Sept. 8, 1964 LIU HONG ONG 3,147,566

MECHANICAL DOLL

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Fig. 1

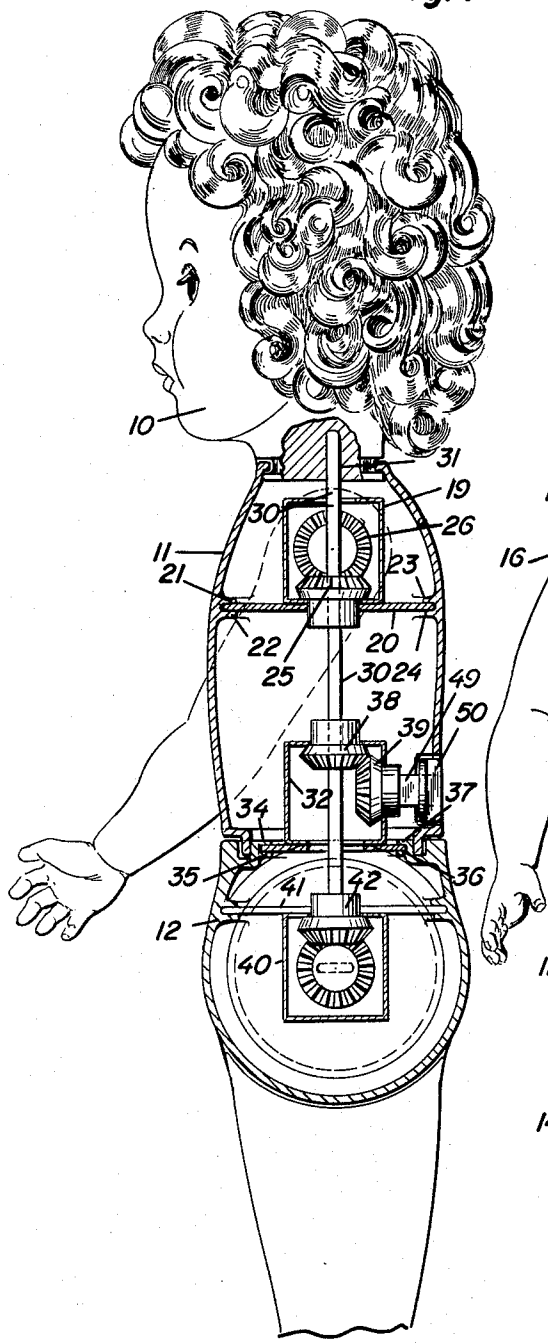
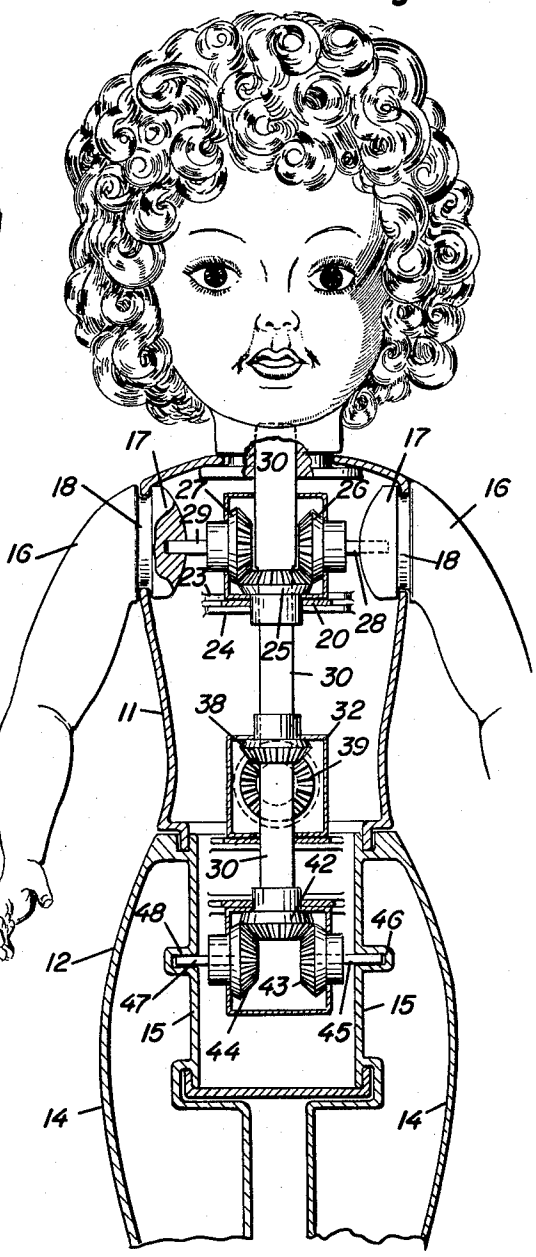


Fig. 2



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Fig. 3

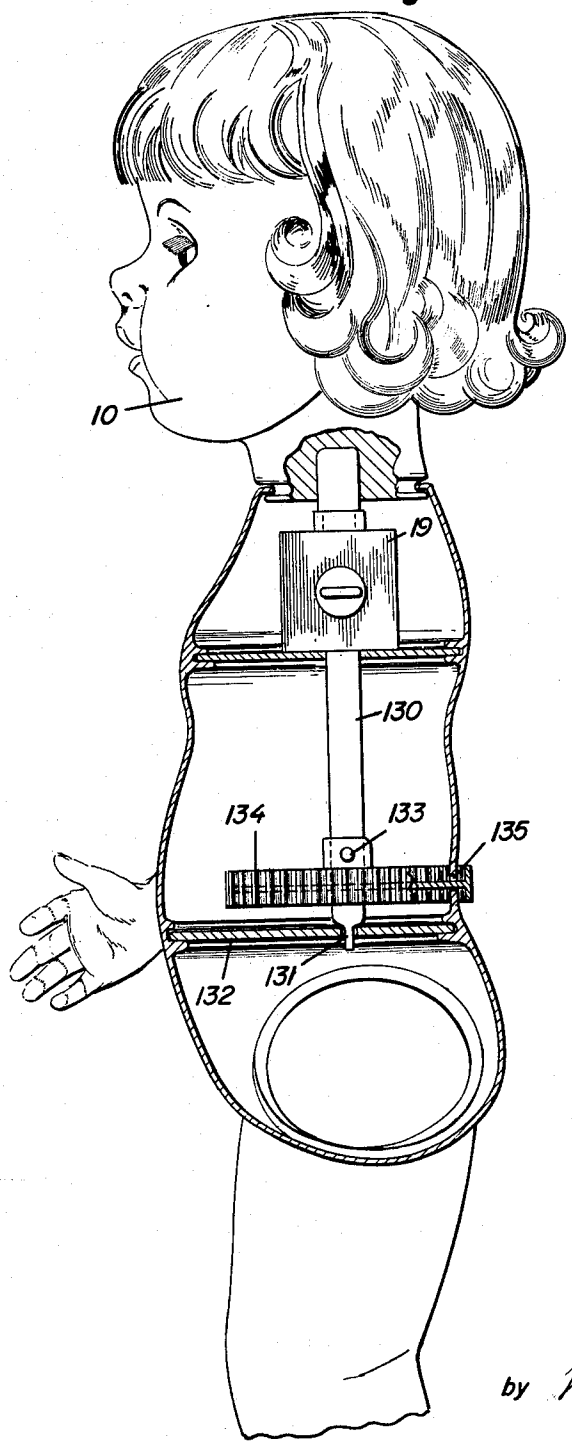


Fig. 4

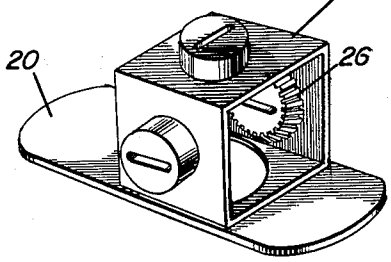


Fig. 5

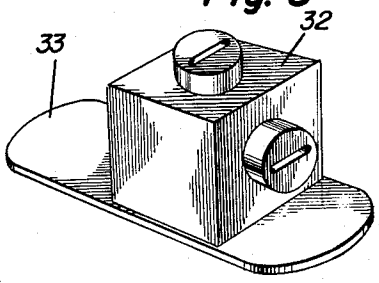
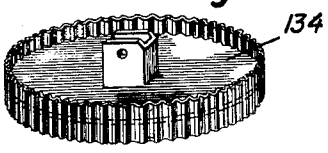


Fig. 6



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MECHANICAL DOLL

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5 Claims. (Cl. 46—149)

This invention relates to mechanical dolls.

It is an object of the present invention to provide a mechanical doll having a head and arms which are movable by means of a novel actuating mechanism.

A further object of the invention is to provide a mechanical doll having a movable head and movable arms, in which an actuator is mounted on or in the body of the doll and mechanical means are arranged within the doll to interconnect the actuator to effect rotary movement of the head and simultaneous swinging movement of the arms.

A further object of the invention is to provide a mechanical interconnection between the various parts so that movement of the head can also be effected to cause swinging of the arms, and vice versa.

A still further object of the invention is to provide a mechanical doll which in addition to a movable head and movable arms has movable legs which are so interconnected that the actuator will simultaneously effect a rotary movement of the head, a swinging movement of the arms and a swinging movement of the legs.

A still further object of the invention is to provide a doll which may be molded from suitable plastic material and the actuating mechanism for the various elements may be formed from metal or from a suitably robust plastic material.

A still further object of the invention is to provide a construction of the actuating mechanism wherein strips of metal are used to bring about the oscillating motions.

With the above and other objects in view which will become apparent from the description below, some preferred forms of the invention are shown in the drawings in which:

FIGURE 1 is a partial side elevational view with parts shown in cross section illustrating one form of the invention wherein the actuating mechanism conveys a movement to the head, the arms and the legs.

FIGURE 2 is a similar front elevational view of the construction shown in FIGURE 1 with the cross-sectional parts taken at right angles to such parts shown in FIGURE 1.

FIGURE 3 is a side elevational view of a modification wherein only the head and arms are movable.

FIGURE 4 is a perspective view of the cage supported at the upper portion of the abdomen of the doll to which the actuating rods for the head and arms are connected.

FIGURE 5 is a perspective view of the cage for the actuating parts located at the center portion of the abdomen of the doll and

FIGURE 6 is a perspective view of the controlling wheels used in the modification of FIGURE 3.

Referring to FIGURES 1 and 2, the head **10** is rotatably mounted in the hollow plastic body **11** and secured to the lower portion of the body **11** is the leg assembly **12** wherein the legs **14** are swingably mounted by the circular flanges **15**. The arms **16** are also mounted within the body **11** by the inwardly directed projections **17** provided with a groove **18** so as to be rotatably mounted. The leg assembly may also rotate to a slight extent relative to the body portion **11** by means of the construction shown.

The actuating mechanism for the head, arms and legs comprises a cage **19** at the upper portion of the abdomen shown particularly in FIGURE 4. The cage **19** is supported by a horizontal plate **20** which is seated at the front of the doll between the spaced ribs **21** and **22** and at the back of the doll between the spaced ribs **23** and **24**. Extending through the plate **20** and the bottom of the cage **19** which is not shown in FIGURE 4, is a bevel gear **25**. The bevel gear **25** meshes with the bevel gears **26** and **27** located rotatably within the cage **19** at the sides thereof and connected to the bevel gear **26** is a flat actuating arm **28** for rotating the left arm of the doll and connected to the bevel gear **27** is a flat strip **29** for actuating the right arm of the doll in opposite direction. The strips **28** and **29** are seated within rectangular recesses provided within the projections **17** of the arms. A strip **30** of flat metal extends from recess **31** provided in the neck of the head of the doll and this strip **70** extends downwardly through the cage **19** between the bevel gears **26** and **27** and then through a rectangular recess provided in the bevel gear **25** to the operating assembly within the cage **32** located at approximately the center of the doll. The assembly cage **32** is mounted upon a flat strip **33** as shown in FIGURE 5. The strip **33** is seated between the projecting ribs **34** and **35** and at the rear between the ribs **36** and **37**. Rotatably mounted within the cage **32** is the bevel gear **38** which meshes with the bevel gear **39** through which the strip **30** passes and then extends through the bottom thereof and through a recess provided in the plate **33** to the lower operating cage **40**. The cage **40** is secured to a plate **41** which is mounted similarly to the plates **33** and **20** between projecting ribs provided at the front and rear. The lower cage **40** has mounted therein a bevel gear **42** which is secured to the operating strip **30** and meshing with such bevel gear are the bevel gears **43** and **44**. Connected to the bevel gear **43** is a strip **45** whose free end is located within a recess **46** provided in the left leg **14** of the doll. Connected to the bevel gear **44** is a flat strip **47** which has its free end located within a rectangular socket **48** provided in the right leg **14**.

The bevel gear **39** located within the cage **32** is connected to a flat strip **49** which extends rearwardly and has connected therewith an operating knob **50**. The knob **50** is preferably located within a recess provided at the back of the doll.

When the knob **50** is manually operated then the actuating strip **30** will be rotated thereby rotating the bevel gears **25**, **38** and **42**. A rotation of the bar or strip **30** will cause a rotation of the head and at the same time there will take place, due to the gears **26** and **27** a swinging of the arms in opposite directions and due to the gears **43** and **44** a swinging of the legs in opposite directions.

If it is not desired to have the legs also swing in unison with the arms and head then the actuating rod **30** may be terminated within the cage **32** and the lower part of the actuating mechanism may be eliminated. In other words, if it is desired to merely bring about a motion of the head and arms alone it is only necessary to eliminate the actuating elements below the cage **32** and such a construction may be obtained.

In FIGURE 3 the modification shows a construction wherein the head and arms only are oscillated. In this construction the entire upper portion including the cage **19** is similar to the construction shown in FIGURES 1 and 2 but instead of the arm **30** extending through the actuating mechanism such as shown associated with the cage **32** the rod **130** terminates at the mid-section of the doll and has a pointed end **131** located in a slot provided in the plate **132**. Fixed to the rod **130** by a set screw **133** is a relatively large controlling wheel **134** having milled edges and such wheel at its periphery extends through a notch **135** provided at the rear of the doll. In this con-

struction only the head and arms of the doll will be actuated and the operation thereof takes place by merely manually rotating to one side or the other the milled wheel 134 where it projects from the back of the doll.

It is thought that the invention and its advantages will be understood from the foregoing description and it is apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing its material advantages, the forms hereinbefore described and illustrated in the drawings being merely preferred embodiments thereof.

I claim:

1. A doll comprising a hollow body portion, a head rotatably mounted on said body portion, a pair of arms rotatably mounted on said body portion, an actuating strip connected to said head extending downwardly in said body portion, a housing within said body portion supported by said body portion, a first bevel gear in said housing connected to said strip, a pair of bevel gears meshing with said first bevel gear in said housing connected to said arms, a second bevel gear fixed to said strip below said first bevel gear and manually operated means including a bevel gear meshing with said second bevel gear for oscillating said strip and thereby said gears within said housing to oscillate said head and arms.

2. A doll comprising a hollow body portion, a head rotatably mounted on said body portion, a pair of arms rotatably mounted on said body portion, an actuating strip connected to said head extending downwardly in said body portion, a housing within said body portion supported by said body portion, a first bevel gear in said housing connected to said strip, a pair of bevel gears meshing with said first bevel gear in said housing connected to said arms, a second housing in said body portion located below said first housing supported by said body portion, a second bevel gear in said second housing connected to said strip, a third bevel gear in said second housing meshing with said second bevel gear and manually operated means extending to the exterior of said body portion connected to said third bevel gear for moving said head and arms.

3. A doll comprising a hollow body portion, a head rotatably mounted on said body portion, a pair of arms rotatably mounted on said body portion, an actuating strip connected to said head extending downwardly in said body portion, a housing within said body portion supported by said body portion, a first bevel gear is said housing connected to said strip, a pair of bevel gears meshing with said first bevel gear in said housing connected to said arms, a second housing in said body portion located below said first housing supported by said body portion, a second bevel gear in said second housing connected to said strip, a third bevel gear in said second housing meshing with said second bevel gear, a pair of legs rotatably mounted on said body portion, a third housing mounted below said second housing, a fourth bevel gear mounted within said third housing connected to said strip, a pair of bevel gears within said third housing meshing with said fourth bevel gear connected to said legs, manually operated means extending to the exterior of said body portion connected to said second bevel gear for moving said head and arms and legs.

4. A doll comprising a hollow body portion, a head rotatably mounted on said body portion, a pair of arms rotatably mounted on said body portion, an actuating strip connected to said head extending downwardly in said body portion, gear means connecting said strip to said arms and a controlling wheel connected to said strip having a portion of its periphery extending to the exterior of said body portion for manually oscillating said strip and thereby said arms and head.

5. A doll comprising a hollow body portion, a head rotatably mounted on said body portion, a pair of arms rotatably mounted on said body portion, an actuating strip connected to said head extending downwardly in said body portion, gear means connecting said strip to said arms and a supporting plate supported by said body portion supporting the lower end of said actuating strip, a controlling wheel connected to said strip having a portion of its periphery extending to the exterior of said body portion for manually oscillating said strip and thereby said arms and head.

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