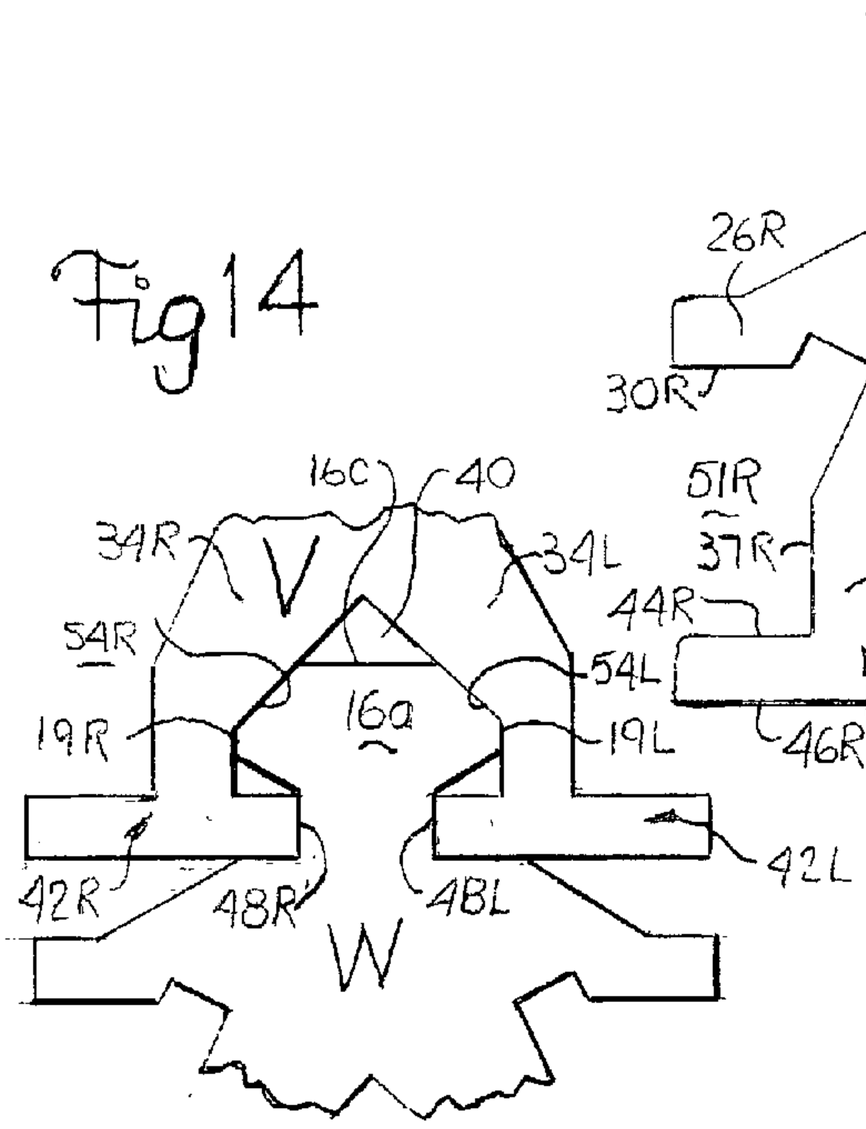


Fig 9

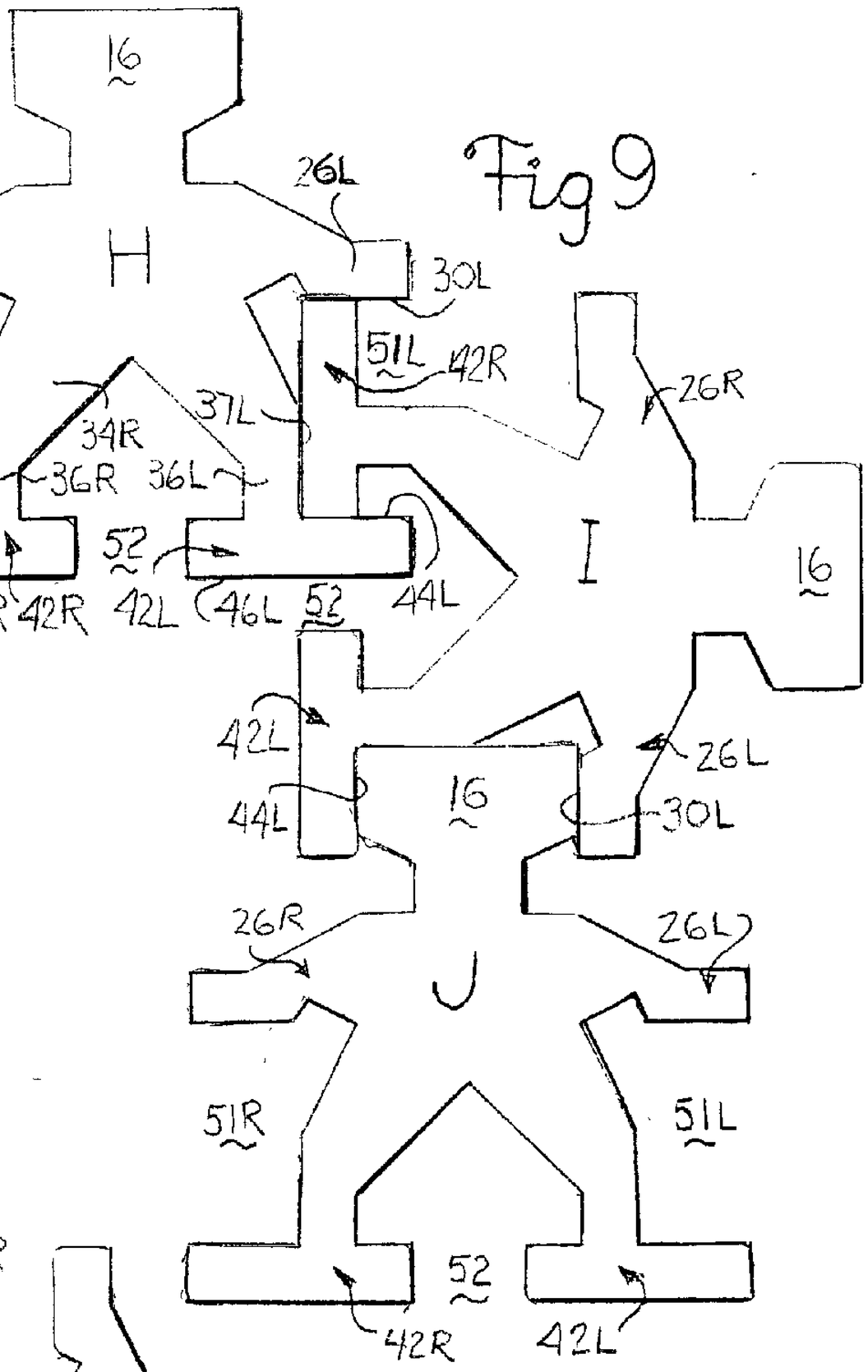


Fig 10

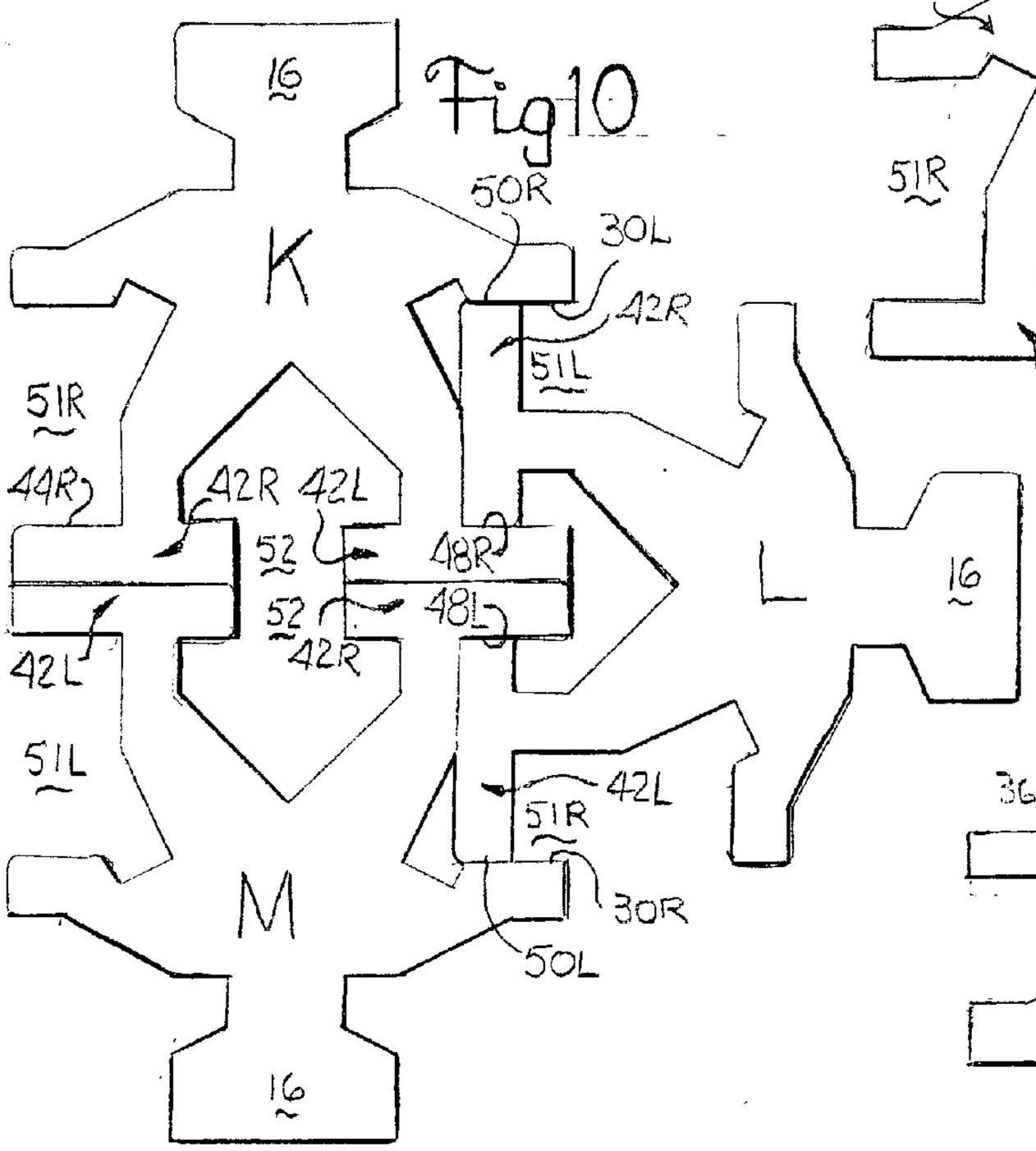


Fig 15

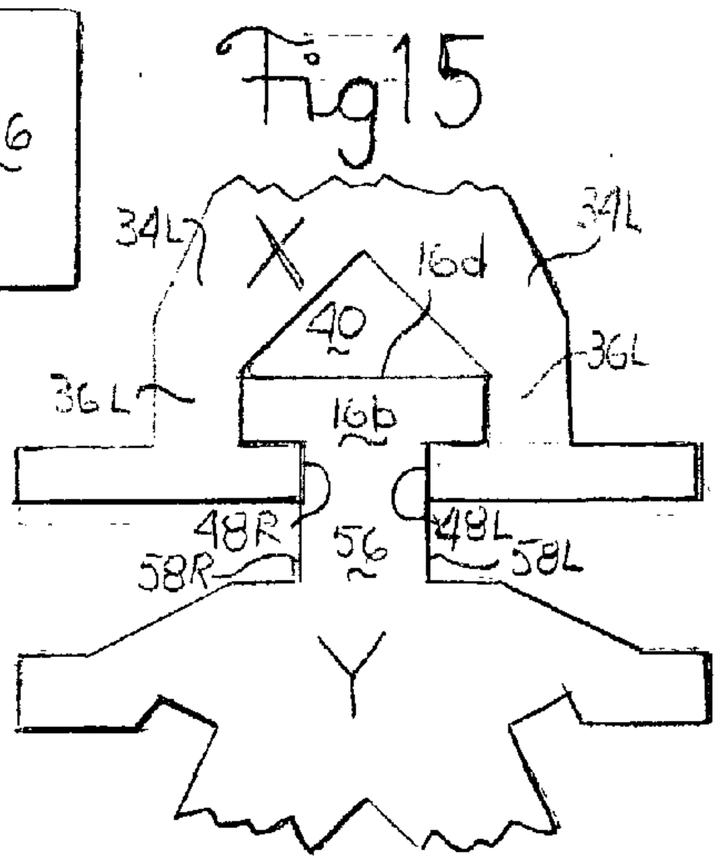


Fig 11

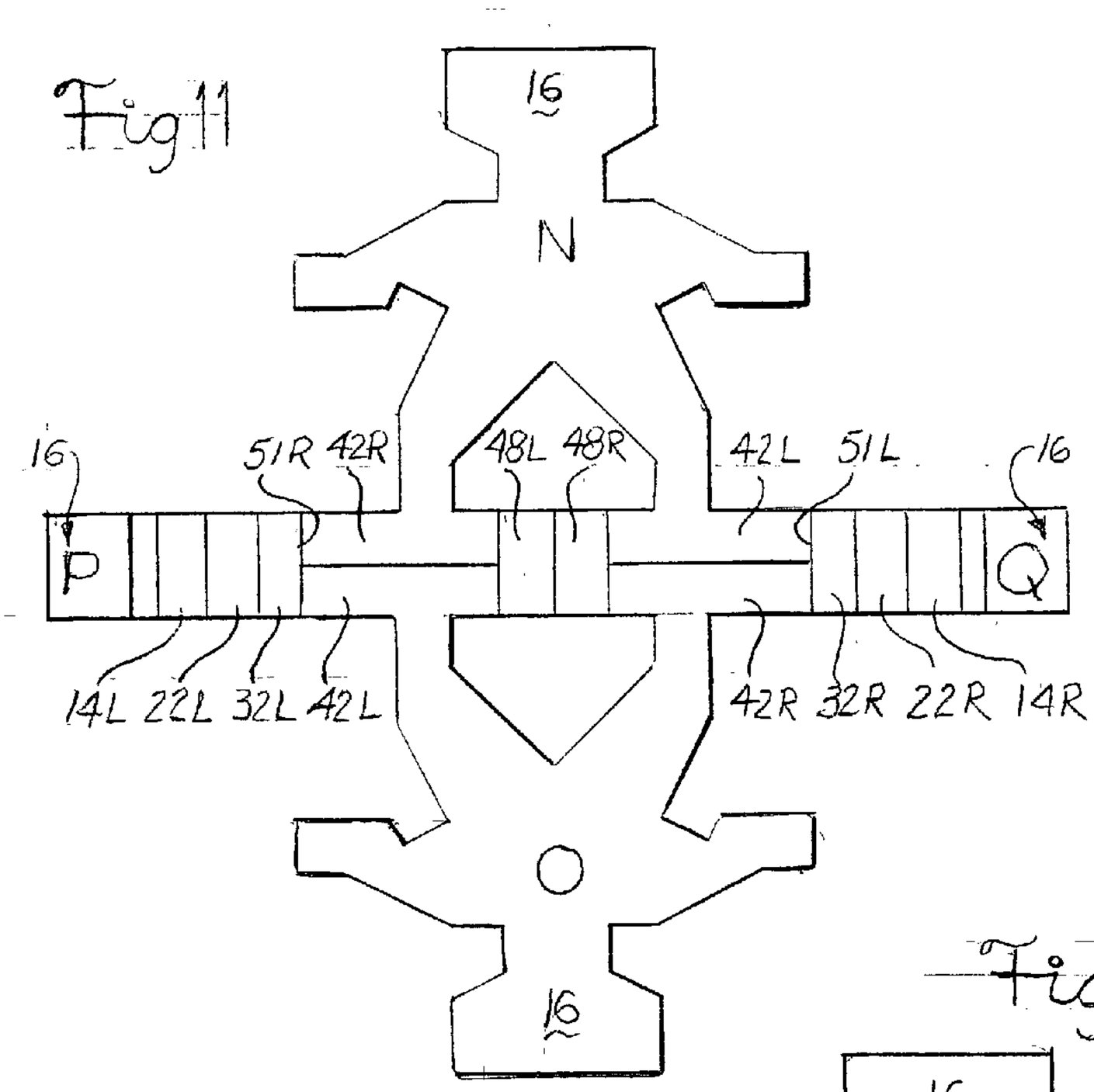


Fig 12

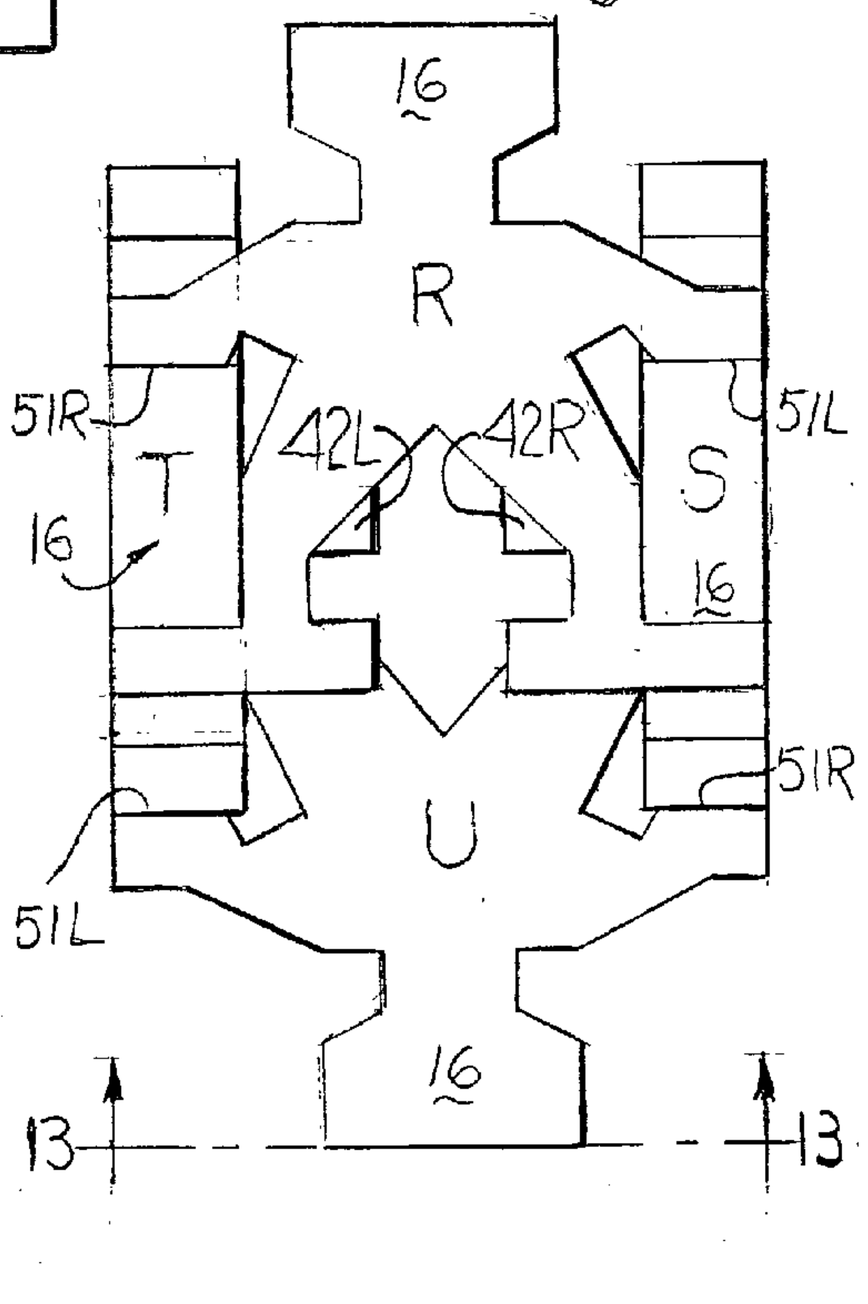
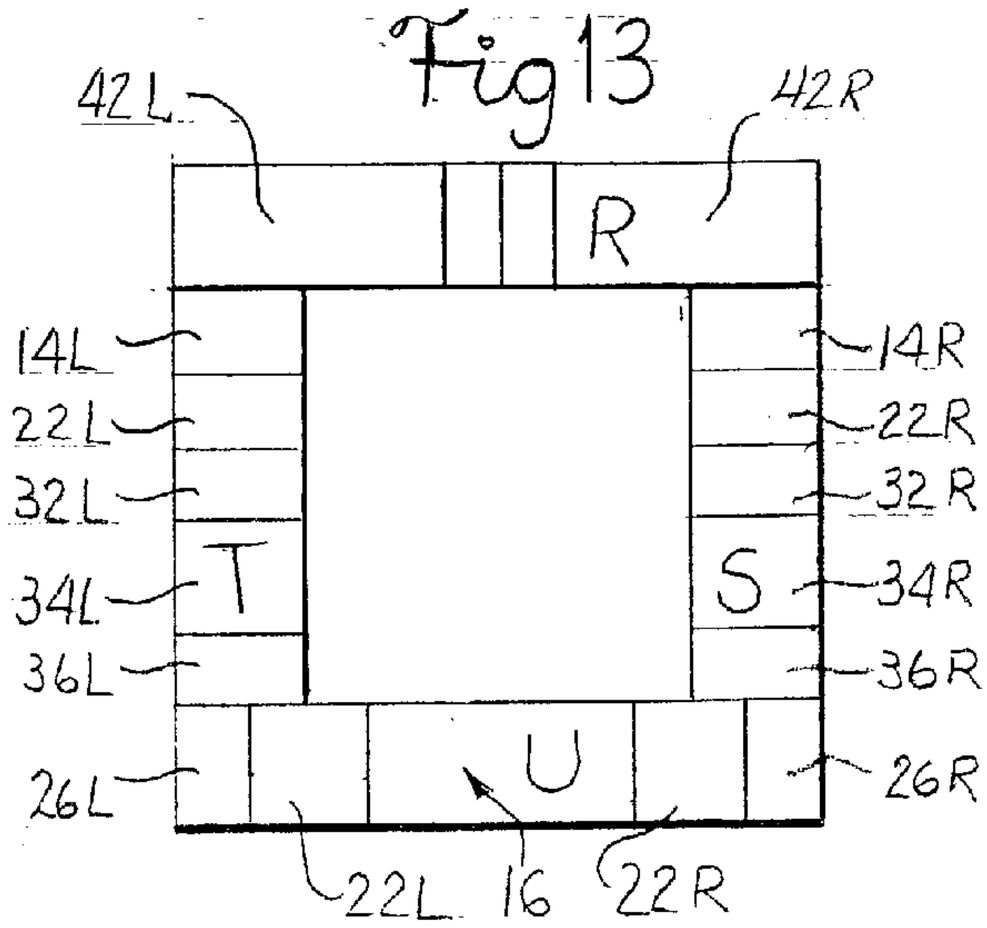


Fig 13



INTERFITTING TOY FIGURE

BACKGROUND

[0001] This invention pertains generally to toy figures having humanoid structural features which make such figures especially suitable for use as interfitting building blocks.

[0002] Toy blocks in a wide variety of configurations approximating the shape of the human body are well known as are the many ways children play with such blocks. Block constructions and manners of play pertinent to the present invention are shown and described in these United States patents:

[0003] U.S. Pat. No. 1,648,199 issued to H. J. Sargent on Nov. 08, 1927

[0004] U.S. Pat. No. 2,078,709 issued to C. J. Hecht on Apr. 27, 1937

[0005] U.S. Pat. No. 2,691,243 issued to W. C. Rade on Oct. 12, 1954

[0006] U.S. Pat. No. 4,682,966 issued to Neil Kagan on Jul. 28, 1987

[0007] Each of these previously patented toy figures comprises a flat, unitary block of wood, plastic or similarly rigid material. The blocks are usually cut, molded or otherwise shaped to display a connected head and torso, the latter having identifiable arms, legs, hands and feet projecting therefrom. The front-to-back width or thickness of the block is such that, when resting on a level surface, the bottoms of the legs or feet will support and maintain individual blocks in a freestanding, upright attitude.

[0008] The cited prior art patents suggest various structural means for arranging and assembling a plurality of block figures in a wide variety of entertaining and instructive configurations. The thickness of the aforementioned blocks affords a degree of stability necessesary to their being stacked one upon another; however, vertical instability is usually unavoidable after only a few blocks have been stacked thereby causing this simple block assembly to collapse. The vertical front and back surfaces of the previously known blocks are perpendicularly intersected by a horizontal surface defining the profile or outline of the figure. Thus, the head, neck, torso, and limbs are in part defined by peripheral surfaces displaying variously shaped curves, notches, cavities and projections which provide opportunities for interstitial interfitments between projecting body parts of two or more figures.

[0009] Although the cited Sargent patent speaks of his blocks as being "hooked" together, careful examination reveals that only the weight of the blocks maintains them in interfering engagement with one another. The Rade patent teaches that two blocks can be assembled by pressing a projecting dovetail shaped limb of one block laterally into a dovetail shaped recess in the periphery of another block. Such locking of two blocks together requires that a child juxtapose the blocks with their dovetail elements in registration before lateral pressure is applied to interfit the blocks in flush relationship. Such an operation demands a high degree of dexterity and physical control as well as carefully sized and cut dovetail elements.

[0010] Hecht provides interfitiing notches and projections adjacent the feet of his figures whereby dovetail-like joints connect two figures in end-to-end relationship. Otherwise, Hecht assembles his figures by stacking, and balancing as does Sargent.

[0011] Kagan discloses figures similar to Sargent's but with the center of gravity of each lying laterally with respect to vertical plane passing through the figures head and torso. While this modification of the Sargent figures provides a variety of new configurations in which his figures can be oriented and assembled, Kagan, like Sargent essentially balances his figures one upon the other.

[0012] Thus, the prior art figure combinations and assemblies mentioned heretofore have at least these constraining characteristics:

[0013] 1. All comprise an assemblage of balanced figures which extend upwardly from a fixed base.

[0014] 2. The width of the supportive base of any assembly corresponds to the front-to-back dimension of a single figure which mandates that the center of gravity of the assembly be located between rather narrow limits.

[0015] 3. The vertical stability of the stacked assemblies is critically dependent not only upon the accuracy acheived in sizing and shaping each figure but also upon the care with which figures are stacked upon one another.

[0016] 4. None shows that body parts of different figure will slide together in surface-to-surface engagement and will thereafter exhibit substantial resistance to disassembly solely due to frictional forces acting between the engaged surfaces.

[0017] 5. While the prior art figures are connectable when extended along a single plane, none are connectable when the figures lie in planes which are angularly displaced from one another whereby three dimensional assemblages are possible.

[0018] 6. None provides a block configured to connect figures oriented in spaced planes to other figures lying in planes perpendicular to such spaced planes.

[0019] 7. None shows body parts of two distinct figures that can be frictionally gripped and joined in abutting relationship by coacting parts by a third figure.

SUMMARY OF THE INVENTION

[0020] The general object of the present invention is to provide toy figures which can be assembled in challanging and entertaining combinations and orientations not attainable with known toy figures of a similar nature.

[0021] It is an additional general object of this invention to overcome the aforelisted constraints on the construction, application and utility of toy building blocks.

[0022] Yet another objective is to provide a unitary humanoid figure comprising a robust torso from which projects a head, oppositely extending arms and diverging legs. Other recognizable human-like features include a neck, shoulders, hands having palms and backs, and feet having

bridges, soles, toes, and heels. The aforenoted human-like body parts of plural figures can be interconnected in a variety of combinations and orientations. To this end, both the projecting body parts and the partreceiving openings, spaces, pockets, etc. have close dimensional tolerances to insure that interfitting parts will easily slide into engagement with one another yet stay in place due to frictional force resisting disassembly. However, it is intended that the force required to slide close fitting parts together can be provided by a child.

[**0023**] Where an assemblage of figures made in accordance with this invention is constructed by frictionally interconnecting multiple figures, it has been observed that such an assemblage exhibits a substantial and surprising degree of stability and resistance to deformation. Due to this rigidity and the myriad opportunities to connect figures without balancing them vis a vis one another, the hereinafter described figures can be joined together to form structures that are more varied and complex than those known heretofore.

[**0024**] These and other advantageous features of this invention will become apparent and the invention will be best understood and fully appreciated by having reference to the following detailed description of embodiments of the invention taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

[**0025**] **FIG. 1** is an isometric view of a toy figure according to this invention;

[**0026**] **FIG. 2** is a front elevation;

[**0027**] **FIG. 3** is a top plan view;

[**0028**] **FIG. 4** is a bottom plan view;

[**0029**] **FIG. 5** is a side elevation;

[**0030**] **FIGS. 6, 7** and **8** are elevational views of pairs of figures wherein the upper figure is balanced atop the lower figure;

[**0031**] **FIGS. 9 and 10** are elevational views of two sets of three interfitted figures;

[**0032**] **FIGS. 11 and 12** are top plan views of two assemblages of figures;

[**0033**] **FIG. 13** is an end elevation looking along line **13-13** of **FIG. 12**; and,

[**0034**] **FIGS. 14 and 15** are fragmentary elevational views of assembled blocks depicting modifications of the block shown in **FIG. 1**.

DETAILED DESCRIPTION OF THE INVENTION

[**0035**] The figures indicated generally by letters A through Y in the appended drawings are identically configured; accordingly, throughout the following description the same numeral will be employed to indicate corresponding body parts. The figures have symetrical right and left sides; accordingly a body part of a figure looking out of the drawing will be designated by an identifying numeral followed as appropriate by letter R or L.

[**0036**] Preferably, the blocks are composed of a plastic material suitable for injection molding. One such material is polypropylene copolymer of a selected grade which produces defining surfaces for the figures which are relatively hard, flat and smooth. The selected plastic material should exhibit a force of friction when surfaces of two blocks of such material tend to slide relative to one another that will suffice to forestall unintended separation of interfitted figures such as those shown in the drawings in **FIGS. 9 through 13**. A fuller appreciation of the important role which intersurface frictional force plays in realizing the benefits of this invention will be had from a detailed description of several possible combinations and arrangements of the figures.

[**0037**] As best shown in FIGS. **1-5**, figure A comprises a solid, unitary block in the form of a human-like figure of rugged proportions. The front-to-back thickness of the figure, therefore the width of the peripheral surface outlining the figure, is sufficiently wide to permit the figure to stand uprightly on its feet, head, arms and legs in a variety of vertical orientations.

[**0038**] Turning now to a detailed description of the features of the figures depicted in the drawings, a robust torso **10** displays broad shoulders **12**R, **12**L and supports a thick neck **14** and an anvil-shaped head **16** having a flat top surface **18** and flat side surfaces **19**R, **19**L. Extending from the torso sides are muscular arms **20**R, **20**L having sloped top surfaces **22**R, **22**L. The arms terminate in hands **26**R, **26**L having back surfaces **28**R, **28**L, palm surfaces **30**R, **30**L and terminal surfaces **32**R, **32**L. Thick, outwardly diverging thighs **34**R, **34**L and depending legs **36**R, **36**L define therebetween a crotch area **40**. Feet **42**R, **42**L point laterally outwardly from their points of attachment to legs **36**R, **36**L and have identifiable bridges **44**R, **44**L; soles **46**R, **46**L; heel backs **48**R, **48**L; heel tops **49**R, **49**L; and, toes **50**R, **50**L.

[**0039**] As best illustrated in FIGS. **1-5**, the rectilinear figures are defined by flat surfaces some of which intersect and others which lie in common planes or in spaced parallel planes. The horizontally spaced front and back surfaces of a figure are parallel and extend vertically when the figure is oriented in an upright position. The horizontally extending head surface **18**; shoulder surfaces **12**R, **12**L; hand surfaces **30**R, **30**L; and foot surfaces **44**R, **44**L; **46**R, **46**L and **49**R, **49**L are normal to the figure's front and back surfaces. The vertically extending head side surfaces **19**R, **19**L; neck surfaces **14**R, **14**L; hand surfaces **32**R, **32**L; leg surfaces **37**R, **37**L; and, foot surfaces **48**R, **48**L and **50**R, **50**L are normal to the just mentioned horizontal surfaces and are also normal to the figures's front and back surfaces. The remaining surfaces which in part define the arms **26**R, **26**L, and the inner and outer surfaces of thighs **34**R, **34**L are inclined to the aforedescribed horizontal and vertical surfaces but are likewise normal to the figure's front and back surfaces. Some of the described surfaces are coplanar, namely, surface **14**R and **48**R, **14**L and **48**L, **32**R and **50**R, and **32**L and **50**L.

[**0040**] If desired, the figures may exhibit friendly, cartoonlike features as suggested by a face depicted on the front surface of head **16**. Appropriate sports or military attire and gear could be painted on, molded into or otherwise associated with the rugged looking figures. To enhance a younger child's interest in the figures as toys and to suggest various play activities involving patterns and sorting, the figures

could be numbered or made of plastic materials of various colors, for example. At an early age, children begin simply to stack blocks and later to develop skills in arranging and connecting blocks for imaginative play. Humanoid blocks, individually and collectively, stimulate children to interact with the figures and with other children. The figures may simply be laid horizontally on their major front or back surfaces or stood erectly on the undersides or soles **46**R, **46**L of their feet **42**R, **42**L.

[**0041**] Vertical stacking of upright figures in various arrangements is illustrated in FIGS. **6-8** where it will be noted that the pairs of figures BC, DE and FG are not actually interconnected or interfitted, but are merely balanced one atop the other in surface-to-surface contact. Although the blocks are identically configured, they afford a substantial variety of balanced stacking orientations. In **FIG. 6**, the lower figure C balances on the flat rectangular top **18** of its head **16** with its feet **42**R, **42**L abutting those of Figure C. The engaging soles **46**R, **46**L of the feet of figures B and C as well as head surfaces **18** of figures B and C are made substantially flat and normal to the front and back surfaces of the figure to assure vertical alignment and stability for the balanced figures. This being the case additional figures could be stacked alternately head-to-head and feet-to-feet atop figure B.

[**0042**] As noted earlier, the terminal hand and foot surfaces **32**R, **50**R and **32**L, **50**L are coplanar; and, these surfaces are equidistant from the vertical centerline CL of the figure. Thus, figure E, if reclined on its right side on a horizontal surface, will balance on surfaces **32**R and **50**R with its left arm **26**L and left leg **34**L extending upwardly. A reversely reclining figure D can then be balanced atop figure E with the terminal hand surface **32**L and the outer leg surface **37**L of Figure D respectively engaging the outer leg surface **37**L and the terminal hand surface **32**L of figure E. In a similar manner, alternately reversed figures could be stacked to form a balanced vertical column of several reclining figures.

[**0043**] While figures C and E have horizontal surfaces engaging a subjacent support surface,the figures F and G of **FIG. 8** are angularly displaced so that lower figure G rests on and balances on two edges, one defined by the intersection of head surfaces **18** and **19**L and another defined by the intersection of the back of hand **26**R and terminal hand surface **32**R. Figure F inclines from horizontal to a like degree as does figure G and is supported and held on figure G by the interaction of the engaged left hands **32**L of figures F and G. With the facing palm surfaces **30**L of hands **32**L engaged as shown in **FIG. 8**, the extending terminal hand surfaces **32**L of each figure will engage the sloped outer surface of the thigh **34**L of the other figure to prevent angular displacement of figure F relative to figure G.

[**0044**] The previously described figures B through G illustrate some of the many balancing and stacking possibilities of the invention. Certain heretofore unattainable interfitting features of the invention will now be explained in detail.

[**0045**] The geometry of the block's surfaces and the spatial relationships of such surfaces depicted in FIGS. **1-5**, provides interstices between certain body parts which afford distinct opportunities to assemble one or more blocks in interfitting relation. Among such interstices is a pair of opposed pockets or receptacles **51**R, **51**L opening laterally to the right hand and left hand sides of the figures. As best shown by figure H in **FIG. 9**, the pocket **51**R is principalby defined by surfaces **30**R, **37**R and **44**R while corresponding left hand surfaces define pocket **51**L. The pocket **51**L of figure H provides a receptacle for the right foot **42**R of figure I and the corresponding pocket **51**L of figure I provides a receptacle for the head **16** of figure J. **FIG. 10** shows figure L having its left foot **42**L received in pocket **51**R of figure M and its right foot **42**R received in pocket **51**L of figure K. **FIG. 11** shows that the right foot **42**R of figure N and the left foot **42**L of figure O are both received in pocket **5**IR of figure P and that the left foot **42**L of figure N and the right foot **42**R of figure O are both received in the pocket **51**L of figure Q.

[**0046**] An essential feature of the figures is that the pockets **51**R, **51**L have the same, or very nearly the same dimension between facing palm surfaces **30**R, **30**L and bridge surfaces **44**R, **44**L of the feet **42**R, **42**L. It is likewise essential that other parts and interstices of the figures be made to close dimensional tolerances; for example, the length of each foot **42**R, **42**L between heel surfaces **48**R, **48**L and toe surfaces **50**R, **50**L; the space or gap **52** between heel surfaces **48**R, **48**L; the thickness of a foot **42**R, **42**L between bridge surfaces **44**R, **44**L and sole surfaces **46**R, **46**L; and, the width of head **16** between side surfaces **19**R, **19**L.

[**0047**] Due to the close attention to the dimensions as required by this invention, the head **16** and either of feet **42**R, **42**L will have a close sliding fit between the spaced surfaces of pockets **51**R, **51**L as viewed in **FIGS. 9 and 10**; and, the feet **42**R, **42**L of the two figures K and M when placed sole to sole, as viewed in **FIG. 10**, will have the same close sliding fit between the heels **48**R, **48**L of a third figure L. The principal function of such close interfigure fits is to assure that the force of friction acting between bearing surfaces will resist unintended disassembly of interfitted figures due solely to gravity or to a child's handling of an assembled group of figures during play. However, the interfigure friction should not be so great that assembled figures cannot be pulled apart by a child old enough to play at interfitting and disassembling the figures of this invention.

[**0048**] Another important functional aspect of this invention is made possible by a close sliding fit between assembled figures. The joined figures H, I and J are shown lying flat; however, these three figures can be assembled in numerous angular attitudes. For example, figures H could be rotated upwardly from the plane of the drawing sheet while its hand **26**L and foot **42**L continue to grasp frictionally the foot **42**R of figure I. Likewise, figures K and M can be pivoted with respect to figure L in the same direction or in opposite directions while a foot **42**L and **42**R of each of figures K and L is clasped together in space **52** between the facing heels **48**R, **48**L of figure L and the toe surfaces **50**R and **50**L of figure L press against the palm surfaces **30**R and **30**L of figures K and M, respectively. **FIG. 10** shows that, the thickness of individual feet **42**R, **42**L equals half the width of the interheel gap **52**; and, **FIG. 11** shows that the thickness of a foot equals half the front-to-back thickness of a figure. These relationships of figure parts and part receiving interstices not only provide alternative ways of connecting two figures in foot-to-foot abutting relation, but also permit the connected figures and a connecting figure to be

oriented, as desired, in alignment with one another, see **FIG. 10**, or perpendicular to one another, see **FIG. 11**.

[**0049**] **FIGS. 12 and 13** illustrate a four-figure, three dimensional assemblage in which the pockets **51**R and **51**L of horizontal figure R receive, respectively, the heads **16** of figure S and figure T. The pockets **51**R and **51**L of horizontal figure U receive, respectively, a foot, unseen, of figure S and a foot, unseen, of figure T. **FIG. 13** shows that the center of this assemblage is open and that the assemblage generally resembles a flat sided tubular beam. Obviously, several additional figures could be connected with figures R, S, T and U to enlarge it in all directions and to create interesting shapes.

[**0050**] The combination of the close dimensional tolerances throughout the structural make up of the figure, the frictionally gripping contact between surfaces of individual figures, and the availability of multiple interstices between the human-like parts of each figure provide several advantages; namely:

[**0051**] 1. The frictional gripping aspect of the invention permits interfitting parts of figures to be slipped together; permits selectable interfigure angular orientations; and, creates a high degree of resistance to separation of figures once joined.

[**0052**] 2. A first figure may be frictionally connected directly to a second figure or may be so connected by means of a third figure connected to the first and second figures.

[**0053**] 3. First and second figures may be frictionally connected by a third figure in either spaced or abutting relation.

[**0054**] 4. Two like interstices between the palms of the hands and the bridges of the feet of a first figure open to opposite sides of that figure; and, such interstices can frictionally retain therein, as desired, either the head or one foot of a second figure or one foot of said second figure and one foot of a third figure.

[**0055**] 5. The heels of the feet of a first figure define therebetween an interstices which can frictionally receive and retain one foot each of second and third figures in variable angular relation with the first figure and with one another.

[**0056**] 6. The feet of first and second figures can be held in sole to sole relation between the heels of third and fourth figures which are respectively retained in the foot to hand interstices of the first and second figure.

[**0057**] An important advantage provided by the block figures disclosed in this invention over those disclosed in the aforecited prior patents is that myriad assemblages of figures can have most, if not all, of their constituent figures frictionally gripped and held together by two or more other constituent figures. Such multiple linkages of figures provides these practical benefits:

[**0058**] 1. Within an assemblage, figure-to-figure coherence is enhanced whereby the complete assemblage exhibits unexpected structural strength and solidarity.

[**0059**] 2. An assemblage retains its external shape and internal arrangement after strenuous manipulation by a child during play.

[**0060**] 3. Assemblages of large numbers of figures used to fabricate sizable and structurally complex animals and mechanical toys, for example, can be made by either serially interfitting individual figures or by connecting prefabricated multifigure panels, columns, beams and the like. Such opportunities for thoughtful building of complex structures challenges the creative abilities of older children and adults as well.

[**0061**] The drawings make it clear that, as illustrated, the head **16** of a figure can not fit into the crotch area **40** of another figure. However, **FIGS. 14 and 15** disclose two modified figure heads **16***a* and **16***b*, which can be inserted into the crotch area **40** of any figure. To this end, head **16***a* is reshaped by providing chamfers **54**R, **54**L which connect the head top **16**c to head sides **19**R and **19**L; and, the slope of the chamfers corresponds to the slope of the inner surfaces of the thighs **34**R, **34**L. A second modification of head **16** is situated upon an elongated neck defined by sides **58**R, **58**L and is rectangular in elevation. The modified head **16***b* resides between the inwardly facing surfaces of legs **36**R, **36**L; and, the neck surfaces **58**R, **58**L engage the heel surfaces **48**R, **48**L. Vertical displacement of head **16***b* is prevented by the interfering engagement between the top **16***d* of head **16***b* and thighs **34**R, **34**L. The ability to interfit the heads of modified figures W and Y with figure A, for example, furnishes a figure builder with additional combinations and orientations beyond those previously discussed herein.

[**0062**] To achieve the resistance to separation of assembled figures contemplated by this invention, relatively tight tolerances on figure dimensions are required, however, well-made molds, standard molding practices, and correctly chosen molding materials can provide acceptable as-molded figures.

[**0063**] The foregoing description of the invention shown in the drawings is illustrative and explanatory only; therefore, various changes in the size, shape and materials of the described figures as well as changes in the manner of their use as toys may be made without departing from the spirit of the invention. It will also be appreciated that there exists virtually unlimited combinations in which the toy figure blocks according to the present invention may be oriented, stacked, interfitted or otherwise employed to build desired structures. Accordingly, I do not intend to be limited to the details shown and described herein, but intent instead to cover all changes and modifications within the ambit of the the appended claims.

What I claim as my invention is:

1) like humanoid figures having front and back surfaces connected by a profile surface defining projecting body parts having interstices therebetween; said body parts of a first figure being configured and dimensioned for insertion into interstices of a second figure with a surface-to-surface sliding fit therebetween; and, the force of friction between the surface of an inserted body part and the surface of its receiving interstices forestalling separation of said first and second figures:

2) The figures set forth in claim 1, wherein:

a) said body parts of said figures are symmetrical and include a head, opposite feet and opposite hands;

b) said hands and said feet define therebetween hand-to-foot interstices opening laterally to opposite sides of said figures; and,

c) either of said feet or the head of said first figure are receivable into either of the hand-to-foot interstices of said second figure.

3) The figure set forth in claim 2, wherein:

abutting opposite feet of a pair of figures are receivable in a common hand-to-foot interstices.

4) The figures set forth in claim 2, wherein:

a) said opposite feet define therebetween foot-tofoot interstices; and,

b) abutting opposite feet of a pair of figures are receivable in said foot-to-foot interstices.

5) The figures set forth in claim 4, wherein:

a) said body parts include diverging legs and a neck;

b) said head is receivable in an interstices defined by said legs; and,

c) and said neck is received in said foot-to-foot interstices.

6) The figures set forth in claim 1, wherein:

said first and second figures are pivotable with respect to one another.

7) The figures set forth in claim 6, where n:

said figures are pivotable from a substantially coplanar relationship to a normal relationship.

8) The figures set forth in claim 4, wherein:

a) said feet have toes, pointing toward opposite sides of said figures, together with heel, sole and bridge surfaces;

b) said sole and bridge surfaces are parallel with one another and are normal to said heel surfaces; and,

c) said foot-to-foot interstices is equal in length to the distance between said heel surfaces.

9) The figures set forth in claim 8, wherein:

the sole-to-bridge thickness of a foot is half the length of the foot-to-foot interstices.

10) The figures set forth in claim 8, wherein:

the sole-to-bridge thickness of a foot is one half the front-to-back thickness of said figures.

11) The figures set forth in claim 1, wherein:

said figures molded of polypropylene copolymer and have hard rectilinear surfaces.

12) A set of toy figures comprising a plurality of the figures set forth in claim 1.

13) Plural humanoid toy blocks joined together and extending

in substantially the same plane; and,

said blocks are pivotable with respect to one another to lie in angularly spaced planes.

14. The blocks set forth in claim 13, wherein:

a pair of blocks are remote from each other and are each pivotably joined to an intermediate block; and,

said pair of blocks are individually movable with respect to said intermediate block to lie selectively in planes normal to one another and in planes normal to said same plane.

15. The blocks set forth in claim 13, wherein:

a pair of blocks abutt one another and are pivotably joined by another block; and,

said pair of blocks are pivotable relative to one another and relative to said another block.

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