Oct. 20, 1964 R. A. KEECH 3,153,300

AIR POWERED WALKING TOY

Filed June 13, 1963

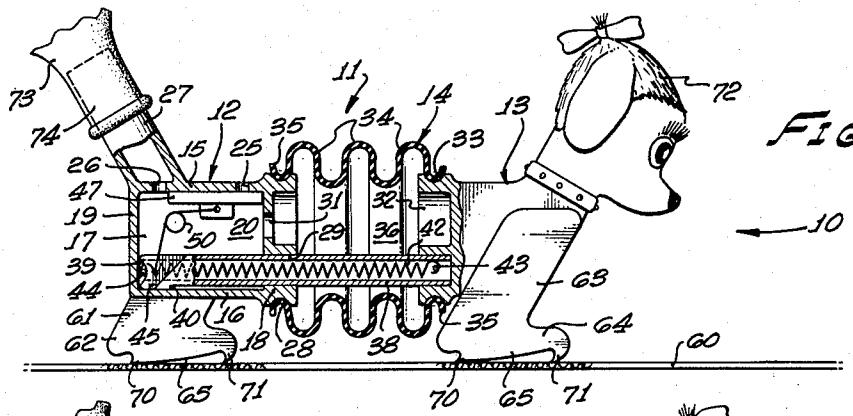


FIG. 1.

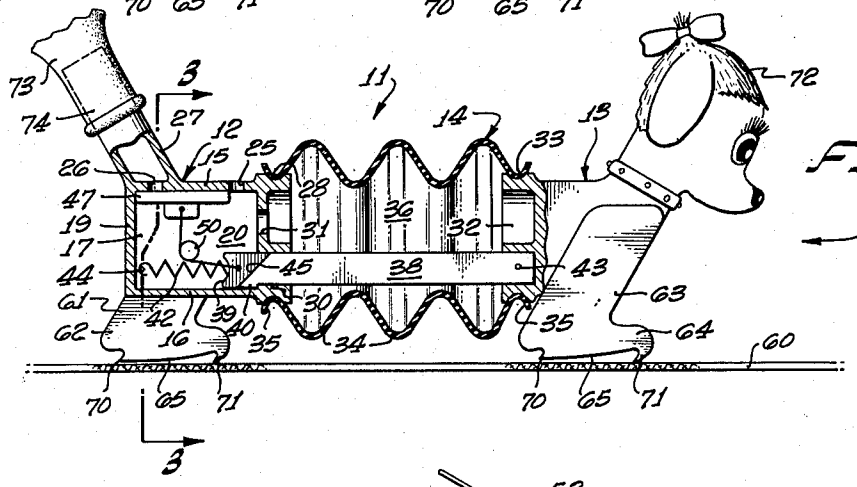


FIG. 2.

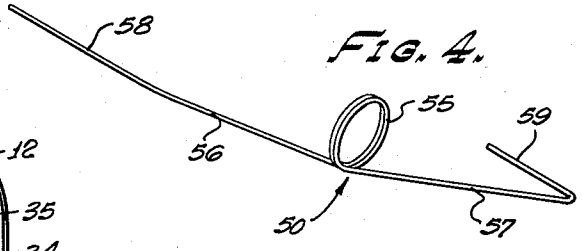


FIG. 4.

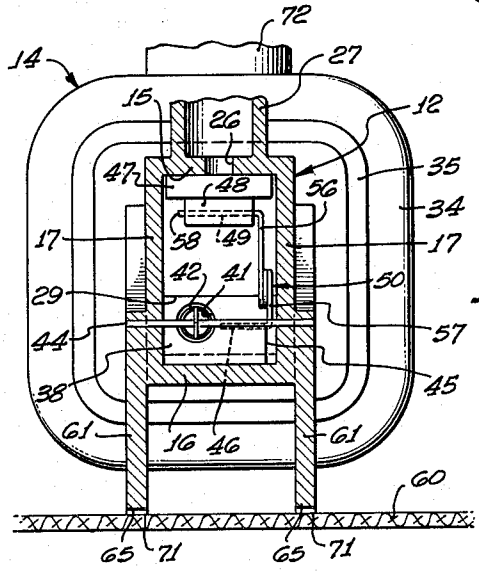


FIG. 3.

ROGER A. KEECH
INVENTOR.

BY

ATTORNEY.

United States Patent Office 3,153,300 Patented Oct. 20, 1964

3,153,300

AIR POWERED WALKING TOY

Roger A. Keech, 16309 Kingside Drive, Covina, Calif., assignor of twenty-five percent to Dana E. Keech, Santa Ana, Calif.

Filed June 13, 1963, Ser. No. 287,689
4 Claims. (Cl. 46—150)

This invention relates to toys and particularly to automotive toys driven by compressed air.

It is an object of the present invention to provide a novel, practical, inexpensive and interesting toy of this general type.

Another object is to provide such a toy which will be in the form of a four-legged animal and will be powered by compressed air supplied from an elastic balloon, which forms the tail of said animal and is connected to an air motor in the toy which moves the legs of the toy to produce locomotion in said toy.

Yet another object is to provide such a toy in which said motor is incorporated in the body of said toy so as to horizontally slidably relate the foreleg section of the toy and the hind leg section thereof and utilize said compressed air to reciprocate said two sections relative to each other to produce self-locomotion in said toy.

Still another object of the invention is to provide a novel fluid actuated reciprocating motor suitable for use in operating a toy by compressed air.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawing in which

FIG. 1 is a side elevational view of a preferred embodiment of the present invention with portions thereof broken away to illustrate the interior structure thereof and with the motor parts thereof contracted.

FIG. 2 is a view similar to FIG. 1 and showing the base and head members and bellows of the motor of the invention in their expanded relation.

FIG. 3 is an end view of the invention looking in the direction of the arrows 3—3 in FIG. 2.

FIG. 4 is a perspective view of one of the elements of the preferred embodiment of the invention.

Referring specifically to the drawings, the invention is shown therein as an air-operated toy 10 embodying an air motor 11 which includes a base member 12 and a head member 13 between which is mounted a flexible bellows 14.

The base member 12 is made up of upper and lower walls 15 and 16, side walls 17 and front and rear walls 18 and 19. These walls confine a valve chamber 20.

Upper wall 15 is provided with an air exhaust port 25 and an air inlet port 26 and has formed integrally therewith a valve inlet tube 27 which connects with the inlet port 26. The front wall 18 is approximately square in outline, with rounded corners, and has a perimetric channel 28 formed about the periphery thereof. Wall 18 also has a relatively long rectangular guide hole 29 formed therein just above the level of the lower wall 16 so as to leave a low stop shoulder 30 along the bottom edge of hole 29 which extends above the upper surface of the lower wall 16. An air passage 31 is also formed in front wall 18 for a purpose which will be made clear hereinafter.

The head member 13 has a wall 32 provided thereon with the same square outline as the front wall 18 and is provided with a perimetric channel 33. The flexible bellows 14 is formed of a series of convolutions 34 and terminates in restricted necks 35 which must be stretched to fit over walls 18 and 32 and snap into the perimetric channels 28 and 33 of said walls so as to combine with the latter to completely enclose a bellows chamber 36 thus provided between said walls. Rigidly provided on the head member wall 32 is a slide bar 38 which is formed so as to be normal to the planes of the perimetric channels 28 and 33 and has a location on the wall 32 corresponding to the location of the guide hole 29 on the front wall 18 so that said slide bar is slidably received in said hole to form an accurate sliding relationship between the members 12 and 13. A shallow notch 39 is formed crosswise in the rear end of bar 38 for a purpose to be made clear hereinafter. A shallow boss 40 extends downward from a rear end portion of bar 38 to engage shoulder 30 and thus prevent withdrawal of bar 38 from hole 29. The bar 38 has a bore 41 in which a coiled tension spring 42 is enclosed the front end of said spring being attached to the head member wall 32 by a pin 43 and the rear end of said spring being attached to the side walls 17 of member 12 by a pin 44. This pin is received in notch 39 when the spring 42 returns the members 12 and 13 to their relatively contracted or collapsed relationship, shown in FIG. 1, following their having been slidably extended into their relatively expanded relationship as shown in FIG. 2. A rear end side portion of the slide bar 38 has a slight recess 45 formed therein and a transverse pivot hole 46 is provided in said bar in the area of said recess.

Confined within the valve chamber 20 and slidably disposed against the lower surface of the upper wall 15 of member 12 is a slide valve 47 having a depending boss 48 in which is provided a transverse pivot hole 49. A light coiled valve spring 50 is provided in the chamber 20, this spring having two or more coils 55 from which arms 56 and 57 extend forwardly and downwardly, respectively (FIG. 1), the arm 56 having an end pivot portion 58 thereof bent laterally to extend into the transverse pivot hole 49 of the slide valve 47, and the arm 57 having an end pivot portion 59 thereof bent horizontally to extend into the transverse pivot hole 46 formed in slide bar 38.

The toy 10 is adapted to rest on a floor while being operated and the base member 12 is provided with a pair of hind legs 61 having feet 62 which rest on the floor and the head member 13 is provided with forelegs 63 having feet 64 which also rest on the floor. The toy 10 is particularly designed to operate on a carpeted floor 60 or some other kind of fabric surface such as a tablecloth and each of the feet 62 and 64 have skate-like blades 65 terminating at their rear ends in sharp points 70 and having hooks 71 at their front ends which extend downwardly to a slightly lower lever than the points 70.

The head member 13 also has provided thereon the FIGURE 72 of an animal's head, while the base member 12 is provided with a rubber balloon 73 simulating a tail which is adapted to be inflated and then applied to the motor 11 by slipping the neck 74 of the balloon over the valve inlet tube 27 as shown in FIG. 1. As is readily apparent from FIG. 1, the toy 10 thus represents a caricature of a small animal such as a dachshund and this lends interest to the operation of this toy which is as follows.

When the balloon 73 is inflated and connected to the tube 27 as shown in FIG. 1 and the toy 10 placed on a fabric-covered surface 60, and slide valve 47 is in its forwardmost position as shown in FIG. 1 thus uncovering inlet port 26 and covering exhaust port 25. Compressed air thus flows from the balloon 73 through port 26, chamber 20 and air passage 31 into the bellows chamber 36 thereby expanding bellows 14 and causing relative sliding movement between the base and head members 12 and 13 until these members are in a relatively expanded relation as shown in FIG. 22. Just before this expanding movement is completed, the pivot hole 46 in slide bar 38 bypasses pivot hole 49 in slide valve 47 so that the direction which pressure is applied to said slide valve through coiled tension spring 50 is reversed thereby suddenly shifting this valve rearwardly into the position

in which it is shown in FIG. 2. This movement of slide valve **47** closes valve inlet port **26** and opens exhaust port **25**. Coiled spring **42** thereupon immediately collapses the bellows **14** and returns the base member **12** and head member **13** to the relationship in which they are shown in FIG. 1.

Because of the claw-like character of the points **70** and hooks **71** of the feet **62** and **64** of the toy **10**, these feet resist rearward movement during the expanding and contracting of the toy **10** so as to produce a progressive forward movement of the toy in a given longitudinal direction. This movement continues as long as the supply of compressed air in the balloon **73** lasts.

The claims are:

1. A fluid motor including: a bellows base formed by top and bottom walls, side walls and a back end wall, said walls enclosing a valve chamber, said top wall having fluid inlet and outlet ports, said base having bar guide means including a bar guide hole at the front end of said base and opening into said chamber; a bellows head spaced longitudinally from said front end of said base; a bar provided on said head and normal thereto at a location thereon corresponding to the location of said guide hole in said base, said bar being slidably received in said hole and thus extending into said chamber, said guide means preventing relative rotation between said base and said head; a flexible convoluted tubular bellows making a fluid-tight connection at its opposite ends with said front end of said base and said head and enclosing the space therebetween, there being fluid passage means connecting said space with said chamber; a slide valve in said chamber slidably fitting against said top wall to close one of said ports while uncovering the other port and vice versa; an expansion spring means pivotally connected on parallel transverse axes at its opposite ends to said valve and to the end of said bar extending into said chamber whereby said axis on said bar bypasses the axis on said valve towards the conclusion of each relative sliding movement between said base and said head thus causing said valve to shift from a position uncovering one of said ports and closing the other to an exactly reverse position; and stop means limiting the outward movement of said bar to prevent its withdrawal from said hole.

2. A combination as recited in claim 1 wherein a fluid delivery tube is provided on said upper wall connecting with said inlet port; compressed fluid reservoir means connected to said tube; separate support means extending downward from said bellows base and said bellows head to support said motor on the floor; and unidirectionally operative friction means provided on said support means whereby relative longitudinal reciprocal movement between said base and head produces travel of said base and said head longitudinally in a given direction, said motor thus progressively advancing over said floor in said direction.

3. A combination as recited in claim 2 wherein said support means simulate legs, said friction means simulate feet, said reservoir means comprises a rubber balloon which simulates a tail; and the figure of an animal's head is provided on said bellows head whereby said motor simulates an animal.

4. An automotive toy comprising: a base member and a head member slidably connected for limited horizontal relative reciprocating movement; forelegs provided on said head member; hind legs provided on said base member; feet provided on the bottom ends of said legs and frictionally engaging the floor to permit movement in a forward direction while resisting movement in a rearward direction; a convoluted tubular bellows attached at its opposite ends to said members and occupying the space therebetween; a rubber balloon mounted on said base member; and valve means responsive to relative reciprocation between said members towards each other to deliver air from said balloon to said bellows to expand the latter and thereby move said members apart and to then shut off said air and open said bellows to the atmosphere; and spring means for returning said members to their starting collapsed condition, said relative reciprocation between said members being automatically continued until the supply of compressed air in said balloon is exhausted.

References Cited in the file of this patent

UNITED STATES PATENTS

712,601	Savage	Nov. 4, 1902
1,438,108	Gund	Dec. 5, 1922
2,817,187	Auzin	Dec. 24, 1957
2,840,951	Green	July 1, 1958
2,882,007	Conlan	Apr. 14, 1959