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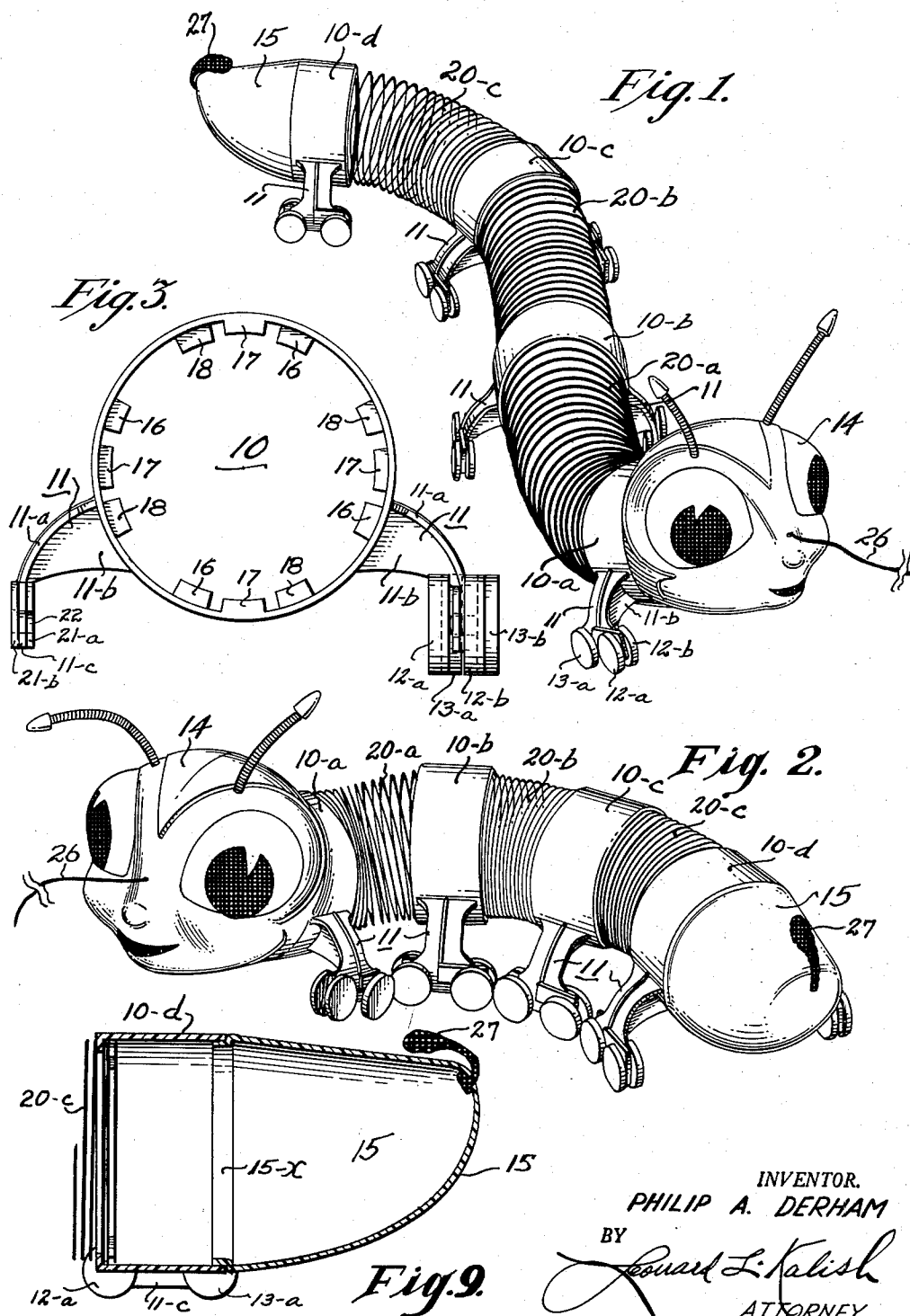
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TOY

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TOY

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The present invention relates to a certain new and useful toy, and it relates more particularly to a pull toy simulating some animate or inanimate object, whose simulated body is formed in sections, with the sections interconnected by a helical spring.

An object of the present invention is a pull toy whose sections are mounted on wheels and whose wheels are so arranged as to cause the sections to move in an undulating path, when the toy is pulled.

Other objects of the present invention will appear more fully from the following description and accompanying drawings.

In the accompanying drawings in which like reference characters indicate like parts:

FIGURE 1 represents a perspective view of a pull toy embodying the present invention.

FIGURE 2 represents another perspective view of the same.

FIGURE 3 represents an elevational view of one of the intermediate wheeled body sections.

FIGURE 4 represents a perspective view of the same, with the wheels removed.

FIGURE 5 represents a side elevational view, on an enlarged scale, of one of the wheel-bearing arms of a body section.

FIGURE 6 represents a view on line 6-6 of FIGURE 5.

FIGURE 7 represents a view on line 7-7 of FIGURE 5.

FIGURES 8 and 9 represent vertical cross-section views through the body sections, namely, the head section and one of the intermediate body sections (FIGURE 8) and the tail section and one of the body sections (FIGURE 9) of the pull toy shown in FIGURES 1 and 2.

A plurality of similar body-sections designated generally by the numeral 10 are formed as annular or otherwise shaped thin-walled injection-molded or otherwise molded or cast or formed plastic shells, as indicated particularly in FIGURES 3, 4 and 8. These similar body sections are designated in FIGURES 1, 2 and 8 as 10a, 10b, 10c and 10d. Each of these body sections 10 is generally tubular. In the particular embodiment shown, where the toy is in the form of a caterpillar, these sections are generally cylindrical. Outwardly and downwardly extending leg-like brackets 11 are provided on each side of the body sections or members 10 for supporting a pair of wheels 12 and a pair of wheels 13, to be described more fully hereinafter.

To the frontmost body section or member 10a a head member 14 may be applied, either by being integrally cast or molded therewith or by being separately formed and then applied thereto by fusion under the influence of a solvent, cement or heat, according to the nature of the plastic used. To the rearmost body section or member 10d a terminal member 15 may be similarly applied.

Each of the body sections 10 is provided with inwardly-extending sets of spring-engaging projections 16, 17 and 18; two such sets being provided at each end of the section, with the sets at one end being staggered in relation to the sets at the other end as indicated in FIGURES 3, 4 and 8.

In each set of projections 16, 17 and 18, one of the

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projections, namely, projection 17 is at the edge or end of the section while the other two projections 16 and 18, of each set, are spaced slightly inwardly and staggered in relation to the projection 17; the axial spacing between the projection 17 on the one hand and the projections 16 and 18 on the other hand (of each set) being such as to frictionally bind against the sides of the convolution 19 of the flat helical spring 20 when the terminal convolution or convolutions are threaded between the projection 17 on the one hand and 16 and 18 on the other hand of the two sets of such projections at the end of the body section, in the manner indicated in FIGURE 8.

The helical springs 20 are formed generally of a flat-cross-section ribbon of spring steel or the like in the manner indicated. These springs may be generally of the form in which the successive convolutions bear against each other with a substantial positive contact-force or contact-pressure, so that when the spring is in repose, namely, when there is no axial pull on the spring, the successive convolutions will abut each other, throughout, with a substantial force. By this reverse pressure between convolutions of the coil spring, the portions of the toy made up of the springs, will have a solid appearance and will tend to remain "solid" until a substantial pull is applied to the toy endwise. This reverse force or reverse pressure is imparted to the spring during the coiling of the spring, in the manufacture thereof, namely, by adjusting the angle of the feed of the flat wire to the coiling instrumentality of the spring-making machine, so that the wire approaches the coil at an angle somewhat less than 90° with the pitch-line of the closed coil (in a manner well known in the spring-making art).

Thus, the springs are represented in FIGURES 1, 2 and 8 in their position when distended by an axial force applied to successive body sections 10 of the toy. The springs are so represented in these figures for purposes of illustration. It is to be understood however that when the toy is not manipulated but when the successive sections are in axial alignment with each other and there is no pull tending to spread the springs or stretch the springs, the successive convolutions of the spring will be in a position with a substantial force between successive convolutions urging them towards each other.

Each of the leg-like brackets 11 is preferably formed of a curved and downwardly inclined web 11a and generally vertical web 11b formed integrally therewith and the two preferably formed integral with the main body portion of the section 10. The lower bearing flange 11c of the leg 11 is provided with oppositely offset complementary bearing flanges 21a and 21b, preferably formed integrally with the flange 11c. Between the flange 11c and the offset bearing flanges 21a and 21b round bearing openings 22 are formed, open towards their lower ends as indicated in FIGURES 4, 5 and 6 with a slightly outwardly flaring entrance slot 23 leading to the bearing opening 22. The narrowest portion 24 of the entrance slot 23, namely, where the entrance slot 23 and the bearing opening 22 meet, is slightly smaller than the diameter of the wheel shaft or trunnion 25. The difference between the diameter of the axial shaft or trunnion 25 and the narrowest portion 24 of the entrance opening 23 depends on the flexibility or the resiliency of the plastic used and the thinness of the flanges 21a and 21b. This difference in dimension between 24 and 25 is such, in relation to the resiliency of the flanges 21a and 21b that the shafts 25 can be forced into the bearing openings 22, through the entrance slots 23 by slightly spreading the legs 21 while the shaft 25 passes the narrowest part 24 of the entrance opening 25. Then the flanges 21 snap back into place and the shafts 25 are thus held within the bearing openings 22.

The bearing openings 22 are preferably of a diameter slightly greater than the diameter of the trunnions 25, so that the latter will be loosely journaled within the bearing openings so as to permit them to wobble while being rotated therein.

Each wheel shaft 25 carries and has preferably formed integrally therewith a pair of disc-like wheels 12a and 12b and 13a and 13b, respectively, as indicated in FIGURES 5, 6 and 7; the axial distance or clearance between the two wheels of each pair (at opposite ends of the same shaft) being slightly greater than the axial distance across the central flange 11c and one of the complementary flanges 21, as indicated in FIGURE 6, so that each shaft, with its pair of wheels, may also move axially to and fro within its bearing 22, while the toy is being pulled.

By applying a pull-string 26 to the front member 14, the toy may be pulled along the ground. In being so pulled, the springs 20a, 20b and 20c will alternately stretch and contract according to the variations in pull and the lag of the rearward sections, and because of the offsetting of the pairs of wheels 12 in relation to the pairs of wheels 13, and the radially and axially loose support given by the bearings 22 to the shafts 25, the pairs of wheels 12 and 13 will wobble and change their course, instead of tracking each other, so that the successive sections will follow each other in an undulating or snake like fashion rather than in a straight-line pattern.

The successive sections 10a, 10b, 10c and 10d are connected by the springs 20a, 20b and 20c as indicated in FIGURES 1, 2 and 8 either by merely threading the last convolution of each spring between the projections 16, 17 and 18, in the manner indicated, and retained therein frictionally, or the innermost end of the so-threaded terminal convolution may be bent over slightly so as to prevent the spring from being unthreaded from the projections 16, 17 and 18.

If desired, a tail 27 may be applied to the tail section 15, as indicated in FIGURES 1, 2 and 9.

If desired, two turns or convolutions of the coil 20 may be inserted between the lugs 16, 17 and 18, as indicated particularly in respect to spring 20a (FIGURE 8) intermediate the body sections 10a and 10b, so as to obtain a more secure attachment between the spring and the body section.

If desired, the head section 14 as well as the tail section 15 may be formed (i.e. injection-molded or otherwise formed) separately from the body sections 10a and 10b, respectively, or they may be formed integral therewith.

If formed separately they may be permanently affixed to their adjoining body sections either by abutting them thereagainst or by telescoping them slightly into the body section, as indicated in FIGURES 8 and 9, respectively. If abutting them, the sections are united by solvent or cement, depending upon the nature of the plastic of which the sections are formed. If telescoping them, with slightly smaller-diametered portions 14x and 15x, as shown in FIGURES 8 and 9, a solvent or cement may likewise be used, more permanently to secure the sections, although friction may be relied upon by tight fit between the telescope portions.

While in the foregoing description and in the accompanying drawings a specific embodiment of the present invention is described and shown, it is to be understood that variations within the scope of and comprehended by the claims are intended to be included as embodiments of the present invention.

Having described the invention, the following is claimed:

1. In a pull toy, a body section having two opposite bearing-extensions, each including a pair of axially offset and spaced apart bearing-openings, and a pair of wheels and a shaft common thereto loosely journaled in each of said bearing-openings both in axial and radial relationship thereto; the pair of wheels so journaled in the bearing-openings of each bearing-extension being axially offset in relation to each other; the offsetting of one pair on opposite sides being in the same direction with respect to the other pair on opposite sides.

2. A toy including a wheel-bearing extension on each side thereof, each of said wheel-bearing extensions having two bearings, one behind the other and in axially offset relation to each other and wheels mounted in said bearings in axially offset relation to each other, the axial offsetting of said bearings and wheels of one wheel-bearing extension being in the same direction as that of the other wheel-bearing extension, so that the front wheels will be axially offset in relation to the rear wheels in the same direction on both wheel-bearing extensions.

3. A toy including a wheel-bearing member on each side thereof, each of said wheel-bearing members having two bearings, one behind the other and in axially offset relation to each other and wheels mounted in said bearings in axially offset relation to each other, the axial offsetting of said bearings and wheels of one wheel-bearing member being in the same direction as that of the other wheel-bearing member, so that the front wheels will be axially offset in relation to the rear wheels in the same direction on both wheel-bearing extensions.

4. A wheeled toy including a pair of bearings on each side thereof, the bearings on each side being disposed fore and aft in relation to each other, each bearing being formed of a resilient but form-retaining material and having an opening facing downwardly which breaks the continuity of the bearing surface, the portion of each bearing on each side of its down-faced opening being offset in relation to each other, in an axial direction, the front half of the forward bearing and the rear half of the rear bearing being offset in opposite directions in relation to each other, and the rear half of the forward bearing and the front half of the rear bearing being in substantial alignment with each other.

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