

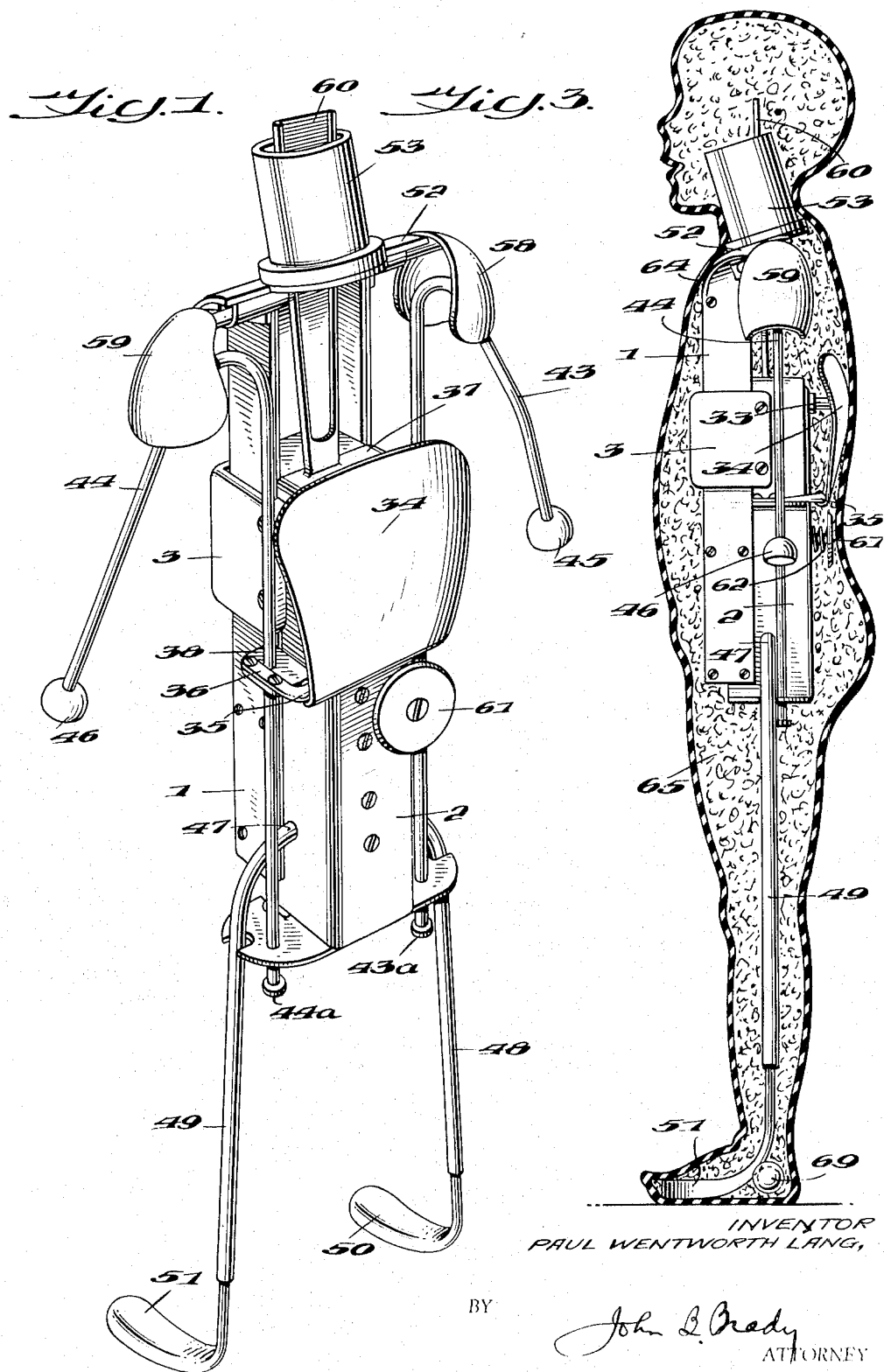
April 17, 1956

P. W. LANG
GROWING FIGURE TOY

2,741,870

Filed Oct. 23, 1951

4 Sheets-Sheet 1



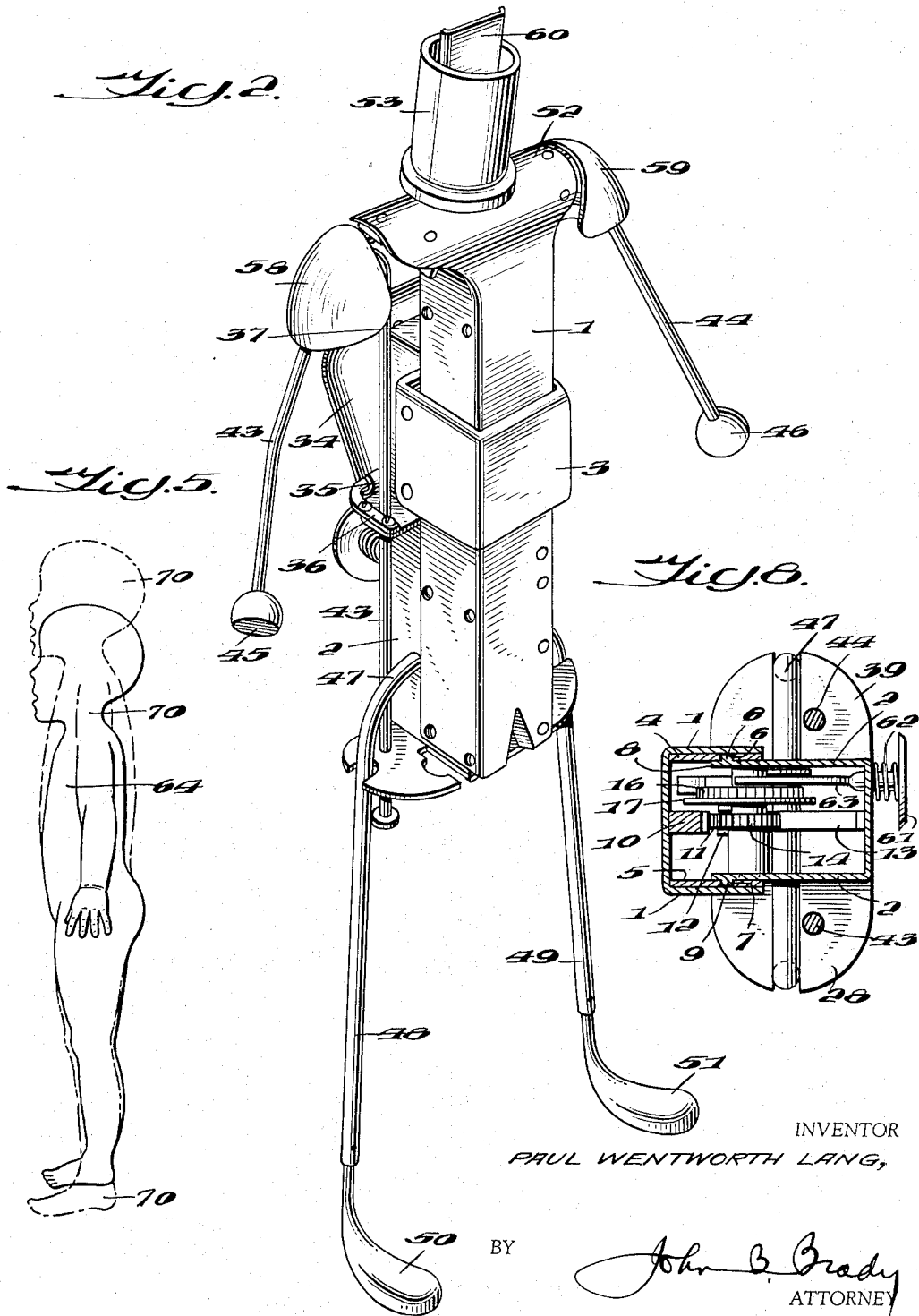
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P. W. LANG
GROWING FIGURE TOY

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4 Sheets-Sheet 2



April 17, 1956

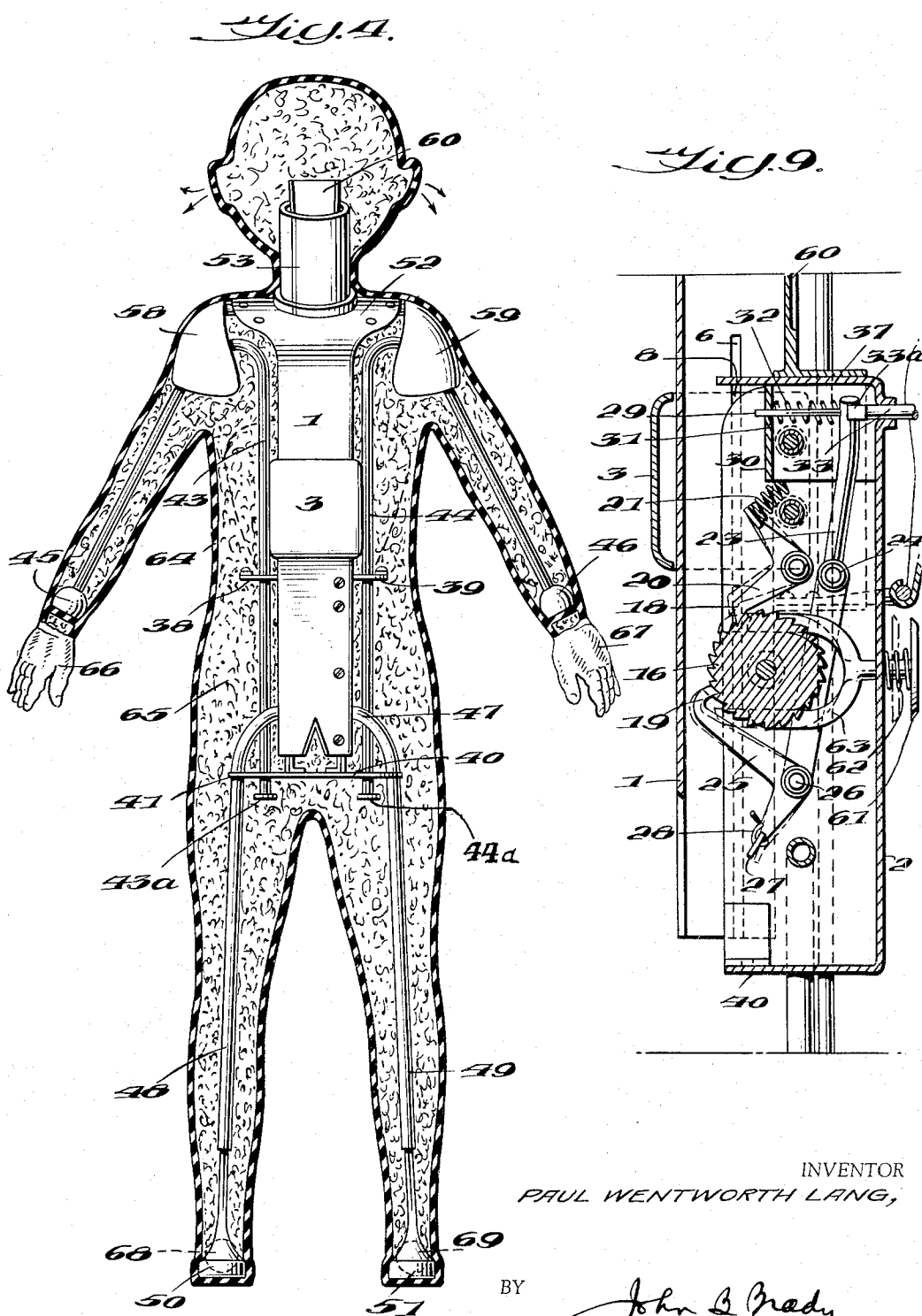
P. W. LANG

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GROWING FIGURE TOY

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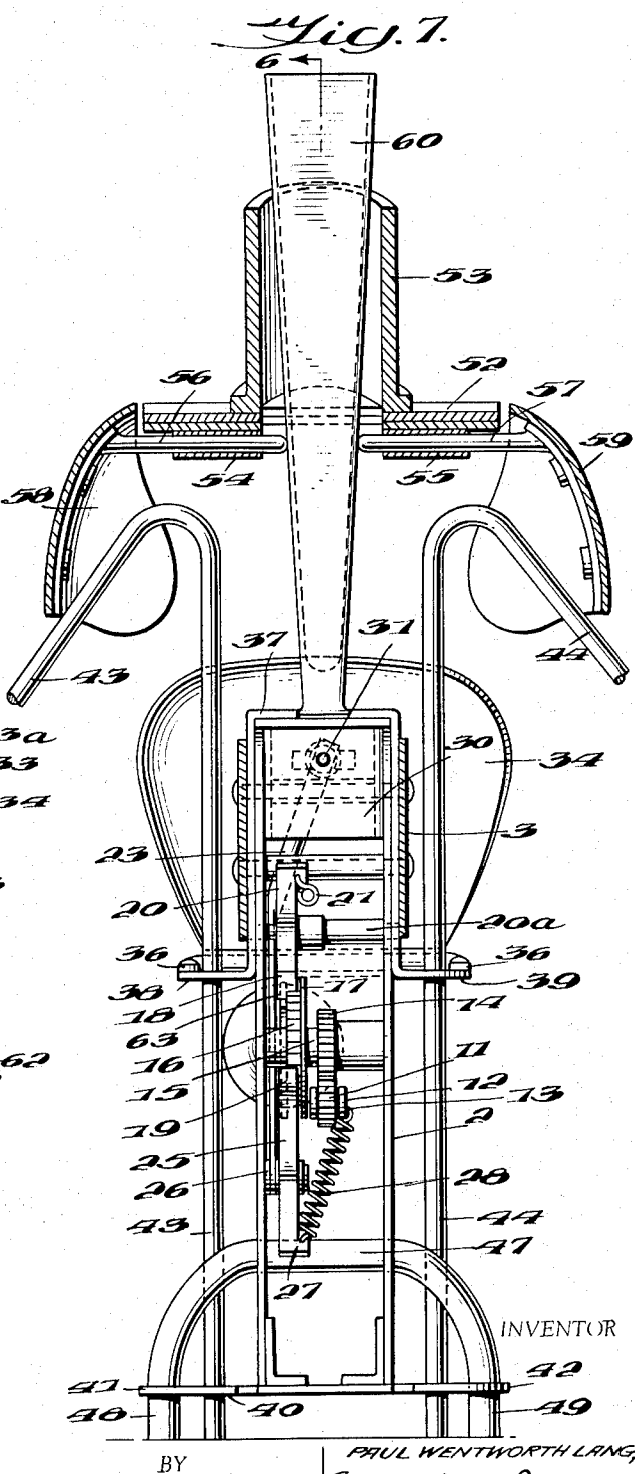
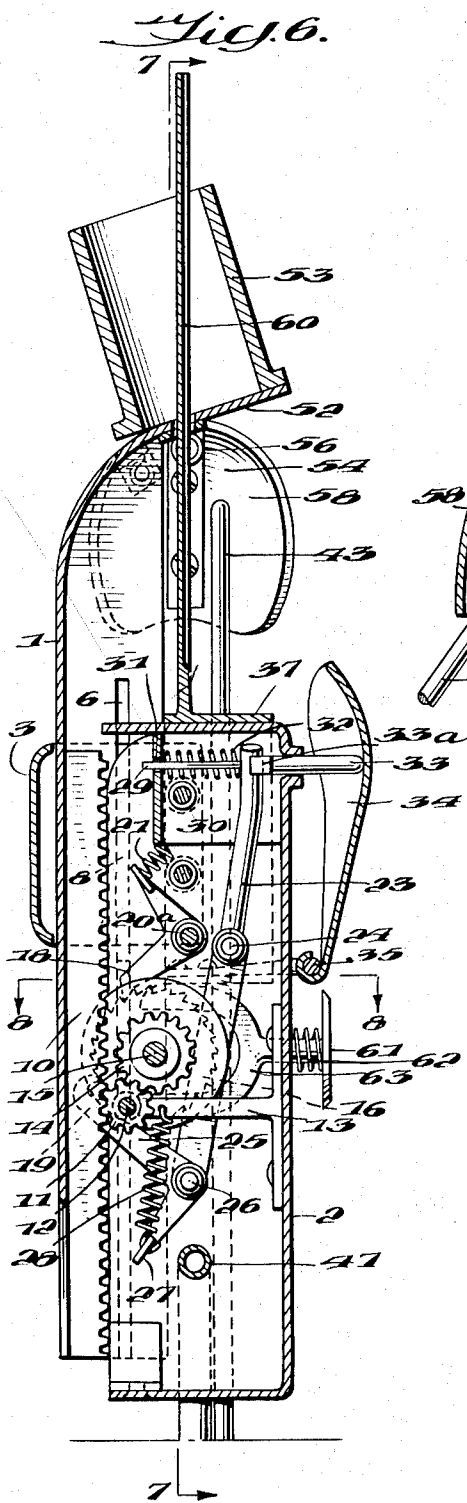
P. W. LANG

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GROWING FIGURE TOY

Filed Oct. 23, 1951

4 Sheets-Sheet 4



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2,741,870

GROWING FIGURE TOY

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Application October 23, 1951, Serial No. 252,620

20 Claims. (Cl. 46—119)

My invention relates broadly to figure toys and more particularly to a construction of figure toy for simulating growth in animate figures.

This application is a continuation-in-part of my application, Serial No. 159,320 filed May 1, 1950, for Device Which Simulates Animate Growth, now Patent 2,669,063, issued Feb. 16, 1954.

One of the objects of my invention is to provide a construction of expansible and contractible figure toy containing mechanism operative to expand the figure toy from a normal condition in both longitudinal and transverse directions for simulating animate growth, the mechanism being contractible for restoring the figure toy to normal position after an expanding operation.

Another object of my invention is to provide an expansible and contractible mechanism for installation within a resilient casing for simultaneously stretching the resilient casing in both longitudinal and transverse sections for simulating animate growth with means for deactivating the mechanism after an expanded operation for restoring the mechanism to normal position preparatory to a repeat operation.

Still another object of my invention is to provide a construction of expansible and contractible figure toy which includes a pair of linearly extending members keyed to slide longitudinally one upon another and associated with means for effecting simultaneously a transverse displacement whereby both longitudinal and transverse motions may be simultaneously produced within a stretchable casing for simulating animate growth.

Still another object of my invention is to provide a construction of motor device for installation within an expansible casing which may be activated by a series of manually induced sensitive pressure applications from the exterior of the casing for effecting a stretching of the casing in a multiplicity of directions simulating animate growth.

Still another object of my invention is to provide a construction of restoring mechanism for a motor device within a stretchable and contractible casing by which the motor device after operating to produce transverse and longitudinal expansion of the casing may be rapidly restored to a normal condition preparatory to a repeat operation.

Other and further objects of my invention reside in the improved construction of motor mechanism for expansible and contractible toys as set forth more fully in the specification hereinafter following by reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the mechanism of my invention looking at the rear thereof before installation within the expansible and contractible skin of the figure toy; Fig. 2 is a perspective view of the motor mechanism looking at the front thereof prior to installation within the expansible and contractible skin; Fig. 3 is a longitudinal vertical sectional view through the expansible and contractible skin of a figure toy and showing the motor

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mechanism of my invention in side elevation installed within the skin and the packing of shredded rubber between the motor mechanism and the skin; Fig. 4 is a front elevational view of the motor mechanism installed within the expansible and contractible skin of the figure toy; Fig. 5 is a theoretical view showing the figure toy in side elevation and illustrating the manner in which animate growth of the figure toy is simulated in accordance with the operation of the mechanism of my invention; Fig. 6 is an enlarged vertical sectional view on line 6—6 of Fig. 7 showing the motor mechanism of my invention; Fig. 7 is a longitudinal sectional view taken on line 7—7 of Fig. 6; Fig. 8 is a transverse sectional view taken on line 8—8 of Fig. 6; and Fig. 9 is a vertical sectional view through the motor mechanism, illustrating particularly the manner of deactivating the motor mechanism at the end of an expanded operation for restoring the motor mechanism to its original position preparatory to a repeat operation.

My invention is directed to an improved mechanism for installation in expansible and contractible figure toys of the type set forth in my application Serial Number 159,320 of May 1, 1950, of which this application is a continuation-in-part.

My improved method has been developed in a form capable of inexpensive mass production and suitable for installation in figure toys which may be sold at relatively low cost in the trade. My improved structure provides means for effecting an expansion of the resilient skin of the figure toy, both in a longitudinal and transverse direction, thereby more closely approximating animate growth and rendering the figure toy more attractive in operation. I also provide a construction of pressure operated motor mechanism which effects a longitudinal and transverse growth within a resilient skin simulating animate growth under control of a series of successive pressure operations applied manually through the resilient skin with auxiliary manual means operated in the exterior of the resilient skin for deactivating the motor means and allowing restoration of the figure toy to its original size.

The details of the motor mechanism and the movement of the parts thereof will be understood more fully by detailed reference to the drawings in which reference character 1 designates the front channel-shaped member of the mechanism and reference character 2 designates the rear channel-shaped member which slides in coacting relation to the front channel-shaped member 1. A band 3 secured to the rear channel-shaped member 2 extends around and embraces front channel-shaped member 1, allowing controlled linear movement of front channel-shaped member 1 with respect to rear channel-shaped member 2. As shown more particularly in Fig. 8, the inside substantially parallel walls of the front channel-shaped member 1 are provided with liner-plates 4 and 5. Liner-plate 4 includes a longitudinally extending slot 6, while liner-plate 5 includes a longitudinally extending slot 7. The rear channel-shaped member 2 has the exterior side walls thereof terminating in keys 8 and 9 which respectively engage the linearly extending slots 6 and 7 within liner-plates 4 and 5. The rear channel-shaped member 2 has substantially one and one-half times the depth of front channel-shaped member 1, as the rear channel-shaped member 2 provides a housing for the motor mechanism which terminates in a pinion 11 whose teeth engage with the longitudinally extending central rack 10 mounted interiorly of the front channel-shaped member 1 for controlling the relatively linear movement between the channel-shaped members as will be hereinafter explained in more detail.

The rear channel-shaped member 2 contains a bracket

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support 13 which projects toward the rack 10 in front channel-shaped member 1 and in alignment therewith. Bracket support 13 carries shaft 12 on which pinion 11 is mounted. A shaft 15 is mounted within rear channel-shaped member 2 and carries spur gear 14 there on which meshes with pinion 11. The shaft 15 also carries a ratchet wheel 16 which is provided with a backing plate 17 to facilitate the guiding of pawls 18 and 19 which coact with the ratchet teeth 16. The pawl 18 is carried by rocker arm 20 which is pivoted on transverse shaft 20a in the rear channel-shaped member 2. A coil spring 21 extends between one end of rocker arm 20 and a fixed position on channel-shaped member 2 provided by frame member 30 located within rear channel-shaped member 2. The pawl 19 which coacts with a spaced position on ratchet 16 displaced from the point of engagement of pawl 18 with the ratchet 16 is carried by rocker arm 25 which is pivotally mounted on stub shaft 26 projecting from the end of the step-by-step actuating lever 23. Rocker arm 25 has an extension 27 on one end thereof which is connected through coil spring 28 with a point on bracket support 13. Thus ratchet 16 is controlled by two pawls 18 and 19.

The motor mechanism is operated by a step-by-step angularly displaceable actuating lever 23 pivoted at 24 within the rear channel-shaped member 2. Thus actuating lever 23 when angularly rocked, effects a step-by-step displacement of pawl 19 for imparting a corresponding movement to ratchet 16, shaft 15, spur gear 14 and pinion 11 for effecting movement of rack 10, thus controlling transitory movement between the front and rear channel-shaped members 1 and 2.

The upper end of the actuating lever 23 is engaged by a saddle 33a formed on an actuating pin 33 which is slidable through a cylindrical sleeve-like recess formed in the wall of rear channel-shaped member 2. The end of the actuating lever 23 is continuously urged into engagement with the saddle 33a by coil spring 32 which is centered around pin 29 carried by actuating lever 23 and projectable through aperture 31 in frame member 30 carried within rear channel-shaped member 2. An actuating pallet 34 is mounted on pivot bar 35. The pivot bar 35 is supported at its opposite ends 36 on the horizontally extending plates 38, 39 which project from the substantially U-shaped member 37 that fits over the top of the rear channel-shaped member 2. The pallet 34 is angularly removable to force actuating pin 33 inwardly against the action of coil spring 32. As the pallet 34 is successively pressed, actuating lever 23 moves pawl 19 for revolving ratchet 16 in a counterclockwise direction as viewed in Fig. 6. This has the effect of revolving pinion 11 as previously explained for moving rack 10 and linearly extending front channel-shaped member 1 with respect to rear channel-shaped member 2.

The rear channel-shaped member 2 carries a horizontally extending plate 40 adjacent the end thereof with side extensions 41 and 42 thereon. These side extensions 41 and 42 are apertured for the passage of the adjustable rods 43 and 44 which also pass through the side extensions 38 and 39. The adjustable rods 43 and 44 are provided with limiting stops in the form of heads 43a and 44a which serve to restrict or limit the maximum overall extension of the front and rear channel-shaped members 1 and 2. The adjustable rods 43 and 44 extend substantially parallel with the axis of the linearly slidable channel-shaped members 1 and 2 to positions beyond the upper end of the rear channel-shaped member 2 where the rods are curved outwardly and form actuating means for the shoulders and arms of the figure toy when the mechanism is applied to a doll or mannikin within the stretchable and contractible skin 64. Within the stretchable and contractible skin 64 I provide cushion members 45 and 46 engageable by the ends of the rods 43 and 44 for application of pressure to the simulated

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hands 66 and 67 of the figure toy for stretching the arms of the toy downwardly as the rear channel-shaped member 2 is displaced linearly downwardly with respect to the front channel-shaped member 1.

I provide a U-shaped rod 47 extending through the rear channel-shaped member 2 and projecting downwardly to form leg stretching members 48 and 49 terminating in foot members 50 and 51 which are displaced downwardly as the rear channel-shaped member 2 is forced downwardly.

The top of the front channel-shaped member 1 is curved to a position over the two channel-shaped members 1 and 2 when in assembled relation. The curved top 52 supports a tubular member 53 which serves as a neck support for the figure top on the curved top 52, the said tubular member 53 being aligned with the central axis of the coacting front and rear channel-shaped members 1 and 2, but disposed at a forwardly extending angle and serving as a support for the neck and head of the figure toy.

Immediately beneath the curved top 52 and on opposite sides of the tubular neck support 53, I provide horizontally extending sleeve-members 54 and 55. The sleeve members 54 and 55 serve as guides for horizontally slidable pins 56 and 57, the outer extremities of which are attached to curved plate members 58 and 59 forming shoulder members for the figure toy and establishing surface contact with the interior of the stretchable and contractible skin 64. The resilient skin 64 normally extends to press shoulder members 58 and 59 and the pins 56 and 57 associated therewith inwardly. This continuous bias applied to pins 56 and 57 by the tensioned material of the skin 64 forces the tips of pins 56 and 57 inwardly into engagement with opposite edges of the elongated tapered strip-like cam 60 carried by the top of the U-shaped member 37 that straddles the upper end of rear channel-shaped member 2. As the elongated tapered cam strip-like member 60 is drawn downwardly it passes through a slot formed in the curved top 52 of the front channel-shaped member 1 and gradually pushes pins 56 and 57 outwardly. This has the effect of transversely stretching the shoulder portions of the resilient skin 64 as represented more clearly in Fig. 4, thereby stretching the figure toy laterally or transversely at the same time that the figure toy is elongated as represented by the dotted lines at 70 in Fig. 5. After the actuating pallet 34 has been operated in step-by-step movement to displace the front and rear-shaped channel-shaped members axially in a linear direction with respect to each other, as determined by the contacting abutment of heads 43a and 44a with the undersurface of horizontal plate 40, the mechanism controlled by push button 61 is operated for restoring the projected members to a contracted or collapsed position. The push button 61 as well as the actuating pallet 34 and all other parts of the motor mechanism are surrounded by the soft rubber filler 65 which serves to pad and shape the body of the figure toy with the stretchable and contractible skin 64 extending over the push button 61 and over the actuating pallet 34. Both the actuating pallet 34 and push button 61 are located at the back of the figure toy. The push button 61 is depressible against the action of coil spring 62 enabling yoke 63 to engage pawls 18 and 19 as illustrated in Fig. 9 in dotted lines for lifting these pawls out of engagement with the ratchet teeth of ratchet 16. This deactivates the control function of the ratchet mechanism and pinion 11 is free to roll in the teeth of rack 10 so that the front and rear channel-shaped members may be collapsed or contracted with respect to each other. Both with the aid of the contracting skin 64 and the manual pressure which may be applied by grasping the upper and lower portions of the figure toy and pressing the uncontrolled parts together to their normal positions, movement of the front and rear channel-shaped members to their restored positions is facilitated by a

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substantial distribution of talcum powder or finely powdered starch or other friction reducing powder through the shredded rubber which packs the interior of the resilient skin of the figure.

The foot members of the figure toy shown at 50 and 51 in Figs. 1-4 are each provided with ball members 68 and 69 for simulating the heels of the feet of the figure toy and insuring uniform stretching of the figure toy at the feet thereof.

The band 3 serves as a solid finger rest at the front of the figure toy through the intervening resilient skin 64 and rubber filler 65 during the time that pressure is applied to the actuating pallet 34 in motivating the rack and pinion mechanism by which the front and rear channel-shaped members 1 and 2 are projected in opposite directions. The band 3 also serves as a hand supporting means through the intervening resilient skin 64 and rubber filler 65 when pressure is manually applied against the push button 61 in restoring the projecting parts to the collapsed or normal position.

I have found the mechanism of my invention as described herein highly practicable and while I have described my invention in certain preferred embodiments I realize that modifications may be made and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim and desire to secure by Letters Patent of the United States is as follows:

1. An expansible and contractible figure toy comprising a stretchable and contractible resilient casing, means disposed interiorly of said casing for stretching said casing in both longitudinal and transverse directions from a normal position in predetermined proportions, gear means for actuating the aforesaid means for stretching or contracting said casing, and manually controllable means for deactivating both of the aforesaid means for enabling said casing to contract to its original normal position.

2. An expansible and contractible figure toy as set forth in claim 1, in which said manually controllable means controls a step-by-step pawl and ratchet mechanism which in turn controls the stretching of said casing.

3. An expansible and contractible figure toy as set forth in claim 1, in which the means disposed interiorly of the casing for stretching the casing in both longitudinal and transverse directions from a normal position consists of a pair of linearly extending channel-shaped members keyed to slide longitudinally one upon the other, a rod member constituting leg stretchers carried by one of said members and a pair of rod members carried by the same member constituting arm stretchers, said leg stretchers and said arm stretchers engaging the interior of the casing for expanding the same.

4. An expansible and contractible figure toy as set forth in claim 1 in which the means disposed interiorly of the casing for stretching the casing in a transverse direction comprises a pair of shoulder pads engaging the interior of said casing and carried by transverse pins extending toward each other and a cam member carried by said last mentioned means, and engaging said pins for thrusting said pins outwardly in a progressive manner for stretching said casing in a transverse direction.

5. An expansible and contractible figure toy as set forth in claim 1, in which the means disposed interiorly of the casing for stretching the casing in both longitudinal and transverse directions from a normal position consists of a pair of linearly extending channel-shaped members keyed to slide longitudinally one upon the other, a rod member constituting leg stretchers carried by one of said members, a pair of rod members carried by the same member constituting arm stretchers, said leg stretchers and said arm stretchers engaging the interior of the casing for expanding the same, a longitudinally extending tapered cam carried by the end of the same member and

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convergently tapered toward the said same member, a shoulder structure carried by the other of said members and slotted for the passage of said longitudinally extending cam therethrough, a pair of transversely slidable shoulder pads carried by opposite sides of said shoulder structure, said shoulder pads establishing surface engagement with the interior of said stretchable and contractible casing, and means connected with said shoulder pads and forming contacting engagement with the opposite edges of said tapered cam for transversely spreading said shoulder pads for correspondingly broadening said casing in proportion to the linear expansion thereof under control of said arm and leg stretchers.

6. An expansible and contractible figure toy as set forth in claim 1 in which said first mentioned means includes a pair of coating longitudinally slidable members where one member carries a strip having edges tapered convergently toward the said member and where the other member is apertured for the passage of said strip, said last member carrying slidable shoulder pads thereon and means slidably disposed between said pads and the edges of said strip whereby said pads are thrust laterally outward in proportion to the linear expansion of said casing.

7. An expansible and contractible figure toy having a stretchable and contractible resilient casing, laterally and longitudinally extending members engaging the interior surfaces of said casing for expanding said casing progressively and simultaneously in two dimensions from a normal contracted position to an expanded position representative of animate growth, and manually controlled means for arresting the expansive movement of said laterally and longitudinally extending members and for collapsing said members for permitting said casing to contract to its normal position.

8. An expansible and contractible toy as set forth in claim 7 in which said laterally and longitudinally extending members constitute part of a manually driven motor device housed interiorly of said casing and wherein said motor device is activated by an angularly rockable mechanism operated by manual pressure applied through said casing from the exterior thereof.

9. An expansible and contractible toy as set forth in claim 7 in which said laterally and longitudinally extending members constitute part of a manually driven motor device housed interiorly of said casing, said motor device being activated by an angularly rockable mechanism operated by manual pressure applied through said casing from the exterior thereof, and means for maintaining said motor device in an activated position for maintaining said casing in a selected condition of expansion simulating animate growth.

10. An expansible and contractible toy as set forth in claim 7 in which said laterally and longitudinally extending members constitute part of a manually driven motor device housed interiorly of said casing, said motor device being activated by an angularly rockable mechanism operated by manual pressure applied through said casing from the exterior thereof, and means for maintaining said motor device in an activated position for maintaining said casing in a selected condition of expansion simulating animate growth, said last mentioned means being disposed immediately adjacent said angularly rockable mechanism and being operative from the exterior of said casing.

11. A motor device for an expansible and contractible figure comprising a pair of linearly adjustable members, a rack carried by one of said members and a gear carried by the other of said members, a ratchet connected with said gear, a pair of spring biased pawls engageable with said ratchet, means for displacing one of said pawls for moving said ratchet step-by-step for imparting movement to said gear and correspondingly displacing said linearly adjustable members, and means for simultaneously displacing both of said pawls out of engagement with said ratchet whereby said gear is free to revolve with respect

to said rack for collapsing said linearly adjustable members with respect to each other.

12. A motor device for an expansible and contractible figure as set forth in claim 11 in which said means for simultaneously displacing both of said spring biased pawls out of engagement with said ratchet is constituted by a yoke member transversely slidable in one of said linearly adjustable members and spring means for normally displacing said yoke member out of engagement with said pawls subject to compressive action for moving said yoke into engagement with said pawls.

13. A motor device for an expansible and contractible figure as set forth in claim 11 in which said means for displacing one of said pawls is constituted by a lever member pivotally mounted within one of said linearly adjustable members with one end of said lever member carrying one of said spring biased pawls and the other end of said lever member being engageable by a reciprocatory member, and means carried by said last mentioned linearly adjustable member for imparting movement to said reciprocatory member for correspondingly moving said lever member for operating the spring biased pawl carried thereby for displacing said ratchet in step-by-step increments.

14. A motor device for an expansible and contractible figure as set forth in claim 11 in which said spring biased pawls are pivoted on opposite sides of said ratchet and wherein one of said spring biased pawls is urged into latching engagement with said ratchet as said ratchet advances step-by-step and wherein the other of said spring biased pawls is operated by said means for displacing the said second-mentioned spring biased pawl and means for maintaining said last-mentioned means in alignment with said linearly adjustable means.

15. A motor device for an expansible and contractible figure as set forth in claim 11 in which said spring biased pawls are pivoted within one of said linearly adjustable members on opposite sides of said ratchet, and wherein the pivot for one of said spring biased pawls is fixed and the pivot for the other of said spring biased pawls is angularly displaceable for imparting step-by-step movement to said ratchet while said first-mentioned spring biased pawl operates as a latch for maintaining said ratchet in the position to which the ratchet is advanced by movement of said second-mentioned spring biased pawl.

16. A figure toy comprising a resilient expansible and contractible shaped hollow skin, a motor device disposed centrally within said resilient-shaped skin, said motor device including a pair of coaxing linearly extending members having end portions substantially conforming with the hollow transverse section of said skin, means for displacing said members in a longitudinal direction relative to each other, and a packing of compressive and

yielding shredded rubber interposed between the exterior of said motor device and the interior wall of said resilient-shaped skin whereby the expansive force developed by the displacement of said linearly extending members is transmitted to the interior walls of said resilient expansible and contractible shaped hollow skin through the compressive and yielding action of said shredded rubber.

17. A figure toy as set forth in claim 16 in which an anti-friction powder is interspersed with said shredded rubber for decreasing the friction developed by the expansive action of said linearly extending members through the shredded rubber.

18. A figure toy as set forth in claim 16 in which a transverse band is fastened at its opposite ends to one of said linearly extending members and encircles the other of said linearly extending members and forms a supporting surface therefor and wherein the first-mentioned linearly extending member includes an expanding and contracting motor mechanism and a pressure actuated member pivotally mounted on said last-mentioned linearly extending member and aligned with said transverse band whereby pressure applied thereto for operating said motor mechanism may be resisted through the supporting surface of said transverse band.

19. A figure toy comprising a resilient stretchable and contractible skin, a motor device located centrally within said skin and including a pair of mutually displaceable members for imparting stretching forces to said skin, a packing of resilient material between said members and the interior wall of said skin, and a pressure operated pallet device pivotally mounted on one of said members and bearing against the interior wall of said resilient skin, a transversely disposed band attached to said last-mentioned member and encircling the other of said linearly extending members and serving as a guide therefor and forming a support transversely aligned with said pallet device and a packing of resilient material surrounding said motor device and interposed between said transversely disposed band and the interior wall of said skin.

20. A figure toy as set forth in claim 16 in which one of said linearly extending members carries a cylindrical member which is disposed on an axis angularly inclined to the central axis of said linearly extending members and shaped to form a support for the neck portion of said resilient contractible and expansible shaped skin.

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