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2,786,304

WALKING DOLLS

Filed Oct. 20, 1954

2 Sheets-Sheet 1

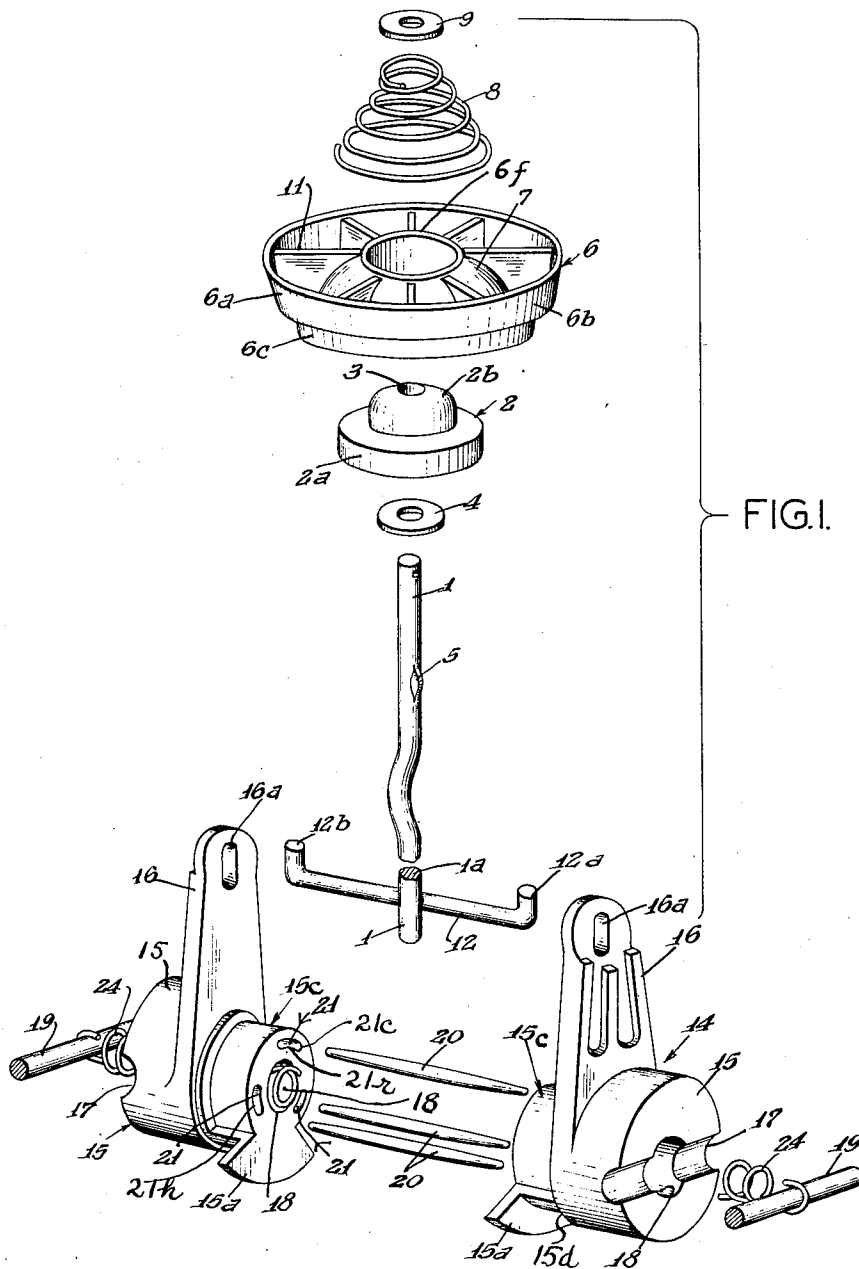


FIG. 1.

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2 Sheets-Sheet 2

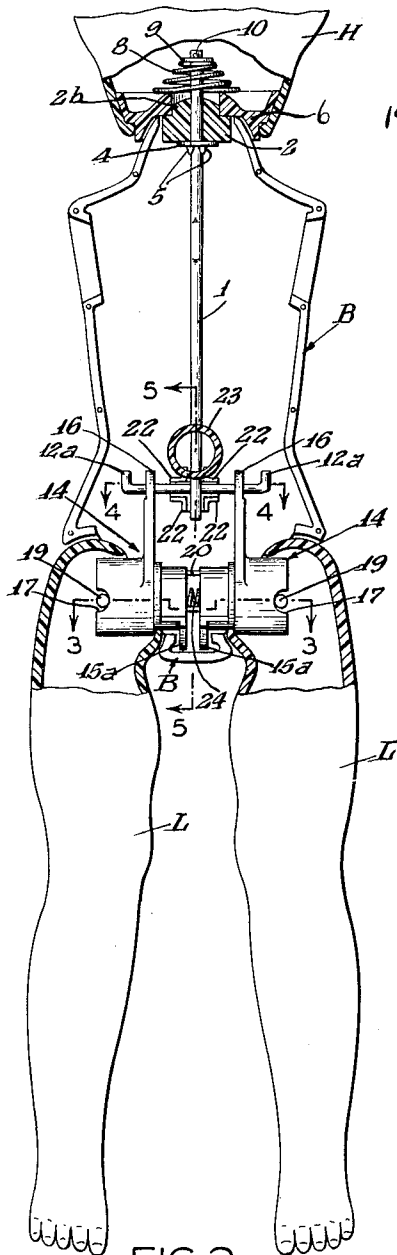


FIG. 2.

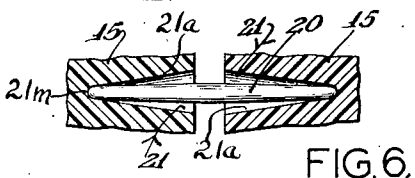


FIG. 6.

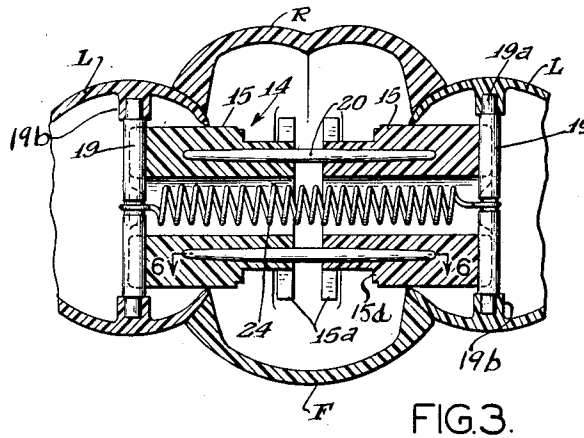


FIG. 3.

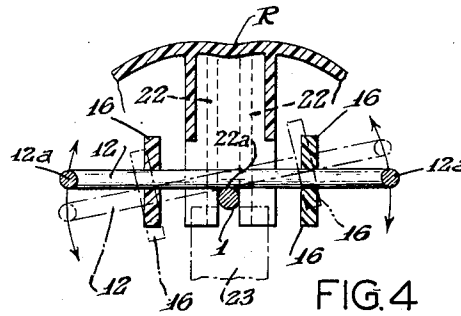


FIG. 4.

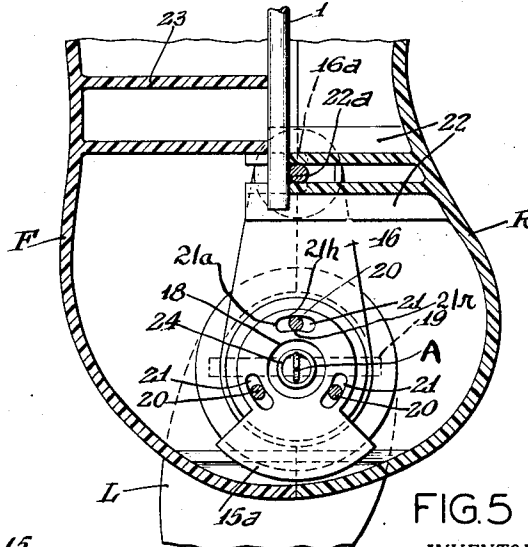


FIG. 5.

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2,786,304

WALKING DOLLS

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4 Claims. (Cl. 46—149)

This invention relates to a new and improved walking doll.

According to this invention, a walking doll is provided which is of improved and sturdy construction, and which can be manufactured and assembled at low cost.

Many other objects of this invention are disclosed in the annexed description and drawings which illustrate a preferred embodiment thereof.

Fig. 1 shows the parts of the walking mechanism separated from each other, said parts being shown in perspective.

Fig. 2 is an elevation, partially in vertical section, of the assembled doll.

Fig. 3 is a horizontal lateral section on the line 3—3 of Fig. 2.

Fig. 4 is a horizontal lateral section on the line 4—4 of Fig. 2.

Fig. 5 is a transverse vertical section on the line 5—5 of Fig. 2.

Fig. 6 is a lateral vertical section on the line 6—6 of Fig. 3.

The drawings are substantially to scale, and show the shapes of the parts and their construction.

The doll has a rigid body B which consists of a front half F, and a rear half R. These parts may be of any suitable rigid material, and they are fixed to each other in the assembly by conventional means, which are not specifically described.

The doll also has a hollow head H, and hollow legs L. This head H and this legs L are made of material which is stretchable and elastic and resilient.

The walking mechanism comprises a vertical rigid rod 1 which can be made of metal or other suitable material. This rod 1 is turnable about its longitudinal axis, in unison with the head H.

The head H has a selected normal shape when it is out of the assembly.

At its lower end, the head H is laterally expanded in the assembly or enlarged from said normal shape, so that the expanded lower end of head H is firmly clamped by its elasticity and friction to a rigid plug 6. This plug 6 is of one-piece construction. It may be made from a single piece of metal or other material.

This plug 6 has a central hollow cylindrical wall 6f. Beginning at the top of said wall 6f, plug 6 has a dome-shaped flange 7. Plug 6 also has an upper peripheral wall 6a—6b, and a bottom peripheral wall 6c, between which an annular shoulder is provided. Spaced radial reinforcing ribs 11 connect cylindrical wall 6f and flange 7 to the inner face of said upper peripheral wall 6a—6b.

The upper peripheral wall 6a—6b is downwardly tapered. In this embodiment, said upper peripheral wall 6a—6b is frusto-conical. Its lower end is of smaller diameter than its upper end.

Lower peripheral wall 6c is frusto-conical in this embodiment, with its lower end of greater diameter than its upper end.

The bottom wall of plug 6, which extends from the bot-

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tom end of central cylindrical wall 6f to the bottom end of lower peripheral wall 6c, has a shape which is shown accurately in Fig. 2. Said bottom wall of plug 6 has a planar annular shoulder adjacent the bottom end of cylindrical wall 6f. Said planar annular shoulder is in a horizontal plane which is perpendicular to the vertical axis of said cylindrical wall 6f.

In applying the lower end-part of elastic head H to plug 6, said lower end-part is laterally enlarged from normal shape. In said laterally enlarged shape, said lower end-part of head H fits tightly and frictionally with walls 6a—6b and 6c, and with the shoulder between them, so that head H is firmly frictionally clamped to plug 6 and head H turns in unison with plug 6.

A perforated supporting washer 4 is supported upon the integral projections 5 of the rod 1. One of these projections 5 is shown in Fig. 1.

A coupling 2 is seated upon the washer 4. This coupling 2 has a disc-shaped body 2a and a coupling-head 2b. This coupling-head 2b has a cylindrical peripheral wall. Said coupling member 2 also has a vertical bore 3, through which the rod 1 extends. Rod 1 may fit tightly and frictionally in bore 3, so that coupling 2 and rod 1 turn in unison.

A planar shoulder is provided between the body 2a and the coupling head 2b. In the assembly, said planar shoulder of coupling 2 abuts the corresponding annular planar shoulder of the bottom wall of plug 6, and the cylindrical wall of coupling-head 2b fits tightly and frictionally in wall 6f of plug 6. The coupling 2 may be made of material which has a high coefficient of friction so that coupling 2 and plug 6 turn in unison with rod 1. A clamping compression spring 8 clamps the plug 6 to the coupling 2.

The lower end of the compression spring 8 abuts the top edge of the cylindrical wall 6f of the plug 6. The upper end of the compression spring 8 abuts a washer 9, which is held in position at the upper end of the rod 1 by means of a lateral pin 10. The spring 8 is maintained under compression in the assembly, thus clamping the plug 6 and the coupling 2 together, so that the head H, plug 6, coupling 2 and rod 1 turn in unison.

At the lower end of the rear half R of the body, said rear half R is provided with four transverse and forwardly extending projections 22, which are of angular shape. Said projections 22 are separated by a vertical slot or recess, and also by a horizontal slot or recess 22a. The lower part 1a of rod 1 fits turnably in said vertical slot or recess.

At its said lower end 1a, the vertical rod 1 is rigidly fixed to a horizontal lateral rod 12. This lateral rod 12 has vertical arms 12a and 12b. This lateral rod 12 is always turnably located in said horizontal slot 22a.

The legs L and their mounts 14 are identical. Each hollow leg L extends through a bearing socket of the assembled body B. These bearing sockets have a common lateral axis A. Each leg L is forwardly and rearwardly turnable in its respective bearing socket around the lateral axis A. Adjacent its open upper end, each leg L is provided with a transverse rigid pin 19, which has reduced ends 19a, which are located in transversely aligned integral sockets 19b of leg L. Each leg L can be easily stretched from its original normal shape, in order to insert its pin 19.

Each leg L is clamped to a mount-head 15c—15 of a respective mount 14. The part 15c is of smaller diameter than the part 15, to provide an annular shoulder 15d.

The upper open end of each leg L is expanded from normal shape to interfit with the respective mount-head 15c—15, thus clamping the leg L frictionally to its said mount-head. As shown in Fig. 2, the inner part of the

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top edge of each leg L engages the shoulder 15*d*. The leg L is thus clamped by its elasticity and friction to the respective mount-head 15—15*c* so that each leg turns in unison around axis A with its respective mount-head, and each leg is firmly retained on its mount-head 15—15*c*.

The identical mount-heads 15*c*—15 have transversely aligned and co-axial central bores 18, through which a spring 24 extends. These bores 18 have the axis A. The spring 24 is a combination tension and torsion spring. Each end of said tension and torsion spring 24 is bent around a groove of a respective pin 19. Each mount-head 15*c*—15 also has a lateral groove 17, in which the respective pin 19 fits, thus further ensuring simultaneous transverse turning movement between each leg L and its respective mount-head 15*c*—15, in the respective bearing-socket of body B, around the common lateral axis A.

The spring 24 is always under tension in the assembly, in order to retain the pins 19 in the grooves 17. When the parts are in the normal position of Fig. 5, the spring 24 is under zero torsion.

Each part 15*c* of each mount-head 15*c*—15 has a bottom sector 15*a*, whose arcuate lower edge is concentric with the common lateral axis A of bores 18. In the assembly, these sectors 15*a* are located in a bottom recess of the assembled body B. The bottom wall of said bottom recess may have the same shape as the lower edges of sectors 15*a*, and the lower edges of sectors 15*a* may turnably and slidably abut the bottom wall of said bottom recess.

The mount-heads 15*c*—15 are held laterally spaced from each other, against the permanent tension of spring 24, by identical pins 20. In this embodiment, there are three pins 20. Each pin 20 is slightly tapered, with rounded ends. Each pin 20 is located in two laterally aligned recesses 21 of mount-heads 15*c*—15. The six recesses 21 are identical.

Each recess 21 has an inner closed end 21*m*, in which the respective rounded end of the respective pin 20 fits turnably.

Each recess 21 has side walls 21*a* which are equally tapered relative to the axis of recess 21.

As shown in Fig. 5, each recess 21 has respective arcuate walls 21*h* and 21*r*, which are concentric with axis A. As also shown in Fig. 5, the radial distance between walls 21*h* and 21*r* is substantially equal to the thickness of the body of pin 20. Hence each pin 20 can pivot at the closed inner recess 21*m*, to shift from its median normal position of Fig. 5, to abut either of the side-walls 21*a*.

Fig. 6 also shows the normal position of each pin 20, relative to its respective transversely aligned recesses 21.

Hence each recess 21 has the general shape of a wedge, which has arcuate opposed walls 21*h* and 21*r*.

Each mount 14 also has an arm 16 which has a vertically elongated slot 16*a*. The width of slot 16*a* is substantially equal to the thickness or diameter of cylindrical rod 12.

The arms 16 can be easily assembled with rod 12, by inserting extension 12*b* or 12*a* through a respective elongated slot 16*a*.

The front half F of body B is provided with an integral forwardly-extending hollow projection 23, which has a vertical planar edge-wall. In the assembly, the lower part 1*a* of rod 1 turnably abuts said vertical planar edge-wall, as shown in Fig. 4.

Fig. 2 shows the normal positions of the legs L, in which the longitudinal axis of each leg is parallel to each other and vertical. When legs L are in said normal positions, rod 1 and arms 16 are in their normal full-line positions of Fig. 4, and the pins 20 are in their normal positions of Fig. 5 and Fig. 6, in which the axis of each pin 20 is coincident with the axes of the two respective recesses 21.

If one of the legs L is turned around axis A from the normal position, the respective arm 16 is simultaneously turned around axis A, thus simultaneously turning rod 12 around the axis of rod 1 from the normal full-line posi-

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tion of rod 12, and thus simultaneously and equally turning said leg L, rod 12, rod 1, coupling 2, plug 6 and doll-head H.

The arm 16 of the other leg L and said other leg L are simultaneously equally turned around axis A. The legs L are thus simultaneously turned reversely, through equal angles. A part of the rod 12 is always located in recess 22*a*.

As above noted, spring 24 is under permanent tension, but it is under zero torsion when the parts are in their normal positions of Fig. 5.

When the legs L are thus turned in opposed directions around axis A, the respective mount-heads 15*c*—15 are also simultaneously turned in opposed directions around axis A, thus subjecting spring 24 to torsion, so that the torsion of spring 24 yieldingly biases the parts to return to their normal positions of Fig. 5.

When the mount-heads 15*c*—15 are thus turned reversely through a selected angle, which is determined by the angle between side-walls 21*a* of recess 21, each pin 20 abuts a respective pair of opposed side-walls 21*a* of the respective recesses 21, such as the side-walls 21*a* which are marked in Fig. 6.

The pins 20 then act as stop-pins, to limit further opposed turning movement of the mount-heads 15*c*—15.

The entire walking mechanism can be pre-assembled, then initially assembled with the rear half R of the doll-body, and the front-half F can then be fixed to said rear half R.

It is clear that the improved walking mechanism is made of a minimum number of identical parts, which can be manufactured and assembled at low cost.

The broken-line positions of rod 12 and arms 16 in Fig. 4, illustrate their respective extreme positions at the end of a turning movement of rod 12 in one direction. The angle through which rod 12 is turned from its normal full-line position to either extreme position, is controlled by the stop action of pins 20. The bores 18 remain coaxial when rod 12 is turned from its normal full-line position of Fig. 4, so that the common axis of bores 18 is always parallel to the axis of rod 12.

The entire walking mechanism can be pre-assembled, and said pre-assembled walking mechanism can be initially assembled with the rear-half R, which has half-sockets for the legs L. The front half F can then be fixed to the rear half R.

The doll is given its walking movement in the usual manner. The body B is tilted to one side, so that the foot of one leg L is initially on the ground or other support, while the foot of the other leg L is above the support. The tilted body B is then pushed forwardly, as one example, thus tilting the first-mentioned supported leg rearwardly relative to body B, and simultaneously equally tilting the second-mentioned unsupported leg forwardly relative to body B. This relative tilt of the legs L around axis A is limited by pins 20. The spring 24 is thus subjected to torsion. The body B is then tilted to the other side, so that the foot of the forwardly tilted leg is on the ground and the foot of the rearwardly tilted leg is above the ground. The torsion of spring 24 then snaps the released, rearwardly tilted leg to the vertical position and also beyond the vertical position to the forwardly tilted position, due to the momentum of the released leg and the walking mechanism. Hence, by tilting the body B from side to side and pushing body B either forwardly or rearwardly, the legs L are given a walking movement.

A preferred embodiment of this invention has been described, but numerous changes and omissions and additions and substitutions can be made without departing from the scope of the invention, as defined in the appended claims, which are also a part of the disclosure herein.

Thus, the preferred embodiment shows a single spring 24 which acts both as a tension spring and a torsion

spring. However, this single spring can be replaced by separate tension and torsion springs.

For convenience, the parts of the walking mechanism are identified with respect to the vertical position of body B. The vertical direction is defined as the longitudinal direction. Thus, the rod 1, which primarily serves as a pivot for rod 12, is designated as a vertical rod or as a longitudinal rod. The rod 12 is designated as a lateral rod or as a horizontal rod. The invention also includes the sub-combinations disclosed herein. Thus, if desired, the simultaneous movement of head H and legs L may be omitted, and the rod 12 may be mounted or located in any manner, to be turnable relative to body B around a vertical or longitudinal axis.

Instead of having a flat annular shoulder between the body 2a and the head 2b of coupling 2, said entire coupling 2 can be dome-shaped to interfit frictionally with the inverted dome-shaped flange 7 of the neck-plug 6, thus providing a limited universal joint between neck-plug 2 and flange 7, to permit tilting of head H in any direction.

It is known in prior devices, to provide each mount head 15 with a supplemental groove which is perpendicular to groove 17, so that pin 19 can be snapped into such supplemental groove, to provide a sitting position of the doll.

One of the important sub-combinations is the sub-combination of the pins 20 and the tapered recesses 21, thus providing combination spacing and stop means and also providing easy relative turning movement between the legs. The invention includes this sub-combination, irrespective of the other features disclosed herein.

I claim:

1. Doll walking-mechanism which has the sub-combination of two mount-heads which are reversely turnable relative to each other around a common axis, said mount-heads having recesses which are parallel to said axis, said recesses being arranged in pairs, said recesses having closed inner ends and having mouths, said mouths being at the adjacent faces of said heads, said recesses having recess-axes, said recesses having side walls which are inclined to their recess-axes so that each mouth is wider than the respective inner end, each recess also having opposed walls which are substantially concentric with said common axis, each recess being spaced radially from said common axis, each pair of recesses bearing an intermediate rigid member whose ends fit turnably in the closed inner ends of said recesses, each intermediate member being of less width than the mouth of the recess

so that each intermediate member can tilt relative to the respective pair of recesses.

2. In a walking doll construction, a doll body having a lower end provided with laterally aligned socket openings, a pair of leg members rotatably socketed at their upper ends in the openings, a mount-head secured to the socketed portion of each leg member, said mount-heads being reversely turnable relative to each other around a common axis and being disposed in side by side spaced relation, means connecting the mount-heads for simultaneous reverse turning movement and including spring means biasing them toward each other and being actuated by the turning movement of the mount-heads to return them to normal positions, said mount-heads having confronting spaced apart faces, said faces having recesses formed concentrically of the turning axis of the mount-heads and having closed inner ends and open mouths, said mouths being wider than the inner ends and the recesses having opposing side walls tapered from the mouths towards the inner ends, said recesses in the one face confronting the recesses in the other face, rigid pins having opposing ends disposed in the recesses and bearing against the inner ends thereof, said pins spacing the mount-heads apart against the urging of the spring means and defining, with the recesses, stop means to limit the opposing turning movements of the mount-heads while providing easy relative turning movement therebetween.

3. A walking doll construction as claimed in claim 2, wherein said mount-heads have outer end portions and inner end portions, said inner end portions being coaxially reduced to define a peripheral shoulder portion, said leg members having elastic open upper ends in which the outer end portions of the mount-heads are socketed with a portion of the end of the leg members being fitted over the shoulder portions to assist in holding the mount-heads in the upper ends of the leg members.

4. A walking doll construction as claimed in claim 3, wherein the doll body has an arcuate lower end, and each of said mount-heads at their inner end portions have depending bearing plates of sector shape, said plates turnably and slidably abutting the wall of said lower end of the doll body.

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