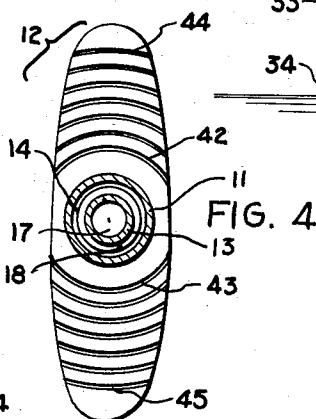
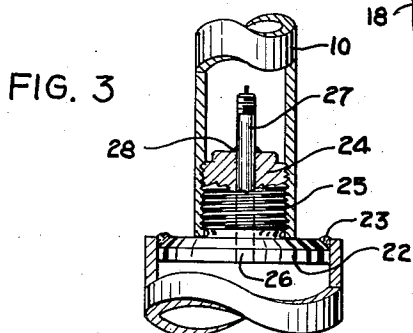
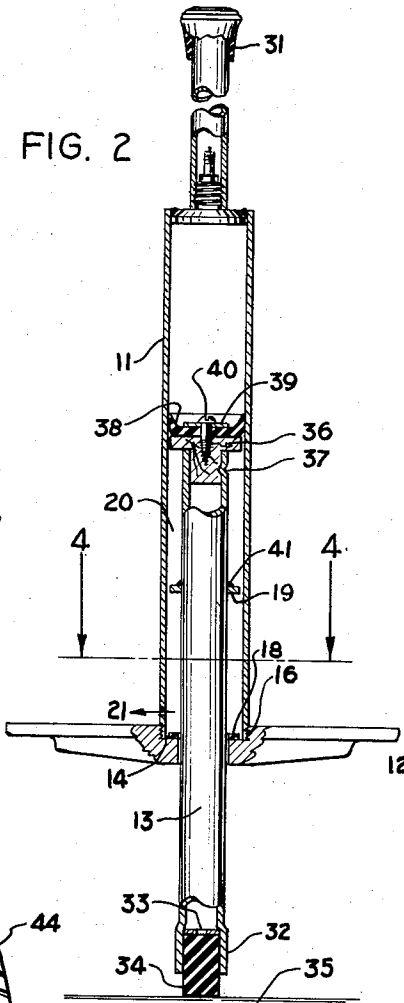
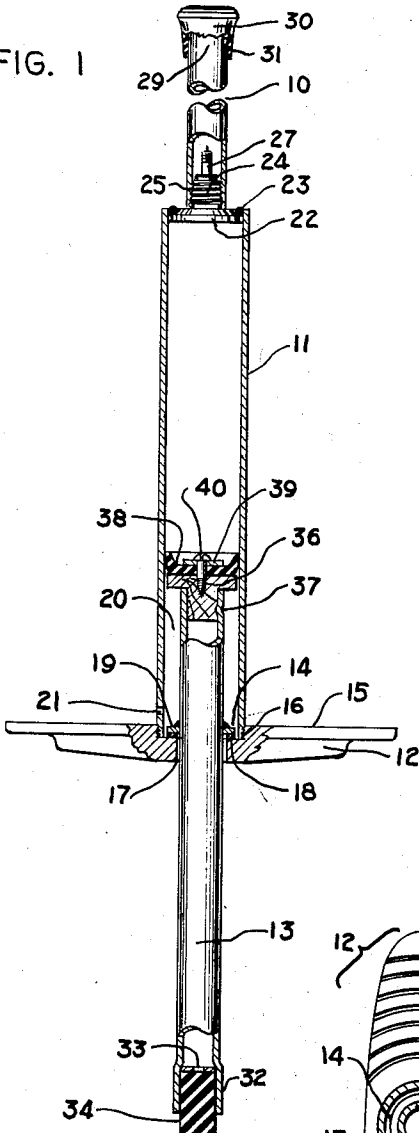


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SPRINGLESS POGO STICK

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SPRINGLESS POGO STICK

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This invention relates to the type of mechanical toy generally known as a pogo stick on which a child may propel himself from place to place in a series of hops and, more particularly, to a pogo stick having a pressure chamber included in its structure and utilizing fluid pressure in varying amounts to obtain the desired amount of weight carrying capacity and compression spring reaction.

Heretofore, pogo sticks generally available have consisted of a straight shaft fitted with a transverse footpiece and terminated downwardly in a mechanical spring means which was depended upon to force the stick and the person balancing thereon upwardly to assist him in making the next jump.

The most obvious and common difficulty present in pogo sticks of the foregoing construction was the fact that a spring adapted in compressibility or stiffness to function satisfactorily with a person of medium weight would prove to be too weak and non-reactive for a heavier person and too stiff for a lighter user, and pogo sticks intended for use by children were so lightly tensioned that they were completely unsuited for use by an adult or older child.

As a result, the formerly available pogo sticks were subject to complete mechanical breakage and failure of the spring means, and at best underwent a gradual deterioration in the characteristics of the spring means until they became completely unsuited for their intended use.

In addition, from a structural standpoint, if they were constructed heavily enough, for instance of hard wood, they were so heavy as to be clumsy to handle and difficult to use, and those which were less heavily constructed were soon fractured beyond repair when used by persons of inordinate weight. As a result of these problems, the pogo stick never achieved a particularly high degree of popularity as a plaything since they were generally so restricted in use, fragile in construction and, in most cases, soon lost the springiness and bounce that made them fun to use.

My invention has been made with the foregoing considerations in mind and can be said to have a plurality of important objectives.

One important object of my invention is the provision of a pogo stick plaything having a very favorable ratio of weight to carrying capacity and being structurally several times as strong as those previously available.

Another important object of my invention is the provision of a device of the character described which does not depend upon mechanical spring means of any kind for its resiliency and bouncing reaction.

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A further important object of my invention is the provision of a device of the character described which is adjustable in tension according to the weight of the person using it and to the relative degree of stiffness or compressibility desired by the user.

An additional important object of my invention is the provision of a device of the character described having moving parts conformed to define a pressure chamber and plunger operative therein, and having convenient means for changing the reaction of the device to certain amounts of compressive force.

In brief, the pogo stick of my invention includes a shaft means conformed of interfitted sections of tubing effective to cooperate in the manner of a cylinder and plunger enterable therein, and having valve means for introducing any desired amount of initial pressure into the cylinder. A transverse footpiece is fixedly attached to the cylinder section of tubing at its downward termination, and a tire tube valve stem assembly is soldered into the opposite end to provide both a closure and a valve therefor, and an upwardly extended tubular handle is threaded over the valve stem. A lower tubular section of smaller diameter is entered into the cylinder through a bore in the footpiece and is fitted with a pressure sealing ring slidable longitudinally within the cylinder, and with stop means effective to limit the movement of the plunger within the cylinder.

Thus, a person forcing himself downwardly on the footpiece forces the cylinder downwardly over the plunger thereby further compressing the air in the top of the cylinder. By the time his downward momentum is neutralized, the air has been compressed to a point far beyond that required to support his weight, and the cylinder together with the person balancing on the footpiece are accelerated upwardly by the energy stored in the compressed air during the downward stroke.

Certain variations of the embodiment and further important objects of my invention will become apparent to persons familiar with the general art upon inspecting the detailed specification that follows and the references therein to the accompanying drawings, in which

Figure 1 is a side elevational view, partially in section of a pogo stick of my invention;

Figure 2 is a similar view showing the device as it would appear when compressed by the weight of a person balancing thereon;

Figure 3 is a fragmentary side elevational view partially broken away and in section showing the valve parts and method of assembly thereof, and

Figure 4 is a plan view of the transverse footpiece as seen from the direction of the arrows 4—4 in Figure 2.

Reference is again made to Figure 1 showing a pogo stick constructed according to my invention with portions of the device shown in vertical section and other areas broken away to further reveal the relationship and methods of attaching the parts. The major components of the assembly include a handle section 10, a main cylinder 11, a transverse footpiece 12, and a lower cylinder or plunger 13.

As can be seen in the sectional portions of the view, the upper cylinder 11 is threadably engaged at its lower termination in a shallow counterbore 14 disposed inwardly of the upper surface 15 of the footpiece 12 as seen at 16 in Figures 1 and 2.

Figure 2 is substantially the same as Figure 1 except

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that the latter shows the device with the cylinder and plunger extended to their limit, whereas in Figure 2 they are seen during the compression stage in which the cylinder 11 is moved downwardly longitudinally of the plunger 13.

The footpiece 12 is also provided with a center bore 17 adapted to receive the plunger member 13 slidably there-through, and a flat washer 18 conformed of an elastomeric material, is disposed in the bottom of the counter-bore 14 in the annular space between the plunger 13 and the inner surface of the cylinder 11 as best seen in Figures 2 and 4. The sole purpose of the washer 18 is to absorb the shock occurring each time the footpiece and the upper cylinder 11 move upwardly sufficiently to lift the plunger member off the ground to make a jump.

The plunger 13 is freely movable through the bore 17 which serves as a bearing for the longitudinal movement of the plunger, but no attempt is made to seal the air at this point since it is actually important that air be free to leave and enter the lower compartment 20 between the lower portion of the cylinder 11 and the upper portion of the plunger 13. To facilitate this intake and exhaust of air, at least one port such as 21 is provided in the lower sidewall of the cylinder 11 adjacent the upper surface 15 of the footpiece 12.

The interior chamber of the cylinder 11 is sealed at its upper end by a valve plug and stem assembly positioned interiorly of the upper aperture of the cylinder, the flanged member of the assembly being fixedly attached in some permanent manner, such as seam welding or hard soldering, to the inner wall of the tubing as shown at 23 to provide not only airtightness but an extremely rigid jointure to withstand the lateral forces imposed when the handle portion 10 is grasped in the hands of a person propelling himself on the device.

Details of the valve plug and stem assembly are better seen in the enlarged sectional elevational view of Figure 3 in which it is seen that a plug portion 24 is extended upwardly from a flanged member 22 and is externally threaded, as at 25, and provided with a centerbore 26 in which the valve stem 27 is enterable and fixedly attached by circumferential soldering as indicated at 28.

The handle member 10 is actually a length of conduit which is internally threaded adjacent its downward end for threadable engagement with the external thread 25 of the plug 24, and the handle is covered at its upward end by a rubber cap member 30 which is similar in conformation to a crutch tip, being conformed of a flexible material and having deep sidewalls 31 extended downwardly around the outer surface of the tubing as indicated at 29.

Access to the valve 27 is secured by unthreading the tubular handle member 10 from the threads 25 of the plug member 24. The plunger member 13, as has been said, is a section of seamless tubing similar in character to that used in the cylinder 11, but is substantially smaller in diameter.

Adjacent its lower end, the plunger tube 13 is enlarged circumferentially as indicated at 32 in Figures 1 and 2, thus providing a socket section being adapted to receive therein a generally conventional washer which is disposed inwardly of the fitting against the circumferential offset or shoulder between the tubular sections of larger and smaller diameter, and a generally cylindrical solid but resilient bottom tip member 34 which absorbed much of the shock occurring when the pogo stick returns to the ground, indicated at 35 in Figure 2, upon completing a jump.

At the upward end of the plunger 13 spaced from the downward tip end 34, a plug member 36 having a cylindrical portion dimensioned for a press fit within the tubing 13 and a flanged portion thereabove which extends outwardly over the end edge of the tubing, is driven into the open end of the tube 13 and staked therein by a plurality of detents such as 37 seen in Figures 1

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and 2. A sealing ring 38, concavely conformed in the manner of a vacuum cup, is secured to the flanged portion of the plug 36 by means of an axially aligned washer and wood screw 39 and 40 respectively, the latter being entered through the washer and the cup member 38 into the center of the plug 36.

A stop ring 19, previously mentioned, is fixedly attached to the surface of the plunger tube 13 by seam welding or soldering as indicated at 41 in Figure 2, and serves to restrain the cylinder section 11 from moving upwardly beyond a point at which enough of the plunger 13 would remain inserted with the cylinder to assure longitudinal stability of the vertical structure when a jump is completed.

A plurality of arcuate grooves is disposed in each of the oppositely extended foot plates as is clearly shown in the plan view of the footpiece 12 shown in Figure 4 showing the part as it would appear from the direction of the arrows 4—4 in Figure 2. The arcs employed in the grooving are actually segments of concentric circles of progressively increased diameter and are used in the arrangement shown so that the arcs of lesser diameter such as 42 and 43 are positioned adjacent the central tube 11 where greater curvature of the grooving is needed to prevent slippage of shoes or feet thereon, either across or laterally of the two foot plates, whereas grooves of lesser curvature such as 44 and 45 are adequate to prevent slippage laterally of the central tube.

Numerous modifications and variations of the present invention will occur to those skilled in the art after a careful study hereof. All such, properly within the basic spirit and scope of the present invention are intended to be included and comprehended herein as fully as if specifically described, illustrated and claimed herein.

The exact compositions, configurations, constructions, relative positionings, and cooperative relationships of the various component parts of the present invention are not critical, and can be modified substantially within the spirit of the present invention.

The embodiments of the present invention specifically described and illustrated herein are exemplary only, and are not intended to limit the scope of the present invention, which is to be interpreted in the light of the prior art and the appended claims only, with due consideration for the doctrine of equivalents.

I claim:

1. A pogo stick for use by children and adults in propelling themselves from place to place using energy stored in a column of pressurized air held captive within said pogo stick, said pogo stick comprising a pair of elongated inner and outer tubular members of different diameters movably assembled telescopically of one another, the smaller diameter tubular member having piston means fixed to its inner end cooperable with the side wall and closed upper end of the outer tubular member to hold a column of pressurized air captive, a removable hollow handgrip at the upper end of said outer tubular member, normally closed valve means at the upper end of said outer member normally concealed within and protected by said hollow handgrip and made accessible for replenishment of the pressurized air by the removal of said handgrip, means for holding said tubular members detachably assembled at their overlapping telescoping ends comprising a unitary member having a transverse bore centrally thereof forming a guide journal for said inner tubular member and including a concentric larger diameter threaded portion mating with screw threads on the lower end of said outer member, and stop means fixed to said inner tubular member at a point spaced below said piston means and on the interior side of said guide journal, said stop means being cooperable with said guide journal to limit the maximum extension movement of said tubular members relative to one another.

2. A pogo stick as defined in claim 1 characterized in the provision of air venting means for admitting air to

and venting air from the chamber formed below said piston means by the overlapping ends of said tubular members, and means at the lower end of said outer tubular member for augmenting the resiliency of said pressurized air column, said last mentioned means comprising an elongated cylinder of elastomeric material of appreciably greater length than diameter, the major upper portion of said cylinder having a close press fit within the lower end of said inner tubular member and the lower portion of said cylinder being exposed beyond the end thereof and providing an elongated elastic energy storing foot piece for said pogo stick effective in supplementing the elasticity of said air column, and means for holding said elongated cylinder assembled to said pogo

stick with its inner end half surrounded by said inner tubular member and its other end exposed beyond the end thereof.

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